

Farmer strategies for market orientation in ACP agriculture

Proceedings of a CTA/Teagasc/Department of Agriculture, Food and Forestry, Republic of Ireland, seminar

Actes du séminaire : les stratégies paysannes et adaptation aux marchés dans les pays ACP

Dublin, Ireland, 23–27 October 1995



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The Technical Centre for Agricultural and Rural Cooperation (CTA) was established in 1983 under the Lomé Convention between the African, Caribbean and Pacific (ACP) States and the European Union (EU) Member States. CTA's tasks are to develop and provide services that improve access to information for agricultural and rural development, and to strengthen the capacity of ACP countries to produce, acquire, exchange and utilize information in these areas. CTA's programmes are organized around three principal themes: strengthening facilities at ACP information centres, promoting contact and exchange of experience among CTA's partners, and providing information on demand.

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Foreword

Until recently, as at many international centres, the thematic focus of CTA's work was on increasing agricultural production and productivity. Lately, however, ACP national and regional priorities have shifted towards improving welfare in rural areas and increasing farmers' wealth. It is widely believed that global trade liberalization and the decentralization of ACP economies will contribute to these developmental issues by providing increased opportunities for marketing ACP food and other agricultural products.

These emerging preoccupations and opportunities explain why CTA's work has shifted progressively to include what is described today as the agri-food chain; in other words, the post-harvest handling, storage, packaging, transport, processing, marketing and trade development aspects. The purpose of this CTA-sponsored seminar was to identify the principal measures which would help to promote market orientation in ACP agriculture.

One of the key messages from the seminar was that farmers and rural people in ACP countries should attempt to identify and build links with other key players in the food chain. Only in this way can a viable, sustainable and integrated agricultural sector be created. The challenge to national policy makers in these countries is to create a framework within which farmers, and all those in the food chain, can respond to new opportunities and challenges.



Dr R.D. Cooke
Director, CTA

Summary

The main objectives of the seminar on “Farmer strategies for market orientation in ACP agriculture”, held in Dublin, Ireland in October 1995 and organized by CTA, Teagasc and the Department of Agriculture, Food and Forestry, were:

- to determine the principles and strategies that ACP farmers need to consider and adopt as market economies evolve in the developing world;
- to promote links on an international basis to encourage the sharing of experiences and knowledge in this area.

The theme of the seminar reflected the current trend among international development organizations to shift the emphasis from increasing sustainable agricultural production in developing countries to improving the quality of life for the rural people in these countries. This, in turn, reflects recent political trends towards greater decentralization, democratization, promotion of free market economies and the development of the private sector.

Welcoming addresses were given by Dr Ronald Barrow (CTA Advisory Committee member), Dr John Walsh (Head of Development Research, Teagasc), Mr Jim Flanagan (Chief Inspector, Department of Agriculture, Food and Forestry), speaking on behalf of Mr Ivan Yates TD (Hon. Minister of Agriculture, Ireland), and Dr Rodney Cooke (Director, CTA). The speakers noted that responsiveness to markets is becoming a major factor in the liberalization of agricultural markets worldwide, offering new opportunities for ACP farmers. The challenge for policymakers is to create a framework within which those involved in food production can best respond to these opportunities. For farmers in ACP countries the challenge is to establish or strengthen links not only with each other but also with suppliers, traders, processors, transporters, retailers, scientists and others in the food chain in order to benefit from the changes and contribute to creating viable agricultural economies.

The keynote address was given by Professor Helen O'Neill (Director, Centre of Development Studies, University College Dublin). Her central theme was that, against the background of declining food production and agricultural value added in many ACP countries over the past decade, agriculture should now be seen in the context of the wider economy – national, regional and global. To this end, ACP agricultural sectors need to produce food for domestic markets, to produce a surplus which could be used to finance development in the wider economy, and to produce high-quality products for national and regional industry and for export.

The lead papers, and the series of country case studies presented to the seminar, illustrated the importance of recognising that ACP countries do not constitute a homogeneous group but differ widely in terms of economy, infrastructures, demography, climate, history and culture. Devising “recipes” for market orientation would therefore be inappropriate; what is needed, instead, is a set of principles on which farmers could base strategies for developing market-oriented activities which suit their own particular conditions. This approach was elaborated upon in the three transnational reports presented to the seminar. A major theme in these reports was the need to strengthen market access and empower the weak link in the food production chain – the farmer – to take advantage of market opportunities.

After the presentations the seminar participants established three working groups and identified a set of themes for discussion:

- building relationships in marketing channels – establishing “win-win” situations;
- communications in marketing channels – market information acquisition, dissemination, use and value;
- opportunities for adding value;

- the nature of competitiveness;
- directions for research – the improvement of competitiveness and the creation of wealth;
- the education and training needs of market-oriented farmers.

Based on discussions of the seminar presentations and working group reports, the participants formulated a set of principles on which to base the development of farmer strategies for market orientation in ACP agriculture. Broadly, the first six principles relate to the characteristics of market orientation, whereas the remainder identify essential ingredients for success.

- Characteristics of market orientation
 - The goal of market orientation is to improve rural incomes and the quality of rural life.
 - Market orientation relates not only to farmers and their strategies but to all sections of the food production industry, including the service sector.
 - Competitiveness is a complex notion which may be defined as the ability to maintain a sustained and profitable presence in a given market. The extent to which real competitiveness exists depends upon the degree of subvention and the extent to which hidden costs are excluded from any appraisal.
 - The role of governments is crucial. Individuals and individual businesses can work only within the framework which policymakers create. This framework should put appropriate emphasis on the role which farmers can play.
 - The need to derive returns from the market applies to small as well as to large farms. For social, land use and other reasons, policymakers may, within their framework, provide support to small-scale farmers so as to ease the transition. This does not absolve these farmers from the responsibility of making the best of market opportunities. If they do not do this they are likely to find themselves marginalized.
 - Market orientation in the context of trade liberalization and adjustment involves seeking added value to agricultural products. This may be achieved through improved management, agronomy, storage, processing, handling and packaging at various points along the chain which the market will reward. This applies to domestic as well as export markets.
- Ingredients for successful market-oriented strategies
 - An understanding of market orientation and what it entails must be part of the education and training of all those in, and concerned with, the food chain at national, regional and international levels.
 - There is a need for research programmes and the priorities within them to reflect the market situation.
 - Effective communication within and between networks is fundamental to the development of productive relationships. This embraces not only the collection and dissemination of market information to farmers, but also the wider concept of communication.
 - It is important that policymakers and advisers should, through consultation with farmers and other trade organizations, be made aware of the potential impact of policies, and their actual impact should be monitored. This communication is crucial.
 - It is usually better to build on and improve existing structures and systems, where these are capable of appropriate adaptation, than to develop entirely new structures.
 - There is a real need to encourage the emergence of enlightened leadership in each of the different stages of the commodity chain.

The seminar concluded that fostering market orientation is a challenge that, primarily, has to be taken up by ACP governments working in collaboration with farmers and other players in the food chain. The international community, however, can help them meet this challenge by creating fora within which these issues can be discussed and analysed and by making information and advice available to as wide an audience as possible.

Résumé

Le séminaire sur le thème "Stratégies paysannes et adaptation aux marchés dans les pays ACP", organisé en octobre 1995 à Dublin (Irlande) par le CTA, l'Organisation irlandaise pour le développement agricole et l'alimentation (Teagasc) et le ministère irlandais de l'Agriculture, de l'Alimentation et des Forêts, avait un double objectif :

- dégager les principes que les producteurs des pays ACP doivent prendre en considération et les stratégies qu'il leur faut adopter face à l'expansion de l'économie de marché dans les pays en développement ;
- promouvoir les contacts à l'échelon international afin de favoriser les échanges d'expérience et de connaissances dans ce domaine.

Le thème du séminaire reflétait la tendance actuelle des organismes internationaux de développement à mettre l'accent non plus seulement sur l'accroissement durable de la production agricole, mais sur l'amélioration de la qualité de la vie des populations rurales dans les pays en développement. Cette orientation nouvelle traduit elle-même une évolution politique récente vers la décentralisation, la démocratisation, la promotion de l'économie de marché et le développement du secteur privé.

Des allocutions de bienvenue ont été prononcées par Ronald Barrow (membre du Comité consultatif du CTA), John Walsh (responsable de la recherche-développement, Teagasc), Jim Flanagan (inspecteur en chef, ministère de l'Agriculture, de l'Alimentation et des Forêts) qui représentait Ivan Yates (ministre irlandais de l'Agriculture) et Rodney Cooke (directeur du CTA). Les orateurs ont noté que la capacité de répondre aux opportunités du marché devient un facteur majeur de la libéralisation des marchés agricoles dans le monde, ce qui ouvre des perspectives nouvelles pour les producteurs des pays ACP. Le défi qui se pose aux décideurs consiste à mettre en place un cadre approprié afin de permettre aux acteurs de la production agricole de répondre de manière optimale à ces opportunités. Pour les producteurs des pays ACP, il importe d'établir ou de renforcer les relations non seulement avec les autres producteurs, mais aussi avec les fournisseurs, commerçants, transformateurs, transporteurs, détaillants, chercheurs et autres intervenants de la filière agroalimentaire afin de pouvoir tirer avantage de l'évolution en cours et de contribuer à l'établissement d'économies agricoles viables.

Dans son discours d'orientation, le professeur Helen O'Neill (directrice du Centre of Development Studies, University College, Dublin) a souligné que, compte tenu du recul de la production alimentaire et de la valeur

ajoutée de l'agriculture enregistré dans beaucoup de pays ACP au cours de la dernière décennie, il convient désormais de considérer l'agriculture dans le contexte de l'économie globale – nationale, régionale et mondiale. Dans cette perspective, le secteur agricole des pays ACP doit produire pour le marché intérieur, dégager un surplus destiné à financer le développement dans un cadre économique plus large, et fournir des produits de haute qualité pour les industries nationales et régionales et pour l'exportation.

Les communications et les études de cas présentées au séminaire ont mis en relief la nécessité de tenir compte de l'absence d'homogénéité des pays ACP. En effet, ceux-ci se caractérisent par des différences marquées sur le plan de l'économie, des infrastructures, de la démographie, du climat, du passé historique et de la culture. Plutôt que de chercher à élaborer des "recettes universelles" en matière d'orientation commerciale, il convient de définir un ensemble de principes sur lesquels les producteurs pourront s'appuyer pour définir des stratégies adaptées à leurs conditions particulières. Cette approche a été explicitée dans les trois rapports transnationaux présentés au séminaire. Ces rapports ont souligné qu'il est indispensable d'améliorer l'accès aux marchés et de donner aux producteurs – maillon faible de la filière agroalimentaire – les moyens de tirer avantage des opportunités du marché.

A l'issue des exposés, les participants se sont répartis entre trois groupes de travail qui ont approfondi la réflexion sur les thèmes suivants :

- établissement de relations dans les circuits de commercialisation – création de situations aux bénéfices équitablement répartis ;
- communication au sein des circuits de commercialisation – obtention, diffusion, utilisation et valeur des informations sur les marchés ;
- possibilités de valorisation ;
- nature de la compétitivité ;
- orientations pour la recherche – amélioration de la compétitivité et création de richesse ;
- besoins en éducation et formation pour des producteurs à orientation commerciale.

Sur la base des discussions suscitées par les exposés et les rapports des groupes de travail, les participants ont énoncé un ensemble de principes devant servir à l'élaboration de stratégies d'adaptation aux marchés dans les pays ACP. Les six premiers principes concernent les caractéristiques de l'orientation commerciale, tandis que les six derniers identifient les conditions essentielles pour la réussite du processus.

- Caractéristiques de l'orientation commerciale :
 - l'orientation commerciale a pour but d'améliorer les revenus et la qualité de la vie en milieu rural ;
 - elle concerne non seulement les producteurs et leurs stratégies, mais aussi tous les autres acteurs de la filière agroalimentaire, y compris le secteur des services ;
 - la compétitivité est une notion complexe pouvant se définir comme la capacité à maintenir une présence durable et lucrative sur un marché donné. L'existence d'une compétitivité réelle dépend de l'ampleur des subventions et des coûts masqués échappant à l'évaluation ;
 - le rôle de l'Etat est crucial. Les individus et les entreprises ne peuvent opérer que dans le cadre mis en place par les décideurs. Ce cadre doit ménager un rôle approprié aux producteurs ;

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- la nécessité de tirer un profit du marché vaut tant pour les petits que pour les gros exploitants. Pour des raisons sociales, foncières ou autres, le cadre mis en place par les décideurs peut apporter un appui aux petits producteurs afin de faciliter la transition. Cela ne dispense pas ces derniers de tirer parti des opportunités du marché, faute de quoi ils risqueraient de se trouver marginalisés ;
 - dans le contexte de la libéralisation des échanges et de l'ajustement, l'orientation commerciale suppose la valorisation des produits agricoles. Celle-ci peut être réalisée par des améliorations dans la gestion, les techniques agricoles, le stockage, la transformation, la manutention et le conditionnement aux différents stades de la filière où ces améliorations sont susceptibles d'être rentables. Cela vaut pour les marchés intérieurs aussi bien que pour les marchés d'exportation.
- Conditions requises pour le succès des stratégies d'orientation commerciale :
 - l'éducation et la formation de tous les acteurs de la filière agroalimentaire aux niveaux national, régional et international doivent leur permettre de comprendre la nature de l'orientation commerciale et les exigences posées par celle-ci ;
 - les programmes et priorités de recherche doivent refléter la situation du marché ;
 - une communication efficace entre les réseaux et à l'intérieur de ceux-ci est indispensable à l'établissement de relations productives. Cela implique non seulement la collecte d'informations sur les marchés et leur diffusion auprès des producteurs, mais aussi la communication au sens large ;
 - il importe que les décideurs et les planificateurs aient des concertations avec les organisations de producteurs et autres associations professionnelles pour évaluer l'impact potentiel des politiques, et que des mesures soient prises pour en suivre l'impact effectif. Cet aspect de la communication est essentiel ;
 - plutôt que de créer de toutes pièces de nouvelles structures, il est généralement préférable d'utiliser et de consolider les structures et systèmes existants lorsque ceux-ci sont susceptibles d'être adaptés ;
 - il convient d'encourager l'émergence de dirigeants éclairés aux différents stades de la filière agroalimentaire.

En conclusion, les participants ont estimé que la promotion de l'orientation commerciale est un défi qu'il revient principalement aux gouvernements des pays ACP de relever en collaboration avec les producteurs et autres acteurs de la filière agroalimentaire. Toutefois, la communauté internationale peut apporter un appui substantiel à ce processus en créant des forums pour faciliter les débats et analyses, et en mettant des informations et des conseils à la disposition d'une audience aussi large que possible.

KEYNOTE ADDRESS

Promoting sustainable national development through enhanced linkages between the agricultural and industrial sectors

H. O'Neill

Director, Centre for Development Studies, University College Dublin

The African, Caribbean and Pacific (ACP) countries are facing significant challenges in their search for sustainable models of national development. The industrial sector plays a very important role in this process but, in contrast to the 1960s and 1970s, agriculture and the rural economy are now also recognised as crucial sectors in the national development effort. Of particular importance is the linkage between the two. Strong backward and forward linkages between the agricultural and industrial sectors, and more generally between the rural and urban economies, are essential mechanisms for sustainable development at the national level.

In many ACP countries, due to a range of internal and external factors, the agricultural sector is not performing well. Food production per capita was lower in 1992 than it had been in the 1979–81 period in no fewer than 43 out of 59 ACP countries. Moreover, agricultural value added had declined in 10 ACP countries, including a number of the larger economies. Indeed, total value added within the group was lower in 1993 than it had been in 1980. And 33 countries displayed a trend of increasing reliance on cereal imports to meet domestic demand.

In examining the role of agriculture within the wider national economy of any developing country, we can define four main goals for the sector. These are:

- producing food for local consumption;
- producing a surplus which can be used to finance development of the wider national economy;
- producing high-quality inputs for the industrial sector;
- producing outputs for export.

It is appropriate to examine each of these in turn in order to identify the ways in which linkages between these separate activities can be used to enhance development of the national economy.

Producing food for local consumption

Not every developing country is capable of growing enough food to satisfy local needs. Food security can be attained in some countries through exports of some stable product – such as oil or minerals – and the resulting foreign exchange earnings used to import food to meet local requirements. But such countries are in the minority.

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Most ACP countries are capable of attaining food security by growing more food domestically and growing it more efficiently than they do at present. Thus, for most ACP countries, producing food for local consumption is the most important activity within the agricultural sector.

Policy-makers need to address two related issues: the quantity issue (the level of food production) and the quality issue. Both are affected by low productivity which characterizes much of ACP agriculture. Low productivity, in turn, can result from a wide range of factors, including inappropriate land tenure systems, adverse climatic conditions, pests, the quality and availability of inputs, lack of credit and training (especially for women farmers), poor storage facilities, and unsupportive macro-economic policies at the national level.

Low levels of productivity in ACP agriculture are particularly reflective of the neglect of the important role that women play within the sector, and within the wider rural economy generally. They do most of the work on the farm; they raise the children; and they have important community responsibilities. Additionally, in some ACP countries they have to undertake the back-breaking task of carrying water every day. In spite of the key role they play in the rural areas, women are often excluded when it comes to the dissemination of innovations and technical expertise through extension services. As a result, there is a gap in the transfer of technology to an important cadre of farm workers and this could explain the failure of productivity to improve despite the development of extension services. Moreover, there are too few women extension workers in many countries.

In the design of macro-economic policies at national level, the terms of trade between the rural and urban sectors needs to be addressed. Low farm-gate prices discourage farmers from increasing food output. Historically, because of the greater political clout of urban populations, food prices have been kept low. But, paradoxically, this has tended to produce a perverse result – indeed, the very opposite from that intended. If incentives in the form of higher agricultural prices were offered to farmers, they would be encouraged to produce more, and this would cause prices to fall. Both rural and urban producers and consumers would benefit from such an outcome.

Finally, under the heading of food production, the question must be asked as to whether there is sufficient research being carried out on food crops of interest to ACP countries. Undoubtedly, many improvements have been experienced in terms of both quantity and quality of output of crops such as wheat, rice and maize. But much research remains to be done into ways of improving the output of sorghum and millet and the other food crops which form the staple diet of many people in ACP countries.

Producing a surplus to finance development of the national economy

A productive and profitable agricultural sector produces a surplus over and above the immediate subsistence needs of the population. Part of this surplus can be “taxed” away to finance development of the wider national economy through promotion of industrial development, building of infrastructural facilities, and provision of social and economic services. This is self-evident. Agriculture itself, however, also requires continuous re-investment. Its neglect in the 1960s and 1970s is the cause of much of the low productivity in agriculture and the poor quality of social services in rural areas today. A rule of thumb would suggest that for every dollar invested in the industrial sector and the urban economy, at least another dollar should be invested in agriculture and the rural areas. Such an investment approach would also help to maintain populations in rural areas and slow down rural-urban migration.

It is very important to leave a sufficiently large part of the agricultural surplus within the rural community in order to provide it with effective demand for the outputs of the industrial sector, both in terms of consumer goods and productive inputs such as tools, machinery and seeds. In this way, rising incomes in the rural areas would promote development of the industrial sector.

Providing high-quality inputs for the industrial sector

In addition to providing demand for industrial outputs, the rural economy is also linked to the industrial sector by virtue of its provision to that sector of many inputs which are then processed into final goods. It is vital to add value to agricultural output through processing. Some processing units – that is, industrial enterprises – can be located in rural areas. This is especially true in the case of small-scale food-processing. Large-scale food processing, however, and the processing of non-agricultural products – wood into furniture, sand and clay into ceramics and building materials, and hard and soft fibres into textiles, clothing and floor coverings – are normally located in urban areas where demand is greater.

Packaging is another significant sub-sector of industry. It is important not only to the domestic market but also in the provision of containers and covering for export products. Production of packaging materials can utilize raw materials that are indigenous to many ACP countries, such as sisal and kenaf. These materials also have the advantage of being more environmentally friendly than man-made packaging materials which are not biodegradable. The production of packaging materials from locally grown raw materials creates valuable backward linkages to the rural economy – and jobs in both sectors.

In many ACP countries today, policy-makers are promoting an approach to industrialisation called resource-based industrialisation (RBI) which focuses on the processing of indigenous raw materials. This can be contrasted to the older policy of import-substitution industrialisation (ISI) which was practised in the 1960s and 1970s and which paradoxically increased rather than reduced the demand for imports because many of the ISI industries had to import their raw materials from other countries.

Under the RBI approach, which emphasizes linkages between the agricultural and industrial sectors, flows of raw materials from agriculture to industry are mirrored by flows of seeds, agricultural tools and equipment, spare parts and consumer goods in the opposite direction back from the urban areas to the rural economy.

Thus, by providing the rural population with high-quality inputs (such as food crops, hard and soft fibres, wood and clay) for processing (into processed foods, floor coverings, textiles and clothing, packaging, furniture and ceramics), a vibrant rural economy is created which helps to promote development of the industrial sector. In turn, industrial prosperity will increase the demand for agricultural outputs, and the resulting growth of incomes in the rural areas promotes demand for the outputs of industry. These two-way linkages between the rural and urban economies promote the development of both sectors, and thus promote sustainable development of the national economy.

Producing output for export markets

It is clear that the contribution to national development made by agricultural exports and the foreign exchange they earn will be greater if value is first added through processing. Production for export, however, should not be at the expense of food security which should be accorded first priority in ACP countries. Indeed, if a hierarchy of markets were to be drawn up, it might look like this for most ACP countries today:

- domestic markets (to promote national food security and RBI);
- regional markets (to promote economies of scale through market widening; these exports are often promoted within formal regional integration schemes);
- global markets (to enhance hard currency earnings and facilitate the importation of goods not yet capable of being economically produced in the ACP country.)

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Regional integration schemes among ACP countries have had mixed results to date. Very often, there are too many countries in the grouping, they are too disparate, and most of them produce similar products from the agricultural sector. In order to gain a competitive edge in regional markets, and even more so in global markets, an individual ACP country may need to take its product further along the processing line and package it to a high standard. Other factors which constrain regional integration schemes include poor communications, over-bureaucratic customs procedures and inconvertible currencies. In many cases, in order to trade with neighbouring ACP countries, it is necessary first to export to the European Union or other industrialised areas of the world economy to earn the hard currency which is demanded in other ACP countries for their products. This underlines the need for more effective linkages among ACP countries – a topic for another day.

PART 1
Lead papers

1.1

Du producteur au consommateur

A. Leplaideur (CIRAD-CA)

Dans un passé encore assez récent, les opérateurs agricoles intervenant auprès des paysans des pays tropicaux ACP focalisaient leurs interventions sur la seule fonction de la production agricole. Il s'agissait d'améliorer la production existante à partir de l'introduction d'innovations telles que de nouvelles semences, des engrais, des produits de traitement et de nouveaux outils de travail du sol. Ces éléments combinés donnaient des modèles multiformes de nouveaux systèmes de culture à promouvoir en milieu rural. L'acceptation par les paysans était la mieux réussie quand on avait pris soin de les associer dès le début de la conception des nouveaux systèmes de culture ou/et quand un projet de vulgarisation amenait aux paysans les moyens de réaliser leur mutation technique (réseaux de crédit, de distribution d'intrants, etc.).

Il faut aussi reconnaître que les financiers de la recherche, de la vulgarisation et des projets de développement ont historiquement privilégié les aides aux cultures d'exportation (café, cacao, arachide, coton, huile de palme, caoutchouc) ou aux cultures ayant un marché mondial établi (maïs, riz, etc.).

Les projections démographiques dans les pays ACP ont ensuite montré un accroissement urbain plus rapide que celui du monde rural. Si ces pays ne veulent pas accroître leur dépendance alimentaire, leurs espaces ruraux doivent augmenter leurs ventes de denrées vivrières vers les villes. Nous souhaitons montrer ici comment ce nouveau thème de "nourrir les villes" induit une nouvelle évolution des programmes de recherche et développement sur les cultures vivrières. En effet, il ne s'agit plus de ne s'intéresser qu'à la production, mais à une production finalisée vers des consommateurs spatialement identifiés. Outre les actions sur la production, il faut alors ajouter la connaissance et l'amélioration des réseaux marchands liant les campagnes aux villes.

Pour illustrer ce processus, je prendrai ici l'exemple de la lente mutation en train de s'opérer au sein de l'institution de recherche appliquée à laquelle j'appartiens, le CIRAD, et principalement son département des cultures vivrières.

L'évolution constatée dans les approches en recherches agronomiques tropicales orientées vers le développement peut se schématiser en trois stades qui associèrent dans leurs parcours au moins agronomes et économistes.

Etablies sur la foi dans le modernisme, les premières démarches pensèrent que l'accroissement des performances productives des pays tropicaux pouvait se résoudre par le simple transfert, adapté, de techniques. Dans le domaine de la production agricole, cela se traduisit par la mise en place de réseaux de stations d'expérimentation où étaient analysées les meilleures combinaisons et les meilleures gestions techniques entre la plante (les variétés), le sol (son travail, le maintien de sa fertilité) et l'eau (maîtrise des apports). La dominance des agronomes dans cette démarche fit qu'on aboutit souvent à proposer des modèles de culture qui étaient uniquement fondés sur l'optimum technique : la combinaison des meilleures variétés avec les meilleurs produits (engrais, pesticides, insecticides, herbicides) et les meilleurs travaux du sol était essentiellement jugée sur le critère des rendements par hectare qui, dans les conditions de l'expérimentation, s'avéraient toujours plus élevés que ceux obtenus chez les "clients potentiels", les paysans.

Les microéconomistes “comptables” relevèrent très vite les limites de ce type de raisonnement. Ils insistèrent sur le fait qu’un paysan qui souhaitait appliquer ces techniques n’avait pas essentiellement une âme d’agronome. Il poursuivait un objectif économique qui lui imposait au moins de prendre en compte le coût de l’opération et la marge qu’il pouvait en retirer. Dans les calculs sur les résultats expérimentaux furent alors ajoutés les éléments sur les coûts et les marges attendues. On introduisit ainsi pour la première fois la notion du prix sur le marché des facteurs et des cultures produites. Chaque station expérimentale put proposer ses résultats sous forme d’une “série d’innovations potentielles” présentées en termes de rendement escompté, de coûts nécessaires à investir et de marge potentielle espérée. Les analyses les plus évoluées en la matière distinguèrent d’ailleurs deux types de marges : la première était ramenée à l’hectare ; la seconde était ramenée à la journée de travail. Beaucoup d’économistes avaient en effet remarqué que les paysanneries auxquelles ils destinaient ces innovations privilégiaient cet indicateur dans leur jugement.

Grâce à cette nouvelle démarche, les stations proposèrent des innovations appréciées non plus seulement en termes d’optimum technique, mais en termes d’optimum économique. Cette mutation ne fut pas si aisée car elle imposa aux agronomes, les véritables inventeurs de nouveaux référentiels techniques proposables, d’accepter le principe selon lequel l’optimum technique peut être inférieur en rendement à l’optimum économique. Il est toujours agaçant pour un chercheur de devoir reconnaître que sa science n’est pas globalisante, donc ne peut tout prendre en compte. Par ailleurs, cette mutation imposait d’accroître la taille des parcelles expérimentales, du moins d’une certaine partie d’entre elles, pour pouvoir notamment estimer les coûts de certaines opérations (labour, etc.), et surtout de calculer de manière à peu près cohérente les nouveaux temps de travaux nécessaires pour le calcul des marges ramenées à la journée de travail.

Dans ces analyses, notons que les “prix de marché” étaient des données exogènes assez arbitraires, comme peut l’être la référence d’une donnée de pluie sans la compréhension du système climatique qui l’accompagne.

Malgré cette avancée, des microéconomistes, cette fois-ci “gestionnaires”, écrivirent leurs insatisfactions. Pour eux, ces approches relevaient d’une démarche comptable – résultat économique sur une plante et sur son itinéraire économique au niveau de la parcelle. Elles ne tenaient aucunement compte des décisions de gestion des clients potentiels, les paysans, qui ont à décider des meilleures combinaisons économiques pour l’ensemble de leur exploitation agricole. Celle-ci peut se définir comme une combinaison de moyens propres (terres disponibles, matériel agricole, travailleurs permanents) qu’ils doivent optimiser. Parfois même, il peut être intéressant pour eux, en termes de coût d’opportunité à un moment donné, de choisir un itinéraire technique sur une culture inférieur à l’optimum économique proposé par les chercheurs (conduite extensive, à la marge par rapport à un intensif, etc.).

Ce débat fut durement ressenti par les agronomes et bon nombre d’entre eux, dont certains encore aujourd’hui, rejetèrent cette façon de voir. Ils la définirent comme extérieure à leur science. Un argument supplémentaire en décida d’autres à relever ce défi. S’appuyant sur des théories schumpeteriennes, certains économistes avancèrent l’idée qu’une recherche appliquée devait nécessairement s’intéresser aux attentes de ses “clients”. En fait, les innovateurs sociaux réels étaient ceux qui prenaient le risque économique de l’innovation. En d’autres termes, il s’agissait des paysans. Dans ce processus, le chercheur n’était qu’un inventeur d’une technique qui, si elle n’était pas appliquée, restait du domaine du “potentiel”, mais sans impact sur la réalité. La mainmise coercitive de l’Etat dans des processus de vulgarisation descendants (recherche vers le développement) tendant à s’estomper avec l’augmentation du libéralisme, il fallait inverser le sens de la flèche et parler également de la demande sociale paysanne.

Pour se rétablir dans leurs marques agronomiques et une part de la maîtrise du processus, les agronomes “mutants” enfourchèrent alors le concept de “gestion agronomique de systèmes de culture” qui intégraient plusieurs plantes et qui s’inspiraient de ceux observés chez les paysans situés aux alentours de leurs stations. Le

thème de l'“évaluation de l'acceptation sociale des innovations” apparut, ce qui donna un nouveau dispositif expérimental ayant deux axes. Le premier était le dispositif station où les chercheurs travaillaient sur la mise au point de nouveaux systèmes de culture, agronomiquement et économiquement plus performants que ceux des paysans. Le second était constitué d'un réseau de fermes de référence où le paysan cette fois-ci était décideur de ses choix, mais où il s'était engagé à essayer certains des nouveaux systèmes de culture mis au point dans les stations. Les paysans inclus dans ce dispositif recevaient un double conseil : celui des agronomes et celui des économistes l'appuyant en “conseil de gestion”, en utilisant notamment les outils de simulation que permettait la florissante expansion de la micro-informatique.

Cette deuxième démarche eut, certes, plus de succès que les précédentes. Beaucoup de systèmes de vulgarisation s'en inspirèrent. Certains continuent à avoir une entrée privilégiée auprès des bailleurs de fonds internationaux. Toutefois, le rapprochement du contact entre chercheurs et paysans dans ces dispositifs où ils étaient considérés comme partenaires suscita un effet en retour, le fameux *feed-back*, qui réinterrogea les chercheurs sur leurs concepts et sur leurs méthodes. On peut résumer les attentes paysannes exprimées en quatre séries d'interrogations.

La première portait sur les finalités économiques de l'acte productif dans les exploitations agricoles. Il se révéla très vite que les paysans, notamment ceux qui avaient le moins de moyens, distinguaient deux objectifs économiques différenciés et non pas un seul fondé sur un profit argent global. Le premier portait sur la gestion d'un équilibre alimentaire qui devait faire disparaître pour eux la hantise de la période de soudure. Faisant peu confiance à un marché qui drainait mal les produits vers eux ou qui les vendait à des prix exorbitants à cette période, ils préféraient appuyer leur sécurité sur une autoproduction jugée prioritaire. Le simple calcul des gestionnaires, en termes de choix des cultures et des techniques, fondé sur l'optimisation des marges, n'était pas opérant car il se référait à une “théorie des prix de référence des facteurs” qui n'avait rien à voir avec la réalité. Quand il faut manger, on ne peut attendre que le produit arrive, il faut trouver la solution. Une première spécificité du marché apparut : celle de son réseau géographique, du rythme temporel des flux, des différences de prix selon les lieux et les moments, et surtout du raisonnement paysan qui le jugeait fiable ou non fiable (aléatoire) selon ses propres attentes. Cela rejoignait également ses inquiétudes sur les aléas de ses revenus pour les produits qu'il vendait, ce qui était son deuxième objectif.

La deuxième interrogation portait sur l'accès aux moyens de production nouveaux proposés par la recherche. La recherche agronomique pouvait créer de nouveaux systèmes de culture en dehors des contraintes de l'approvisionnement économique et des prix locaux. Son influence naturelle, ses réseaux internationaux d'alliance lui permettaient d'acheminer en dehors des marchés locaux conventionnels et à de faibles prix (détaxation, etc.) les nouvelles variétés, les nouveaux produits, les nouveaux matériels nécessaires à son expérimentation en station et chez les paysans de référence.

Quand ils arrêteraient leur démarche, et quels qu'en soient les attraits et succès auprès des paysans, qui prendrait la relève ? Une deuxième spécificité du marché apparut ainsi, portant sur sa structure d'organisation.

La troisième interrogation vit le jour lors de l'effort entrepris par la recherche et les institutions d'Etat pour lever l'objection mentionnée ci-dessus. Malgré les réseaux institutionnels d'approvisionnement mis en place, l'accès était socialement très différencié entre ceux qui avaient ou non l'argent et/ou les influences pour obtenir les produits et services. Par ailleurs, les dynamiques agraires créées en cas de succès révélaient une course à la terre dont l'accès n'avait alors plus rien à voir avec la libre offre du foncier dans un marché ouvert.

L'enjeu des rapports sociaux apparut, le microéconomiste gestionnaire ne suffisait plus pour comprendre ce processus et agir avec lui, et ce d'autant plus que les découvertes sur les “stratégies individuelles d'accumulation de terre hors marché et de bétail” révélèrent un troisième objectif paysan non pris en compte lors de leur analyse très gestionnaire.

Les socioéconomistes s'intéressèrent alors à l'affaire. En suivant Durkheim, puis Balandier, ils argumentèrent en disant que le fait social est toujours "plus" que le fait d'intérêt économique des séries de microcosmes individuels ajoutés les uns aux autres. Des éléments hors des seuls enjeux du marché régulaient et ordonnaient les choix individuels. Des institutions sociales arbitraient les conflits et favorisaient les alliances entre groupes sociaux. Les géographes du fait humain et des historiens, trop peu nombreux, furent invités à se joindre à ces mouvements de pensée et d'action pour apporter aux nouveaux discours les éléments sur l'espace concerné et les épaisseurs temporelles sur lesquelles se forgeaient ces pratiques.

Les économistes adeptes des théories de la répartition sociale – les néomarxistes – se joignirent à ces groupes.

Cette troisième phase de la démarche donna les plus beaux fleurons des approches francophones et anglophones en matière de systèmes agraires. Celles-ci montrèrent l'emboîtement qui existait dans les processus de passage d'un centre d'analyse fondé d'abord sur la technique, puis sur l'individu-acteur, pour s'élargir vers son insertion sociale et économique dans un village et dans une région. Fut alors mise en avant la complexité des phénomènes sociaux agissant dans un processus de développement technique régional. Les vues purement agronomiques et économiques furent jugées trop normatives, simplistes. Furent alors prônées les approches de recherche-développement participatives. Elles devaient inévitablement réaliser, avant l'expérimentation, une série de diagnostics techniques et socioéconomiques visant à déterminer les axes techniques et économiques de la "demande sociale", en précisant à quels acteurs elle était destinée. Elles demandaient également à associer systématiquement les types de paysans concernés aux expérimentations, et ce dès leur conception : expérimentation à la ferme. Les sociologues établirent une savante hiérarchie entre "thèmes techniques légers" et "thèmes techniques lourds" (en termes simples, ceux qui sont aisément acceptés car à peu de risque économique pour les paysans – exemple, une nouvelle variété – et ceux qui demandent une mutation risquée, tel un équipement lourd entraînant un fort endettement). Le degré de prise de risque potentiel des paysans fut classé en termes de "stratégies offensives" ou "stratégies défensives". Ces approches prônaient également des alliances très étroites avec les "organisations paysannes en place".

La capacité d'expertise sur le changement technico-économique passa à une aptitude à la planification régionale globale, processus qui suppose de gérer certes l'innovation technique et économique, mais aussi les mouvements et rapports sociopolitiques que le processus engendre. Partant des associations avec la base, on parla parfois de "processus démocratique de recherche". Le développement n'était plus un fait technique ou économique mais un fait social global.

A ce nouveau stade ont correspondu deux séries de critiques qui, selon certains, ont limité son efficacité, mais, pour mon avis plus optimiste, ont contribué à stimuler de nouvelles approches, notamment celle d'une meilleure connaissance, non plus seulement théorique, mais réelle des marchés.

L'entrée des sciences sociales aux côtés des agronomes apporta à ces derniers une nouvelle nécessité de redéfinir leur place et leurs méthodes. Ils avaient conscience de devoir garder une place privilégiée au centre du dispositif de création-adaptation de nouvelles techniques potentiellement attractives pour le milieu social. Ils étaient toutefois un peu perdus de voir à présent dominer les sciences et techniques de l'observation et de l'animation au détriment de celles de l'expérimentation-vérification. Si nous passons au-delà des stériles polémiques portant sur les "sciences dures" et les "sciences molles", j'émet la périlleuse tentative de restreindre cette "nouvelle affaire" à deux débats de fond plus constructifs. (Cet exercice est périlleux car les débats sont encore chaudement animés.)

La première fut de difficilement accepter la longueur et le coût de diagnostics précis, qui apportent certes de la connaissance mais, à leurs yeux de techniciens, ne font pas avancer l'impact sur et pour le développement. Cette petite aigreur pouvait se transformer en opposition houleuse, voire catégorique, quand ces sciences voulaient à

elles seules et sans techniciens, hormis de simples exécutants, relever le défi du “développement”. Voir fleurir les projets de pure organisation sociale, villageoise, où la philosophie était de mettre tout le monde en commun autour d’un enjeu trop global, peu ciblé, tendait à faire sourire ceux qui étaient armés d’humour, à faire rager ceux qui étaient encore armés de solides croyances sur les capacités révolutionnaires du progrès technique. Heureusement, il exista cependant certains terrains où méthodes du milieu naturel et du milieu humain purent s’associer. Dépassant ces procès d’intention et reconnaissant à chacun une place dans le processus de la connaissance et de l’action avec les partenaires paysans, agronomes et spécialistes des sciences sociales eurent à travailler ensemble sur les mêmes terrains. Malgré leur bonne volonté pluridisciplinaire, ils se heurtèrent à une difficulté d’une autre ampleur que le discours : celle de leurs méthodes et principalement des méthodes mathématiques, qui sont académiquement jugées essentielles pour maintenir leur renommée de “rigueur scientifique”. Dans ces approches, les sciences sociales sont les moins perturbées. Finalement pour elles, ce nouveau champ de recherche continuait à être fondé sur les méthodes d’observation qu’elles maîtrisaient déjà : les enquêtes et l’utilisation des méthodes de statistique descriptive pour en traiter et en interpréter les résultats. Tout au plus eurent-elles quelques taquineries sur leur échantillonnage, donc leur représentativité, dans un milieu d’étude il est vrai très hétérogène. La mutation était d’un tout autre ordre pour les agronomes.

Dans leur approche expérimentale (prouver par l’expérimentation), il leur faut fixer certains facteurs pour en faire varier d’autres. Les approches participatives et pluridisciplinaires aboutissent à établir des réseaux d’expérimentation et des protocoles différenciés d’expérimentation selon les demandes des paysans, qui rendent difficilement maîtrisable le processus de sélection des variables à fixer et des répétitions avec un même protocole à réaliser. Des expériences sont actuellement conduites sur ce thème et la recherche continue son travail de fourmi en la matière. De nouveaux outils apparaissent, tels les modèles associant biologie et économie, dont on attend avec espoir les résultats. Mais déjà, les processus de résolution qu’ils utilisent, fondés sur la dominance de la logique, tendent à rendre trop normatifs certains éléments pourtant déterminants : processus sociaux et agronomiques complexes.

Quoi qu’il en soit, cette troisième période des recherches appliquées au développement a accru l’efficacité des réappropriations par les paysans de nouvelles techniques, de nouvelles pratiques organisationnelles. Bizarrement, on est étonné de constater qu’elles n’ont que très marginalement intégré l’analyse des formes de l’impact des échanges marchands vivriers. Même quand leurs analyses prétendaient prendre une vocation régionale, il y eut hypertrophie des analyses sur la fonction de production, mais pas de celles sur les prix et les circuits d’échanges de biens. La raison, je pense, en est due à l’histoire de ces courants de pensée qui se préoccupèrent davantage de rechercher une coordination entre eux autour du fait agricole que d’accepter avec intérêt l’arrivée de spécialistes focalisés sur un autre champ que le leur : celui des échanges. L’espace agricole était le point de ralliement de toutes ces sciences. Il y avait risque de le disperser en considérant également un nouvel espace : celui des échanges marchands et des phénomènes urbains associés. Une autre raison semble résider dans la réticence qu’eurent les économistes, associés aux démarches agrariennes, focalisés sur l’analyse des modes de production, à avoir recours au champ des théories économiques des échanges, relevant d’une école qui reconnaît trop peu le fait du rapport social humain lié à l’échange. Des esquisses timides d’association avec l’école des économistes institutionnalistes permirent cependant ce “pointage” vers une analyse liant la recherche-développement dans les campagnes aux grands enjeux de ses effets sur l’approvisionnement des villes.

Avec une nouvelle vision, les projets ruraux de développement intégrés multi-objectifs purent trouver des projets fédérateurs autour de produits vivriers clés liant les intérêts d’autoalimentation des producteurs, leurs intérêts de recherche d’un revenu monétaire par la vente et l’attente des consommateurs urbains cherchant à se nourrir non pas seulement à partir de “nutriments” indifférenciés à moindre coût, mais de produits issus de leur campagne et rentrant dans leur conception culturelle de la gastronomie. L’idée de “filière”, concept francophone, était née. Elle s’inspirait de la recherche des liaisons entre la sphère des systèmes agricoles et celle des systèmes

commerciaux, la première plus francophone et la seconde plus anglophone. Ne pouvant réétudier et agir sur toutes les liaisons à la fois, elle sélectionnait un, deux, voire trois produits dominants ayant une forte importance sociale et économique dans les échanges. Elle regardait ensuite quels étaient les points de productivité que l'on pouvait gagner en introduisant des innovations, notamment techniques, dans chaque fonction de la filière : transformation, commerce de collecte et de distribution, production. Sur cette dernière, les agronomes avaient un rôle déterminant à jouer.

Par ces analyses, le développement rural régional échappa à sa tendance à trop autocentrer ses objectifs. Dans ses projets, la campagne acquit le droit de se fixer des objectifs de liaison avec les villes, ce qu'elle avait déjà accompli dans les faits (et depuis des temps historiques) mais pas dans les projets.

Cela a actuellement deux conséquences dans la programmation des projets de recherche-développement dans les campagnes et des enjeux que l'on soumet aux agronomes et aux "agraristes". La première est de progressivement découvrir les formes d'organisation d'un commerce, souvent présent depuis longtemps, et de reconnaître qu'il n'est pas si informel ni si anarchique que cela. Apprendre à respecter son existence et ses nécessités peut aider à mieux programmer les types d'innovations agricoles à introduire. Le marché, les prix, les réseaux d'approvisionnement et d'exhaure des produits d'une région ne sont alors plus des données mythiques (prix moyens, flux moyens) comme l'étaient l'arrivée d'une pluie et une pluviométrie moyenne, mais des données réelles (prix bord champ réel, saisonnalité des flux et des prix). De même que les analyses en agrométéorologie ont permis de faire des avancées agronomiques puis agricoles autour de la notion de risque, ces analyses sur les marchés transforment ce qui était perçu comme un aléa en un système qui a sa cohérence et avec lequel le paysan doit apprendre à négocier.

Le second enjeu consiste à reconnaître que, dans le cadre de ces échanges de marchandises entre villes et campagnes, il faut parfois essayer d'améliorer les plantes et les systèmes de culture de plantes dites auparavant "autochtones sans intérêt majeur", dont on n'avait jusqu'à présent que peu capitalisé les avantages en recherche agronomique : manioc, igname, taro, mil, sorgho, voandzou, héréré, karité, légumes feuilles plutôt que légumes fruits, coix (ou larmes de Job), anacarde.

Pour finir, et sans que cela apparaisse comme des méthodes qui vont révolutionner la science, je vous décrirai succinctement où en sont nos travaux "d'honnêtes artisans" menés dans le cadre de nos réseaux d'alliances avec des collègues des pays ACP. Je vous présente brièvement ici les principales avancées qu'a permis de faire chacun de mes collègues du CIRAD de Montpellier travaillant sur ces thèmes. Une petite note finale résume le niveau de schématisation auquel nous avons abouti à ce jour. N'y sont reproduits que les axes de méthodes opérationnelles maîtrisées pour être rapidement exécutées. Des recherches plus méthodologiques et plus théoriques continuent, notamment avec des collègues anglais et anglophones des universités de Manchester, Oxford, Sussex, Londres.

L'esprit dans lequel il nous semble devoir travailler à présent peut être énoncé en deux points auxquels il nous faut rester fidèles.

Le premier concerne ce que certains commencent à appeler la *post normal science*. C'est celle qui accepte d'être jugée non plus seulement par les pairs de sa discipline et sur son seul académisme, mais par tous les acteurs de la production qui espèrent les effets de l'innovation. Ainsi, une "pluralité" de sciences accepte la sanction de l'efficacité jugée non pas uniquement par les bailleurs de fonds, mais par les clients, agriculteurs du terrain.

Le second rejoint le premier : en face de méthodes permettant des synthèses globales à de larges échelles naturelles, macrorégionales, continentales, mondiales (systèmes d'information géographique, macroéconomie), admettre et raisonnablement tenir notre volonté d'expériences concrètes et réussies, du local. Organiser le local de manière qu'il puisse réagir et négocier sa place dans ce large univers des grandes idées et des grands enjeux. Sans ce contre-pouvoir, le local ne serait plus que l'exécutant de grands projets-gendarmes.

Quelques travaux des socioéconomistes du CIRAD-CA

A partir de janvier 1989, le département IRAT puis CIRAD-CA a entamé des travaux sur les réseaux marchands des denrées vivrières destinées à approvisionner les villes. Les principaux produits et les principaux pays concernés par ces analyses sont cités dans le tableau 1.

Les recherches sur trois des quatre produits (légumes, manioc, riz) étudient la production et les réseaux informels (commerce, transformation, transport) qui approvisionnent les villes. Des travaux sont également menés sur les quantités consommées dans les villes et les formes de cette consommation. Les recherches sur le dernier produit (maïs) s'intéressent davantage aux réseaux qui approvisionnent les industries de provenderie et les brasseries (unité de fabrication d'aliments à base de grains pour les animaux).

Pour les légumes, P. Moustier indique aux créateurs potentiels d'innovations, les agronomes, qu'il faut davantage s'intéresser aux légumes feuilles, à la tomate et à l'oignon. Le principal problème à résoudre semble être de régulariser l'approvisionnement des marchés en limitant les effets de la saisonnalité (travailler sur les variétés précoces, tardives, la production de contre-saison). Le rapport de prix entre la production et la consommation ne montre pas de marges excessives au niveau des intermédiaires, mais un coût très élevé des transports.

Pour le maïs, J.L. Fusillier montre, dans le cas de la Côte d'Ivoire, qu'une demande nouvelle de petites industries d'alimentation du bétail a entraîné une réponse spontanée du paysannat dans les années 80 (de 5 000 à 40 000 tonnes). Cette offre nouvelle s'est moins réalisée dans la région écologique où elle était attendue (la savane) que dans la zone pionnière de forêt où les réseaux "informels" et bien structurés de collecte du café et du cacao ont su s'adapter à cette nouvelle demande en stimulant les producteurs. En l'absence de schémas techniques intensifs, les producteurs ont pratiqué des systèmes extensifs issus de leurs pratiques antérieures. Dans le cas du Cameroun, Fusillier insiste sur l'existence d'une bonne dynamique de production, celle-ci étant

régulièrement collectée par les commerçants pour une revente aux brasseries et aux provenderies. Toutefois, ce réseau rencontre des difficultés pour répondre à la demande industrielle au moment de la soudure alimentaire. La constitution de stocks régulateurs améliorerait le système.

Dans le cas du manioc, D. Naire montre que le manioc et les légumes constituent les principales rentrées d'argent des paysans du Pool au Congo. Cette production est commercialisée de longue date (avant la période coloniale) et renforce encore de nos jours ses flux vers l'alimentation des deux principales villes, Brazzaville et Pointe Noire. L'évolution des formes de la demande urbaine fait passer petit à petit les modes de transformation de la "chicouange" (pain cuit de manioc) à la production de cossettes séchées pour le "foufou".

L'étude du cas du riz destiné à l'approvisionnement des villes a nécessité un dispositif de recherche particulier dans ces travaux : ce n'est pas simplement une production africaine de longue date (plus de 3 500 ans

Tableau 1. Etudes du CIRAD-CA sur les réseaux marchands des denrées vivrières

	Légumes ^a	Maïs	Manioc	Riz
Bénin				x
Cameroun	x	x	x	
Congo			x	
Côte d'Ivoire		x		
Ghana				x
Guinée-Bissau	x			
Guinée-Conakry	x			x
Madagascar				x
Mali				x
Sénégal				x
République centrafricaine				x
Thaïlande				x ^b
USA				x ^b
Vietnam				x

Note: a Ces travaux continuent au CIRAD-FLHOR depuis janvier 1994
b Dans ces pays on étudie les réseaux commerciaux à destination de l'Afrique

en Afrique de l'Ouest), mais également une denrée politico-économique de secours aux grandes capitales africaines dont la demande alimentaire excède l'offre nationale en céréales et tubercules. Elles se tournent alors vers les importations qui sont passées en Afrique de 10 % du marché mondial dans les années 60 à 25 % dans les années 80. Quatre chercheurs ont principalement travaillé sur la problématique de "nourrir les villes en riz".

H. Benz, par ses études sur les principaux pays exportateurs (USA et Thaïlande) et dans ses trois exemples africains (Bénin, Guinée-Conakry et Sénégal), a montré que le riz importé avait un pouvoir de concurrence vis-à-vis des denrées locales supérieur à celui des productions locales. Cet avantage s'appuie sur trois facteurs complémentaires des différentiels de prix entre riz locaux et riz mondiaux. Le premier est dû à l'accessibilité d'un gros tonnage centralisé (bateau) en face d'une offre nationale atomisée. En cas de pénurie urbaine imprévue, les importations sont d'autant plus utilisées que l'aide internationale a su forger de nouvelles habitudes urbaines de consommation...et qu'elles peuvent toujours intervenir de manière rapide.

Le deuxième s'explique par le tissu social que ce genre de commerce a créé. Jouant sur de gros volumes, nécessitant de grands capitaux et ayant un rôle stratégique important (paix sociale dans les villes), ce commerce a réuni autour de lui des acteurs influents très proches du pouvoir politique. Ce milieu du "politico-business" a un certain intérêt à son maintien.

Enfin, les taxes perçues sur les importations constituent une ressource parfois importante pour l'Etat qui, en termes d'analyse purement financière, peut préférer la pratique de l'importation à celle de la promotion de sa riziculture nationale, qui lui coûte souvent de l'argent par les subventions accordées.

J-F. Lecoq est parti au Vietnam pour deux ans en vue d'étudier les facteurs qui expliquent l'arrivée récente de ce pays sur le marché mondial, alors que la demande intérieure au Vietnam est encore élevée.

Dans une étude de cas sur la Guinée, historiquement rizicole depuis plus d'un millénaire, L. Pujo démontre que le sud-est de ce pays est la zone privilégiée de la riziculture guinéenne. Les réseaux informels de collecte et de transformation y ont, comme dans le cas des légumes, une bonne efficacité pour approvisionner une grande partie des zones urbaines du pays à des prix très compétitifs vis-à-vis des importations. Toutefois, cet équilibre est précaire car il est à présent concurrencé par l'aide alimentaire, et l'appareil de production national manque de nouveaux référentiels techniques pour accroître son offre en face d'une demande grandissante.

A. Leplaideur a abordé ce thème de l'approvisionnement des villes en riz dans quatre situations particulières (Ghana, Guinée, Madagascar, Mali). Il a mis en place un double appareillage d'enquête. Le premier est tourné vers l'analyse microéconomique des filières rizicoles nationales (production, collecte, transformation, consommation). Le second s'appuie sur certaines estimations macroéconomiques de la compétitivité entre les riz importés et les riz "nationaux" dans trois de ces quatre pays. Ses constats aboutissent à proposer une nouvelle relance de la riziculture en Afrique de l'Ouest qui soit davantage fondée sur les spécificités historiques et socio-économiques de sa riziculture que sur le modèle ethnocentrique développé jusqu'à présent, celui de la riziculture irriguée asiatique. Il s'étonne que plus de 90 % des aides destinées à la riziculture entre 1960 et 1985 se soient portées sur le type de production "irriguée", qui concerne 5 % des surfaces et 10 % de la production rizicole de l'Afrique de l'Ouest. Pourtant, les études économiques confirment l'absence d'avantage comparatif de cette pratique. Il préconise une relance des autres types de riziculture compétitifs (riziculture pluviale, de bas-fond, inondable, etc.), fondée sur des innovations facilement accessibles à l'ensemble des producteurs et qui amènent plus à la réduction des risques qu'à la haute performance technique.

Il insiste sur la nécessité de soutenir et de relancer certains acteurs du commerce de collecte singulièrement menacés par les réseaux établis pour le riz importé. Il insiste également sur le recul, dans les différents pays analysés, des formes de la grande transformation en usine au profit d'une multiplication des petites unités de

décorticage plus accessibles aux moyens des commerçants, moins coûteuses et qui atomisent leurs services dans toute la campagne. La période actuelle de diminution des niveaux de vie urbains supporte aisément la baisse de qualité du produit final qui accompagne ce changement technologique.

Tous ces travaux d'économistes font ressortir l'existence de zones rurales liées de façon privilégiée aux villes pour leur approvisionnement. Une carte peut être établie pour la majorité des pays analysés, ce qui permettrait d'orienter la recherche d'innovations et leur vulgarisation vers les zones qui, commercialement bien drainées, répondront sans doute plus vite aux enjeux d'approvisionnement des villes. Il semble judicieux, dans le futur, de continuer la "cartographie" de ces réseaux liant les campagnes aux villes et d'analyser les différences de prix à chaque opération de vente/achat et selon les saisons de la production.

Le point actuel sur les méthodes d'analyse des marchés régionaux et nationaux des produits vivriers en pays tropicaux

Champ d'analyse

- Un des champs privilégiés des analyses du CIRAD-CA porte sur les petites paysanneries qui produisent des denrées vivrières pour leur autoconsommation et pour la vente. Les recherches, conçues dans l'esprit de proposer des innovations proches des attentes des petits producteurs, sont souvent menées de manière pluridisciplinaire : écologie, agronomie, socioéconomie. Les recherches ont à présent une bannière, celle des systèmes agraires.
- D'un très grand intérêt, elles ont toutefois souffert d'une absence d'analyse de l'articulation de cette petite production marchande (PPM) avec les réseaux marchands qui irriguent les campagnes : le petit commerce des vivres (PCV) qui approvisionne les villes.
- Nos recherches essayent de forger des méthodes d'analyse de ces articulations entre les villes et les campagnes productrices.

Question originelle

Les travaux de l'histoire économique attestent l'existence précoloniale de circuits d'échanges vivriers de courte et de longue distance. Au cours des siècles se sont donc formées des pratiques et règles sociales des échanges. Présentées dans cette perspective, les phases coloniales et libérales plus récentes sont perçues comme de nouvelles opportunités et de nouvelles perturbations de formes commerciales préexistantes.

Pour comprendre les processus en cours, il apparaît intéressant de changer les approches économiques usuelles qui, dans leur présentation de l'économie formelle et informelle, ne se réfèrent implicitement qu'à des pratiques économiques dont les foyers originels sont les pôles dominants du grand commerce international. En inversant la perspective, c'est-à-dire en centrant l'analyse sur les pratiques institutionnelles de l'économie dite informelle, on additionne un champ nouveau qui permet de mieux comprendre les soi-disantes "imperfections" par rapport à nos modèles d'analyse. Ainsi, en période de libéralisme, on peut s'apercevoir que les pratiques d'échanges du commerce international s'adaptent autant aux formes commerciales "anciennes" africaines que ces dernières s'adaptent à celles du commerce international.

La question originelle devient donc de comprendre s'il existe un modèle (ou des modèles) d'échanges spécifiques en Afrique et à Madagascar (diversité des pratiques, profondeur sociohistorique qui est encore une référence opératoire) et comment il s'adapte progressivement à celui d'un nouveau courant dominant, le libéralisme.

Il y a alors un double intérêt à choisir les produits vivriers. D'une part, les phénomènes coloniaux et libéraux les ont moins touchés (mis à part le cas de quelques denrées comme le riz) que d'autres produits du marché mondial (café, cacao, coton). D'autre part, ils donnent un enjeu tout particulier à l'analyse car ils posent le problème des chances nouvelles d'approvisionnement des villes africaines en période peu propice aux importations alimentaires autres que l'aide. L'articulation villes-campagnes devient alors le centre privilégié de notre approche.

Les méthodes

Des lectures théoriques et méthodologiques dans les sciences sociales ont permis de forger petit à petit les outils d'une analyse de terrain volontairement ouverte. Cette recherche a utilisé des travaux de l'histoire économique (Polanyi, Coquery-Vidrovitch, J. Illife, A.G. Hopkins), de l'anthropologie économique (C. Meillassoux, D. Forde), des théories marxistes (Le Capital, livre I, partie 2, chap. 4 à 7 ; livre II, chap. 6, 9, 12, 13, 14), des théories institutionnalistes (G.M. Hodgson, Jones), des méthodes d'analyse des filières (Duruflé, Fabre, Freud, Yung) et enfin des travaux d'économistes et de sociologues africanistes (Arditti, Couty, Grégoire, Amselle).

Si on essaie de savoir s'il existe un (ou des) modèle(s) spécifique(s) des échanges vivriers en Afrique et à Madagascar, il faudra toujours le décrire comme quelque chose qui émerge et/ou disparaît en un lieu et un temps donnés et, de là, en déduire la genèse. Mais si ce ou ces modèles sont en réalité un ensemble de relations ouvertes, alors il est préférable dans un premier temps de se munir d'une grille d'analyse qui rende possible une analytique des relations d'échange. Notre démarche revendique donc le retour à un empirisme, contrôlé toutefois par nos connaissances en sciences économiques.

La méthodologie des "filières" structure la recherche autour des différentes fonctions économiques existant depuis la production jusqu'à la consommation : la collecte et le regroupement, la transformation, la redistribution. A cette méthodologie principalement conçue à l'origine comme un outil de bilan national de comptabilité économique, nos recherches entreprises à partir de 1989 ont donné de nouvelles orientations. Si la détermination précise des fonctions représente le squelette (voir figure 1), trois méthodes d'approche différentes permettent de comprendre le fonctionnement socioéconomique, mais également la structuration des processus sociaux et géographiques.

La première s'attèle au calcul des coûts et des marges réellement observés sur le terrain, lors des enquêtes. La deuxième essaie de donner une vision spatialisée des différentes fonctions : aires de production, collecte,

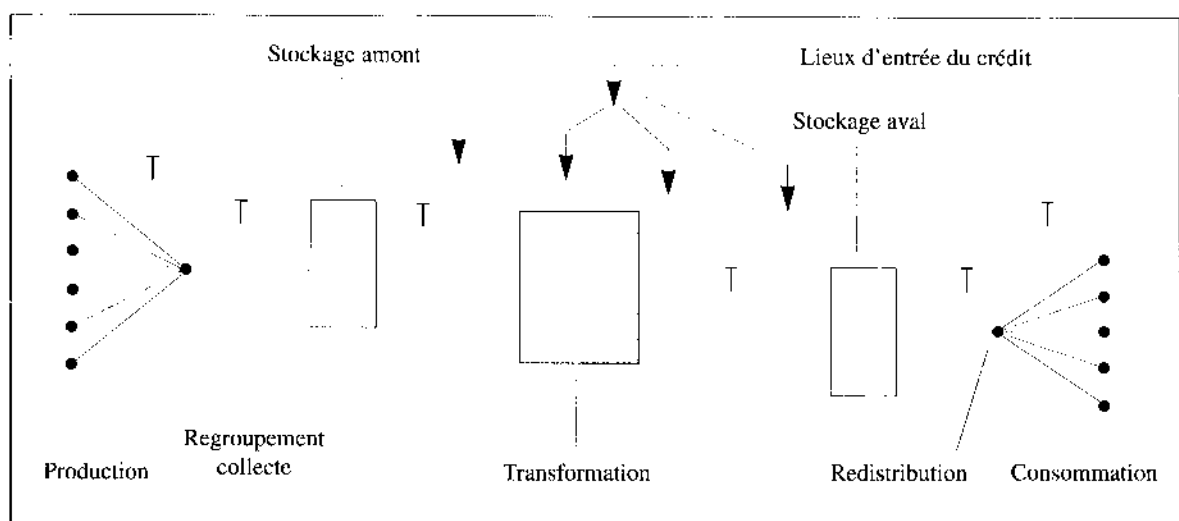


Figure 1. Les différentes fonctions (simplifiées) des démarches

transformation, consommation, flux consécutifs. Une troisième dimension étudie plus particulièrement les rapports sociaux autour de l'appropriation et des utilisations des moyens de production de type historique, elle permet de situer les noeuds du pouvoir du capital et du travail, et de voir comment les acteurs s'articulent autour de règles et d'institutions pour se répartir les biens et gérer les conflits et les alliances (voir figure 2).

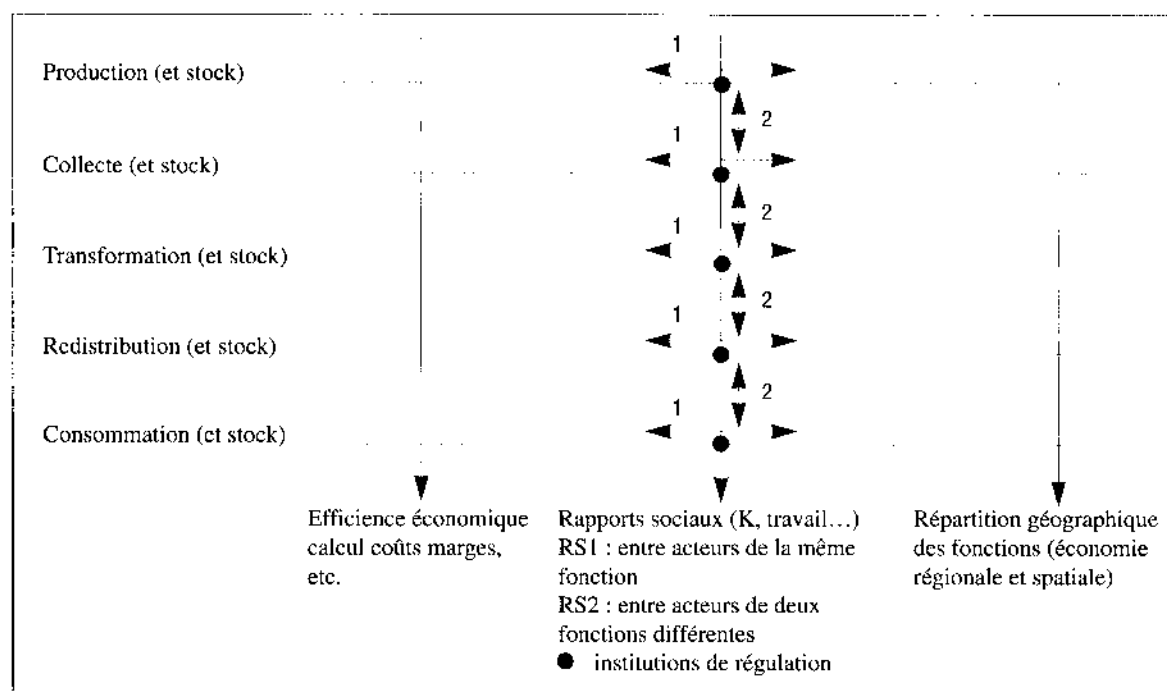


Figure 2. Les trois regards sur les fonctions

La spécificité de ces méthodes réside dans le choix a priori d'un produit ou d'un groupe de produits similaires (exemple : légumes) qui est d'un grand enjeu en termes d'accumulation et/ou en termes de survie pour les principaux opérateurs de la production. En sélectionnant pour l'analyse un produit clé plutôt que tous les produits de l'échange, on arrive plus aisément à comprendre les efficacités économiques et les rapports sociaux, donc les enjeux sociaux entre les différents acteurs. La limite de ce troisième éclairage réside cependant dans sa pertinence même. Son approche sectorielle ne permet pas de rendre compte de l'ensemble des rapports sociaux entre producteurs et commerçants transformateurs. Le juste équilibre revient donc à bien choisir le ou les produits déterminants et les acteurs pour lesquels ce ou ces produits sont fondamentaux dans leur survie et leur accumulation possible. Les enjeux de l'Etat et de son équilibre économique sont parfois opposés à ceux de certaines de ses classes paysannes ou d'entrepreneurs.

Dans les conclusions de nos études, ces trois éclairages différents acquièrent une cohérence plus globale, notamment quand nous y adjoignons l'analyse de plusieurs "filères" sur un même espace.

Terrains et résultats pour le développement et la recherche

Ces outils ont été testés sur différents produits (maraîchage, riz, tubercules), puis appliqués pour l'analyse de cas de différents pays : Congo, République centrafricaine, Guinée-Bissau, Guinée-Conakry, Ghana, Mali, Cameroun, Madagascar, Togo.

L'intéressante dualité de la fonction de "recherche appliquée" nous a conduits à systématiquement écrire nos résultats pour le développement et pour la recherche.

Pour celui-là, trois pays ont été particulièrement intéressés par nos résultats : riz en Guinée-Conakry, riz et maraîchage à Madagascar, maraîchage au Congo. Pour celle-ci, quatre nouveaux développements sont annoncés :

- un livre (en cours de publication) avec nos collègues anglais sur le “deuxième axe” de notre démarche, à savoir les rapports sociaux dans les échanges ;
- une réflexion théorique renouvelée par l’articulation de nos démarches avec les théories des institutionnalistes. Elle est conduite par P. Moustier (Wye College), par L. Pujo (université d’Oxford) et par F. Lancon (université de Nanterre) ;
- un nouveau déploiement de nos analyses autour du thème “approvisionnement vivrier des villes africaines – les organisations au coeur des ajustements”. Cette action thématique programmée interne au CIRAD est animée par Paule Moustier ;
- un déploiement géographique nouveau par rapport à notre champ originel : Indonésie (F. Lancon) et Vietnam (A. Leplaideur, J.F. Lecoq).

Abstract

From the producer to the consumer

A. Leplaideur (CIRAD-CA)

Until recently, research and development targeting farmers in tropical ACP countries focused almost exclusively on agricultural production. The aim was to increase production through the introduction of inputs, such as seeds and fertilizers, and the formulation of new cropping systems. With populations increasing faster in urban than in rural areas, however, a new research trend emerged in which the focus was on production oriented toward customers’ needs.

In this presentation, the author describes the change which has taken place in CIRAD, particularly in its food crops research department. Since its establishment in 1960, CIRAD has had two main approaches. The first emphasized the development of technical packages, few of which took adequate account of farmers’ expectations and constraints. The second approach, adopted in the late 1960s, was based on an interdisciplinary approach and farmer participation. This approach promoted the socio-economic aspects of production, and involved studies on rural economy and farm management. When other social sciences (such as sociology) were integrated into this work, the concept of the individual producer was broadened to the village, and then to the region, giving rise to the farming systems approach. The study of marketing systems, however, remained absent from these regional analyses.

Social scientists now advocate integrating analyses of marketing systems into the overall approach, with an emphasis on the links between farming and marketing systems, and with due attention being given to the role of the informal sector. CIRAD scientists have started a series of studies in tropical ACP countries incorporating this approach. The knowledge gained on marketing systems and rural-urban commercial links will enable them to identify areas where research is needed if there is to be an immediate impact on food supplies in the cities.

1.2

Market opportunities from a producer's perspective

J.A.O. van Lieshout (KIT), B. Huijsman (KIT) and J. Daane (ICRA)

Promoting the market participation of small-scale farmers in ACP countries has become a major theme in current policy debates. Within the context of Structural Adjustment Programmes (SAPs) and institutional reform, it is seen as an important element in transforming ACP economies and making them more competitive.

This paper focuses on factors that enhance the market participation of small rural households. It presents an outline of a methodology for arriving at policy measures to achieve this participation. First, we clarify the rationality of small-scale producers in ACP countries, who are operating within the context of complex social and economic units. We then provide definitions of the concepts used and describe the seven-step methodology. The remainder of the paper elaborates upon these steps.

Producer rationality

When discussing market opportunities for small-scale producers in ACP countries, we need to clarify two things at the outset. The first is that agricultural production and the sale of agricultural produce are organized in social units which take a variety of forms and do not necessarily coincide with a nuclear family. The second is that these units do not necessarily limit their economic activities to agriculture. So when we speak of "farms" in ACP countries, we need to be aware that these show little resemblance to the classical notion of the European family farm. We also need to be aware that we often cannot understand the logic of these "farms" until we begin to see them as a part of a larger whole, comprising all the economic activities, both agricultural and non-agricultural, that sustain the livelihood of the unit.

A complicating factor in the analysis of farms in many ACP countries is that the social units that make their livelihood as a group can comprise various units of production which, although they could not exist on their own, are managed more or less independently by different members of the larger social unit, who each control a different part of the larger unit's resources. An illustrative example is the extended family household typical of most of the Sahel and Sudan zones of West Africa (Meillassoux 1975, Ancey 1978, Gastellu 1978). These households consist of a polygamous male head, his wives, his unmarried children, his married sons, his daughters-in-law and his grandchildren. Often there are also some male members of the household who are not related to the family but who are considered as sons. The head of the household organizes the resources of the group to produce enough food for the entire household, as well as cash for investment, school fees, medicines, ceremonies and the bride price for the first marriage of each of his sons. All members of the household have to contribute labour to these activities, their tasks depending on their age and sex. The food produced collectively is distributed among the married women and consumed in small groups. The wives of polygamous men take turns in cooking for their husband.

Apart from this household production, married sons are allocated land by their father and farm this of their own accord, usually producing cash crops and using the labour of their wives and children. The married men and married women in the larger household usually undertake individual non-agricultural activities such as trade and transport services (older male household heads), wage work off the farm (younger men), minor trade and processing activities (women) or craft work (both sexes have their own specializations). The income that this produces is used partly for private purposes by the individuals concerned and partly for their own children. In some cases even unmarried men and women are allowed to farm independently and/or undertake non-agricultural activities. Married women sometimes also farm their own plot of land. A household of this type therefore comprises various production and consumer units that can neither be analysed as independent economic enterprises nor as an integral part of a single household enterprise.

We also need to recognise that the structure of these units is subject to dynamic change. The complexities illustrated by the example given are in many ways a consequence of the introduction of cash crops and the opportunity to produce for the market. Young men needed cash, and no longer wanted to work exclusively for their fathers. So they were allocated individual fields on which to grow cash crops and/or allowed to seek opportunities off the farm. Similarly, in some areas married women started trading, farming and processing for their own benefit and no longer wanted to work exclusively for their husband or their husband's father. Market opportunities thus increased the autonomy of young men and women by undermining the authority of fathers over their sons and of husbands over their wives, as both sons and wives believed that, at least partly, their interests were better served by working on their own. In areas with a longer history of market production, such as along the coast of West Africa, household units have become smaller as many sons set up their own households at the time of their first marriage and then no longer worked for their father.

The example also shows that farming is only one of the economic activities undertaken by individuals or by household units. It exists alongside several other activities, some of which require a degree of market orientation, such as trade, transport services and processing (which usually involve buying raw materials and selling the processed products). This is an important observation that, obvious as it may seem, has often been overlooked by professionals and agencies dealing with agriculture. The implication is that agricultural production for the market has to compete for the allocation of household or individual resources with other market-oriented activities. These other activities are often more remunerative, less risky and confer higher status than agricultural work. Hence, it often happens that a reasonably well-developed market orientation in these other activities goes hand in hand with a low degree of market orientation in agriculture.

To a large extent this is due to the unfavourable general policy environment of market-oriented agricultural production in most ACP countries. After independence, many ACP governments continued the colonial policies that aimed at keeping the prices of food low and skimmed off a disproportional amount of the value added of cash crops. Rather than promoting agricultural production for the market via output price incentives, these governments chose to subsidize inputs and credit. They curtailed the role of market forces in favour of a mode of control based on rationing and selective distribution of goods and services to reward the most loyal subjects (Bates 1983, Mbembe 1988, Daane and Mongbo 1991). The debt crisis and SAPs have forced governments to phase out input and credit subsidies and to abandon direct control of food prices. In the long run, the devaluation of national currencies that is part of some SAPs will also lead to an increase in food crop processing and should in principle allow governments to increase farm gate prices of cash crops, without losing income for the State.

Most ACP countries are currently probably in a transition from a policy environment that discriminated strongly against agriculture to one that, if managed well, has a greater potential to stimulate agricultural production for the market. However, there remains a strong tendency to favour urban over rural interests, and only time will tell to what extent this potential will actually be used.

Market opportunity analysis

We provide here some definitions of the concepts used in this paper.

“Livelihood” is the way people sustain a living. It is the outcome of a decision-making process in which the best possible use is made, given a certain rationality, of perceived resource endowments – both of the family and the physical and institutional environment, including market access – in order to meet (family) demand. A livelihood is reflected by the (productive) activities in which someone is engaged, as well as the output of those activities (for home consumption or for sale). (See Annex, page 39)

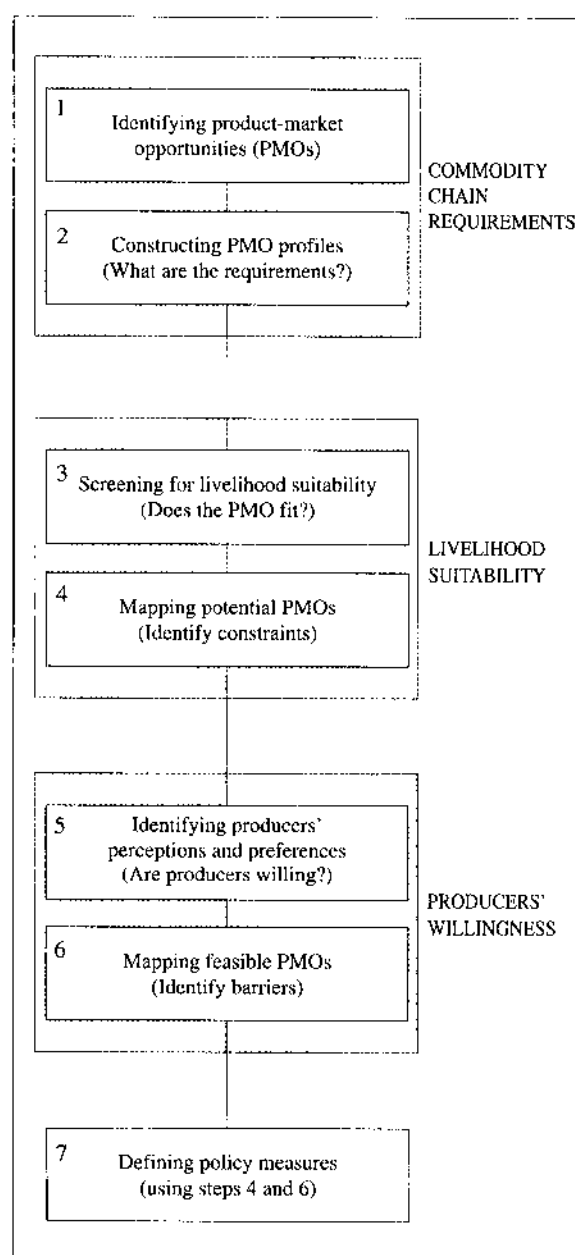


Figure 1. Market opportunity analysis

“Market participation” is the degree to which specific producers or traders operate in specific markets with specific products. It is measured in terms of sales – in volume, value or as a percentage of total sales (market share). By being more or less specific in terms of factors, markets or products, market participation can be aggregated or de-aggregated.

“Marketing opportunity” is a possible product-market combination; that is, a production opportunity for a certain market, or a market opportunity for a certain product. It is best described as a product-market opportunity (PMO).

“Market orientation” is the degree to which production and marketing decisions are based on market information. It is measured in terms of the decision maker’s marketing knowledge, marketing skills and commercial attitude (that is, the disposition to act).

“Market opportunity analysis” is an investigation into the feasibility of a specific product for a specific market for a specific producer or group of producers. In our view, a PMO has potential when it suits a producer’s livelihood and when the required resource endowments (in the family and the environment) are available. A PMO is feasible when, at the same time, producers consider the PMO attractive, and thus are willing to seize it.

An instrument which can be used to assist with market opportunity analysis is illustrated in Figure 1. In the figure, the first block (steps 1 and 2) is concerned with commodity chain requirements. The second block (steps 3 and 4) looks at livelihood suitability and the third block (steps 5 and 6) looks at the farmer’s willingness to seize opportunities. Step 7 is concerned with policy measures. We shall now look at these steps in more detail.

- 1 Identifying PMOs: Opportunities can be identified by anyone from within the commodity chain (input suppliers, producers, traders and processors) or outside the chain (researchers, planners and extensionists). A first screening can be made with the help of a strategic development tool such as Ansoff's Matrix (see Annex, page 39). At this stage it is important to develop not just "an idea", but a more elaborate concept – a PMO, a (new) product opportunity for a market, or a (new) market opportunity for a product. For further information on this stage, the reader is referred to Perez (1991) and Urban and Hauser (1993).
- 2 Constructing PMO profiles: After the initial identification of PMOs they are classified according to general characteristics such as production and marketing risks. These characteristics indicate the requirements that the producers and other actors in the commodity chain, or *filière*, have to meet to realise the opportunity. These requirements are termed the "PMO profile".
- 3 Screening for livelihood suitability: The PMO profile will facilitate assessing whether the producers have the resource endowments and market access needed to seize the PMO. At this stage it will be possible to identify constraints in the natural and enabling environment as well as constraints in existing livelihoods (for example, the degree of vulnerability). Indications as to how to remove constraints must be formulated – these form the first input for policy making.
- 4 Mapping potential PMOs: This map will show what type of opportunity suits the livelihood in question. It serves to present the results of the first three steps.
- 5 Identifying producers' perceptions and preferences: The purpose is to identify a producer's perceptions of and preferences for certain PMO characteristics and classify them accordingly. At this stage the reasons why farmers do not find a PMO attractive ("barriers") must be identified; these barriers form the second input for policy making. This identification of perceptions and preferences should also be done with other actors in the commodity chain, but in this paper the focus is on the (small-scale) producer.
- 6 Mapping feasible PMOs: This is a refinement of the earlier map. Within livelihoods, categories of farmers are identified according to high and low willingness to seize a PMO.
- 7 Defining policy measures: The constraints (step 4) and barriers (step 6) are translated into positive recommendations for policy action. ("Barriers" refer to reasons for non-adoption stemming from unwillingness, whereas "constraints" refer to reasons stemming from "inability" [Ram 1989]).

In the remainder of this paper we shall discuss this analysis instrument. The emphasis will be on the general principles of the method (that is, how to do it) rather than on what particular factors should be taken into account because these factors will be very specific to particular situations and PMOs.

Assessment of PMO profiles

Once a PMO has been identified (step 1), the next step is to assess its profile. Each PMO has its own typical requirements of price, product quality and service that must be met in order to be able to sell the product in question. These requirements should match producers' livelihoods (as well as those other actors in the commodity chain). Suitability must be specified in terms of inputs, production factors and knowledge, as well as the market access needed to produce and deliver the required product. Figure 2 presents factors which can be used to describe a PMO.

To construct a PMO profile it is essential to single out those factors that are critical to success – that is, those that have the greatest influence on costs and benefits for the producer and the other actors in the chain. These factors ultimately determine whether or not a PMO has potential. Some PMO factors which are of general importance and will help determine the suitability of a PMO for particular producers are:

- intensity factor use (is the production and marketing process intensive in terms of capital, labour, knowledge and/or land?);
- level of production risk;
- level of market risk;
- volume/value ratio.

On the basis of these four PMO factors, profiles can be constructed by combining their levels (high, medium, low). A PMO with high market risk and low volume/high value ratio (for example, flowers for export) will require good management, a well-developed market structure and information system, and good support

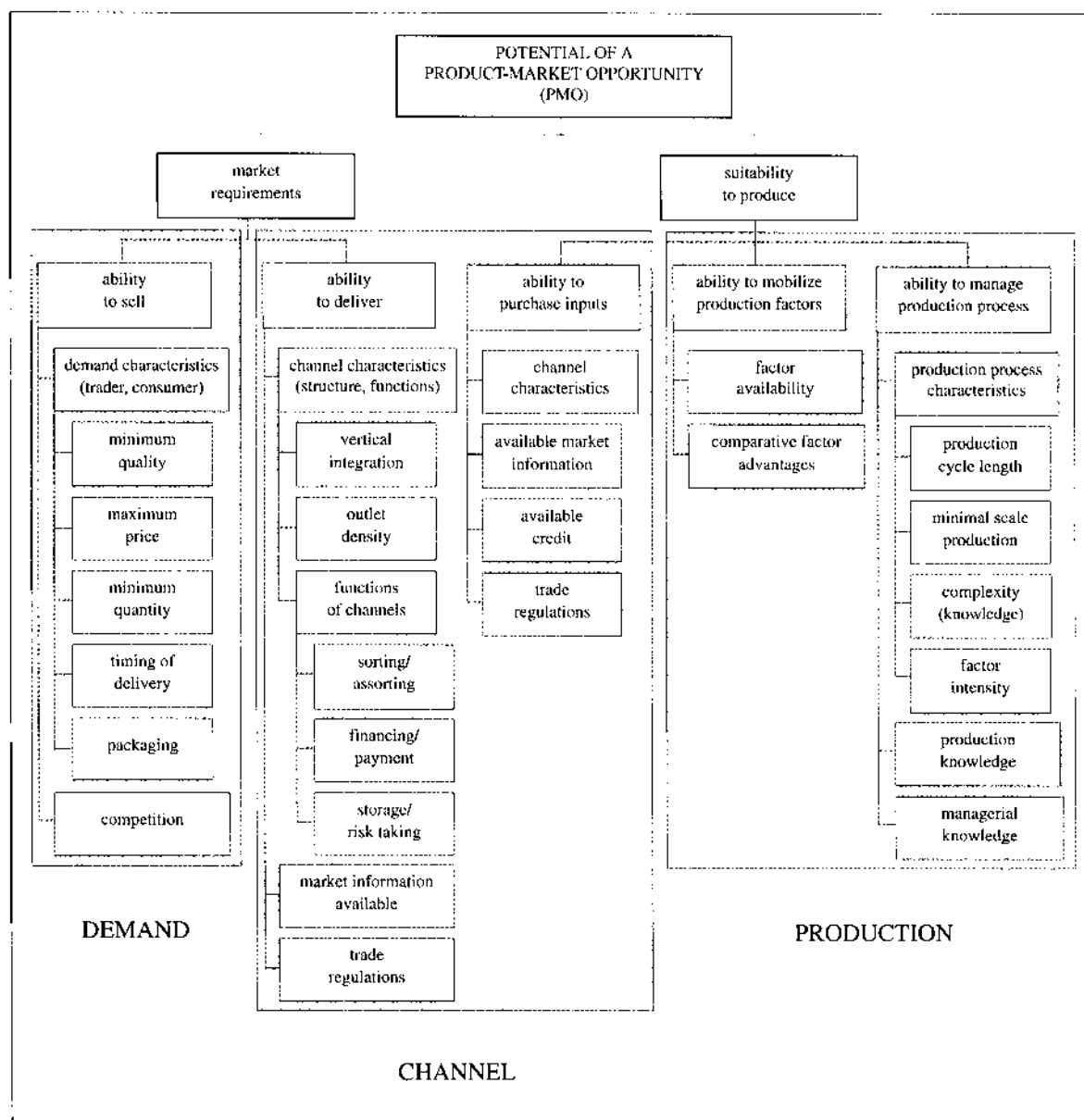


Figure 2. Commodity chain requirements of a product-market opportunity

FARMER STRATEGIES FOR MARKET ORIENTATION IN ACP AGRICULTURE

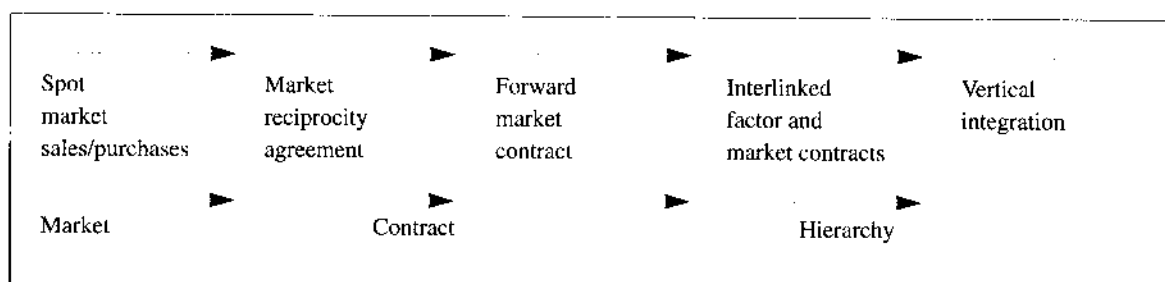


Figure 3. Market arrangements

services. A PMO with low market risk and high volume/low value (for example, cereals) will require a good infrastructure to reduce transportation costs, which form a high proportion of total costs; less stringent requirements are good market management skills and continuous market information.

All four factors are “compounded” in that they are affected by underlying factors. Production risk, for example, is influenced by susceptibility to adverse weather conditions, reliability of input supply, and so on. These underlying factors are specific for each PMO.

An example of the use of a profile is provided by Jaffee (1992), who developed it for horticulture in Kenya. Using different levels of production and market risks, Jaffee showed that these risks strongly influenced market arrangements. These arrangements can range from spot market sales/purchases to complete vertical integration, as shown in Figure 3.

In the case of “spot market sales/purchases” the relationship between producer and trader/processor is limited to the transaction only. Informal relations of longer duration with some degree of loyalty between producer and trader/processor are classed as “market reciprocity agreements”. The two institutional arrangements between producer and trader/processor are generally referred to as “contract farming”. These can be limited to the obligation to buy and sell specified quantities and qualities of product at particular times (“forward market contract”), or involve some form of input supply and technical advice/control by the trader/processor (“interlinked factor and market contracts”). “Vertical integration” means that production, processing and marketing are all within the same enterprise.

Production risks can be related to the specificity and scale of the investment required. The more specific the investment (that is, limited to a single user) and the larger the scale, the more risky the PMO. The critical factors are:

- Length of the crop production cycle: Investments in, for example, fruit trees fix the producer’s assets over long periods and make it costly to shift to other products.
- Scale of the investment needed: Some products may be produced profitably only if investments of a certain scale are made (for example, the need for cold storage on-farm).
- Degree of specialization of material production inputs and technical knowledge: Some products require investments in building, equipment and knowledge that cannot be used for any other purpose. This involves a higher risk than equipment that is multifunctional.

Market risks relate to the specificity of the product quality required. The more rigid the requirements, or the more vulnerable the product is to quality losses, the more risky the PMO. The critical factors are:

- Perishability of the product.

Table 1. Typology of product-market opportunities and institutional arrangements

		PRODUCTION RISKS		
		High	Medium	Low
MARKET RISKS	High	Vertical integration	Vertical integration	Long-term contract
	Medium	Vertical integration	Long-term contract	Long-term contract/ spot market
	Low	Vertical integration	Long-term contract	Spot market

- Rigidity of product quality required. At one end of the scale are products that must meet exacting standards; at the other are products that simply have to meet flexibly applied minimum standards.
- Rigidity of timing between harvests and product deliveries. The shorter the period, the greater the risk. This can depend on the technical requirements of the product, as well as on the organizational requirements of the traders/processors.

The resulting typology is given in Table 1. When production risks are high, vertical integration is a means of reducing the risks arising from unreliable quantity, quality and timing. When production risks are medium or low, market risks can be reduced by forward or backward linkages (for example, producers making forward sales contracts or middlemen supplying specific inputs backwards and providing a guaranteed purchase of produce). Only when both production and market risks are low will spot market arrangements be sufficient.

Table 2 applies this classification to various farming activities. It shows that each activity has a specific combination of production and market risks and thus its own optimal marketing arrangement. Spot market sales/purchases are a suitable arrangement only for robust products (such as French beans for export, or maize for the local market) that do not require specific investments. The more sensitive the product and the more specific the investment needed, the higher the need for more stable arrangements, ranging from contract farming (for example, oranges for fruit juice, or milk processing) to complete vertical integration (for example, chrysanthemums or frozen peas for export). In other words, production-demand characteristics impose channel requirements with which producers (but also traders and, in this case, processors) have to comply. When these conditions are not met, the PMO is unlikely to be successful.

Jaffee (1992) found that in most cases actual market arrangements were as expected. This strengthens our belief in the application of these typologies to other situations.

Screening for livelihood suitability

Once PMOs have been identified and profiles established, the next step is to screen the suitability of the PMOs for various categories of producers, distinguished on the basis of their livelihoods, as defined above.

To ascertain whether a PMO suits the livelihood of a producer, the following issues need to be considered:

- Decision-making structure: Making use of a PMO requires coordination between production and marketing decisions. If the internal decision-making structure is such that the person who decides about production is not the same as the one deciding about marketing, there is a coordination problem to be solved.
- Availability of resources: In order to seize a PMO a producer needs access to the right type, quantity and quality of resources at the right time. Are the inputs accessible? Are the required production factors and management sufficient? Are the produce markets accessible?

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Table 2. Product-market opportunity profiles for farming activities

PMOs ^a	PRODUCTION RISKS			MARKET RISKS			Required market arrangement ^b
	Production cycle	Scale of investment	Input specificity	Perishability	Rigidity of quality	Rigidity of timing	
French beans (for canning, export)	Short	Medium	Low	Medium	High	Medium	LTC
Oranges (for juice, local market)	Long	Medium	Low	Low	Medium	Low	LTC
Carnations (export)	Short	Medium	Medium	High	Medium	Medium	LTC
Chrysanthemums (export)	Short	Medium	High	High	High	High	VI
Mangoes (export)	Long	Medium	Low	Medium	Medium	Medium	LTC
French beans (export)	Short	Low	Low	Medium	Medium	Medium	SM
Meat (for canning, local)	Long	High	High	Low	Low	Low	LTC
Cotton for ginning (for ginning, local)	Short	High	High	Low	Low	Low	LTC
Groundnuts (for paste, local)	Short	Low	Medium	Low	Medium	Medium	SM
Maize (local)	Short	Low	Low	Low	Low	Low	SM

Note: a At the conference, lines were left open to be filled in by the seminar participants for the following: cassava (Nigeria), frozen peas (UK), lettuce on film (Trinidad), vegetables (Papua New Guinea), pasteurized milk (Kenya), pasteurized milk (Zimbabwe)

b LTC = long-term contract; VI = vertical integration; SM = spot market

- Control over resources: Even when resources are available, a producer's control over them, and even over his/her own resources, is only partial.
- Control over output and income: Products are not always in the hands of the producer, but may be a responsibility of the other members of the household. Also, income earned from a PMO may go not only to the people who produced the output, but also partly to other household members.
- Need for food security: If the resources needed for market-oriented production are such that the producer has to give up (part of) the production for food needs, attention has to be paid as to how these needs can be met.
- Risk taking capacity: The producer must have the resources to bear the risks associated with the PMO.
- Accumulation strategy: The PMO should fit into the producer's strategy to secure long-term interests. These can require investments that compete with those that have to be made for the PMO.
- Gender division of labour: The PMO should fit the division of tasks and responsibilities between genders.
- Status related to economic activities: The activities that the producer must perform to realise the PMO should be in accordance with his/her status.

Table 3. Opportunity map^a

PMO profiles	Producer livelihoods			
	A	B	C	D
1	+	–	–	–
2	–	+	+	–
3	–	–	–	–
4	+ / –	–	–	+ / –
5	–	+ / –	–	+

Note: a + = suitable; + / – = suitable, but...;
– = not suitable

Mapping potential PMOs

Screening PMO profiles for livelihood suitability should produce an “opportunity map” similar to that shown in Table 3, where five PMOs are evaluated according to four hypothetical livelihoods.

In Table 3, PMO 1 is suitable only for livelihood A, and PMO 2 is suitable for B and C. PMO 3 is not suitable for any of the given livelihoods. PMO 4 partly suits A and D, but some constraints have to be removed. PMO 5 suits B and D, but for the former some constraints have to be removed.

Constraints must be removable within an agreed period of time. They include:

- Environmental constraints: This refers to such constraints as adverse agro-ecological conditions, poor physical and institutional infrastructure, lack of roads or irrigation systems, and lack of credit or veterinary services.
- Commodity chain constraints: Within the chain there may be a need, for example, to form more reliable market partnerships or to improve input supply.
- Livelihood constraints: The main constraints here relate to availability and control over resources, and degree of vulnerability to risks.

The opportunity map gives an indication as to whether or not to proceed with a PMO for a specific target group.

Identifying producers' perceptions and preferences

It is also important to establish whether the producers themselves are willing to embark upon such an activity. What degree of production risk and what level of market risk do farmers think they can handle? The search for market opportunities should take these preferences into account. Feasible market opportunities are then determined on the basis of professional criteria of potential as well as on the basis of what the producers prefer and consider to be feasible. This approach also has to be extended to the other actors in the chain, as their preferences and perceived abilities are just as important for the successful realisation of a market opportunity as those of producers. Here, the discussion is limited to the producers' points of view. Figure 4 illustrates what this involves.

In Figure 4, “real opportunity” refers to the real requirements of an opportunity. “Perceived opportunity” is the producer's perception of an opportunity. How does the producer see his/her environment? How does s/he judge his/her own knowledge? What requirements does s/he think a PMO has? “Preferred opportunity” is how the producer would like the real opportunity to be. Is it attractive? Does s/he like carrying out the activities involved? Does it give him/her enough benefits? Is the risk too high? Do the activities give status?

Real, perceived and preferred opportunities do not necessarily overlap: perceptions may be a little unrealistic or perceived opportunities may not tally with preferences. However, they must overlap to a large extent for a market opportunity to be seized successfully. At this stage, barriers that inhibit adoption must be identified and judged (with the participation of the producer) as to their “removability”. Barriers can be removed by bringing the producer's real abilities closer to the required and perceived ones, or by bringing perceived attractiveness closer to the preferred one, (for example, by making the PMO appear less risky).

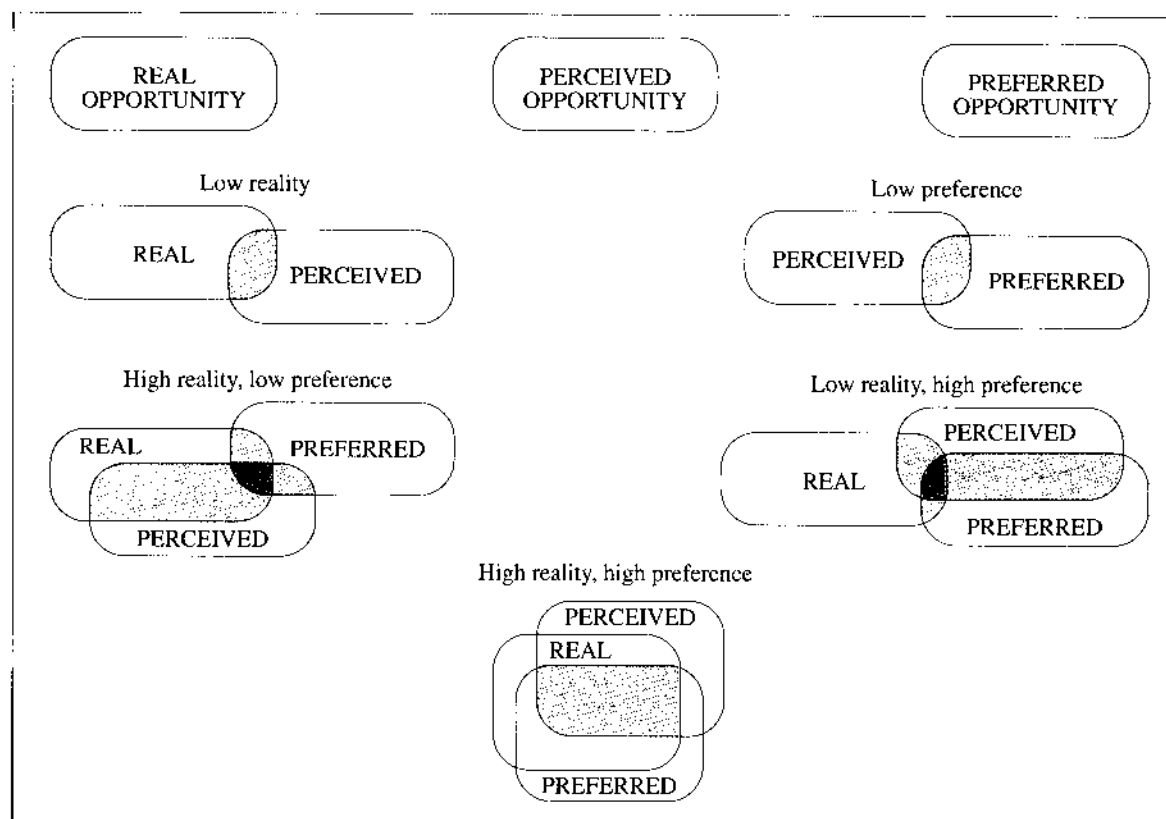


Figure 4. Real, perceived and preferred product-market opportunities

To identify these barriers, more information is required. Figure 5 provides a closer look at the factors that influence a producer's willingness to seize a PMO.

Mapping feasible PMOs

Once the barriers and the producer's perceptions and preferences are known, they can be displayed on a "feasibility map", an elaboration of the opportunity map (see Table 3). "Feasibility" refers to an opportunity that is perceived realistically and preferred. The example of a feasibility map given in Table 4 shows the PMOs and target groups A and B from Table 3 evaluated according to livelihood and preference categories 1 and 2.

In Table 4, PMO 1, suitable for livelihood A, is feasible only with category A1. PMO 2, suitable for B, is feasible only with B1. PMO 3 is not suitable for A or B. PMO 4 suits A, but some constraints need to be removed. In addition, it appears that only category A1 is willing but some barriers need to be removed. PMO 5 partially suits B; after some constraints are removed, it will be feasible for B2, and for B1 only when some barriers have been removed.

Barriers must be removable within an agreed period of time. They include:

- Usage barriers: Is the activity itself considered useful and liked?
- Value barriers: Is the activity sufficiently beneficial?
- Risk barriers: Is the activity not considered to be too risky?
- Status barriers: Does the activity yield sufficient status?
- Tradition barriers: Is the activity accepted by the peer group – does it fit traditional values?

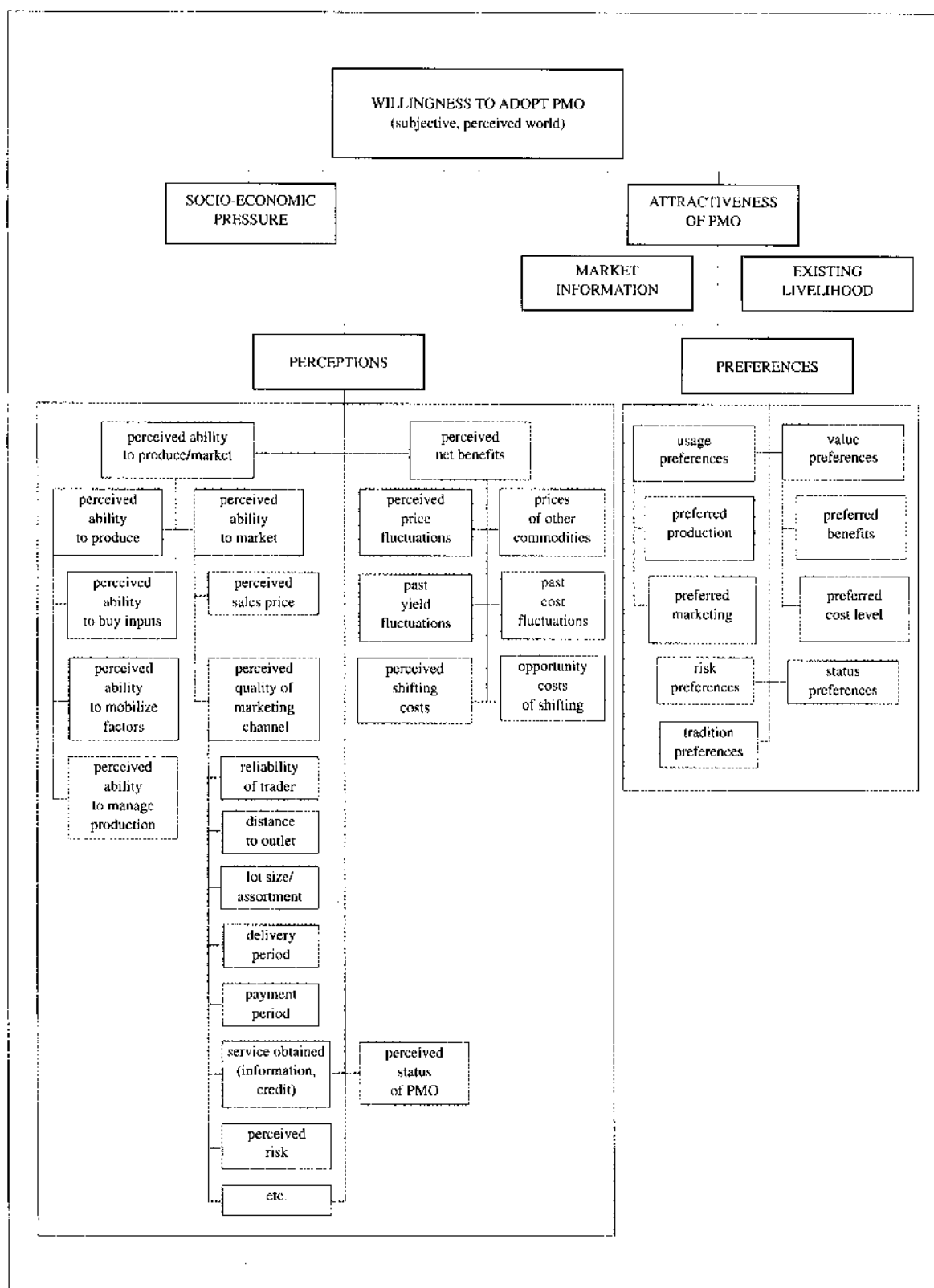


Figure 5. Factors affecting a producer's willingness to seize a product-market opportunity

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The feasibility map gives an indication as to whether or not to proceed with a PMO for a specific target group. This is still no guarantee for success because unanticipated circumstances may arise. However, it seems that this methodology yields policy measures as close to the producer's perspective as we can get.

Policy measures

This section deals with the measures that need to be taken in order to remove specific constraints and barriers. Professionals, researchers and planners who are involved in promoting market participation among small-scale agricultural producers in ACP countries should use Tables 3 and 4 as a basis for policy making.

Based on the livelihood potential that target groups have to seize a PMO (screening based on a PMO typology) and their willingness to do so (screening based on livelihoods and preferences), a two-way entry table can be made to classify policy measures. Table 5 gives an example.

In the short run it may prove difficult to remove barriers related to producers' preferences, and we therefore need to find market opportunities that respond as much as possible to those that producers prefer and perceive as feasible. If professional and producer perceptions of the feasibility of an opportunity differ, the reasons must be investigated and action taken to correct perceptions on both sides.

To summarize, in order to analyse and recommend PMOs to small-scale producers in ACP countries, the following factors need to be taken into account (*see* Figure 6).

- commodity chain requirements;
- livelihood suitability;
- producer's willingness.

Table 5. Policy measures to stimulate market participation of a specific product-market opportunity profile by specific producers, in relation to potential

Producer's perception and preferences	LIVELIHOOD POTENTIAL	
	High	Low
High perceived ability, high preference	Go	Stop, improve ability (remove constraints)
Low perceived ability, high preference	Stop, improve perceptions	Stop, improve ability (remove constraints)
High perceived ability, low preference	Stop, make PMO more attractive	Stop, look for another producer
Low perceived ability, low preference	Stop, improve perceptions (remove barriers)	Stop, look for another producer

Table 4. Feasibility map^a

PMO profiles	Producer livelihoods			
	A1	A2	B1	B2
1	+	-	-	-
2	-	-	+	-
3	-	-	-	-
4	+/-	-	-	-
5	-	-	+/-	+

Note: a + = suitable; +/- = suitable, but...;
- = not suitable

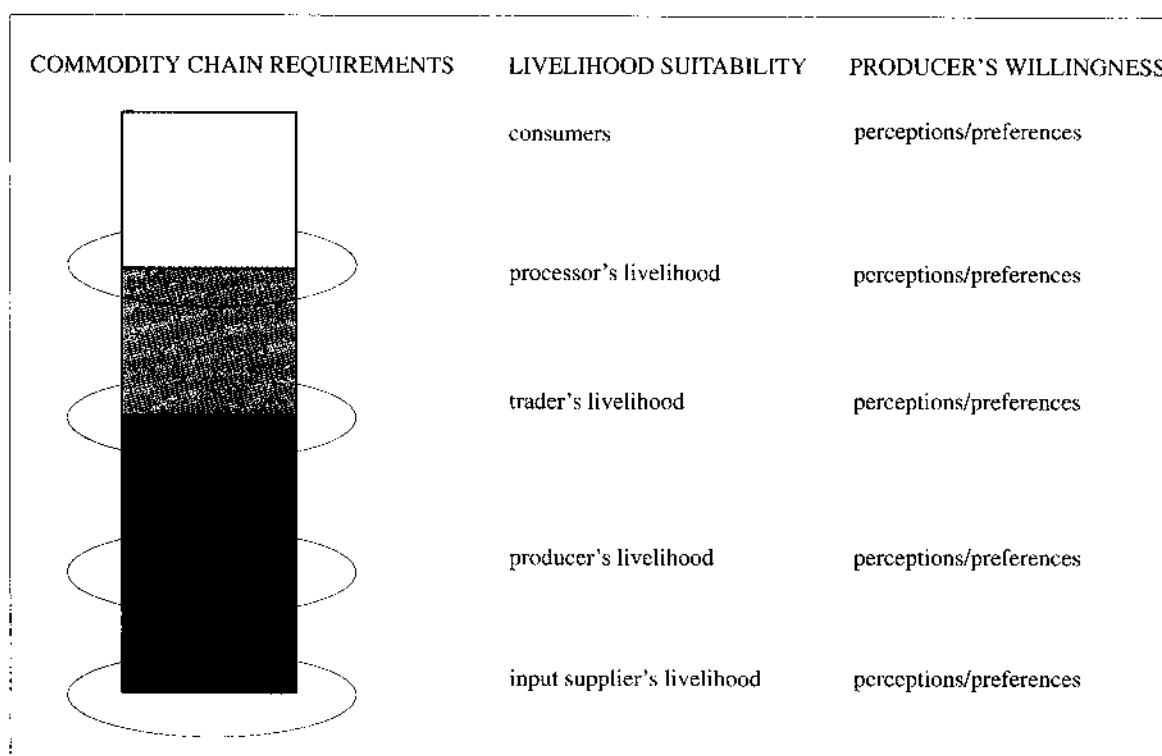


Figure 6. Summary of factors to consider in analyses of product-market opportunities

Annex

A PMO classification is based on objective characteristics of products and markets. An initial classification of combinations is made by distinguishing existing products from new ones and existing markets from new ones, as shown in Table 6. From the matrix given in Table 6, four strategic options can be derived:

- improve existing products for existing markets;
- diversify production by developing new products for existing markets;
- develop new markets for existing products;
- develop new products for new markets.

This is useful because different requirements exist for each combination, varying in the amount of existing knowledge. It is obvious that the less knowledge there is, the more difficult the PMO will be to adopt.

Table 6. Classification of market opportunities

Classification of strategic options		PRODUCER OPPORTUNITIES	
		Existing products	New products
MARKET OPPORTUNITIES	Existing markets	Penetration (strengthening position)	Product development
	New markets	Market development	Total diversification of products and markets

Source: Ansoff, H.I. 1970. *Ansoff Strategic Management*

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1.3

Value-added activities in small-scale agricultural production in Africa

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With the increasing number of ACP countries heeding the call from the International Monetary Fund (IMF) and World Bank for structural adjustment and a greater role for private enterprise, debate and research on the impact of this strategy has become of paramount interest. Severe economic crises – deteriorating balance of payments, increasing budget deficits, rising inflation and falling economic growth – forced many of these countries in the 1980s to introduce Structural Adjustment Programmes (SAPs).

These programmes have revived interest in the role of governments in agricultural marketing. Instead of intervening directly by setting prices and financing parastatals to buy, hold and sell stocks, governments are being encouraged to establish regulations for marketing operations by independent enterprises and to promote competition between them by ensuring free entry of new enterprises and easy access to finance, information and training (FAO 1988, Mittendorf 1992).

Liberalization and privatization have been significant components of SAPs. Nevertheless, it is recognised that the private sector does not automatically work better than government agencies and institutions. How to create conditions for the development of competitive market structures and a successful private sector has become an important goal of current research, especially as various non-price factors constitute significant constraints, particularly in many countries in sub-Saharan Africa. There is growing awareness of the need to re-orient agricultural production towards production for the market. Considerable efforts are needed by farmers in these countries to identify opportunities, use the potential available to respond to various reforms and become competitive and self-sufficient. However, it cannot be ignored that ACP countries are facing many difficulties in keeping their reforms on track, primarily because the main development bottlenecks are often deep-rooted and cannot be easily overcome in the short term.

This paper focuses on the need to identify possible areas for adding value to agricultural produce on and off the farm. It discusses some of the problems associated with high-volume, low-value agricultural produce, and provides an outline of the general principles that are common to farmers despite differences in economic policies. The issues discussed are used to illustrate the potential for adding value and the risks arising from inherent constraints in market-oriented agricultural production.

Problems of high-volume, low-value produce

There are constraints in many agricultural products which have a direct bearing on marketing systems and organization (Abbott and Makeham 1979). Some products call for special handling strategies if their market value is to be increased. Bulky and perishable products, for instance, pose particular problems.

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An example is cassava, widely grown in many African countries. Its ability to grow under diverse agricultural conditions has resulted in a wide variety of uses. Since its introduction into Africa in the 16th century, it has played an important role as a source of dietary energy and in food security for many tropical countries. The problems associated with its post-harvest characteristics, however, pose major marketing constraints. Cassava is bulky, with a moisture content of 70–80%. It is also perishable, fresh cassava roots beginning to deteriorate 2–4 days after harvest. In its fresh form, the weight and volume of cassava is great in relation to its monetary value. Thus, transporting bulky fresh cassava roots from rural areas to markets is cumbersome and expensive.

Reliance on cassava as a low-cost staple food in urban centres and rural areas and as a source of steady income for farmers will to a large extent depend on how far and how fast it can be transported to consumers, at a competitive price and quality, without incurring significant increases in processing costs.

The need and opportunities for adding value

In most parts of Africa agriculture has remained the main source of wealth and of raw materials for industry. While the debate on the impact of various economic reforms on agriculture continues, farmers have to take action now, particularly as governments withdraw from many of their previous activities and reliance on the market for the allocation of resources increases. It is therefore a matter of urgency that farmers seek to improve their income and quality of life through improving the market value of their agricultural produce. Part of the challenge for farmers is to identify opportunities for attaining these objectives.

The main argument put forward here is that there are common principles of socio-economic development from which arise common elements in marketing improvements, despite differences in the economic policies of Africa countries (Abbott 1977, Jackson 1995). The opportunities for raising the value of farmers' output lies in three main areas along the agricultural marketing chain, from production to consumption.

Opportunities at the farm level

Few farmers sell their output directly to consumers. Usually, there are several stages in the marketing chain before a product reaches the consumer. The first is at the farm level. Farmers need to plan their production so that sales of their produce provide the greatest benefit. This means that they should orient production towards meeting the demand for their produce. Strategies to plan production so as to derive the greatest benefit include:

- acquiring the necessary information and skills and being prepared to share experiences;
- planning production so that products are available at different times and thus take advantage of higher prices; this calls for various measures, such as having storage facilities at the farm level controlled by the farmer;
- improving marketable yields through good agronomic practices (such as time of harvest and choice of variety); marketable yield may also be increased if farmers are business minded and the farm offers the potential to produce more;
- improving the quality of the produce because poor quality means poor market value;
- ensuring that the quality produced is the quality needed;
- carrying out basic processing on the farm (such as sorting, grading, preparing and preserving); this not only gives farmers more bargaining power, it also increases the market value of the produce;
- finding a buyer and transferring ownership.

To take advantage of these opportunities, farmers need advice and information on orienting their output of food and other products to market demands and on identifying sales opportunities at both the domestic and export levels. Policy makers should endeavour to promote farmers' self-initiative, self confidence and self-reliance in these areas.

Opportunities arising from farmer integration in the food chain

In the absence of government intervention, there is a great need for farmers to become as involved as possible in the various stages of the food chain. Through such integration they gain access to other services and facilities. For example, the private sector can provide them with credit, fertilizers or other farm inputs. In Kenya, over 60% of the credit for fertilizer sales is provided by private distributors (Abbott 1993). As competition increases, it is possible that farmers may become involved in group marketing and make contracts with wholesale traders or processors. Through such collaboration, arrangements and agreements can be made which will increase farmers' access to various services.

Opportunities arising from direct involvement in marketing

There are many opportunities to add value to agricultural produce when marketing functions and initiatives are taken over and controlled by farmers. One of the possibilities is for farmers to sell their produce directly to consumers. However, the determining factors here include distance and geographical location. Farmers who can cultivate products such as cassava, vegetables or fruits near markets (for example, on the periphery of towns or cities) can benefit through direct access to markets. With cassava, for example, farmers can prepare fast foods and sell to urban consumers directly.

Other possibilities include:

- village markets, and periodic and permanent markets;
- roadside markets;
- wholesale markets in rural towns;
- retail and peripheral markets in larger towns and cities;
- wholesale markets in cities.

In most African countries there are periodic rural markets where farmers can sell their produce direct to consumers. This has the advantage of giving farmers direct access to consumers, allowing them to earn the full price of their produce by avoiding intermediaries, who usually get a higher market value for the produce than the farmers.

Value-added activities

Finance

Financing value-added activities is an important issue. Products cannot pass through the marketing system without financial support. The owner of the produce at any stage must either sacrifice the opportunity to use his/her capital elsewhere or s/he must borrow the necessary capital from some other sources. Farmers therefore need financial capital for the phase during which they are in possession of their produce and awaiting sale or payment.

Because of the limited formal credit facilities, however, financing value-added activities in African countries has increasingly to be based far more on the mobilization of local resources, savings and self-help. More focus

should be directed towards non-governmental organizations (NGOs), which have the means to help farmers organize themselves, rather than relying on government finance.

Rural employment

In addition to increasing the market value of agricultural produce, value-added activities on the farm will provide employment for rural people. Processing cassava, for example, has been a major source of employment for women in West Africa (ATSAP 1994). Thus there is a need to encourage the development of value-added activities in rural areas which take the form of small-scale labour-intensive processing units. The potential for this type of development is there – what is needed are deliberate policies to foster this potential.

Integrating and building alliances

The mutual assistance that still characterizes many societies in Africa could be utilized as a basis for developing group value-added activities. Group formation and networking could be an effective way for farmers to assist each other in competing against middlemen or traders. Membership of such groups could be based on factors which provide a common link (for example, neighbours, friends, all-women groups, and so on) which can be used to develop a common interest in value-added activities. Sales of produce and access to markets should be one of the reasons for forming these groups. Such alliances, not necessarily registered cooperatives, have the potential to increase the competitiveness and bargaining power of rural people.

Through such groups, farmers could share not only experiences but also transport, purchase of inputs, sales of produce and informal financial development through savings and credit clubs. This would strengthen their position and thus could lead to better cooperation with traders, the sharing of equipment, and the development of joint marketing facilities (such as storage facilities, market centres and processing equipment). Jointly, farmers can also overcome many infrastructural obstacles such as those related to building and maintaining access roads and market centres.

Nevertheless, major pre-requisites for this type of group formation are the commitment and willingness of individual farmers. The challenge to policy makers is to support such activities. The farmer group could later be linked to other groups to form a network for the exchange of experiences, ideas and information.

Conclusion

The implementation of SAPs in many African countries has highlighted the need for farmers in these countries to take greater initiative and develop strategies to improve their situation, especially where governments lack the means to support them. Deliberate efforts should be made to promote local farmers' initiatives in developing value-added activities.

The scope for farmers to add value to their produce is considerable. They can increase the market value of their produce at the farm level and through direct involvement in marketing activities, either as individuals or as members of a group.

The problems of high-volume, low-value commodities demonstrate how some agricultural products call for the formulation of special strategies if farmers are to increase the market value of their produce. For example, if processing and storage are implemented at the farm level, this will not only reduce the problem of perishability but will also increase the farmers' bargaining power. Direct involvement in marketing activities means that farmers, either as individuals or in groups, must acquire the relevant skills, be willing to collaborate and be prepared to take risks.

Despite the many constraints to economic development in African countries, the principles underlying the development of market-oriented agricultural production are common to all countries. There is a need now for more research on the development of value-added activities in particular countries and situations. Specifically, research is needed to:

- identify the potential for increasing the output of value-added products to increase farmers' income;
- identify domestic and export markets for value-added products, and make the results of this research available to farmers;
- find solutions to problems associated with value-added activities and assess the resources available to overcome these problems.

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PART 2

Country reports

2.1

Backyard lettuce production using nutrient film techniques: A case study in Trinidad

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The economy of Trinidad and Tobago is heavily dependent on petroleum which, in the 1982–92 period, accounted for an average of 25.6% of the GDP and 73.9% of the value of exports. Agriculture's contribution to the GDP in 1993 was 2.4% (*see* Table 1), but it employed about 11% of the labour force (Ministry of Agriculture 1995). In the late 1970s, when oil prices were high, the country basked in relative affluence. The agricultural sector, however, suffered because it could not keep pace with wages in other sectors. The government, nevertheless, retained various policies aimed at encouraging local production of food, such as import restrictions on certain commodities, including lettuce. As a result, prices of local commodities increased sharply; tomatoes, for example, sold for as much as TT\$10.00/lb at certain times (TT\$5.7 = US\$1.00, February 1995).

Table 1. Trinidad and Tobago: Some economic indicators

	1991	1992	1993	1994
GDP at current prices (US\$ million) ^a	3930	3895	4263	4842 ^b
Real GDP growth (%)	3.0	-0.1	-1.5	4.1
Consumer price inflation (%)	3.8	6.5	10.8	5.1
Population (million)	1.3	1.3	1.3	1.3
GDP/head (US\$)	3023	2996	3279	3725
Total external debt (US\$ million)	2329	2262	2306	2001
Origins of GDP 1993	% of total			
Agriculture	2.4			
Oil	23.0			
Manufacturing	8.6			
Electricity, gas and water	1.9			
Distribution, hotels and restaurants	15.5			
Transport and communications	8.7			
Financial services	13.1			
Government	11.3			
Other	15.5			

Note: a TT\$5.7 = US\$1.00 (February 1995)

b Estimated

Source: EIU Country Report, First Quarter 1995

Vegetable production and marketing

Vegetables and short-term root crops are grown mainly on small-scale farms ranging from 0.2 to 2 ha; many farms, however, produce vegetables on less than 1 ha (Williams 1993). Given the small sizes of farms, such crops offer the best potential for farmers to earn a reasonable income because they can use intensive systems for fairly high-value crops and can get more than one crop a year from the plots; the produce is marketed mainly through small wholesalers and retailers who buy directly from the farmers. The vegetables are then sold to consumers at markets in the cities and main towns throughout the country. Although these markets are open during the week, most sales are conducted during the weekend. Some supermarkets, however, are becoming more established as suppliers of fresh local vegetables and fruits, and increasing numbers of farmers are now selling directly to them.

The combination of increasing prices and a policy framework which sought to encourage local production of vegetables offered opportunities for enterprising individuals to make relatively high incomes from agriculture. However, the June–December wet season placed limitations on the traditional systems involving outdoor production, including:

- the physical impact of the raindrops which could damage or dislodge young plants and knock off flowers;
- high soil moisture content which could affect cultural operations and waterlogging;
- high incidence of diseases and pests;
- flooding in low-lying areas.

These limitations applied mainly to outdoor tomato production and, to a less extent, to other vegetables. As a result, the supply was usually lower and prices higher in the last few months of each year than in the earlier months (see Figure 1).

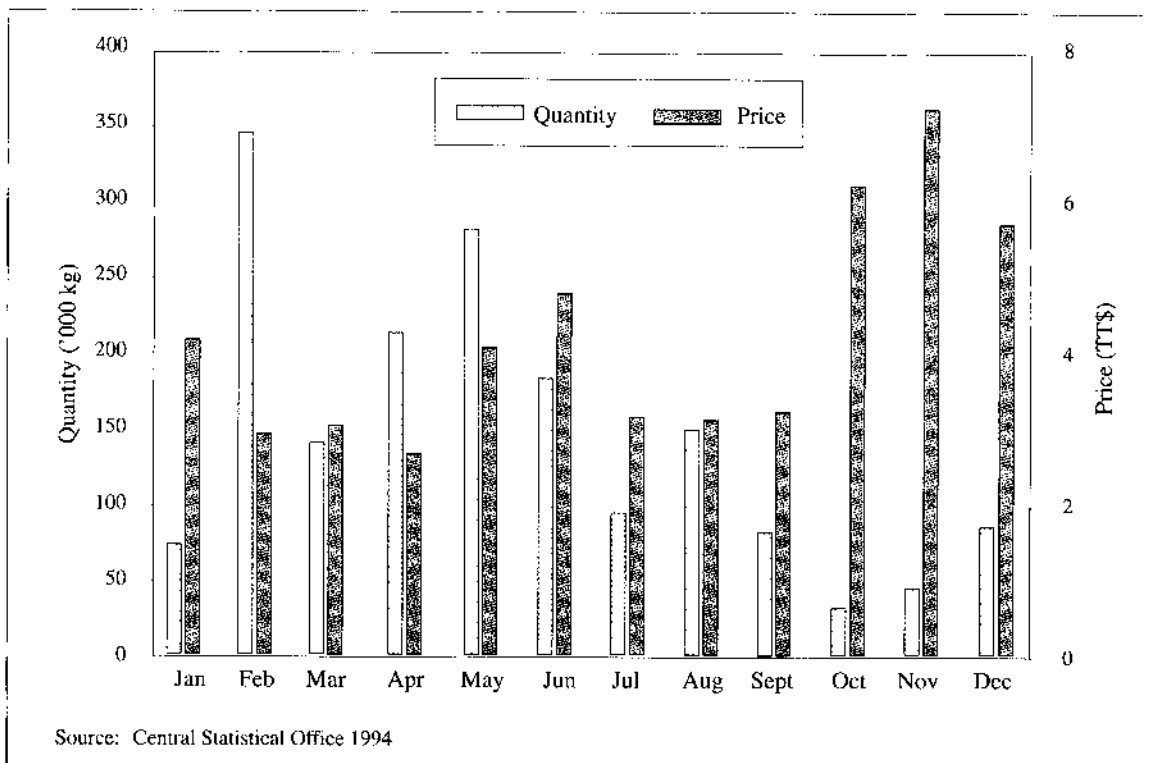


Figure 1. Quantity of tomatoes produced and average price/kg received by farmers in 1993

The emergence of soilless culture

The limitations outlined above stimulated growers to consider alternative systems such as undercover or protected cropping and soilless culture as a means of meeting demand. In addition to overcoming many of the problems inherent in the wet season cultivation of vegetables, the use of such systems would obviate the need for irrigation facilities for dry-season cultivation. It was felt that the high costs of establishing such systems could be offset by the high prices which the market would bear for the vegetables.

The main form of soilless culture, promoted mainly by a few commercial dealers, was the nutrient film technique (NFT). The dealers, of course, were also involved in the sale of the necessary equipment. The promotions emphasized the advantages of NFT as a “backyard system” – that is, suitable for farmers who had very limited land space and, in particular, for the production of tomatoes, the most popular locally produced vegetable. The focus was also on people who already had a job, perhaps because they were the ones who could afford the equipment.

The sales pitch promoted the idea that NFT was an “automatic” system, not needing close attention and supervision; this perception is thought to have been partly responsible for many failures with early attempts. Another reason for failures was that NFT was better suited for fast-maturing crops, such as lettuce, rather than tomatoes, the crop with which most farmers started.

The results of a preliminary survey in 1987 showed that there were about 60 growers involved in undercover production on a total covered area of 4.5 ha. Some 75% of them were using NFT. A few farmers eventually went out of business, with the failure rate highest among the tomato growers. In 1991 there were 12 lettuce growers using NFT; their production was, and remains, about 40,000 heads/month (Bedasie 1991).

The farmer selected for the case study started growing tomatoes on a part-time basis in 1994 after being exposed to the technology through a friend who was using NFT. He lost money on the venture, and attributed this to the fact that he had not realised that the system called for close supervision. He later contacted someone trained in soilless culture from the Ministry of Agriculture who advised him to try growing lettuces instead. He started growing lettuces in a small area of his backyard; now, however, the entire backyard, about 15,000 square feet, has been taken up with lettuce production.

The NFT system

Equipment and machinery

NFT has been described by one specialist (Steiner 1984) thus: “In principle, it is made up of gullies with a continuous circulating nutrient solution as a thin layer, a nutrient film. In the gullies are plants grown in blocks. The roots grow out of the blocks into the film in the gully.” The plants are grown in very small pots (60 cc in volume) which are placed in the channels of galvanized roofing sheets covered with mulching plastic. The solution is pumped through lines, released through emitters, flows slowly along the grooves and then drains to a collection point for recycling. The sheets stand about 2 feet above the ground. This arrangement is also quite convenient for harvest and post-harvest operations.

In terms of cover, the farmer in the case study started first with clear plastic. This was later removed completely when it deteriorated as a result of wind damage, and the farmer carried on without any cover for a while. He observed, however, that the solution temperatures varied by as much as 3°C from the closest to the furthest point from the emitter. Consequently, plants furthest away were not growing properly and failed to meet the size requirements.

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The farmer has since started using saran netting instead of plastic, but this has to be rolled back every afternoon for a short while to allow enough sunlight to reach the plants; without adequate sunlight, the lettuce heads become badly shaped and are therefore less marketable. The rolling back operation takes two workers only about 15-20 minutes.

In addition to the materials required for production, the farmer also has:

- several large plastic tanks for water storage when the pipe-borne supply is shut off;
- a water pump for pumping the solution through the pipes;
- a stand-by generator in case of disruptions in the supply of electricity.

All this equipment is easily available locally.

Variety

The farmer grows a variety which produces the crisp leaves preferred by his customers. It also has a longer shelf life than the more popular varieties sold at the markets. Almost all the lettuce grown for sale in the country is leaf lettuce. Because of high temperatures, the head lettuce varieties do not form proper heads, and thus are also grown as leaf lettuce.

The farmer obtains his seed from one supplier but had to change the variety recently because of the unavailability of the one he was accustomed to growing. The dealer claimed that his overseas supplier no longer provided it because of low demand. The farmer preferred the former variety because it produced a more compact head whereas the new variety has a more "open" head. With the new variety he has had to be more careful with the size of the lettuces because customers are less likely to accept some heads that are smaller than usual if they are less compact.

Production techniques

Seeds are sown in plastic trays containing a shallow layer of potting mixture. They are transplanted 1 week later into re-usable plastic pots (one seed/pot) containing commercial potting mixture, and they remain in the pots until they are harvested. They are "hardened" before being placed 3 weeks later in the NFT system at their final spacing. Here, too, another advantage over the field and even the "grow-box" systems is apparent in that the NFT system allows maximum use of limited space. At first, the plants are kept fairly close together; later, they are shifted to the correct spacing. The nursery operations must ensure that the plants have a good start if they are to be uniform in size.

The nutrient consists of a specially formulated commercial fertilizer for hydroponics and fertilizer-grade calcium nitrate. Small amounts of iron chelate are added to ensure that the leaves have the desired green colour. The solution is recycled and the strength is checked regularly using a conductivity meter. The system is flushed once a month to prevent the build up of toxic materials, and a new mixture sent through. The plants are sprayed once a week with a fungicide to protect them against downy mildew. Insecticides for the control of leaf miners are used if necessary. The cut-off periods for spraying are carefully observed.

Harvesting and post-harvest practices

Harvesting is done three times a week throughout the year when the plants are 7 weeks old. It is carried out in the morning of the same day that the farmer has to make deliveries. Thus, refrigerated facilities are not necessary and the plants reach the customer in a fresh state. The farmer is responsible for delivery. He does not own a vehicle but has a regular arrangement with someone else for transport. His customers are 15–12 km away, and the roads to them are fairly good.

Harvesting under this system is a less tedious operation than when the plants are growing in the ground. The plants are fairly clean and only a little washing is usually necessary. Cleaning also involves the removal of dead or unsightly lower leaves. Heads are placed immediately in plastic bags, usually one in each bag; if under the standard size, however, two are placed in a bag. Usually, no more than 15% of the crop sold will consist of bags with two undersized heads. If larger percentages of small heads are produced, the farmer still maintains the rough limit of 15% rather than give the impression that he is a producer of poor-quality lettuce. All the operations are carried out in the backyard, so there is no need to move the product from one place to another to carry out a particular operation.

Marketing

The operation is geared towards providing a year-round supply of about 3,000 heads of lettuce a week to the customers. These include a supermarket chain, an airline catering service and two "fast food" restaurants. The number of heads produced and sold per square foot per year is 10 if the area required for the whole operation is included.

The assessment as to whether or not a head of lettuce meets acceptable standards is based on a rough visual appraisal. The lettuces are sold on a per bag basis, and the price ranges from TT\$1.25/bag to TT\$1.50/bag in times of scarcity or high demand. Bagging is estimated to provide about 0.04c value added to the farmer. His customers will not buy the lettuces unless the heads are bagged.

Bagging offers many advantages:

- it results in less damage, higher marketable yield and, therefore, customer satisfaction (crisp leaf lettuces are especially susceptible to brittleness); this could be regarded as value added which benefits the farmer;
- it enhances the shelf life when stored under refrigerated conditions;
- it improves hygiene, which is important in the food business and for supermarket customers;
- it protects the lettuce when placed in a shopping bag to carry home.

The major factor that appears to have influenced the farmer to sell to his particular customers is that he has an assured and fairly stable market. He knows that at times he could get 75% or even 100% more if he retailed the produce himself in the open markets but, apart from the time involved and the inconvenience, there is always the risk that he may have to sell it too cheaply.

The characteristics of the open markets versus the other outlets (supermarkets and restaurants) are as follows:

Open markets:

- Shelf life is shorter, so there is more waste.
- Demand fluctuates, and therefore price fluctuates.
- Customers are mostly in the low- to middle-income groups and, in general, tend to place price above quality and to regard lettuce as a "treat" rather than as a basic food.

Other outlets:

- The demand from the restaurants and airline caterer is regular because lettuces are a standard ingredient in some of the meals they provide.

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- While supermarkets are patronized by people from all socio-economic groups, those who buy fresh vegetables and fruits in these outlets constitute a minority. They value the convenience of shopping in a supermarket and are willing to pay the higher prices there than in the open markets. Open markets are generally crowded and parking is difficult. It is likely, therefore, that the price of vegetables for supermarket customers does not seriously influence the amounts purchased, within certain limits, whereas this is not the case in open markets.

The marketing arrangement between the farmer and his customers is in the nature of an informal agreement rather than a legal contract. Mutual trust is a key factor. The arrangement seems to have operated satisfactorily over the years, such that when the farmer sought an increase in price because of currency devaluation and an increase in input costs, his customers agreed to pay the higher price.

The arrangement also allows him flexibility. Thus, in times of high demand, he can sell some produce at a higher price to some customers than to others, but he only takes such chances when supplies are scarce because he does not want his customers to find other suppliers. Indeed, when he has been unable to supply customers he has arranged to have another person supply them rather than risk their going directly to other farmers.

Payments are made shortly after delivery. The farmer notes, however, that there is now a disquieting trend for payments to be held back longer than before, up to 1 month after delivery in some instances. He is watching this situation carefully although it does not seem to be causing him undue concern, probably because he has a regular cash flow and does not have to service bank overdrafts.

Influences on outcome

Tables 2, 3 and 4 summarize the influences of critical factors in production, harvest, post-harvest practices and marketing on outcome. The items are rated on a scale of 1 to 5, with 5 as the highest rating. Table 5 provides an estimate of the financial returns per head of lettuce.

Table 2. Production factors

Production factors	Rating of contribution of factor to	
	Yield	Quality
Variety	4	5
Nursery management	5	5
Nutrition management	5	5
Shade control	5	5
Disease protection	4	4
Pest protection	3	3
Plant population	5	4

Table 3. Harvest factors

Harvest factors	Rating of contribution of factor to	
	Yield	Quality
Days after planting	4	4
Damage avoidance	5	5
Time of day of harvest	4	4
Transport to outlets (assuming same-day delivery)	4	4

Table 4. Post-harvest and marketing factors

Post-harvest and	Rating of contribution of factor to final price
Cleaning/removal of unwanted leaves	4
Bagging	5
Consistency of quality and volume	4

Table 5. Returns per head of lettuce^a

Minimum price received per head	1.25
Capital costs (TT\$80,000 written off over 10 years)	0.06
Variable costs	
Nutrients	0.12
Potting mixture	0.1
Pesticides	0.03
Transport and bagging	0.24
Labour and supervision (inc. farmer/manager)	0.55
Margin	0.15

Note: a All figures are in local dollars (TT\$5.7 = US\$1.00, February 1995)

Farmer characteristics

The farm family consists of four people (the farmer, his wife and their two sons) who depend entirely on the income from the farm. The farmer and his sons work full-time on the farm and he also employs three other people on a regular basis. The sons, who live with him, assist in monitoring the NFT system when the farmer has to be away. He has used credit from the Agricultural Development Bank mainly to finance capital expenditure rather than operating expenses. He considers that his operation is successful and does not plan any changes in the near future. Outwardly, he appears to be successful, owning a comfortable house with modern amenities. He is clearly an innovative farmer, and there is much evidence of constant experimentation, although he does not take undue risks. He started small and acquired some experience before expanding.

SWOT

Strengths

Good knowledge, understanding and experience of the technology and the market.

Good relationships with customers.

Not dependent on one or two customers, thus minimizing the risks.

Strong relationships with support individuals and institutions (credit agency, input suppliers and, particularly, the Ministry's specialist, in whom the farmer appears to have a great deal of trust and confidence).

Some flexibility in the contractual arrangements with his customers.

Weaknesses

The system is dedicated to the production of lettuce or similar crops; if he has to change his enterprise, costly adjustments will have to be made.

The informal marketing arrangement could be risky; changes in personnel or operating procedure in the buying agencies could result in a breakdown of the arrangement.

It is not clear whether he has sufficient knowledge to deal quickly with any serious problems that might arise in soilless culture.

Opportunities

The number of "fast food" operations is rapidly increasing, presenting new market opportunities.

The health food trend, with its emphasis on fresh fruits and vegetables, may lead to increased demand for lettuce.

Threats

The movement towards organic farming and ecological agriculture might influence people away from crops produced through soilless culture.

Trade reform measures are now being implemented in Trinidad and Tobago. Although some commodities still enjoy a measure of price support through tariffs, these will be removed in a few years time. Lettuce, however, is among those products that cannot be freely imported and this will result in increased competition among local producers.

The system is heavily dependent on inputs, most of which are imported. Currency devaluation might make the price of these inputs prohibitive. Also, the market in Trinidad for the specialized inputs is relatively small, and customers will therefore be unable to influence the decisions of overseas suppliers; the farmer could be adversely affected by such decisions, as happened when the variety he was using was no longer available.

Acknowledgements

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2.2

The efforts of a woman farmer to market vegetable produce: A case study in Papua New Guinea

M. Dominic (FPDC)

The marketed fruit and vegetable industry in Papua New Guinea (PNG) is in its infancy in terms of meeting demand. According to a survey undertaken in 1991 by the Fresh Produce Development Company (FPDC), the demand for fruit and vegetables in the formal sector of the major urban centres was estimated at 18,867 t/annum ("formal sector" is used here to refer to supermarkets, hotels and institutions; open markets make up the "informal sector"). This is the nominal demand and not actual volume, which is lower. Census figures for 1990 estimated that the overall population in 1995 was 4,047,670, with a growth rate of 2.30%. About 15% of the population are urban dwellers. Some economic indicators for PNG are given in Table 1.

In Port Moresby, the high demand relative to supply is reflected in the high prices for fresh produce. A survey of supermarkets in Port Moresby in June 1995 indicated that the per kilo price range of green capsicum, for example, was K4.00 to K5.00; cucumber K1.20 to K2.00; and eggplant K2.00 to K2.60 (K1.717 = US\$1.00,

Table 1. Papua New Guinea: Some economic indicators

	1991	1992	1993	1994
GDP at current prices (US\$ million) ^a	3079	3484	4210	n/a ^b
Real GDP growth (%)	9.5	11.8 ^c	15.0 ^c	1.9
Consumer price inflation (%)	6.7	4.3	5.0	6.0
Population (million)	3.77	3.85	3.92	3.99
GDP/head (US\$)	817	905	1074	n/a
Total external debt (US\$ million)	2735	3731	3168	n/a
Origins of GDP 1990	% of total			
Agriculture, forestry and fishing	30.3			
Mining and quarrying	18.2			
Manufacturing	10.0			
Construction	3.6			
Services	37.9			

Note: a Kina 1.717 = US\$1.00 (February 1995)

b Not available

c Estimated

Source: EIU Country Report, First Quarter 1995

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February 1995). The supply of fresh fruit and vegetables is low and inconsistent relative to demand. Generally, people involved in this industry lack production and marketing information. Even if such information were readily available to farmers, the high rate of illiteracy among farmers hinders practical use of this information. Farming enterprises are on a small scale, subsistence or semi-commercial oriented, with little modern farming machinery involved.

The lack of proper distribution and quality assurance measures results in high losses. A handful of wholesalers, growers and suppliers have taken the initiative to implement appropriate post-harvest care, but most farmers pay little attention to post-harvest treatment. The few storage facilities tend to be owned and managed by large companies.

Successive governments have acknowledged the importance of horticulture in the national economy and have developed and implemented policy guidelines to promote horticultural projects. Most of these projects, however, are either non-functional or struggling to survive. There are many reasons for this, including: lack of basic infrastructure to assist in the development of horticultural projects; lack of proper distribution chains to move produce easily to the nearby markets; inadequate dissemination of technical and marketing information; and lack of skilled manpower to manage the various projects. Despite the difficulties, many farmers, mostly family units, persist with their farming activities. In the past 6 years, however, improvements have been made in this industry, particularly in satisfying market information requirements at the national level. This has been effected primarily through the FPDC, a joint project funded by the PNG and New Zealand governments.

Port Moresby markets

According to the 1990 census, the population of the National Capital District, which includes the city of Port Moresby, was 195,570. The city is growing rapidly, evidenced in the sprawling suburbs and shanty settlements. Many rural people are migrating to the city in the hope of finding better job opportunities and living conditions.

Port Moresby's location (dry tropical) makes successful vegetable ventures difficult. Many temperate vegetables, such as broccoli, cauliflower, carrot, tomato, zucchini, lettuce, potato and peas, can be grown only with difficulty. The area experiences distinct wet and dry seasons and there are marked seasonal variations in the volume supplied. An irrigation system of some sort is vital for successful vegetable ventures.

The total formal market demand for fruit and vegetables in the city in 1991 was estimated at 10,064 t/annum. With the rapid growth of the city since then, this demand will have increased. The city depends heavily on the highlands growers to supply temperate fruit and vegetables. Most perishable crops, such as broccoli and lettuce, are airlifted, while less perishable crops, such as potato and sweet potato, are shipped on a weekly basis from Lae to Port Moresby. This seafreight currently averages 100 t/week, up from 30 t/week in 1989–90. Local farmers supply tropical crops such as bananas, taro and a range of local greens.

Formal retailing of fresh fruit and vegetables in Port Moresby is dominated by five or six major supermarket groups, all of which buy fresh produce directly from the growers. There are no formal contracts between a supermarket and a grower. Wide variation exists in the prices at which the supermarkets sell fresh produce. The June 1995 survey, for instance, found that among the 14 regular supermarkets in the city the price of broccoli ranged from K3.30 to K5.70 and head cabbage from K0.99 to K2.00/kilo. Historically, prices of fresh fruit and vegetables in Port Moresby have been high (Epstein 1982). Fresh vegetables retailed by these supermarkets are aimed at the small expatriate community and the growing indigenous middle class market.

The bulk of the city's population, those in settlements and the average wage earners, purchase most of their vegetables in the open markets. Supermarkets, "fast food" outlets (kai bars), institutions and major catering

services also purchase vegetables in these markets. There are no volume figures available for the open markets but they are estimated to handle five times the volume of the supermarkets. A survey in 1988 (Department of Agriculture 1988) indicated an annual volume of about 7,000 tonnes in the two main markets. This may well have reached 15,000 tonnes by 1995.

The open markets, of which there are five or more located at various sites in the city, are managed by the City Council. There are no price controls and competition and price fluctuations are high. Seasonal influences are a major element in these markets. For instance, watermelons are a highly priced commodity during the Christmas-New Year period which coincides with the hot, dry season. During this period, a top-quality watermelon weighing 5–6 kg could fetch K20.00.

Farm status

Status prior to project collaboration

The farm which formed the focus of this case study covers 18 ha of flat land. It is situated about 30 km north-east of Port Moresby, near the Laloki River which runs from Sogeri Plateau and flows through the north-east of the city. A poultry enterprise, Ilimo Country Choice Chickens, had started cultivating vegetables on the farm in the early 1980s. The objective was to ensure a consistent supply of tomatoes and other fresh vegetables to its employees as well as to customers in Port Moresby. In the mid-1980s, however, Ilimo Country Choice Chickens ceased its farming activities and leased out the land.

Three unemployed agricultural officers jointly took on the lease of the farm, but this tenancy lasted for less than a year because of a difference of opinion among the tenants on the types of crops to cultivate. A Chinese project team working with the Department of Agriculture and Livestock took over the lease but this tenancy also subsequently lapsed. During each tenancy, the farm manager had remained on the farm, and when the second tenancy lapsed he took on the lease, at a cost of K1,500.00/quarter, in an effort to support his wife and eight unemployed sons. Soon afterwards, however, he became ill and died in March 1995, leaving the farm under the supervision of his widow.

When the farm manager had taken over the farm there was virtually nothing there except an old tractor, a small greenhouse, semi-permanent staff quarters built of corrugated iron and an irrigation system. At that time, his wife had been employed as a librarian who, in her spare time, helped her family on the farm. When her husband became ill, however, she resigned from her paid job and by the time he died she had taken over the running of the farm.

The family could not afford skilled labour so she employed her sons. One or two other workers, family friends, assisted the family when necessary. The widow supervised the day-to-day operations, her main focus of attention being on harvesting, transporting and marketing. In her spare time she assisted her sons on the farm. The family could not afford modern farming machinery and thus the sons undertook most of the physical tasks on the farm.

Apart from the family's inability to employ skilled labour and purchase new machinery, production and marketing information was not readily accessible. Assistance through local extension networks was not available due to lack of resources in terms of vehicles and materials. Also, the family's attempts to negotiate financial assistance from the various financial and funding organizations were unsuccessful.

A limited number of crops, including cucumber, capsicum, snake beans and eggplant, were grown on the farm. The produce was harvested almost every morning and transported on the same day in a small family van to the main open markets in Port Moresby, in particular Gordons market. Occasionally, orders were received from a

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hotel and a few supermarkets. The produce from the farm had to compete with similar or better-quality produce from other growers in the coastal and highlands areas.

Limited access to production and marketing information hindered the family's search for varieties that were suitable for the soil and climate and which would meet market specifications. In addition, no proper growing plans were devised and there was minimal management. Therefore, the desired plant population was not achieved, resulting in low yields. Only about half a hectare of the total farm land was cultivated. Returns to the farm were low, and were further aggravated by the competition in the markets. The family was struggling to pay the rent.

Despite these difficulties, the widow and her sons did not give up hope of earning a reasonable income from the farm. They were determined to carry on with their enterprise, primarily because the family had no other means of survival. In mid-1994, the farming problems confronting the family were eased when the Taiwanese Technical Mission to PNG came to the family's rescue.

Status during project collaboration

The Taiwanese Technical Mission to PNG consists of a group of Taiwanese horticultural experts who are working in collaboration with the Department of Agriculture and Livestock (Food Management Division) (DAL-FMD) to provide production and technical assistance to smallholder farmers. Based on recommendations from the DAL-FMD, the project team selects a farmer who has demonstrated some farming skills but, hampered by the lack of basic factors of production such as machinery, is not carrying out his/her farming activities successfully.

The selected farmer is assisted for 12 months, after which the project moves on to another farmer. This period is seen as long enough to provide the assistance necessary for the farmer to be able to stand on his/her own feet and carry on normal farming activity. The project team provides seeds and gives advice up to harvesting stage but selling the produce and determining prices is left to the discretion of the farmer.

In the case studied, when the project team moved in with farming machinery, skills and other farm inputs, the area of cultivated land increased to about 7 ha. The team capitalized on the existing irrigation system on the farm and introduced furrows. Water from the Laloki River was pumped onto the farm by several electrical water pumps situated at various locations on the farm, and then was piped into furrows. Consideration was given to selecting varieties which were appropriate for the soil and climate, and new varieties were introduced. There was careful supervision of soil preparation and sowing in order to ensure that the desired plant population was achieved.

Although the project's main emphasis was on achieving high yields from the new varieties (these included Slice Master cucumbers, Giant Bell capsicums, Island Red [hybrid] tomatoes, and Sky Mountain and Tenbow watermelons), there was no restriction on the family from growing other varieties and crops. As a result, a combination of varieties was grown at the same time. Other crops included eggplants, pumpkins and snake beans.

With careful supervision of field operations and regular crop inspections, the level of production soared (no comparative data are available). In addition, the new varieties proved to be a major attraction in the market because of their size and appearance. Despite the increased production, however, there was no change in the underlying mode of marketing, and no value-added measures, such as slicing and pre-packing watermelons, were undertaken to meet market requirements and achieve greater profit margins. The produce from the farm was still sold in the open markets, but the new varieties and the improved consistency in supply gave the farmer an edge in the market.

Influences on outcome

According to the farmer, the returns to the farm prior to the arrival of the Taiwanese project team were generally low. On average, the net margin from produce sold was about K200.00/month. During the period when the farmer could sell watermelons, the income was slightly higher. Sales increased initially when the project team was involved, due to higher yields.

Although the project team kept some records on vegetable sales during the period that it was involved with the family enterprise, there are no records on expenditure or yields. The returns to the farm during part of this period (from October 1994 to March 1995) are summarized in Table 2.

The figures presented in Table 2 reveal that there was a downward trend in vegetable sales. There are two possible reasons for this. First, the assistance provided by the project team was gradually being withdrawn, which meant that the high level of output of marketable produce could no longer be maintained. The second reason was that seasonal crops such as watermelon grow and sell best during the Christmas-New Year period, and therefore the sales at this time are higher than during the other months in the given period.

As pointed out earlier, no formal farm records were kept by the project team on expenditure. In Table 3, in order to provide some indication of the gross margins, the average prices in the market in which the produce was sold have been used, in conjunction with production costs data collected by DAL. It should be noted that these data do not include packaging and labour costs.

The figures in Table 3 make it clear that high gross margins (or producer surplus) are achievable. Estimates on yield cannot be given due to the lack of records.

To provide some insight into the farm expenses on a monthly basis, the sales and expenses figures for March 1995 are given in Table 4.

The figures given in Table 4 indicate that, at the present volume of output, the economic viability of this vegetable venture is questionable. The wages, for example, are given as K500.00/month. If this figure is divided between the nine adults on the farm, it means that each person is receiving well below the minimum rural wage level of about K4.00/day.

Table 2. Sales per month (1994-95)^a

October	5,000
November	3,000
December	3,500
January	3,000
February	1,500
March	1,500
Total sales	17,500

Note: a Figures in PNG Kina (K1.717 = US\$1.00, February 1995)

Table 3. Estimated gross margins^a

Crop	Market price (K/kg) ^b	Production cost (farm gate) (K/kg)	Gross margin
Watermelon	1.00	0.09	0.91
Tomato	3.50	0.18	3.32
Capsicum	2.50	0.24	2.26
Cucumber	1.50	0.09	1.41

Note: a Figures in PNG Kina (K1.717 = US\$1.00, February 1995)

b Average prices at Gordons market, April 1995

Table 4. Sales and expenses, March 1995^a

Sales	1,500
Expenses	
Rent for land	500
Seed	10
Fertilizer	100
Sprays	25
Wages	500
Other	65
Total expenses	1,200
Net margin	300

Note: a Figures in PNG Kina (K1.717 = US\$1.00, February 1995)

SWOT

Strengths

Family team
The mother's drive to succeed
Well-established irrigation system

Weaknesses

Lack of technical and business knowledge
Dependency on machinery provided by the project team
Use of rented land
Death of the head of the family

Opportunities

Several outlets in which to sell produce, and high market demand
Relatively close proximity to main markets in the city
Good relationship with some buyers in the market
Potential for increased production and returns to the farm
Potential for securing new markets in the city
Potential for developing value-added measures to meet market specifications

Threats

Withdrawal of project team support
Competition and price fluctuations in the open markets
Natural disasters, such as floods, which can destroy much of the crop during rainy periods

Conclusion

Returns to the farm were low prior to the involvement of the project team. Lack of the necessary factors of production resulted in low marketable yields, which provided an inadequate income. However, during the involvement of the team, production soared initially, resulting in high returns to the farm because of the increase in sales. Income would have been maintained had the farmer used measures to increase the levels of production and been more innovative in undertaking value-added activities to meet market requirements. The close proximity to the main markets in Port Moresby provides a great opportunity for a venture of this nature to be viable. The paramount question is: Is there sufficiently consistent production of marketable yields to earn an income? The availability of marketing options and value-added is not a major issue in this case.

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2.3

Milk processing for value-added production: A case study in Kenya

J. Waweru (KNFU)

At independence in 1963 Kenya inherited a dualistic rural economy that favoured expatriate farmers (numbering about 1,000) at the expense of indigenous farmers (about 1 million), most of whom were small-scale farmers, marginalized and reduced to subsistence farming and supplying cheap labour to the estates. They were barred from growing anything for the formal market, such as the more lucrative export crops, ostensibly to prevent a lowering of the quality of marketed produce.

One of the priorities of the independent government was to dismantle this segregation so that all farmers, irrespective of farm size, would be treated in the same way. This was to be achieved through a package of reform measures, including the redistribution of high-potential land, the introduction of production support services such as extension, training, marketing, the improvement of rural infrastructure and encouragement for indigenous farmers to grow cash crops. Thus, whereas at independence less than 20% of agricultural produce came from indigenous farmers, this group now accounts for 75% of the coffee output, 60% of sugarcane, 100% of pyrethrum and 75% of maize.

Major strides have also been made in dairy sector. Only 10% of the total dairy herd was in the hands of the indigenous farmers at independence. Now over 80% of total milk production is produced by the small-scale sector and this sector owns most of the national dairy herd. Some general economic indicators for Kenya in the period 1991–94 are given in Table 1.

Milk production and marketing

Milk production is now dominated by 400,000 small-scale producers; large-scale producers number about 40,000. It is estimated that 1.8 billion litres is produced annually, making Kenya the third largest milk producer in Africa, after South Africa and the Sudan. Of the total milk production, 53% is consumed at home and 47% sold into the market.

The commercialization of the small-scale farming sector would not have been possible without the cooperatives. These were introduced into most of the small-scale sub-sectors, such as dairy, coffee, pyrethrum, cotton and sugarcane. There are now about 100 cooperatives whose major responsibility is milk marketing. Through these cooperatives, farmers have acquired access to the previously centralized marketing boards that served only the large-scale farmers. Milk marketing had been monopolized by one countrywide creamery which had been protected by a system of quotas. After independence, the quota system was abolished and dairy cooperatives were established to collect and transport milk to the national creamery for sale to consumers.

FARMER STRATEGIES FOR MARKET ORIENTATION IN ACP AGRICULTURE

Table 1. Kenya: Some economic indicators

	1991	1992	1993	1994
GDP at factor cost (US\$ million) ^a	4299	4942	6130	n/a ^b
Real GDP growth (%)	2.1	0.5	0.1	2.8 ^c
Consumer price inflation (%)	19.6	27.3	46.0	20.0
Population (million)	25.9	27.0	28.5	n/a
GDP/head (US\$)	166	183	215	—
Total external debt (US\$ billion)	7.00	6.37	n/a	n/a
Origins of GDP 1993 (provisional)	% of total			
Agriculture, forestry and fishing	28.9			
Manufacturing	10.4			
Trade, restaurants and hotels	14.1			
Transport, storage and communications	8.2			
Government services	15.1			
Other (nct)	23.3			

Note: a KSh44.38 = US\$1.00 (February 1995)

b Not available

c Estimated

Source: EIU Country Report, First Quarter 1995

This liberalization process has gathered momentum during the past 5 years, with the government implementing liberalization policies for the entire rural economy, including the dairy sub-sector. Competition is being encouraged and prices are no longer fixed, as before, but depend on market forces. The support services that used to be provided by the government, such as artificial insemination (AI), veterinary services and dipping, are also being privatized. More cooperatives and individual farmers are now investing in independent dairy processing plants and providing more competition for the national creamery.

Milk is marketed under both formal and informal arrangements. The informal market includes all milk sold other than to processors – back door sales, sales to neighbours, hawked milk and unprocessed milk sold by cooperatives in their immediate locality. The formal sector is made up of milk received, processed and sold by the national creamery. About 80% of this is sold as liquid, and the balance is processed into cheese, butter, milk powder and ghee, as well as into UHT for the school milk programme.

Consumption of milk in the urban areas accounts for 50% of total milk consumption (see Figure 1). With the urban areas growing at more than twice the rate of rural population, demand in the cities will take an increasing share of the demand. It is projected that the demand for milk will double by the turn of this century. In the main milk producing areas, however, less milk reaches the market than farmers wish to sell. This is because farmers still lack adequate access to the marketing system, and thus more milk is consumed in the home than would otherwise be the case. It is estimated that this forced consumption accounts for 23% of all milk production.

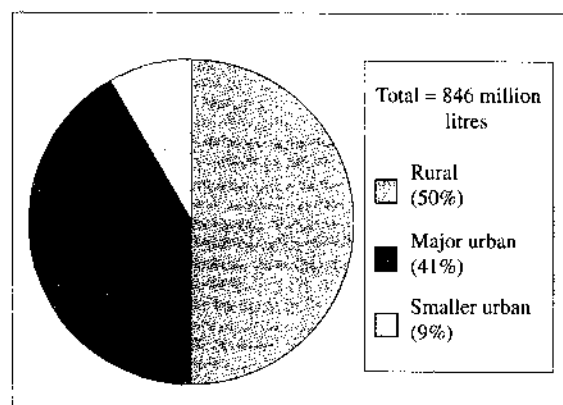


Figure 1. Consumption of marketed milk

The farm profile

The farm in this case study belongs to a man who, on retiring from a high-profile job, decided to take up full-time farming. He is one of the beneficiaries of the land resettlement policy in the high-potential highlands, where he owns 150 acres of land. The land was used by the previous owners for dairy production and the farmer opted to continue in the same tradition. Most of the farm is therefore under grass apart from about 10 acres under coffee, 5 acres under fruit trees and 2 acres taken up by farm buildings.

The dairy herd consists of 80 cows, 10 heifers and a bull. In the absence of a reliable AI service, the bull is used for breeding purposes. The cattle are grazed in paddocked fields; this is supplemented with maize silage, particularly during the dry season. Milking cows and calves are fed with purchased concentrates to supplement their feed. The current carrying capacity of the farm is 1.5 acres/animal. This is reasonable for the type of animal that the farmer has selected, a cross between the Friesian and Ayrshire breeds. It is possible to improve on this, however, by growing more fodder crops, increasing silage production, making hay and feeding the cattle more concentrates. On average, the number of cows in milk is 50. This leaves 30 dry cows, which is a high number. This is an area in which improvements could be made through better practices, feeding and general management.

The farm produces an average of 400 kg of milk daily from the herd during peak periods. At 1,825 kg/cow/year, this compares favourably with other dairy farmers in the country. Some direct costs of milk production on the farm are given in Table 2. In addition to the milk produced on the farm, the farmer receives 1,500 kg of milk daily from neighbouring dairy farmers contracted to supply milk to the farm.

The farmer has invested in a milk processing plant. All the liquid milk received by the farm is processed before selling it to the market. The plant was acquired about 5 years ago at a cost of about KSh5 million. It has the capacity to process 2,500 kg on a single shift. The cost of a similar investment would be about KSh20 million today. Of the total amount of milk received, 60% is pasteurized, 20% is fermented and the remainder is turned into cheese. The fresh liquid milk is packaged in plastic half-litre sachets bearing a distinctive brand name, and has a shelf life of 3 days. The other products are also well packaged and labelled. The cheeses currently made on the farm include Cheddar, Mozzarella, Red Highland and Tilsiter. Estimated milk processing costs, excluding depreciation, are given in Table 3.

The farmer owns several milk vans and transports his dairy products direct to the retailers who buy from him. There is a large town only 20 km from the farm where most of the liquid milk is sold. The balance is sold in smaller towns within a reasonable radius of the farm. Consumption of cheese, however, is dependent on the tourists, most of whom visit the capital city, Nairobi. The farmer has obtained orders from hotels and supermarkets in Nairobi and transports his products to them using his own transport. There is currently a substantial demand for cheese which the farmer cannot yet meet.

Table 2. Some direct costs of milk production (KSh/cow/month)^a

Feed	100
Dipping	200
Veterinary costs	50
Water and electricity	80
Wages	60
Total before forage costs and other overheads	490

Note: a KSh44.38 = US\$1.00 (February 1995)

Table 3. Estimated milk processing costs (KSh/kg)

Packaging	2.00
Spares and maintenance	0.60
Storage	0.50
Transport	0.30
Wages	0.80
Insurance	0.30
Total processing (excluding depreciation)	4.50

Table 4. Marketing margins/value added over the farm gate price for liquid milk and cheese (KSh/kg)^a

Product	Farm gate value	Processing cost	Distribution cost	Retail value	Consumer price	Market margin/value added
Liquid milk	10.00	3.85	0.65	26.00	30.00	20.00
Cheese	10.00	3.85	3.00	26.00	37.00	27.00

Note: a KSh44.38 = US\$1.00 (February 1995)

Farmers who sell milk to the farmer receive KSh10.00/litre. This is the same price that the farmer pays himself, for bookkeeping purposes, for his own milk supplied to the processing plant, as well as being the price that the competing cooperatives pay to their members. Pasteurized milk is sold to retailers at KSh26.00/litre, and the consumer price is KSh30.00/litre.

Although the packaging costs for some products are lower than those for liquid milk it is assumed in this paper that all dairy products yield a gross margin of KSh16.00/kg and a profit before depreciation of KSh11.50/kg. The marketing margins (value added) for liquid milk and for cheese are summarized in Table 4.

Milk production is seasonal, most of it being produced in the wet season between July and October. To overcome the reduced intake in the dry months (January to April) the farmer is still recruiting more farmers to supply his farm; currently he has some 400 suppliers. As shown in Table 5, by buying milk from neighbouring farmers he has raised his total margin nearly threefold. Thus the farm has become much more profitable than it was previously, due to the investment made to add value to the raw milk before selling it to the market.

Challenges and opportunities

Any newcomer to a milk processing activity would first have to face the high initial investment required. There is a shortage of long-term loan capital because most banks lend only on a short-term basis (usually 2 years). The interest rates are also extremely high, rising to over 20% per annum. There are now attempts to address these constraints and banks are to be enabled to lend on longer terms and to offer attractive packages.

The high cost of investment is partly a result of the imported technology, which tends to be capital intensive. It is necessary to look into alternative technology that is less expensive and would use more of the abundant labour available in the country.

Competition also provides a challenge, especially when dealing with the national creamery. Some newcomers in the market have experienced the negative side of this competition and found it difficult to compete. The existing ones have so far not been able to operate at costs as low as those at the creamery. They need to improve their efficiency, increase their capacity utilization and aim to sell more diverse products.

At the farm level, there are many challenges facing farmers if they are to improve the quality and quantity of the milk they produce. The critical factors are listed in Table 6. Obviously, farmers differ as to what their priorities are, but essentially a combined package of the factors in Table 6 is necessary for a successful dairy enterprise.

Milk yields on many dairy farms are much lower than would be expected. A major reason is that feeding regimes are not well developed (for example, improvement of pastures, preservation of fodder and feeding of adequate concentrates to lactating animals). Many dairy cattle are early crosses of exotic breeds and the local zebu, and require more crossing before they can achieve a higher milk production. There are also difficulties in organizing an efficient breeding service, especially through AI; many farmers still rely on unimproved bulls.

Table 5. Total farm income per annum (KSh)^a

Farm level gross margin @ KSh6.70/litre	978,000	13%
Profit from own processed milk @ KSh11.50/litre	1,679,000	22%
Profit from purchased milk @ KSh11.50/litre	5,037,000	65%
Total margin	7,694,000	

Note: a KSh44.38 = US\$1.00 (February 1995)

Table 6. Farm level factors contributing to the quality and quantity of milk^a

Factor	Quality	Quantity
Choice of breed	4	4
Feeding practices	4	4
Veterinary services	4	3
Dairy building and equipment	3	4
Motivated workforce	3	3
Dairy records	1	1
Marketing strategy	3	1
Water supply	4	4
Fencing	1	1
Replacement policy	4	4

Note: a Ranked from 1 to 5, with 5 as the highest value

Table 7. Processing factors important for quality dairy products

Factor	Quality	Quantity
Bacterial count	5	1
Acidity level	5	1
Nature of equipment	5	1
Processing technology	5	5
Skills	5	5

Table 8. Marketing factors important for quality dairy products

Factor	Quality	Quantity
Distribution	3	5
Storage temperature	3	—
Strategy	1	5
Product assessment	5	5
Packaging		
– type of packaging	1	5
– size of packaging	1	5
– cost of packaging	1	5
Display	1	5
Promotion	1	5

There is much scope for upgrading the dairy herd and increasing its milk production through better management practices. Some practices, such as breeding and disease control, require group action, and cooperative societies are being encouraged to take up this challenge. For his own farm and the neighbouring farm, the farmer in this case study intends to set up an AI service, employ a qualified veterinary doctor and establish a feed-mixing plant.

The farmer considers that pasteurizing and packaging milk is more demanding and carries higher risks than making cheese, yoghurt, ghee and other dairy products. The main market for these goods is in Nairobi, which is some 400 km away, and they need to be of high quality and marketed efficiently. It is, however, an opportunity the farmer wishes to take, while drastically reducing sales of liquid milk. The million or so tourists who visit Kenya annually and the influx of people into the towns (estimated at 7% annually) makes him confident that the market for these products will improve still further. This will leave the national creamery and other interested dairies to satisfy the local demand for liquid milk. The factors perceived to be important in processing and marketing are given in Tables 7 and 8.

SWOT

Reference has already been made to the need for the project to improve the level of technical performance. If the business is to grow it must seek to improve margins and retentions. A SWOT analysis reveals a framework which provides a complex web of counter-balancing strengths, weaknesses, opportunities and threats.

FARMER STRATEGIES FOR MARKET ORIENTATION IN ACP AGRICULTURE

Strengths

Organization

Simple family structures with little differentiation
Abundant, literate and low-cost labour

Communications

Most larger market centres have telephones and postal services

Products

Ready market for liquid milk
Increasing demand for other dairy products

Finance

Great willingness by local entrepreneurs to invest
Willingness by some donors to extend investment grants and soft credit

Credentials

Higher local patronage possible
Dependability of new enterprises

Knowledge

Good local knowledge of producers and the market

Opportunities

Market

Rising urban population and tourist traffic
Export opportunities under trade liberalization

Economy

Full liberalization of the economy
Liberal exchange control system attractive to investors

Society

Well-established trade union practices
Labour market well supplied with potential workers

Legislation

Strong Bureau of Standards
Ministry of Health actively enforces health regulations

Ecology

Existence of a special environment monitoring unit

Weaknesses

Inadequate job specialization
Heavy reliance on on-the-job training

Limited access to faxes and market information
Negligible use of computer technology
Poor rural access roads
Most households not yet connected to electricity
Imported capital-intensive technology

Inadequate facilities for quality control
Narrow range of products
Expensive packaging for products
Inadequate refrigeration facilities

Limited access to long-term credit
Very high interest rates
Inadequate support to dairy producers

Threats

Competition with cheap, subsidized imports
Stiff competition with entrenched monopoly

Structural adjustment policies' effect of reducing level of support to local producers and entrepreneurs

Capital-intensive technology
Technology a threat to labour absorption

Need to harmonize legislative activities

Unsatisfactory disposal of dairy plant effluent

Conclusion

There is a need for competition in the collection, processing, transportation and marketing of milk if the dairy industry is to benefit from full liberalization. Those individuals and groups who can afford these measures should be given encouragement to take advantage of this. Such encouragement will come through policy support for newcomers to the industry to obtain investment capital, appropriate technology and a level playground with regard to competition. They need support to increase efficiency both at the farm level and in the market place.

2.4

Vining pea production and marketing by a farmer group: A case study in the United Kingdom

G. Jackson (University of Coventry)

It is sometimes said that market-oriented or commercial farming has the single overriding goal of profit maximization and is thus inherently destructive in, for example, environmental and social terms. However, there is ample evidence in those countries where the development of the industry has matured that this is simply not the case. Farming is about the long term and there are few farms, family or corporate, that do not seek to achieve a plurality of goals – social, cultural and environmental, as well as financial. What differentiates farms of any scale and capital structure is the way in which the different goals are pursued, the balance between them and the skill with which the sometimes conflicting, sometimes complementary activities are put together – what can best be described as the whole-farm approach to farming systems.

This case study illustrates how some of the principles of market orientation are applied in practice. It describes a successful farmer initiative in securing a share of value added in the UK market for convenience foods.

Food consumption and processing

The UK economy is a mature one, with a sophisticated farming, food processing and distribution industry. Food retailing is dominated by four major supermarket groups. The proportion of household expenditure allocated to food has fallen steadily as disposable incomes have risen. The share of consumers' expenditure on household food in 1979 was 17.6%; by 1993 it had fallen to 11.4%. The expenditure on meals out increased over this period and the hotel and catering trade is growing in importance as a market (HMSO [MAFF] 1993, HMSO 1993).

Some 80% of all food consumed in the UK is processed in some way or other between farm and kitchen. The market is willing to reward convenience and almost 34% of household expenditure is on convenience foods. The market for frozen garden peas provides a useful illustration of the sophistication of this market segment and the principles involved. In the 1992–93 crop year only some 1,478 ha of peas were grown in the UK for picking and sale fresh in the pod, and only 1–2% of households purchased peas in this form during the season. Most peas were, and are, consumed processed. Whilst household consumption has fallen slightly in recent years (but the use of frozen peas in the hotel trade and catering establishments has increased as a market sector), some 51,333 ha of peas were grown for vining in 1992–93, with an average yield of about 5.0 t/ha of shelled peas. Yields fluctuate seasonally by 6–8%. Gross production averages about 257,000 tonnes, with the greater proportion going for frozen peas. Wastage varies with season but is usually 8–11% for both freezing and canning.

As a legume, the crop brings obvious benefits in arable rotation systems but the area grown is constrained by the high husbandry standards necessary to survive in a highly competitive situation and the acreage needed to justify investment in modern machines. The latest model of viner may need to cover 400 ha and thus most vining peas are grown either by a few very large-scale individual producers or by farmer groups. There are many forms of collaboration but, even allowing for those who participate in the groups, only 2,500 to 3,000 farmers are involved in growing vining peas. The peas are grown on contract to a price. For the three crop seasons up to and including 1992–93, the price fluctuated by about 10%, with a 3-year average of about £212.26/tonne.

Household consumption also varies slightly; the 1992 National Food Survey showed the average consumption per head to be 41 g/week. The average price was £0.82/kg for canned peas and £1.09/kg for frozen peas. Frozen peas for the 5-year period up to 1989, when elasticities were last published in the UK National Food Survey report, had high price elasticities of demand (a coefficient of -1.12), suggesting that a percentage price increase will be met by a slightly more than proportionate reduction in demand. (This should not be taken as necessarily typical of all foods considered as convenience foods. The more specific and identifiable the processed food and the more possibilities there are for substitution by other foods, the higher the coefficient is likely to be – against a background where coefficients for food as a whole are low.)

In crude terms, based on UK retail prices of £1.08/kg and farm gate prices of £0.20/kg in late 1994, the increase in price for frozen peas between farm gate and shopping basket carried a factor of value added of 5.5. This is the increase necessary to meet the costs of and provide the rewards for grading, freezing, storage, delivery and distribution, freezer display at the retail point and all associated retail costs, as well as promotion and statutory costs.

Exploring value added

The farmer in this case study provides an example of how an able and entrepreneurial individual has been able to explore the route to value added in frozen peas. From a small initial contract to grow peas on his 120 ha family farm, he has established a farmer group that now grows some 1,000 ha of peas in an area in eastern England, while he himself grows some 250 ha, both on his own land and on land rented for the season from neighbouring farmers who have suitable land and who value the break in their rotation.

Each year a careful study is made of the results of variety trials conducted by research stations and seed suppliers, and varieties are selected to meet processors' criteria. A field allocation and growing plan is carefully put together that suits situations, soils and harvesting requirements. Soil preparation, sowing and post-sowing management is closely supervised so as to achieve the important criterion of desired plant population, the sowing dates being based on a system of accumulated heat units or mean meteorological information from the previous eight seasons, adjusted for current conditions. The aim is to ensure that sowings reach the desired maturity in succession and thus ensure a smooth progression in harvesting and processing, with a product of consistently good quality.

Throughout these operations careful supervision of field operations and regular crop inspections ensure that the husbandry programme is being interpreted correctly and adjusted to accommodate seasonal influences. This attention results in consistently above-average marketable yields and quality, thus ensuring that contractual obligations are met.

The production of shelled peas is about 5,000 tonnes (allowing for 8–11% field wastage), of which half is on contract to a processor in order to reduce risk and provide some early income to meet cash flow needs. Ownership of the crop changes hands at the processor plant, the grower being paid the contract price less deductions for tare and downgrades.

The balance is sold direct to a major national retail outlet. The group enters into a contract with a processor to grade, freeze, store and pack the peas in either the group's own packaging for retail or under the retailer's own label. Ownership of the crop moves to the retailer on delivery to the retailer's depot, the supplier receiving a wholesale price for the specified grade. (Although the processor may have as many as seven grades, the retailer will offer only three or four to the consumer, each grade commanding a different price.)

Influences on outcome

The process from conception to sale is long and complex, involving a range of activities which all carry some degree of risk. Some of the factors are agronomic; others are organizational or marketing factors. To gain an understanding of what is involved and then attach a degree of weighting to these various elements, the process is broken down here into five sections: pre-sowing; husbandry from sowing to harvest; harvesting; processing; and marketing.

Within each section, the key factors are defined. Each factor is then assessed in terms of its contribution to a successful outcome by ranking it on a scale of 1 to 5. In each case, the degree of importance is in ascending order. This kind of methodology is somewhat crude and inevitably calls for value judgements, but it does reflect the experienced perceptions of the key person involved in managing the system. The discussion also identifies the various sections in relation to the particular tier of opportunity that is being exploited.

Place in rotation, variety choice and seed rate have a significant effect on yield, and are critical for quality and for ease and timeliness of harvesting – planning and preparation have to be right (*see* Tables 1, 2 and 3). Time of harvest is decided by tenderometer tests in the field and is critical to a matter of a few hours.

About half the production (some 2,500 tonnes of shelled peas) are sold on contract, having been grown to the precise specifications set down by the processor and supplied to the processor's plant on demand. This situation reflects involvement in the second tier of opportunity, and this mutually beneficial relationship has been sustained for many years (*see* Table 4).

Unless the farmer is involved in processing there is no opportunity to influence outcome. In this case study, the farmer is involved and the processor is carrying out work for the farmer as a contractor. This allows the farmer to exercise a measure of control. By integrating forward in this way the farmer is exploiting the second tier of opportunity by involving the processor in a reverse relationship – a win-win situation.

Table 1. Pre-sowing (the first tier of opportunity)

Husbandry factor	Influence on		
	Yield	Quality	Harvest
Clean ground in rotation	5	5	4
Date of sowing	2	5	4
Seed rate	4	5	4
Variety	5	5	5
Soil condition at sowing	3	5	3
Preceding crop ^a	3	5	5

Note: a In some cases the preceding crop is critical (for example, rogue linseed can be a contaminant causing rejections). In general, peas are best grown in a 4-year rotation

Table 2. Husbandry from sowing to harvest (the first tier of opportunity)

Husbandry factor	Influence on	
	Yield	Quality
Water ^a	1	1
Nutrition ^b	1	1
Weed control	5	5
Protection from disease	5	5
Protection from pests	5	5
Plant population	4	4

Note: a Except in very dry seasons, water is not a limiting factor in the UK; the crop is sown at or near field capacity

b The crop is not a demanding one on fertile soils. Plant population has an important influence on yield but once the crop is established plant protection assumes particular significance; seed dressing is especially important

The marketing factors involved are those which fall within the sphere of control of the farmer group in providing a supply of quality peas to the retailer's distribution centre. Although ownership is transferred at this point, the need to exercise diligence at each stage is underlined by the reality that if the product is found by the retailer's customers to be faulty or poor value for money, resulting in complaints, the retailer will simply ditch the stock and demand replacement at the supplier's expense. The four factors considered in Table 5 received equal ranking.

The influence of each of the different sections can also be compared for their effect on value added by ranking them on a 1–5 scale (*see* Table 6). Whilst acknowledging again that this method of comparison is fairly crude, it is useful in that it gives some means of weighting the different elements of a complex process as perceived by the person in control. Harvesting stands out as a critical factor – like processing, it is time critical. The fate of the crop is decided to a large extent by the quality of field and transport organization and the reliability of the machines.

Amount of value added

It is possible to estimate both the amount of value added which is captured and its effect on the financial return from the crop. The starting point is to consider what the return would be for a straightforward contract growing operation based on standard figures (Chadwick 1994) (*see* Table 7).

At the level of return shown in Table 7, the crop, however desirable as a break crop, provides a margin only perhaps two thirds that of wheat, despite the degree of precision needed, the very high level of investment in viners and the need to collaborate with others in a joint activity.

The level of return given in Table 7 will apply to half the area which is handled by the group. The output from the other half of the area should benefit by the capture of some of the value added, however, and there will therefore be an improvement in the overall return from the crop. This is indeed what happens. The costs involved are presented in Table 8.

Table 3. Harvesting (the first tier of opportunity)

Harvesting factor	Influence on	
	Yield	Quality
Transport time to processor plant	5	5
Damage avoidance	4	4
Tolerance of delay	5	5
Speed and sequence of harvesting	4	4
Days after planting	4	4
Tenderness	5	5
Field control	4	4

Table 5. Marketing (the third tier of opportunity)

Marketing factor	Influence on value added price to supplier
Consistency of quality and volume	5
Management in store	5
Packaging	5
Ability to respond to customer demands	5

Table 6. Comparison of sections

Section	Relative influence on value added (on a scale of 1–5)
Pre-sowing	2
Husbandry – sowing to harvest	4
Harvesting – timing and quality	5
Processing	5
Marketing	4

Table 4. Processing (the second tier of opportunity)

Processing factor	Influence on final price
Organizational efficiency (no delay)	5
Quality control	5
Preparation for process	4
Technical effectiveness of process	5

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Table 7. Financial returns (£/ha)

Output (4.9 t @ £198/t cleaned and delivered)	970
Variable costs	
Seed (@ £590/t), fertilizer and sprays	210
Contract	17
Other crop expenses (e.g., bird control)	27
Gross margin	716
Group costs (harvesting, administration, interest)	350
Net margin	366

Table 8. Marketing costs (£/t)

Farm price delivered to plant	198
Additional losses (say 2.5%)	5
Freezing cost	160
Handling charges	9
Storage for average of 6 months	50
Packaging and transport	120
Average sale price	627
Additional margin	85

It is now possible to relate these figures to an area basis. Allowing for the further 2.5% of losses, the marketed yield is 4.875 t/ha which, at £85 additional margin per tonne, brings in an extra £414/ha on 500 ha. The effect of this on the average net margin is clear:

1000 ha at £366/ha	£366,000
500 ha at £414/ha	£207,187
Total	£573,187
Average net margin/ha	£573

The figures used in this case study have sometimes been rounded off for convenience and simplicity, and because they are being used to illustrate principles rather than establish an audit. It should be noted that they reflect about 2.5% of the UK consumption of frozen peas, however, and this is therefore a substantial sample to use for the purposes of illustration.

SWOT

Any business that hopes to survive, let alone expand and prosper in a competitive market place, needs to keep its options and performance under regular review. The techniques for analysing current performance are well documented but it is relevant to undertake a SWOT analysis as this provides a structure for thinking about and appraising the longer-term operational strategy for the business.

The group leader might list the points below for consideration. (Notice that lack of capital is not regarded as a constraint. The individuals who make up the group are sufficiently well established, with adequate assets and equity to make raising capital relatively straightforward. Their concern is not with raising capital, but with making an adequate return on it.)

Strengths

Established relationships
 Family team
 Good soil and climate
 Available local expertise
 Concentration of plant and plant management in the area
 Good relationships with industry research station
 Family share of production
 Several outlets, including export
 Major investment in specialized equipment written down

Weaknesses

Possible over-reliance on the marketing drive of one person
 Returns heavily reliant on one supermarket outlet
 Freezer/storage contractor may be taken over
 Highly competitive UK market – large companies may reduce prices
 Few market makers
 Possible continental competition with lower transport costs for the EU market

Opportunities

Growth prospects in continental markets
 Sound base on which to expand as others drop out under competition
 Establish own brand name
 Develop other lines, such as beans, on the basis of established good reputation

Threats

Family relationships may change
 Environmental constraints on cropping practices
 Key group members may be poached
 Group jealousies/weaknesses may emerge at times of major investment decisions
 Rate of innovation may slow down
 Technological advance may make some specialized skills redundant
 Large companies may compete on price to secure market share
 EU agricultural policy may interfere with the workings of the market
 Changes in eating habits, diets and fashions may have an adverse effect on demand
 Some other form of technical innovation in food processing may appear with serious effects on demand

The analysis does not seek at this stage to come to a view on whether the initiative is sustainable in the long run. What it does do, however, is flag up the various factors, some internal and some external to the project, that have a greater or lesser effect on the project and its prospects, and on the lives of those involved in it. It also reinforces the reality that businesses and the environment within which they operate are dynamic and change is sometimes forced from outside as well as inspired from within.

Conclusion

It is useful to summarize some of the principles this study illustrates in terms of market orientation.

The first principle relates to the constraints. Frozen peas are a highly competitive market. Consumption in the UK is relatively static, in any case being limited to homes with a freezer or at least with a refrigerator with a frozen food storage compartment. There is potential for growth in the catering trade but this is even more competitive. Most sales for household consumption are made through the half a dozen major supermarket chains. Of the branded lines, one brand produced by a major multinational food company dominates and attracts a premium, but supermarkets are tending to move to own brands as a means of improving margins or offering cheaper lines to customers. The elasticity of a convenience food such as frozen peas is such that a price increase is likely to bring a response of a slightly more than proportionate drop in consumption. The processing industry for frozen foods is also concentrated in few hands and is very capital and energy intensive, well beyond the

capability of the individual farmer to finance. The cost of vinders is such that 500 or more hectares are needed to justify a machine; protein peas which are useful in providing a break in the rotation attract subsidies from the EU and provide a gross margin comparable to vining peas without the need to invest in specialist machinery.

It is important to recognise the degree of integration which exists – the processing function is undertaken to add value, not utilize a surplus. Production is for a specific market and the whole operation is closely integrated to achieve the profit target.

Vining peas do offer the potential for value added in a market sector less immediately influenced by the decisions of politicians. There is a long tradition in the area in the technology for freezing as a means of food preservation and a concentration of facilities on Humberside with its hinterland of arable farming expertise in eastern England. There is a trend for the supermarkets to move closer to farmers and to take an interest in production systems reflecting the interests and concerns of consumers.

The group does not itself invest in expensive specialist processing equipment and storage capacity, but instead hires the necessary plant and the skills; with the price it pays comes the technology, resources and organizational expertise of specialists in processing and distribution. Clearly, the group must compete for these resources and the price it pays reflects both market price and the recognition by both parties of the need for a sustainable and mutually beneficial relationship. This is one of the most important principles in marketing and applies to relationships right along the chain, from farmer to final consumer and back to farmer. Each relationship has to be mutually beneficial for it to be sustained; marketing relationships are about satisfying customers all the way along the line. Each relationship has to be win-win, for successful marketing cannot be built on the win-lose philosophy.

Most importantly, however, this study illustrates once again the contribution of the entrepreneurial individual able to step beyond the farm gate, evaluate a situation, identify opportunities, minimize risks, be prepared to work hard and diligently to establish systems and credentials so as to gain the commitment of others. What is needed, therefore, are individuals who are capable of using all the resources around them and who can see the need to train others so that the organization can grow and a successful business be established.

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2.5

Smallholder dairy development: A case study in Zimbabwe

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Paper presented by N. Zitsanza

The dairy sector in Zimbabwe consists of two strongly contrasting categories of producers: the large-scale commercial producers, who on average have a milking herd in excess of 100 cows and use modern production technology to achieve high output per cow; and the smallholder dairy producers who on average have a herd of less than 5 cows and use more traditional methods of production that result in low output per unit. The commercial supplies come mainly from about 500 large-scale producers who deliver about 250 million litres of milk annually. Most of the dairy products processed from this milk are marketed in urban and peri-urban areas. Smallholder farmers produce primarily for family consumption and, to a lesser extent, for sale within the local community.

In 1983 the government set up the Dairy Development Programme (DDP) with a mandate to promote smallholder dairy development throughout the country. Government policy on smallholder dairy development is directed towards increasing the number of producers and the production of larger volumes of milk. The objective of the DDP is to assist rural communities with an integrated development process covering a wide variety of issues, with the twin goal of producing adequate supplies of milk and creating a viable development base. In short, the DDP seeks to broaden the existing milk production base by bringing smallholders into the commercial sector, using dairying as a development tool.

To date, the DDP has established 10 smallholder dairy projects in five of the eight provinces in the country as a nucleus of dairy development in these areas. DDP projects are normally expected to be self-sustaining within 5–10 years from the time farmers start producing and marketing milk. Assistance from several donors and the private sector has contributed greatly to improved productivity within the smallholder dairy sector in recent years, and the DDP is now adding more projects to the existing 10. Milk volumes from this sector are expected to increase from 2% to 5–10% by the year 2000.

Nharira Dairy Association

The focus of this case study is the Nharira Dairy Association smallholder project. It is 170 km south of the capital city, Harare, the leading milk catchment, processing and distribution area in the country, and also about 170 km from Gweru, another large urban centre with the second highest milk intake after Harare. Nharira is in an agro-ecological region suitable for semi-intensive farming systems based on both livestock and crop production. Rainfall is 650–800 mm/annum and the rainfall season is often characterized by mid-season dry spells. Livestock production, particularly beef cattle, is the major farming activity in the small-scale commercial farming area, while in the communal farming area there is a more balanced mix between livestock and crop production.

Membership

The Nharira Dairy Association was initiated by the farmers themselves after consultation with DDP staff. After research had been conducted on the feasibility of milk production, an awareness and membership mobilization drive was carried out. Two liaison workers paid by the DDP were hired to link the community to the programme and to prepare the groundwork for project implementation. A constitution and agreement in both Shona (the vernacular language) and English (the official business language), spelling out areas of responsibility, was drawn up by the committee members and presented to the association for approval. All members of the association have a say in how it is organized and managed.

The total population in the project area is 9,000 comprising 1,650 households. Membership is drawn from both communal and small-scale commercial farming areas, with most members coming from the communal areas. Almost all the members of the association derive their livelihood primarily from agriculture. The typical communal producer farms an average of 3 ha and has 2 or 3 milking cows. Small-scale commercial farm hectarages average 15–50 ha, with an average herd of 10 milking cows.

As can be seen in Table 1, only about 23% of the members deliver milk to the centre. Non-milk delivering members expressed the wish to join the association because of future prospects and the training offered to improve farming practices. Although women make up only 30% of the total membership, there are more active women producers than men in the communal areas.

Table 1. Nharira Dairy Association membership by gender (May 1995)

	Communal		SSCFA ^a		Total
	Women	Men	Women	Men	
Fully paid up	69	112	6	25	252
Partially paid up	7	7	–	–	14
Schools	–	–	–	–	4
Total registered	76	119	6	25	270
Active producers	20	18	2	22	62

Note: a SSCFA = small-scale commercial farming area

Training and extension

Training for members of the Nharira Dairy Association started from the inception of the project. The DDP collaborated closely with the Agricultural Technical and Extension Service (AGRITEX), the Dairy Service and the Veterinary Service. Subjects covered by AGRITEX included pasture improvement, pasture conservation and management, silage and hay making. The Dairy Service advised on mastitis control, selection of good dairy cows, heat detection, good milking methods and dairy hygiene and management. The Veterinary Service was involved with disease control and treatment, vaccination, and calf and dairy cow management. Other areas, such as training in records keeping, leadership and the conduct of meetings, were covered by the DDP.

Further training is carried out at a national training centre at Nyarungu near Harare where training facilities are based on two model farms, one resembling conditions under a zero grazing system and the other simulating conditions under the communal farming system, with improved pasture and the utilization of farm by-products. Farm and extension staff participate in the training activities. Regular training and demonstrations are also conducted at group sites by resident DDP and AGRITEX staff. The Nharira Dairy Association established a permanent training and demonstration base at the present Milk Centre when the project was in its early stages.

Dairy cattle breeding and acquisition

The supply of suitable stock for smallholder farmers continues to be poor and this has become a priority for the association. A committee of the association advises on formulating a sound cattle breeding plan and assists in the acquisition of appropriate dairy cattle. The immediate aim of the breeding plan is to reduce the bull:cow ratio from 1:40 to 1:20, bringing the number of services to at least two per month to improve conception rates and to reduce calving intervals to 420 days or less.

Artificial insemination (AI) has not been fully utilized and there appears to be a need to change attitudes as very few farmers appreciate the use of this method for livestock breeding. Problems with heat detection, although several training sessions have been conducted on this aspect, also account for the low use of AI.

Farmers have bought improved dairy breeds from money realised from delivering milk to the Nharira Milk Centre and from loans from the Agricultural Finance Corporation (a government-owned agricultural lending institution), the only financial institution to extend credit to the association. Finance from other sources has been a problem as individual farmers are often unable to meet financing institutions' conditions for loans.

To help farmers acquire dairy cows, Heifer Project International has donated some heifers to the association. The donation has benefited farmers in that once the donated heifers calve, those farmers who have initially benefited will pass on the progeny to the next farmer, and so on. If the first beneficiaries want to retain the calves, they have to pay an amount of money equivalent to the value of the calves to the association so that the money can be used to source heifers for other farmers.

Milking sheds and the Milk Centre

Each member of the association either has to have a milking shed or access to a shared milking shed. Although milk shed specifications have been modified by the Ministry of Agriculture to accommodate smallholder dairying, some standards are still beyond the resources of smallholder farmers.

The Nharira Milk Centre, like all the centres involved in the DDP, consists of a building equipped with an electrically cooled bulk storage tank, a cold room, pre-cooling apparatus and milk testing equipment. There are pasteurization boilers used to process cultured milk and an outbuilding for the storage of stockfeeds.

Farm management practices

Dairying is generally undertaken as part of a mixed farming system which embraces crop and livestock production activities. The major emphasis, however, is on increasing milk production on a viable and sustainable

Table 2. Dairy herd composition (crosses and pure breeds)

	October 1993	October 1994
Cows	175	166
Heifers	93	118
Lactating cows	94	104
Heifer calves	44	39
Bull calves	34	20
Bulls	25	29
Total	465	476

Table 3. Milking shed construction (May 1995)

	Communal	SSCFA ^a
Completed individual sheds	30	28
Completed group sheds	3	—
Incomplete individual sheds	16	3
Incomplete group sheds	1	—
Individual sheds in use	21	22
Group sheds in use	3	—

Note: a SSCFA = small-scale commercial farming area

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basis. On average, in the typical communal farming setting some 50% of the land holding is utilized for food and cash crops, while 30% of the land is utilized for cattle fodder production. There is also access to communal grazing.

Table 4. Cattle production levels (April 1995)

Total number of lactating cows	307
Daily average production	1070
Average production (litres/cow/day)	3.5

Dairy production in Zimbabwe is heavily dependent on stockfeeds due to the long dry season, which means that dairy cows have to be maintained on conserved fodder for many months. Purchased stockfeeds, particularly for pure exotic dairy breeds, can account for 50% of the total milk production costs. The association supplies stockfeeds to its members from a central store at the Milk Centre and reclaims the cost through stop orders on milk deliveries to the centre.

Members are encouraged to start milk production with mainly indigenous cows, and then progress to dairy crosses and pure dairy breeds as management experience is gained. The breeds of milking cows are mostly indigenous Mashona, crosses of indigenous and exotic breeds, and pure exotic breeds such as Jersey Holstein/Friesland and Red Dane.

Milk production

The Nharira Dairy Association started producing milk in May 1989 with only 32 fully paid up members delivering 50 litres/day to the Milk Centre. There are now 270 registered members with 62 active producers delivering 600 litres/day. Milk production volumes have been consistently on the rise since the Milk Centre opened.

Milk delivered to the Milk Centre varies from an average of 15,000 litres/month in the dry months (June to October) to 30,000 litres/month in the wet season (December to March). Water shortage is easily identifiable as the major constraint to milk production in the Nharira area.

Milk Centre management

Members of the association deliver the bulk of their milk production to the Milk Centre, retaining some of it for home consumption. At the centre it is tested, chilled, processed and marketed. The management and operation of the centre is fairly complex, and the skills to run it have to be obtained not only by employees but also by association members. Four workers are employed at the Milk Centre: a full-time attendant receives the day's milk from the farmers and tests it to establish its quality; a clerk maintains milk delivery records and processes payments for farmers; and a milk processing supervisor and his assistant attend to the value adding aspect.

Three products are currently sold by the Nharira Dairy Association – fresh milk, naturally soured milk and cultured milk. About 34% of the milk delivered is sold as fresh milk, 40% as naturally soured milk and the remainder as cultured milk. A simple traditional method is used to produce a thick and nutritious, non-pasteurized soured milk. The product is sold locally, has an unrefrigerated shelf life of up to 1 week and caters for traditional tastes. Naturally soured milk is expensive to produce, requiring 2.2 litres of fresh milk to make 1 litre of naturally soured milk. Because of the absence of a market for whey, most of the whey has to be thrown away, causing both losses and environmental concerns. There are plans to discontinue the processing of naturally soured milk because of the high production costs and the losses incurred.

Taking advantage of the distance from Nharira to processing plants in Harare and Gweru, cultured milk processing was launched at Nharira in 1993. A culture is added to the pasteurized milk and, after setting, the cultured milk is packaged using simple equipment. The plastic sachet in which the milk is contained is heat-sealed and labelled clearly to indicate that it is a product of the Nharira Dairy Association.

Marketing

To enable smallholder dairy associations such as Nharira to market milk, changes had to be made to the Dairy Service licensing system. Three major avenues of marketing milk are now used – vendors paid on commission, deliveries to bulk buyers by vehicle, and Milk Centre sales. All the milk delivered to Nharira Milk Centre is sold to the surrounding communities, schools, clinics, hospitals, the district prison and rural business centres within a radius of 50 km. The marketing thrust is towards greater smallholder producer involvement working through a marketing committee chaired by one of the producers. The committee is directly involved in distributing the cultured milk using a delivery vehicle loaned to the association by the DDP.

Cultured milk is seen by the association members as having the greatest long-term potential. The Nharira cultured milk, according to the members, is much preferred because it is wholesome as none of the cream is removed. There are plans to add more boilers and another packaging machine to meet the current and anticipated high demand for cultured milk in the surrounding area.

Revenue and running costs

Table 5 presents the Nharira Milk Centre's revenue and expenditure figures. Revenue would have been higher had it not been for the whey losses. Farmers were paid for the milk they delivered regardless of how much was later lost through whey. For the dairy to improve its profitability it must be able to manufacture more profitable products such as cultured milk. The sales of packaged cultured milk are expected to rise significantly. There seems to be little prospect of market saturation levels being reached for cultured milk in the foreseeable future as long as the price remains competitive. Table 6 shows the growth in milk sales between 1992 and 1994.

Social and environmental impact

The main achievement of the DDP in Nharira has been to demonstrate dairying to smallholder farmers. It has shown that once smallholders have access to the

Table 5. Nharira Milk Centre revenue and expenditure, 1995 (Z\$)^a

	March	April
REVENUE		
Centre sales		
– fresh milk	6347	4756
– naturally soured milk	29115	15795
– whey	110	170
– cultured milk	5390	5993
Mobile sales		
– cultured milk	3390	7266
Vendor sales		
– fresh milk	2866	3711
Total sales	47218	37691
EXPENDITURE		
Transport	1458	1868
Wages, commission, allowances	1247	1444
Consumables	973	1405
Water charges	525	280
Electricity	487	439
Telephone	282	–
Repairs and maintenance	298	159
Other	64	193
Farmer payout	35549	28647
Total costs	40883	34435
REVENUE AND EXPENDITURE		
Total revenue	47218	37691
Total expenditure	40883	34435
Surplus	6335	3256

Note: a Z\$10.00 = US\$1.00

Table 6. Growth in milk sales (Z\$)^a

	1992–93	1993–94
Revenue	261738	357487
Farmer payout	210691	274881
Centre running costs	27131	58898
Total costs	237822	333779
Surplus	23916	23708

Note: a Z\$10.00 = US\$1.00

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required resources and the know-how to produce and market milk under certain conducive conditions, they can move out of subsistence into commercial production. Increased milk production has contributed towards improved nutrition standards in the farming families, schools and clinics in the local area, the generation of additional income and an improved cash flow in the Nharira rural community.

Smallholder dairy farmers have become better conservationists through improved utilization of resources such as land, water, crop residues and livestock. Through successive training, they have become better at maximizing the potential productivity of farming systems in their rural environment. Generally, compared to smallholder farmers who are not members of the association, those in the association earn better incomes and their income is not seasonal but is earned throughout the year.

The impact of cooperative development, which traditionally has not been popular in Zimbabwe, is beginning to be appreciated in Nharira largely because of the DDP. The creation of strong local farmer institutions working with the government and NGOs is having a positive influence on development priorities in the area.

SWOT

Strengths

- The creation and maintenance of a strong local farmer institution
- Adoption of appropriate dairy skills incorporating the use of sound business management principles
- Government and donor commitment to support the DDP financially and politically
- The existence of a reasonably well-developed dairy infrastructure
- The cattle breeding plan to increase the number of dairy cows

Weaknesses

- Lack of capital resources by smallholder farmers to purchase dairy cows and inputs
- General inability by smallholder farmers to meet bank loan requirements
- Water shortages, making it difficult to grow enough fodder
- The heavy reliance on purchased stockfeeds
- Long distance of some members from the Milk Centre and hence difficulties in delivering milk
- The low usage of the AI programme, adversely affecting the breeding programme
- The slow cycling rates of the crossbreeds widely used by smallholder dairy farmers

Opportunities

- Demand for milk and dairy products is forecast to rise continuously for the foreseeable future
- Nharira Milk Centre is within easy reach of remunerative markets such as schools, clinics and Chivhu town
- Distance from established dairies offers wider market potential for increased production

Threats

- Shortage of appropriate dairy stock
- Stringent Dairy Act regulations requiring standards that are beyond the resources of smallholder farmers
- Reduction of breeding stock as a result of drought
- Losses experienced due to poor quality control, leading to returns from retailers
- The high costs of finance, stockfeeds and veterinary medicines
- Inadequate water resources

Conclusion

Demand for dairy production in the area surrounding the Nharira Milk Centre, and particularly in the town of Chivhu, which has a population of over 10,000 and is only 30 km from the Milk Centre, exceeds supply. The Nharira Dairy Association has the potential to become a much more significant element in the production and marketing of dairy products in the surrounding area. As the de-regulation and trade liberalization programme accelerates, there will be additional opportunities for the association to increase its market share by offering cheaper dairy products in the local community. The distance from the major urban milk processing and distribution centres is an advantage that the association can derive maximum benefit from if adequate water resources can be developed. The potential exists; it needs only to be exploited by fully utilizing the resources now available.

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2.6

Negociations interprofessionnelles chez les producteurs maraîchers sénégalais

P.A. Seck (Ministère de l'Agriculture, Sénégal)

Le Sénégal, à l'instar des pays de l'Afrique au sud du Sahara, connaît une profonde mutation marquée par le passage d'une agriculture fortement administrée à une agriculture d'inspiration libérale. Ce que d'aucuns appellent la libéralisation accélérée de l'économie, traduite par la formule "moins d'Etat, plus de promotion privée".

Avec le désengagement de l'Etat, les producteurs se voient obligés de s'organiser pour la prise en charge de leur propre destin. Le secteur horticole n'y échappe pas. Il est même suffisamment préparé car il n'a jamais fait l'objet d'une attention particulière de la part des autorités, contrairement à l'agriculture pluviale dominée principalement par les céréales.

Dans cette communication, nous nous posons les questions suivantes :

- Quels sont les problèmes de la filière maraîchère sénégalaise ?
- Qui sont les producteurs maraîchers ?
- Quels sont les circuits intérieurs et extérieurs de commercialisation ?
- Quelles sont les structures impliquées dans la commercialisation ?

Avant d'aborder ces différentes questions, il nous paraît important de donner en quelques mots un certain nombre de repères historiques pour dessiner l'évolution du secteur horticole sénégalais.

Historique

De manière générale, le secteur horticole est considéré par les décideurs sénégalais comme un secteur prioritaire. Cela résulte du fait qu'il renferme en son sein d'innombrables potentialités qui devraient lui permettre de contribuer efficacement et durablement à l'amélioration du revenu des ruraux, à l'équilibre de la balance commerciale et à la réalisation d'une croissance agricole durable. Le dynamisme de ce secteur peut être aisément démontré. Quelques dates permettent de valider une telle idée :

- en 1837, "un habitant de Gorée, Bodin, avait créé à l'oasis de Hann un jardin où poussaient à merveille des arbres fruitiers des Antilles et presque tous les légumes de type européen" ;
- en 1846, la Mission catholique des côtes occidentales avait créé un établissement à Dakar et s'était proposé de faire l'éducation agricole des indigènes ;
- en 1911, F. Moindrot synthétisa dans un ouvrage de vulgarisation les principaux résultats obtenus en cultures maraîchères à Dakar ;

- en 1917, le service de l'Agriculture lança une véritable campagne pour la culture de la pomme de terre, légume dont la pénurie se faisait le plus sentir ;
- en 1920, le gouverneur Ponzio avait dégrevé de toute taxe les exploitations maraîchères ;
- en 1921, la première association de maraîchers fut créée ;
- en 1945, ce fut la création du Syndicat des cultivateurs, horticulteurs et jardiniers. Ses objectifs étaient centrés sur la production, l'amélioration de la qualité, l'établissement d'un calendrier plus conforme aux exigences du marché. A l'actif de ce syndicat, il faut noter la création d'une revue, "La terre sénégalaise" ;
- en 1962, la Société de mise en valeur des Niayes fut créée, mais dissoute après six ans d'existence. Les raisons de cet échec sont, d'après J. Belvaque, "le programme trop ambitieux mis au point, l'incompétence du personnel, la lourdeur administrative pour les produits périssables, la mauvaise gestion" ;
- en 1963, l'Union des coopératives rurales de Dakar vit le jour ;
- 1972 marqua le début de la recherche horticole avec la création du Centre pour le développement de l'horticulture ;
- en 1976, l'Association sénégalaise des exportateurs de produits agricoles fut formée par une trentaine d'exportateurs de fruits et légumes ;
- en 1983, vu la perte de l'image de marque des produits maraîchers sénégalais à l'extérieur, les "gros" exportateurs se démarquèrent des "petits" en créant leur association, le Groupement des exportateurs de produits agricoles du Sénégal (GEPAS).

Ces quelques repères historiques attestent le dynamisme du secteur horticole. Cette idée est renforcée par d'autres faits :

- la production maraîchère est passée de 25 000 tonnes au moment de l'indépendance du Sénégal (1960) à 150 000 tonnes en 1995 ;
- le maraîchage n'est plus le monopole des petits agriculteurs. Aujourd'hui, de plus en plus, des membres de la société civile, des diplômés de l'enseignement supérieur, des fonctionnaires et des commerçants s'y investissent, et parfois même en font leur activité principale ;
- au cours des dix dernières années, beaucoup d'initiatives ont vu le jour (création d'un syndicat par exemple).

Les problèmes de la filière

A l'heure actuelle, les problèmes maraîchers sont dus à :

- un mauvais étalement de la mise sur le marché de la production nationale, qui implique des difficultés d'approvisionnement à certaines périodes de l'année ;
- de fortes fluctuations de prix notées en deux périodes : janvier-juin et juillet-décembre) ;
- de significatives pertes post-récolte. A titre d'exemple, on note que la consommation nationale d'oignon est de 36 000 tonnes. Le Sénégal en produit 35 000 tonnes et en importe 7 000 tonnes (1993), ce qui signifie qu'une partie non négligeable de la production n'arrive pas au consommateur ;
- une importante hémorragie de devises due aux importations d'oignon et de pomme de terre. Quant aux exportations, elles ont plutôt tendance à la baisse au cours du temps.

Typologie des exploitations maraîchères

Du point de vue production, il faut noter la variabilité des situations. En fonction du système d'exhaure de l'eau et du statut de la main-d'oeuvre au service de l'exploitation, on peut distinguer plusieurs types d'exploitations.

Les exploitations dites traditionnelles

Leur contribution se chiffre à environ 90 % de la production nationale de légumes. Elles ont une taille moyenne de 0,2 jusqu'à 0,5 hectare, utilisent l'eau de nappes de surface grâce à des céanes creusées en pente douce. En situation de pluviométrie normale, elles peuvent fonctionner d'octobre à juin pour la production de légumes dits de type européen. Le cas échéant, la saison de culture est beaucoup plus courte et s'arrête au mois de mars. La main-d'oeuvre est essentiellement familiale, mais suivant l'intensité des travaux culturels, les exploitants traditionnels font appel à un complément qui peut être en situation de salariat ou de métayage.

Les exploitations moyennes

Elles ont une dimension beaucoup plus grande que les premières. Leur taille varie entre 0,5 et 20 hectares. Leur système d'exhaure est constitué par un puits à grand débit, un forage ou un branchement sur le réseau public d'alimentation en eau. Dans cet ensemble, il faut distinguer :

- les groupements de producteurs ;
- les exploitants appelés "maraîchers du dimanche", qui ont une main-d'oeuvre étrangère à leur famille. Leur contribution à l'approvisionnement de Dakar en légumes concerne essentiellement la pomme de terre, le chou et la tomate d'hivernage.

Les exploitations agro-industrielles

Leur superficie est égale ou supérieure à 20 hectares. On y note des exploitations paysannes et des sociétés privées.

Les circuits intérieurs et extérieurs

Circuits intérieurs

Pour la commercialisation intérieure, les travaux de la recherche ont permis de recenser les différents circuits et d'identifier les acteurs et la logique qui pilote leurs décisions.

Les circuits traditionnels ne sont régis par aucune disposition étatique. Les prix aux différents stades de la commercialisation dépendent de la loi de l'offre et de la demande. Ces circuits peuvent se présenter dans le figure 1.

Quels sont les marchés ciblés ?

- 1^{er} et 3^e circuits : ces circuits sont ceux suivis par les légumes cultivés dans la banlieue dakaroise, dans de petites exploitations maraîchères dont la superficie est de l'ordre de 0,2 hectare. Il s'agit des zones maraîchères de Cambérène, Thiaroye, Pikine, Yembeul, etc. Les produits maraîchers disponibles sur les marchés de détail, et qui ne proviennent pas du marché de Castors et de Thiaroye, ont généralement suivi l'un ou l'autre de ces circuits. Ils représentent environ 7 % de l'ensemble des circuits traditionnels.

- 2^e circuit : certains producteurs disposant de facteurs de production adéquats arrivent à obtenir des produits d'excellente qualité. Ils s'adressent à des épiciers ou à de grandes surfaces avec des échantillons, négocient un prix et livrent leur production en cas d'accord. En fonction des besoins de la clientèle, ils établissent souvent des contrats avec les épiciers.

La contribution de ce circuit peut être évaluée à environ 3 %. Il revêt une plus grande importance pendant la contre-saison car les producteurs qui l'utilisent se lancent dans la production de chou et de tomate en hivernage pour approvisionner, d'une part, les épiciers et les grandes surfaces et, d'autre part, des marchés tels que Kermel. La clientèle de ces marchés peut payer les prix élevés qu'on enregistre en contre-saison.

- 4^e circuit : c'est le circuit le plus répandu. Il représente environ 90 % des transactions faites dans les circuits traditionnels. Il a pour destination principale le marché de Castors et celui de Thiaroye. Il concerne les exploitations maraîchères proches de Dakar dont la famille ne peut assurer à elle seule l'écoulement de toute la production et les exploitations plus ou moins éloignées de Dakar (Mboro, Lompoul, Fass Boy, Diogo).

Nos recherches ont également permis d'établir une typologie des principaux acteurs :

- les vendeuses sont des femmes de maraîchers et des vendeuses indépendantes. Les premières jouent un grand rôle dans les prises de décisions concernant le fonctionnement de l'exploitation maraîchère. C'est en fonction de leur analyse de la situation du marché que les conjoints choisissent les cultures à mettre en place ;
- parmi les grossistes, on distingue les grossistes coxeurs et les grossistes indépendants. Les premiers jouent un rôle essentiel dans la filière maraîchère, car c'est en fonction de leurs suggestions que les bana-bana choisissent les légumes qu'ils vont acheter dans les zones de production, négocient un prix d'achat bord champ et fixent un prix de vente en gros. Les grossistes coxeurs sont employés par les bana-bana et sont rémunérés suivant le nombre de sacs qu'ils arrivent à prendre ;
- parmi les bana-bana, on recense des bana-bana producteurs, des bana-bana employés par d'autres bana-bana et des bana-bana participant à l'opération de production en fournissant des intrants à crédit aux producteurs.

Du prix au producteur au prix de détail, la structure est la suivante (voir figure 2).

Par conséquent, du prix au producteur au prix de détail, on a un coefficient multiplicateur de 3.

Figure 1. Circuits de commercialisation intérieurs du Sénégal

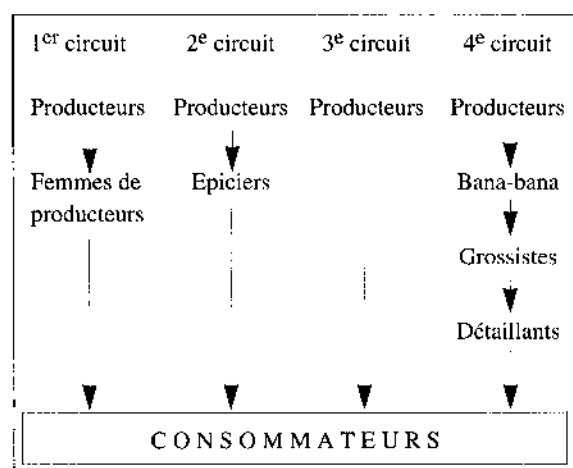
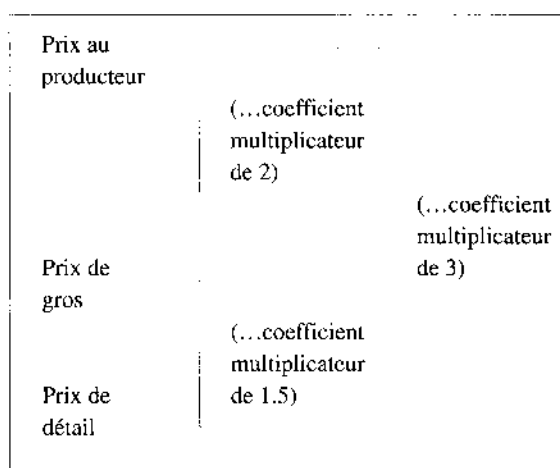


Figure 2. Structure du prix au producteur au prix de détail



Circuits extérieurs

Les exportations sénégalaises ont débuté en 1957 et concernent principalement le haricot vert, le melon, la tomate cerise, le piment, le gombo, l'aubergine, le bissap, etc. Elles ont connu une évolution très irrégulière, comme l'atteste dans le tableau 1.

La part actuelle des exportations sénégalaises dans le commerce international est loin du niveau record enregistré en 1975-76 (10 254 tonnes). La recherche d'une plus grande compétitivité de nos produits sur le marché international des légumes est imposée par deux éléments :

- l'étroitesse du marché local ;
- l'importance des gains de devises susceptibles d'être générés par l'exploitation. A titre d'exemple, pour un volume exporté de 2 500 tonnes, on emploie 3 400 personnes en permanence de décembre à mai et on gagne en devises environ 500 millions de FCFA. L'Etat sénégalais voudrait que le secteur réalise dans un proche avenir 100 000 tonnes d'exportation de légumes. Ce qui signifie qu'on pourrait lutter contre le chômage en employant environ 136 000 personnes pour les produits destinés à l'exportation et injecter dans l'économie nationale, sur une période d'environ cinq mois, 10 milliards de FCFA. De bonnes raisons de tout mettre en oeuvre pour la matérialisation de cet objectif.

Les facteurs limitants qu'on peut enregistrer pour le développement des exportations sénégalaises sont, entre autres :

- la forte concurrence de pays tels que le Kenya et le Burkina Faso ;
- le système de vente à la consignation ;
- l'absence d'une réglementation de la profession d'exportateur. En dépit de l'existence d'un syndicat d'exportateurs, on note la présence d'exportateurs occasionnels qui ternissent l'image de marque des produits sénégalais à l'extérieur ;
- le faible assortiment des produits exportés (quatre à cinq produits) ;
- la sous-utilisation du marché africain ;
- l'irrégularité dans l'approvisionnement ;
- la non-utilisation de l'avantage qu'a le Sénégal d'être un pays côtier.

Le schéma suivi par les produits maraîchers destinés aux marchés extérieurs est représenté au figure 3.

Institutions impliquées dans la commercialisation et les services rendus aux acteurs de la filière

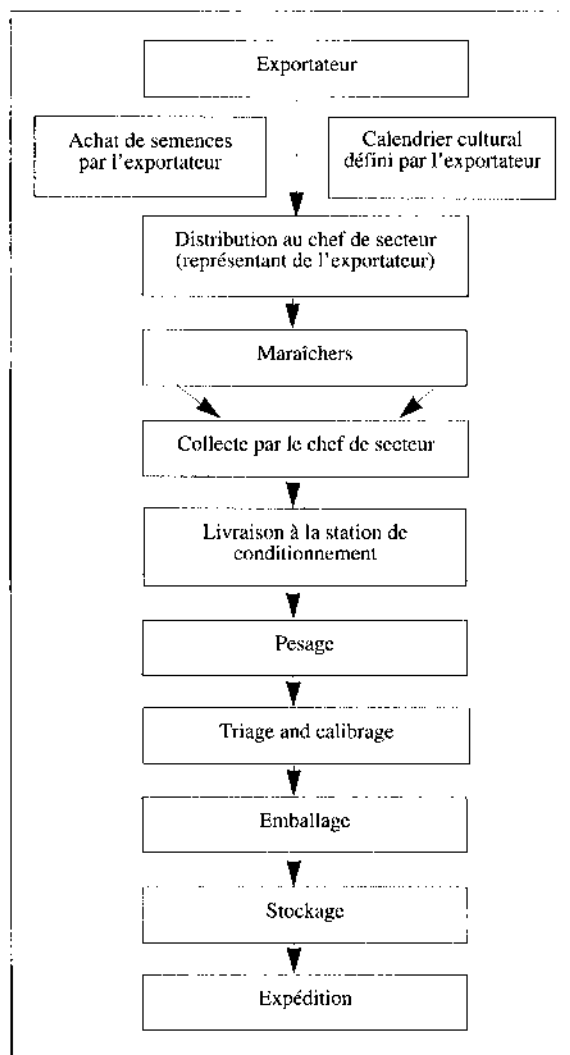
Comité de suivi de l'horticulture

Chaque semaine, sous la présidence du Directeur de l'horticulture, se tient un Comité de suivi de l'horticulture. Celui-ci réunit les structures suivantes :

- le Bureau de contrôle phytosanitaire de la gare ferroviaire de Dakar ;
- le Bureau de contrôle phytosanitaire portuaire ;

Tableau 1. Exportations sénégalaises de produits maraîchers

Année	Tonnage	Année	Tonnage
1975-76	10254	1985-86	6135
1976-77	8942	1986-87	5825
1977-78	9145	1987-88	4545
1978-79	4316	1988-89	3569
1980-81	5040	1989-90	3651
1981-82	5732	1990-91	2724
1982-83	5838	1991-92	4694
1983-84	5991	1992-93	4845
1984-85	6000	1993-94	4784

Figure 3. Schema suivi par les produits destinés à l'exportation

- le Centre pour le développement de l'horticulture ;
- la Direction du commerce intérieur et des prix ;
- la Direction du commerce extérieur ;
- le Bureau de contrôle phytosanitaire de l'aéroport de Dakar-Yoff ;
- la Direction de l'horticulture ;
- le Comité national interprofessionnel de l'horticulture.

Le Comité de suivi permet de cerner hebdomadairement tous les problèmes de la filière horticole et d'informer le ministère de l'Agriculture afin que des dispositions appropriées soient prises. Pour analyser la commercialisation horticole, le Comité de suivi collecte des données sur :

- le tonnage hebdomadaire des importations horticoles ;
- la quantité de semences importées ;
- les superficies emblavées en tomate industrielle pour les industries de transformation ;
- les exportations hebdomadaires et les destinations ;
- l'évolution hebdomadaire des prix de détail dans différentes régions du Sénégal.

De l'avis général des participants, le Comité de suivi est fonctionnel et ses suggestions sont généralement prises en compte par le ministère de tutelle. Cela tient essentiellement au fait que ses comptes rendus sont faciles à lire, succincts et précis.

Centre pour le développement de l'horticulture

Ce centre de l'Institut sénégalais de recherches agricoles, créé en 1972, dispose d'un service de recherche en économie et commercialisation horticoles. Celui-ci mène chaque semaine des enquêtes dans les principaux marchés légumiers de la région de Dakar (principale zone de consommation du Sénégal). Ces enquêtes reposent sur :

- le recueil des prix aux différents stades de la commercialisation maraîchère ;
- le relevé des quantités de légumes débarquées dans les marchés de gros et les origines ;

- le recueil des coûts de commercialisation des principales zones de production aux marchés de gros ;
- l'inventaire des problèmes de commercialisation.

Par ailleurs, ce service mène des recherches sur la rentabilité des exploitations maraîchères en pleine saison et en contre-saison maraîchère. Fort de ces différents points, le service participe à divers comités comme fournisseur d'informations et assiste plusieurs projets et producteurs dans l'élaboration de leurs stratégies.

Comité national interprofessionnel de l'horticulture (CNIH)

Objectifs

Ce comité se fixe les objectifs suivants :

- organisation des producteurs dans des structures formelles ;
- participation à une régulation correcte entre les produits importés et la production nationale ;
- création d'un cadre de concertation entre producteurs, commerçants, importateurs et exportateurs ;
- bonne circulation de l'information entre les différents intervenants de la filière et formation de ceux-ci ;
- création de comités régionaux dans toutes les régions du Sénégal, et particulièrement dans celles où la production maraîchère est importante. A l'heure actuelle, les comités régionaux sont au nombre de quatre : Saint-Louis, Louga, Thiès et Dakar.

Organigramme

Le CNIH est composé d'un bureau national, d'un comité directeur et de quatre comités régionaux.

Actions

Quelques actions concrètes menées par le CNIH :

- le CNIH organise régulièrement des forums présentant le bilan des campagnes horticoles en vue de formuler, à l'intention des membres et des décideurs, des propositions susceptibles d'assainir la filière ;
- il participe activement aux comités chargés de veiller à un approvisionnement correct des marchés légumiers (Comité de suivi de la commercialisation de l'oignon et de la pomme de terre, Comité interministériel de suivi de l'horticulture) ;
- il recense et transmet aux autorités les doléances des acteurs de la filière ;
- il intervient auprès de l'Amicale des commerçants chaque fois que des difficultés d'écoulement sont constatées afin qu'une solution soit trouvée ;
- grâce à ses interventions, les autorités ont supprimé la taxe sur l'importation des plants de fraisiers.

Perspectives

Dans le but de s'impliquer davantage dans la commercialisation horticole, le CNIH est en train de réfléchir sur les voies et moyens de créer une société dont le capital serait détenu en totalité par l'ensemble des intervenants de la filière. Cette société devrait intervenir dans :

- la commercialisation des produits locaux ;
- la distribution des semences, de produits phytosanitaires et d'engrais vers les zones de production ;
- les actions de stockage des produits maraîchers (entrepôts frigorifiques, hangars séchoirs).

Comité de suivi de la tomate industrielle

Dans le but de couvrir les besoins nationaux en tomate concentrée et de renforcer la compétitivité de ce produit, le ministère de l'Agriculture et les deux usines de la place ont mis sur pied un protocole d'accord. Conformément à ce protocole, les industriels s'engagent à acheter la totalité de la production paysanne en tomate industrielle sur la base de contrats à conclure entre les producteurs et industriels. Les producteurs, quant à eux, s'engagent à :

- respecter le calendrier cultural défini ;
- employer les variétés de tomate et doses de fumure préconisées ;
- exécuter convenablement les traitements phytosanitaires ;
- conduire l'irrigation.

En outre, les producteurs livrent la quasi-totalité de leurs récoltes à l'industriel sur la base de 35 tonnes de tomates par hectare. Il leur est permis d'écouler 5 à 10 % de leur production. Les prix sont fixés en début de campagne pour la vente bord champ et une prime est accordée aux producteurs qui livrent directement à l'usine et à ceux qui assurent la fourniture des caisses jusqu'à la livraison à l'usine.

Direction nationale de l'horticulture

En vue de renforcer les performances de la filière horticole, les autorités sénégalaises ont transformé le Bureau horticole en direction nationale. Le directeur de cette structure a été nommé en décembre 1993 et s'attache actuellement à mettre sur pied un organigramme permettant de couvrir au mieux les préoccupations de la filière. L'ouverture de cette structure en direction des opérateurs qui sont étroitement impliqués dans toutes ses réunions est de bon augure. La Direction nationale de l'horticulture préside actuellement le Comité de suivi de l'horticulture.

Syndicat des exportateurs de produits agricoles

Au Sénégal ont cohabité pendant plus d'une décennie deux associations d'exportateurs : l'Association des exportateurs de produits agricoles (ASEPAS) et le Groupement des exportateurs de produits agricoles (GEPAS). Ces deux associations ont pris la décision de fusionner pour créer un syndicat dénommé Syndicat des exportateurs de produits agricoles. Le souci majeur qui a guidé une telle option réside dans la nécessité de former un groupe de pression fort, capable de défendre les intérêts matériels et moraux des exportateurs. Il serait prématuré de tirer un bilan de ce syndicat, compte tenu de sa jeunesse (moins d'un an d'existence). On peut cependant espérer qu'il jouera un rôle dans :

- la moralisation de la profession, car nombreux sont les exportateurs occasionnels qui ternissent l'image de marque des produits sénégalais à l'extérieur ;
- la répartition du fret disponible ;
- la négociation du coût du fret aérien et maritime.

Préalables pour des négociations plus équilibrées

Même si les autorités ont résolument opté pour un désengagement du secteur agricole, les opérateurs privés ne doivent pas être laissés à eux-mêmes. Car tout transfert de charges doit être fait graduellement. Ce qui passe par l'augmentation de la capacité opérationnelle des acteurs. Il faut par conséquent concevoir un programme de développement de la commercialisation privée ciblant les objectifs suivants.

Objectif 1

- renforcement des capacités commerciales et de gestion des opérateurs privés de la filière pour une réponse plus pertinente aux besoins du marché local et international.

La matérialisation de cet objectif devrait permettre d'avoir :

- des producteurs et commerçants privés bien formés en commercialisation horticole ;
- des opérateurs capables d'analyser leurs coûts et leur marge de commercialisation ;
- des opérateurs privés capables d'analyser les approvisionnements des marchés légumiers, les prix courants et les tendances du marché ;
- des producteurs maîtrisant les mécanismes d'action de crédit et bénéficiant d'une assistance pour la réalisation des dossiers de financement ;
- des organisations professionnelles capables de sauvegarder les intérêts de chaque catégorie d'opérateurs privés ;
- des producteurs moins affectés par l'incertitude liée au transport ;
- des zones de production mieux approvisionnées en intrants ;
- des opérateurs mieux outillés pour concevoir une stratégie de commercialisation.

Objectif 2

- amélioration du réseau d'information et des observations économiques.

Compte tenu du caractère éminemment périssable des produits horticoles, une bonne connaissance des informations techniques et commerciales est indispensable pour agir avec efficacité et efficience. Il faut également concevoir des cadres de convention entre les différents agents de la filière en vue d'analyser les informations recueillies, ce que nous appelons des "observatoires économiques de la filière".

2.7

L'enjeu du Système d'information du marché à travers l'expérience du Mali

S.B. Diarra (Ministère des Finances et du Commerce, Mali)

Le commerce des céréales est resté pendant longtemps marqué par une politique interventionniste de l'Etat à travers l'Office des produits agricoles du Mali (OPAM) qui "exerçait son activité sur l'ensemble du marché des céréales et produits agricoles et avait pour objet l'achat, la transformation, la représentation commerciale et la vente du mil, du sorgho, du riz, du maïs, du blé et de tous céréales et produits n'entrant pas dans le monopole d'autres organismes ou sociétés d'Etat". Cette politique s'est révélée trop coûteuse et la régulation du marché est demeurée un mythe de Sisyphe. De 1973 à 1981, les déficits accumulés par l'OPAM se sont chiffrés à 20,4 milliards de FCFA. Face à cette situation qui entraînait davantage d'interdictions que de prescriptions positives pour les citoyens maliens, le gouvernement, avec l'appui de neuf pays et organismes d'aide alimentaire (Belgique, Canada, France, Grande-Bretagne, Pays-Bas, Allemagne, USA, CEE et OPAM), a lancé à partir de la campagne agricole 1981-82 le Programme de restructuration du marché céréalier, mieux connu sous le sigle PRMC.

Malgré la libéralisation, les prix à la production et à la consommation faisaient l'objet de fixation par l'Etat. Le secteur privé était amené à commercialiser dans la limite des prix fixés. En cas de hausse des prix à la consommation et de baisse des prix à la production au-delà des limites fixées par l'Etat, l'OPAM devait intervenir par des ventes et des achats.

Ce rôle de stabilisation ainsi imparti à l'OPAM a été mis à rude épreuve durant la campagne 1986-87 où l'OPAM n'a pas été en mesure de soutenir les prix au producteur à cause d'une bonne récolte et de ses ressources financières limitées. Dans sa tentative de soutenir les prix, l'OPAM a accumulé des stocks importants qu'il a été incapable de vendre à cause de la baisse des prix à la consommation et, de ce fait, s'est trouvé dans l'incapacité de rembourser son crédit de campagne.

La nécessité est ainsi apparue au gouvernement et aux bailleurs de fonds de réviser la politique de régulation du marché céréalier. Dans cette optique, l'OPAM, en plus de la constitution d'un stock national de sécurité (SNS) en mil, maïs et sorgho, de l'approvisionnement correct des zones déficitaires et de la gestion des aides alimentaires en cas de besoin, doit réguler le marché par la collecte, le traitement et la diffusion des informations essentielles à la gestion des décisions de tous les intervenants de la filière céréalière (Etat, producteurs, intermédiaires, consommateurs).

Mise en place du Système d'information du marché (SIM)

Le Système d'information du marché (SIM) est passé tout d'abord par le stade d'un Système d'information transitoire (SIT).

Système d'information transitoire (SIT)

Le séminaire national sur la politique céréalière du Mali organisé du 15 au 18 juin 1987 par le gouvernement de la République du Mali en collaboration avec les donateurs du PRMC recommandait à "l'Etat en tant que puissance publique la mise en place d'un système efficace d'information, d'évaluation et de prévision concernant le marché céréalière..."

Cette recommandation a été adoptée en conseil des ministres lors de la session ordinaire du 7 octobre 1987. C'est ainsi qu'a été mis en place, avec l'aide du groupe des donateurs du PRMC, un Système d'information transitoire (SIT) regroupant les trois systèmes de collecte existants : le système de l'Agence canadienne de développement international (ACDI), le système de la Michigan State University rattaché à la Commission d'évaluation de la stratégie alimentaire et financé par l'Agence des Etats-Unis pour le développement international (MSU-CESA-USAID) et la cellule de l'OPAM. Cela dans le but d'une harmonisation des méthodologies de collecte des trois systèmes qui avaient des objectifs tout à fait différents.

En effet, le système de l'ACDI était présent sur 17 marchés ruraux où il relevait de façon hebdomadaire les prix et les quantités de mil, sorgho, maïs, riz blanc et riz étuvé. Le système MSU-CESA-USAID couvrait quatre marchés ruraux et quatre marchés de gros une fois par mois. La cellule de l'OPAM, quant à elle, était présente sur 13 marchés de Bamako et des sept capitales régionales où elle relevait de façon décadaire les prix à la consommation (prix de détail) du mil, du sorgho, du maïs, du riz brisure (ou BB) et du riz RM40.

Le SIT est opérationnel depuis mars 1988, avec pour missions essentielles :

- de réfléchir sur les aspects pratiques devant mener à la mise en place d'un système permanent ;
- d'assurer la formation des homologues de l'OPAM au traitement informatique et à l'analyse des données. Cette formation a été assurée par le représentant du MSU-CESA-USAID. Elle devait permettre aux agents ainsi formés de gérer le système dans sa phase permanente, après le retrait des deux autres systèmes ;
- d'assurer la coordination entre la cellule SIT et le Comité d'orientation et de coordination (COC) qui en était l'organe de gestion au niveau institutionnel ;
- d'harmoniser les différentes méthodologies d'enquête utilisées par les trois systèmes après la mise en place d'une méthodologie de collecte pour l'OPAM ;
- d'assurer la centralisation et le traitement des données des systèmes.

Dans le cadre de cette réflexion, la cellule SIT a travaillé conjointement avec la Direction nationale de la statistique et de l'informatique (DNSI) et l'Office statistique des communautés européennes (OSCE) qui a participé au financement de la formation des agents de l'OPAM et à la réfection des bureaux de la cellule.

En plus des objectifs cités plus hauts, le SIT s'est fixé comme autre objectif la préparation d'un séminaire au cours duquel utilisateurs (privés, institutionnels, etc.) et producteurs d'informations devaient se rencontrer pour consacrer la mise en place d'un système permanent sur la base de l'expérience acquise dans le cadre du système transitoire.

Pour passer du système transitoire à un système permanent, le gouvernement du Mali, avec l'appui des donateurs du PRMC et du Centre européen de gestion de politique de développement (CEGPD) de Maastricht (Pays-Bas), a organisé un séminaire national sur le thème "Sécurité alimentaire et système d'information du marché céréalière" tenu à Bamako du 6 et 9 décembre 1988. Les recommandations issues de cette rencontre ont été adoptées par le conseil des ministres lors de sa session ordinaire du 25 janvier 1989, ce qui a permis de résoudre les problèmes :

- institutionnels, par le choix de l'OPAM comme organisme centralisateur du SIM ;
- techniques, par la conception du cadre d'analyse et l'élaboration de l'échantillon des marchés, par l'harmonisation des techniques de collecte, saisie et traitement, et par l'identification des données et des besoins des utilisateurs.

Système d'information du marché (SIM)

Les activités du SIM ont démarré à partir du 1er avril 1989 après la formation des agents de l'OPAM chargés de la couverture des marchés à la suite du retrait des systèmes ACDI et MSU. En vue de permettre aux agents de l'OPAM de se familiariser avec cette nouvelle tâche qui venait de leur être assignée, le PRMC a accepté de prendre en charge le financement du maintien des enquêteurs des réseaux ACDI et MSU aux côtés de leurs homologues de l'OPAM jusqu'en septembre 1989.

Deux évaluations ont été programmées à cet effet, à l'issue desquelles les évaluateurs se sont assurés :

- du degré de collaboration entre les enquêteurs SIM/OPAM et leurs homologues des réseaux ACDI et MSU ;
- du degré de maîtrise par les agents SIM/OPAM des techniques d'enquête recommandées par le séminaire de décembre 1988 et auxquelles ils avaient été formés ;
- du degré de collaboration entre les enquêteurs SIM/OPAM et les enquêtés (les intervenants sur les marchés) ;
- enfin, du degré de suivi des enquêtes par les délégués régionaux de l'OPAM.

À l'issue de ces évaluations, les problèmes rencontrés, notamment ceux liés à la transmission des données et à l'application des questionnaires, ont été pour l'essentiel résolus. Ceux d'entre eux qui n'ont pas reçu de solution, notamment les problèmes méthodologiques, ont été recensés et posés lors du séminaire d'évaluation qui s'est tenu à Bamako du 14 au 16 décembre 1989.

Structure du SIM

Rattachement

Le SIM avait été érigé en division et rattaché à la direction de la sécurité alimentaire de l'OPAM, qui est elle-même rattachée à la direction générale. Une telle structure s'est avérée très lourde et c'est la raison pour laquelle le SIM a été érigé en cellule rattachée directement à la direction générale, conformément aux recommandations d'une évaluation externe réalisée par M. Johny Egg sur financement PRMC. Il compte au total 53 agents, dont six cadres de conception, 43 enquêteurs (39 dans les régions et quatre basés à Bamako), un coursier, deux chauffeurs et un planton. À cela, il faut ajouter un assistant technique. La cellule SIM comporte :

- une unité centralisation, saisie et traitement des données ;
- une unité analyse et production ;
- une unité diffusion des informations ;
- un secrétariat rattaché au chef de la cellule.

Dans les régions, le SIM compte 39 enquêteurs répartis sur 66 points de relevé des données. La supervision de ce réseau est assurée à deux niveaux :

- par les délégués régionaux de l'OPAM ;
- et depuis la cellule centrale, par le chargé de l'unité centralisation appuyé par les autres cadres, selon la disponibilité des uns et des autres.

FARMER STRATEGIES FOR MARKET ORIENTATION IN ACP AGRICULTURE

Transmission des données collectées à travers le réseau SIM

Le SIM couvre 78 points de collecte situés pour la plupart dans les zones dites excédentaires du pays (en dessous du 14^e parallèle). Les enquêteurs basés au niveau du cercle avaient l'habitude de transmettre les données aux délégations régionales de l'OPAM par l'intermédiaire de l'administration. Autrement dit, l'agent commercial passait par le RAC du cercle pour communiquer les informations au gouvernorat de la région, qui à son tour les transmettait à la délégation régionale de l'OPAM. A partir de la délégation régionale, les données étaient communiquées tous les mardis à la direction générale de l'OPAM.

Bien que les données suivent jusqu'à présent le même circuit, le mode de transmission à travers le RAC de l'administration n'est plus d'actualité à cause des difficultés (essentiellement d'ordre technique) liées à ce mode de transmission. Les bordereaux sont envoyés à la fin du mois, afin de permettre à la cellule centrale de vérifier les données. Ainsi, tous les mardis, la cellule centrale SIM reçoit par les RAC les données collectées sur les marchés des capitales régionales, cercles, arrondissements et villages retenus dans l'échantillon des marchés couverts.

L'opération de saisie des données est précédée d'un contrôle. Les données de la semaine sont comparées à celles de la semaine précédente par marché et point de relevé, ce qui permet de déceler les erreurs ou incohérences qui sont corrigées le lendemain. Les données sont ensuite saisies à l'ordinateur à l'aide du logiciel SPSS, WordPerfect. Une fois terminées ces opérations de contrôle, saisie et traitement, les données sont transmises à l'unité diffusion pour la rédaction du communiqué radio. L'unité diffusion effectue à son tour un dernier contrôle avant de finaliser le communiqué.

Les délégués régionaux sont saisis chaque fois que des incohérences sont constatées aux différents niveaux de contrôle. Après le communiqué radio, les données sont reprises pour l'élaboration de divers documents.

Objectifs du SIM

Le Système d'information du marché, entièrement financé par le PRMC, s'est fixé comme objectif essentiel la régulation du marché céréalier par l'information. Dans le cadre de cet objectif, les données du SIM ont pour cibles les producteurs, les commerçants et les consommateurs.

En plus de cet objectif, le SIM, par les rapports hebdomadaires, rapports mensuels et bulletins trimestriels d'analyse qu'il produit, oriente les choix des décideurs. En effet, dans le cadre de ses ventes ou achats par appel d'offres, l'OPAM s'inspire des relevés du SIM. Ces mêmes publications sont exploitées par les banques et le PRMC pour les études de dossiers dans le cadre de l'octroi de crédits de campagne aux opérateurs économiques et aux associations villageoises.

Pour atteindre ses objectifs, le SIM dispose des moyens suivants.

Moyens humains

La cellule centrale se compose de 15 personnes réparties dans les fonctions suivantes : 1 chef de cellule; 3 chefs d'unité (analyse, diffusion et centralisation); 1 secrétaire; 1 consultant extérieur chargé d'appuyer le chef de l'unité centralisation; 1 coursier; 4 enquêteurs; 1 planton; 2 chauffeurs; 1 assistant technique. Au niveau des régions, le SIM compte 39 enquêteurs répartis sur 66 marchés de collecte et de consommation.

Moyens financiers

Le SIM est entièrement financé par le PRMC pour un montant de 225 000 000 FCFA (budget 1995) réparti entre les équipements (70 000 000 FCFA) et le fonctionnement (155 000 000 FCFA).

Moyens logistiques

- Matériel informatique : Le SIM dispose de huit microordinateurs, dont un acheté sur le budget SIM et le reste fourni par le MSU-USAID. A cela s'ajoutent trois imprimantes laser, trois imprimantes Epson fournies par le MSU-USAID, trois onduleurs achetés sur le budget SIM et trois onduleurs fournis par le MSU-USAID.
- Matériel roulant : Le matériel roulant est composé de deux véhicules acquis sur le budget SIM et de 43 motos Yamaha 100 destinées aux enquêtes.

Cadre d'analyse du SIM*Méthodes utilisées par le SIM : circuits et typologie des marchés*

Dans le cadre du SIT, la distinction n'était pas faite entre les différents niveaux de transaction sur les marchés. A titre d'exemple, le SIT relevait les prix au producteur à la fois sur les marchés spécialisés dans la collecte, le regroupement et la consommation (vente au détail). Par ailleurs, les marchés couverts par le SIT n'ont pas été choisis en fonction d'axes céréaliers définis. Pour remédier à ces lacunes, il a été défini, à la lumière des recommandations du séminaire de décembre 1988, un cadre de collecte de données et d'analyse de l'information tenant compte :

- d'une typologie des marchés ;
- des axes céréaliers.

Ainsi, les marchés ont été classés d'après leurs fonctions selon la typologie suivante :

- marchés ruraux (de collecte primaire) ;
- marchés de regroupement (ou magasins de transit) ;
- marchés frontaliers (ou tournés vers l'extérieur du pays) ;
- principaux marchés urbains de consommation ;
- marchés secondaires de consommation (comprenant les marchés des zones déficitaires).

Sur la base des réseaux marchands identifiés et des connaissances des participants au séminaire sur les circuits des céréales, quatre grands axes de circulation des céréales ont été retenus. Dans cet esprit, les céréales produites et faisant l'objet de transactions sur chaque axe ont été classées par ordre décroissant d'importance :

- axe oriental – sorgho, mil, maïs et riz (local et importé) ;
- axe sud – maïs, sorgho et mil ;
- axe centre – sorgho, mil, maïs et riz local ;
- axe occidental – sorgho, mil, maïs et riz importé.

Après la détermination des axes, les marchés de regroupement ont été identifiés, recensés et choisis par axe suivant leur importance et leur position géographique les uns par rapport aux autres. A partir des marchés de regroupement ainsi retenus, les marchés de production reliés à ces marchés de regroupement ont été choisis suivant la même démarche. Ensuite, il a été procédé au choix des marchés de consommation approvisionnés à partir des marchés de regroupement retenus. Ces axes ainsi définis couvrent l'ensemble du pays comme l'indique leur nom (oriental, occidental, sud et centre).

S'il est vrai que les axes se ressemblent dans certains domaines (variétés de céréales, période de récolte, techniques agricoles, etc.), il est encore plus vrai qu'ils diffèrent dans d'autres domaines (caractéristiques géographiques, degré d'enclavement, habitudes alimentaires, ordre d'importance des céréales produites, etc.). Malgré ces différences, le SIM suit les mêmes céréales sur les quatre axes identifiés plus haut. En effet, chaque

semaine, le SIM relève et diffuse pour l'ensemble du pays les prix des céréales suivantes : mil, sorgho, maïs, riz RM40, riz brisure et paddy. Depuis février 1992, le SIM relève les prix et les quantités vendues par les producteurs, les prix et les quantités collectées par les regroupements, les prix et les quantités à la vente et à l'achat des grossistes, ainsi que les stocks des grossistes.

Analyse, interprétation et diffusion des informations

L'utilisation de l'analyse des prix et quantités ne fait pas de doute après tout ce qui vient d'être dit plus haut. En effet, on tire de cette analyse d'importantes informations qui sont exploitées dans plusieurs directions :

- comme instrument de suivi de la campagne de commercialisation et des différentes filières céréalières ;
- comme indicateur des tensions pouvant se manifester sur le marché.

Ainsi, les informations du SIM, comme il a été dit plus haut, s'adressent aux opérateurs économiques (privés et publics), aux consommateurs et aux producteurs. Elles s'adressent également aux utilisateurs institutionnels (banques, institutions de recherche, structures d'encadrement du monde paysan, etc.).

Il existe, pour ce faire, plusieurs modes de diffusion ciblés selon le public à atteindre. Ce sont :

- un communiqué hebdomadaire télévisé tous les dimanches ;
- un communiqué radio hebdomadaire diffusé tous les vendredis dans le journal parlé en français, bambara, peuhl, sonraï et sarakolé ;
- des communiqués radio préparés et diffusés sur les antennes des radios rurales et privées à l'intérieur du Mali profond ;
- un communiqué à l'intention du monde rural diffusé dans toutes les langues nationales dans l'émission "poi kan poi" du vendredi ;
- un rapport hebdomadaire diffusé tous les lundis ;
- un rapport mensuel ;
- deux bulletins semestriels d'analyse.

En outre, trois types de bulletins d'information sont actuellement publiés à l'intention des utilisateurs institutionnels :

- un flash tous les trois jours sur l'évolution des prix à la consommation relevés dans les capitales régionales, qui a été initié au lendemain de la dévaluation en vue de mieux suivre l'impact de ce phénomène sur le panier de la ménagère ;
- des études de cas en vue de permettre une plus grande compréhension de la structure et du fonctionnement du marché céréalier ;
- des rapports spéciaux traitant de sujets spécifiques susceptibles d'apporter des solutions à des phénomènes ponctuels qui peuvent avoir une certaine incidence sur le fonctionnement du marché céréalier.

Impact du SIM

L'impact du SIM a été perçu dès les premières semaines de diffusion des données par la voie des ondes. En effet, une analyse menée par le SIM a révélé que deux mois seulement après le démarrage de la diffusion des prix des

céréales à la radio, les consommateurs et les commerçants de Bamako ont commencé à intégrer les informations dans leurs décisions d'achat et de vente de céréales. Cette situation a permis aux commerçants du centre du district de Bamako, notamment ceux du marché de Niaréla (principal marché d'approvisionnement des marchés de la périphérie), de réaliser des chiffres d'affaires record. Ainsi, certains commerçants, naguère réticents à coopérer avec les enquêteurs, se sont rendus au SIM pour communiquer leurs prix. En même temps, les prix sur les marchés de la périphérie ont amorcé un mouvement de baisse et les différentiels se sont stabilisés entre 10 et 15 FCFA/kg pour les mil/sorgho et entre 10 et 20 FCFA/kg pour le maïs, alors qu'ils étaient respectivement de 15 à 40 FCFA/kg et de 10 à 35 FCFA/kg avant la diffusion. D'une manière générale, les différentiels de prix entre Niaréla et les autres marchés de la ville de Bamako ont baissé de 50 % à partir de la diffusion des prix à la radio.

Les estimations des besoins de consommation en mil, sorgho et maïs étant de 50 000 tonnes pour la ville de Bamako, cette baisse se traduirait par une économie de l'ordre de 500 000 000 FCFA pour les consommateurs des autres quartiers. Il aurait fallu à l'OPAM davantage de ressources financières pour jouer ce rôle à partir des stocks régulateurs. Par ailleurs, un sondage réalisé par l'ORSTOM auprès des utilisateurs institutionnels révèle que "les publications du SIM (rapports hebdomadaires et mensuels sur l'évolution des prix au producteur et à la consommation, bulletins trimestriels d'analyse et publications dans le quotidien l'Essor) sont déjà devenues un outil de travail et/ou un support d'information fondamental pour beaucoup de décideurs, d'ONG, de chercheurs...."

Un sondage analogue réalisé par le projet sécurité alimentaire MSU-CESA-USAID indique que "le SIM est une nécessité perçue par les commerçants.... Le taux d'écoute des communiqués radio est très élevé.... Les enquêtes prouvent que le meilleur moyen d'atteindre les commerçants reste la radio...." A preuve, à l'occasion d'une des missions du SIM à Ouélessébougou, le chef d'arrondissement a gratifié le SIM d'un exposé sur les économies réalisées dans sa localité grâce à la diffusion des prix à la radio.

Une évaluation réalisée en juin 1994 par deux consultants extérieurs révèle cependant que des commerçants souhaiteraient, entre autres :

- que d'autres produits soient pris en compte par le SIM en plus des produits déjà suivis ;
- que l'échantillon des marchés soit revu ;
- que le SIM intègre dans son communiqué le prix de certains intrants.

D'autres recommandations issues de cette évaluation ont été prises en compte à travers la nouvelle politique de décentralisation de la diffusion des informations mise en oeuvre depuis juillet 1994. Après une année, le résultat est très satisfaisant. En effet, il nous a été donné de constater sur place (courant août 1995) que des paysans se rendent souvent eux-mêmes dans les stations des radios rurales ou privées, selon le cas, pour voir de plus près les prix afin de mieux se positionner sur le marché. Par exemple, dans la zone de l'Office du Niger où le SIM couvre quatre marchés (parmi les plus importants de la zone), les exploitants souhaitent une diffusion quotidienne des prix. Cela permet à ceux qui sont intéressés par plusieurs foires de mieux se positionner par rapport aux différents marchés.

Perspectives

A la lumière de ce qui précède, il apparaît que le Système d'information du marché (SIM) occupe une place de choix dans la stratégie élaborée par le gouvernement du Mali dans le cadre de sa politique de sécurité alimentaire. En effet, par la diversité des cibles visées par ses informations, le SIM a contribué à la réalisation d'un certain nombre d'objectifs, notamment la publication régulière des informations, la réduction des différentiels de prix entre les différents marchés, la prise en compte des dérives constatées dans le circuit de la commercialisation et

leur transformation en module de formation au Centre de formation et de documentation (CE.FO.DOC) de l'OPAM, un autre instrument de notre politique céréalière, toutes ces actions s'inscrivent dans la logique de la stratégie alimentaire du Mali.

Toutefois, comme l'a souligné Johny Egg dans son rapport d'évaluation de décembre 1989, "le succès médiatique du SIM est indéniable ; parmi les systèmes d'information mis en service dans les pays du CILSS, celui du Mali est en avance, un succès qui repose sur des bases fragiles...." C'est pourquoi le séminaire-atelier organisé par l'OPAM du 14 au 16 décembre 1989 et financé par l'Office statistique des communautés européennes (OSCE/Bamako) a été placé sous le signe de la consolidation des acquis du SIT et du SIM.

Dans cette optique, des innovations importantes sont envisagées pour alléger le travail des agents tout en préservant l'objectif recherché. Deux commissions ont été mises en place :

- la commission consultative composée de la Direction nationale des affaires économiques (DNAE), de la Direction nationale de la statistique et de l'informatique (DNSI), de l'Office des produits agricoles du Mali (OPAM), du Système d'information du marché (SIM), du Programme de restructuration du marché céréalière (PRMC), de l'Institut d'économie rurale (IER), du Système d'alerte précoce (SAP) de l'OSCE, de la Chambre de commerce et d'industrie du Mali (CCIM), de la Chambre d'agriculture du Mali (CAM), plus des observateurs. Cette commission a pour mission d'amender et d'approuver les bulletins SIM et de se prononcer sur les résultats des travaux de la commission technique ;
- la commission technique permanente du SIM, composée du SIM, du SAP, de l'IER, de la DNSI, de l'ACDI et d'observateurs. Cette commission présidée par le SIM a pour mission de traiter les problèmes techniques relatifs à l'organisation du réseau d'enquête SIM.

Par ailleurs, au regard des réalités socioculturelles de notre pays, il apparaît que les prix ne sont pas seulement le résultat de la rencontre de l'offre et de la demande de produits. Ils sont surtout le résultat de "prix de convention" entre producteurs, intermédiaires et consommateurs.

Cela est d'autant plus perceptible quand on sait que le Mali est un pays à traditions orales connues où tout se négocie sur la base des relations sociales, l'étiquette sur les produits constituant l'exception et les prix négociés à la palabre la règle.

Pour mieux cerner cette spécificité malienne, le SIM, en relation avec la Radio Télévision du Mali, a institutionnalisé un programme spécial d'information et de sensibilisation par des interviews en langue nationale bamanan réalisées avec des producteurs, commerçants et consommateurs lettrés et illettrés dans le cadre de l'émission 8/10 qui est diffusée tous les matins entre 8 et 10 heures.

La nouvelle politique de décentralisation de la diffusion de l'information à travers les radios privées et rurales est en train de renforcer le pouvoir de négociation des producteurs, en même temps qu'elle oriente davantage les opérateurs des zones rurales et des centres de regroupement qui ne disposent pas d'autres moyens de communication tels que le téléphone.

L'évaluation de ces actions spéciales autorise de nouvelles pistes dans la recherche de la consolidation des acquis de notre Système d'information du marché céréalière mis en place grâce au soutien précieux des donateurs du PRMC. Cependant, la pérennité de toutes ces actions dépendra de celle du financement même du système. Malheureusement, ce financement ne semble pas être assuré au-delà de décembre 1996 si l'on sait qu'aucune alternative n'a jusqu'à présent été mise en oeuvre pour la prise en charge des activités de collecte du SIM.

PART 3

Transnational reports

3.1

Crop production response to improved access to markets: Cassava in Africa

F. Nweke (IITA)

Paper presented by N. Zitsanza

Much has been made of cassava's advantages as a food security crop for subsistence, but recent research has shown that this stereotyped concept of cassava is not valid. Both rich and poor farmers in sub-Saharan Africa often sell a higher proportion of cassava and/or derive more cash income from cassava than from any other crop or income-earning activity. It has been shown that an average of 40% of the cassava output in sub-Saharan Africa is marketed. In the more prosperous rural economy of south-western Nigeria, sales range from 66% to 90% of women's cassava output. Even very poor farmers often sell a significant proportion of their crop. Tollens (1992) estimated that, in the Bas Zaire and Bandudu regions of Zaire, 45% of the output of maize, 54% of plantain and 20% of rice, compared with 55% of cassava, was marketed.

This paper aims to show that cassava production responds positively to improvement in farmers' access to markets. It is based on information collected during the Collaborative Study of Cassava in Africa (COSCA). Funded by the Rockefeller Foundation, the study aimed to gather information over a wide area on cassava production systems, processing methods, market prospects and consumption patterns. These data were needed in efforts to improve research on cassava by national and international agricultural research centres, in order to realise cassava's potential for increasing the food supply and cash income of the people of sub-Saharan Africa.

Study method

The COSCA study covered Burundi, Côte d'Ivoire, Ghana, Kenya, Malawi, Nigeria, Tanzania, Uganda, Zaire and Zambia which, together, produce over 80% of Africa's cassava output. They provide sufficient variability in the key determinants – climate, demography and market pressures – of cassava production in sub-Saharan Africa. The zones were classified as follows:

- Lowland humid climate zone: Areas with a growing season daily temperature (GSDT) mean of above 22°C, a range of less than 10°C and a dry season of less than 4 months (a dry season month is taken as one in which there is less than 60 mm of rain);
- Highland humid climate zone: Areas with a GSDT mean of less than 22°C, a range of less than 10°C and a dry season of less than 4 months;
- Sub-humid zone: Areas with a GSDT mean of above 22°C, a range of above 10°C and a dry season of 4–6 months;
- Non-humid zone: Areas with a GSDT mean of above 22°C, a range of above 10°C and a dry season of 4–9 months.

FARMER STRATEGIES FOR MARKET ORIENTATION IN ACP AGRICULTURE

Information available on all-weather roads, railways and navigable rivers was derived from the 1987 Michelin travel maps and used to create a market access infrastructure map of Africa. This map was divided into good and poor zones according to density of the roads, railways or waterways. Population data from the US Census Bureau were used to calculate population density and create a population map of Africa. This was divided into high demographic pressure zones (50 or more persons per km²) and low demographic pressure zones.

The three maps of climate, population density and market access infrastructure were overlaid to create zones in cassava growing areas with homogenous climatic, demographic and marketing conditions. Each climate/population/market zone with less than 10,000 ha of cassava in each country was excluded as unrepresentative of cassava growing areas. The remaining areas were divided into grids of cells 12' latitude by 12' longitude to form the sample frame for site selection. In each country a certain number of grid cells, determined by the size of the country, were distributed among the climate/population/market zones, in proportion to the sizes of the zones, and were selected using a random method. The total for the 10 countries was 463 (*see* Figure 1). One village was selected, randomly, within each grid cell. In each selected village a list of farm households was compiled and grouped into large, medium and smallholder units. Farm units which cultivated 10 or more hectares of all crops were excluded. One farm unit was randomly selected from each stratum.

A rapid rural appraisal technique was used to collect village-level information. Farmer groups consisting of men and women with a wide range in ages were constituted. The groups in each village were interviewed using structured questionnaires for the collection of qualitative information on many issues, including production practices, processing methods and market access conditions. This survey was conducted between 1989 and 1991.

Information was also collected at field level in Côte d'Ivoire, Ghana, Nigeria, Tanzania, Uganda and Zaire on such aspects as the use of inputs and cassava root yields. There was a total of 1101 cassava fields. The field-level information was collected in 1991 from the same villages as in the 1989–91 survey. Leaders in cassava research in the national agricultural research systems in each country conducted the survey.

Smallholder access to markets

Smallholder access to markets was defined to include easy access to market centres, and availability to smallholders of the services of middlemen (processors and traders), of farm products and inputs, of credit and of improved post-harvest handling facilities. Easy access to market centres was determined by distance and transport means to the market centres. If the distance was short, or if all-season vehicle transport was available, transport costs would be lower than otherwise. Transport means could be classified into motor vehicles, non-motor vehicles (bicycles, animals and non-motor boats) and foot/headload.

Based on a subjective estimate of the distance an individual with a headload of cassava products could cover in a day on foot, 10 km or less was considered short and a distance above 10 km long. The conditions of 10 km or less on foot and above 10 km by non-motor vehicles could not be easily classified as easy or difficult market access conditions because the 10 km cut-off point was subjective. Any distance by motor vehicle constituted easy market access, while above 10 km on foot generally constituted difficult market access. The classification on the bases of distance and transport means available to farmers would be inadequate for the assessment of the ease of farmers' access to market centres because there were situations where the farmers and the middlemen faced different access conditions to the same markets. For example, Tollens (1992) reported that in Zaire traders moved from one farmer's home to another buying cassava products.

Availability of the services of the middlemen would facilitate the marketing process for the farmers, especially for distant markets. The farmers would be able to spend more time on production activities and less on

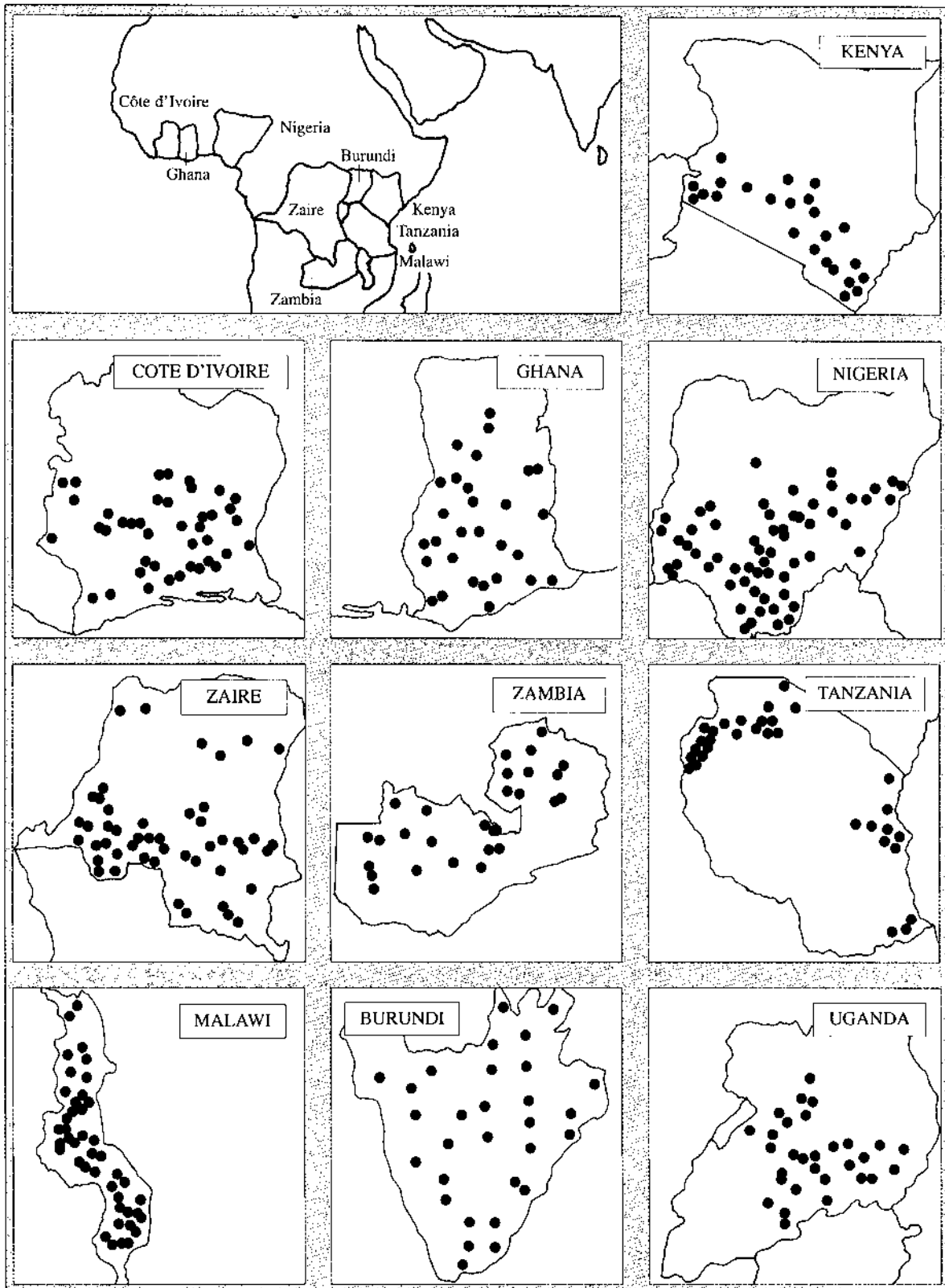


Figure 1. COSCA survey sites

FARMER STRATEGIES FOR MARKET ORIENTATION IN ACP AGRICULTURE

marketing. Moneylenders and formal and informal cooperative societies were the credit institutions which had traditionally served the smallholders. In some instances the middlemen had also made credit available to the farmers. The traditional credit institutions would facilitate smallholders' access to farm inputs such as rented farmland, hired labour, mechanized land preparation and mechanized farm transportation. Sometimes, the smallholders also had to purchase planting materials or certain farm chemicals.

Access to improved cassava processing technology was important for the marketing of cassava. In fresh form, cassava roots are bulky and perishable; processing reduces the bulk and therefore reduces transportation costs. In addition, fresh cassava roots have low value per unit weight; processing adds value and therefore extends the market to medium-income urban consumers. Cassava grating machines and food crop milling machines were observed in the villages surveyed. The milling machines were used to convert cassava chips or any other food crop in dry form into flour. Grating machines were used to convert fresh cassava roots into pulp in the process of making cassava granules (known as "gari" in Nigeria and "attieke" in Côte d'Ivoire).

People in over 25% of the representative villages reported that they went to the primary markets by motor vehicles. The distances to the markets centres varied. About 50% went to markets on foot over distances of under 10 km, 10% went by non-motor vehicles over varying distances, and 15% went on foot over distances of more than 10 km (see Table 1). The villages with motor vehicle access to their primary markets were concentrated in West Africa, particularly in Ghana and Nigeria. Those where access was generally on foot over distances of more

Table 1. Percentage distribution of representative villages in relation to market access factors^a

Market access factors	B (n=39)	CI (n=40)	G (n=30)	K (n=34)	M (n=67)	N (n=65)	T (n=40)	U (n=39)	Zr (n=71)	Z (n=38)	All (n=463)
Distance/means to market:											
– motor vehicle (any distance)	0	28	46	19	6	38	27	3	5	35	24
– non-motor vehicle (any distance)	3	3	4	23	2	5	12	28	7	12	9
– foot (less than 10km)	94	59	39	42	85	54	50	69	47	32	53
– foot (more than 10km)	3	10	11	16	7	3	11	0	41	21	14
Main cassava root buyers:											
– middlemen	43	52	81	32	34	86	19	31	42	8	54
– consumers	57	48	19	68	66	14	81	69	58	92	46
Credit facilities:											
– money lenders available	0	33	7	9	12	17	11	5	12	13	15
– not available	100	67	93	91	88	83	89	95	88	87	85
– cooperative services available	23	93	53	76	70	91	79	82	17	68	70
– not available	77	7	47	24	30	9	21	18	83	32	30
– trader loans available	8	28	13	6	7	31	11	0	26	5	20
– not available	92	72	87	94	93	69	89	100	74	95	80
Mechanized processing technologies:											
– grating machines available	0	10	17	0	0	52	0	0	0	0	15
– not available	100	90	83	100	100	48	100	100	100	100	85
– milling machines available	18	18	83	38	34	55	33	62	1	4	38
– not available	82	82	17	62	66	45	67	38	99	96	62

Note: a B = Burundi, CI = Côte d'Ivoire, G = Ghana, K = Kenya, M = Malawi, N = Nigeria, T = Tanzania, U = Uganda, Zr = Zaire, Z = Zambia

than 10 km were concentrated in Zaire. Uganda had the largest number of villages where people went to markets on foot over distances of less than 10 km.

About 35% of the villages sold cassava to traders, 20% to processors and 45% directly to consumers as their most frequent buyers. Access to middlemen was most common in West Africa, especially in Ghana and Nigeria. It was not common in Tanzania or in Uganda, where middlemen were observed in fewer villages than in Zaire. Tollens (1992) reported that the cassava marketing system in Zaire was dominated by small-scale informal traders called *par-colis* or *lutteurs* (wrestlers). They roamed village markets or hustled from door to door, in search of cassava. When they had collected a sufficient load, they rented space on a passing truck or on a river boat and travelled with their sacks to Kinshasa where they sold the sack on arrival.

Among traditional credit institutions, cooperative societies were the most widespread, being available in 70% of the villages. They were widespread in all countries except Zaire. Access to production credit from traders was not as widespread as cooperative societies, being available in only 20% of the villages. It was most common in Nigeria and was not observed at all in Uganda. Access to moneylenders was the least common, being available in only 15% of the villages. It was most common in Ghana and Nigeria and least common in Tanzania and Uganda.

Food crop milling machines were more widely available than cassava grating machines. Milling machines were observed in 38% of the villages and were most common in Ghana; almost all villages in Zaire lacked these machines. Grating machines were observed in 15% of the villages, but were not seen in Tanzania, Uganda or Zaire. They were available in more than 50% of Nigerian villages, more than 15% of Ghanaian villages and 10% of the villages in Côte d'Ivoire.

In general, ease of access to market was substantially better in West Africa, especially in Ghana and Nigeria, than in East and Central Africa. Access to cassava processing technology was particularly poor in East Africa in comparison with West Africa. Access to credit institutions (except cooperative societies) and access to middlemen were also poor in Uganda and Tanzania compared with the countries of West Africa.

Cassava production response to improved market access

Cassava production response to improved access to markets could be related to change in land area or in yield per unit area or both. Improved access to market would lead to an increase in the use of purchased inputs for cassava production. Use of some purchased inputs would affect area planted, others would affect yield per unit area, and still others would affect both land area and yield. Improved access would also lead to an increase in market demand for cassava products, which in turn would affect land area. Expanded cassava production would reinforce the improvements in market access (for example, services provided by middlemen, as well as post-harvest handling facilities, would expand because there would be more products to handle). Credits would be paid and credit institutions would be able to lend more (*see* Figure 2).

Given its important role, the use of purchased inputs in relation to improved market access is discussed first. Yield and land area expansion responses to improved market access are then presented using an analytical model and empirical results.

Use of purchased inputs under alternative market access conditions

Inputs purchased by some of the representative farmers for cassava production included rented farmland, hired labour, chemical fertilizers, planting materials (especially of improved cassava varieties), and mechanized land preparation and field-to-home transportation. The use of chemicals other than fertilizers was not common.

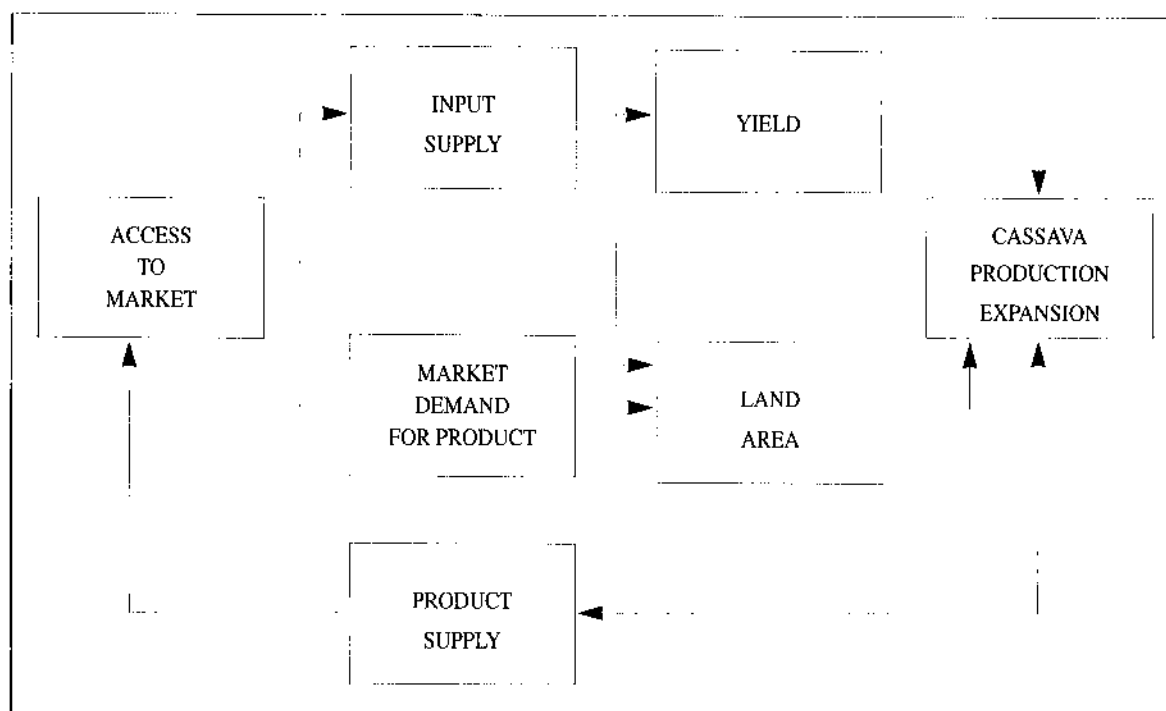


Figure 2. Links between farmer access to market and cassava production expansion

Mechanized land preparation was unlikely to influence land area or yield significantly because this input was not relevant to cassava production. Cassava was frequently grown in no-till seedbeds. Where cassava required tillage or ridging, soil physical structure conditions were not favourable for mechanized seedbed preparation. Mechanized field-to-home transportation would have a positive effect on land area expansion as it would affect transportation labour; its effects on yield would be indirect. Availability of land for renting would affect land area expansion positively as farmers would be able to acquire additional land for cassava production. Its effect on yield would depend on whether or not farmers used other purchased inputs on rented land. Use of rented land for cassava production need not be a disincentive for the use of hired labour or chemical fertilizers, although it might discourage long-term investment if the rent was for a short period.

The use of chemical fertilizers may not have a direct effect on land area expansion, but cassava root yield responded selectively to chemical fertilizer application. It has been reported that no response was observed either to N or K applications on newly cleared land. Instead, tuber yields were depressed with increasing rates of N, particularly without K. On poor soils, however, there seemed to be some response to N. Farmers who wanted to could supplement family labour with hired labour to expand cassava production. Hired labour may also be used to ensure timeliness in carrying out critical farm operations, especially in areas where the growing season is short. Available improved cassava varieties were bred for high yield, and their use would therefore affect yield.

Hired labour was used in 55% of the cassava fields and was the most widely used purchased input in cassava production. Rented land and mechanized field-to-home transportation, including the use of motor vehicles, bicycles, animals and boats, were also commonly used. But planting improved cassava varieties, mechanized land preparation and, especially, chemical fertilizers were not widely used. Improved cassava varieties were cultivated mainly in Nigeria where they had been released and disseminated by the time of the COSCA study. Since then, however, the improved cassava varieties have been officially released to the farmers in several other African countries.

Nearly all the purchased inputs were used in significantly more fields in villages where the market access factors were good than where they were not; the exception was mechanized land preparation. Okigbo (1984) reported that labour shortages in some countries, especially for clearing large areas of land in large-scale agricultural projects, or for timely clearing of dense forests for smallholders, had resulted in increasing mechanization of clearing and tillage operations; it was not uncommon for ministries of agriculture to assist farmers in clearing and tillage through tractor hiring units. Government assistance in the mechanization of land preparation distorted the effect of market factors on the use of this factor as a purchased input. Availability of food crop milling machines did not significantly influence the use of improved varieties because the machines were not specific to cassava.

Yield response to improved market access

The overall mean of fresh cassava root yield/ha was estimated as 11.9 tonnes. In different ecological zones in south-east Nigeria, mean root yields were 10.7 t/ha for villages around Onitsha, 9.2 t/ha in the Abakaliki area and 36.9 t/ha around Zaki-Biam. In villages in north-west Zambia, there was a mean yield of 10.4 t/ha for cassava harvested at 30 months or less after planting, 11.3 t/ha when harvested at 31–36 months, and 16.8 t/ha at 37 months. FAO information indicates that the average annual yield for the period 1986–88 for the COSCA countries was 8.5 t/ha. This figure was obtained by weighting the annual average with the number of COSCA villages in each country. The unweighted mean was only 7.1 t/ha.

Data for the period closer to 1991 when the COSCA information was collected were not readily available. Year-to-year variation in the FAO statistics, however, is minimal. FAO derived its yield data from detailed area and production reports prepared by the various countries. One researcher, commenting upon official government data for cassava, observed that it is difficult to document trends in output or yield. Yields of cassava are difficult to measure accurately, given the farmers' practice of harvesting bit by bit, and published data rarely give the method of measurement used. Given these problems, it is not surprising that previous production data are inconsistent and unreliable.

Cassava root yield response to improvements in farmers' access to market was determined using regression analysis. The theoretical model for the regression analysis was the ordinary least square (OLS) model.

Empirical model and results

The root yield/ha as the dependent variable was regressed on the market access factors as the explanatory variables. Agronomic variables which would affect the root yield – plant density and age of crop at harvest – were also specified as explanatory variables. The plant density was additionally specified in a polynomial form because yield could decline beyond a certain level of plant density. Four separate variations of the regression function were estimated, one for each of the two post-harvest variables and one for the other market variables because of potential close correlations among the market variables.

Plant density and age of crop at harvest were both positive and significant determinants of the cassava root yield. The estimates for the polynomial form of plant density, however, showed that there was an optimum plant density above which yield would decline. Root yield was positively correlated with four of the five market variables; the exception was the cassava marketing middlemen. The correlations were significant at high probability levels except for cassava grating machines.

Discussion

Access to cassava grating machines was not significantly correlated with root yield; however, this was only in a statistical sense because mean root yield was substantially higher in villages which had access to machines than among those that did not (*see* Table 2). Only a small proportion of the representative villages had access to

Table 2. Cassava fresh root yield (t/ha) reponse to market access factors

Market access factors	Mean	Minimum	Maximum	Standard deviation	Number of fields
Distance/means to market:					
– motor vehicle (any distance)	15.55	1.30	67.30	10.53	110
– foot (more than 10km)	10.02	1.75	25.00	6.57	48
Cassava marketing middlemen:					
– available	12.09	1.13	67.30	7.85	207
– not available	11.77	0.40	52.20	7.88	331
Credit facilities:					
– available	12.95	0.78	67.30	8.32	383
– not available	9.28	0.40	28.38	5.85	156
Cassava grating machines:					
– available	13.91	4.33	34.50	6.54	103
– not available	11.55	0.40	67.30	8.18	416
Food crop milling machines:					
– available	12.77	0.40	52.20	7.94	216
– not available	11.48	1.23	67.30	7.90	303

cassava grating machines. Apart from this access, access to cassava middlemen was the only market factor which did not have a significant correlation with the cassava root yield.

The effect of improved market access on cassava root yield was not direct; it was derived from the use of purchased inputs in cassava production. In a separate analysis it was shown that cassava root yield per unit area was higher in fields in which chemical fertilizers were applied than in fields with no fertilizers; the difference was not statistically significant in a multivariate analysis. This was explained, first, by the low variability in the use of the chemical fertilizer variable and, second, by the fact that cassava root yield responded only selectively to the application of chemical fertilizers. In addition, root yield was significantly higher in fields in which hired labour was employed than in those without hired labour.

The use of hired labour facilitated timeliness in the performance of critical farm operations. Cassava root yield from fields of improved varieties was nearly one and half times as high as yields from fields of local varieties. The improved varieties were more tolerant than the local varieties to common diseases such as African cassava mosaic disease (ACMD) and cassava bacterial blight (CBB), and to pests such as cassava mealybug (CMB) and cassava green mite (CGM).

Land area expansion response to improved market access

The farmer groups interviewed in the representative villages were asked what the trend (increasing, no change or decreasing) in cassava production had been in the previous 20 years, and what was replacing, or being replaced by, cassava. Cassava production was reported to have increased in about 65% of the villages; famine and hunger, market demand and population growth were the reasons most frequently advanced by the farmers for this trend. About 30% of the villages reported that cassava production had declined, mainly because of plant pest and disease problems. About 5% of the villages reported that cassava production had not changed. The relative impact of the various reasons advanced by the farmers for the cassava production trends was estimated using an appropriate econometric model.

Theoretical model

Qualitative dependent variables such as whether the cassava production trend was increasing or not were analysed using the Probit regression model (Polson and Spencer 1991):

$$T_i = F(w_i) = \int_{-\infty}^{w_i} \frac{1}{\sqrt{2\pi}} \exp(-s^2/2) ds \quad \text{Equation 1}$$

$$\text{For } -\infty < w_i < \infty; w_i = X^i \beta$$

where T_i is the probability that i th village reported an increasing cassava production trend, X is the $n \times k$ matrix of the explanatory variables, and β is a $k \times 1$ vector of parameters to be estimated.

The logistic distribution function is closely associated with the standard normal cumulative function of the Probit model. For Equation 1 the change in the probability that a village reported an increasing cassava production trend given change in any one of the explanatory variables can be computed as:

$$\frac{\partial T_i}{\partial x_i} = \left(\frac{\partial F}{\partial w_i} \right) \left(\frac{\partial w_i}{\partial x_i} \right) = f(w_i) \beta \quad \text{Equation 2}$$

where $f(w_i)$ is the standard normal density (logistic density) function for the Probit (Logit) model.

Empirical model and results

The cassava production trend expressed in a binary form, one for increasing trend and zero otherwise, was regressed as the dependent variable on village famine experience, population density, incidence of cassava plant pests and diseases, and the market access factors as the explanatory variables.

The farmer groups interviewed in each village were asked if the people of the village had suffered from famine in the past. Famine was defined as a situation in which people died from starvation or had to move away from the village because of food shortages. The investigators scored a representative sample of cassava plants in each village for incidences of CMB, CGM, ACMD and CBB, the major cassava plant pests and diseases of economic importance.

Famine experience, population density, pest and disease incidence, availability of any of the three traditional sources of credit, availability of cassava grating machines and food crop milling machines, and the various categories of ease of access to market conditions were expressed in binary forms. Five variations of the model were estimated; the four market factors were alternated in four variations and combined in the fifth variation. Famine experience, population density and pest and disease incidence were in each variation to remove the effects of those basic environmental factors.

The statistical relationships between the cassava production trend, in terms of land area expansion, was such that the probability of an increasing cassava production trend declined from the lowland humid climatic zone through to the sub-humid and non-humid climate zones (see Table 3). The probability was lowest, however, in the highland humid climatic zone. The relationships between the probability of an increasing cassava production trend and the incidence of pests/diseases except CMB were statistically significant in most of the specifications. The relationships were positive, however, between the probability of an increasing production trend and ACMD and CBB incidence. The relationship between cassava production trend and village famine experience or demographic pressure was not statistically significant.

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Table 3. Parameter estimates of explanatory variables of the cassava production trend regression function^a

Explanatory variable	Means/distance to market centre	Marketing middlemen	Credit facilities	Post-harvest facilities
Intercept	0.484 (2.015)**b	0.472 (2.178)***	0.615 (2.672)***	0.556 (2.589)***
Climate zone is humid (1 if yes, otherwise 0)	-0.335 (-1.649)*	-0.132 (-0.729)	-0.118 (-0.659)	-0.130 (-0.700)
Climate zone is non-humid (1 if yes, otherwise 0)	-0.391 (-1.947)**	-0.187 (-1.038)	-0.243 (-1.371)	-0.194 (-1.073)
Climate zone is highland humid (1 if yes, otherwise 0)	-0.428 (-1.517)	-0.396 (-1.525)	-0.425 (-1.648)*	-0.314 (-1.209)
Cassava mealybug was observed (1 if yes, otherwise 0)	-0.311 (-1.624)*	-0.395 (-2.303)**	-0.333 (-1.970)**	-0.330 (-1.885)*
Cassava mosaic disease was observed (1 if yes, otherwise 0)	0.336 (1.940)**	0.447 (2.852)***	0.481 (3.101)***	0.423 (2.706)***
Cassava green mite was observed (1 if yes, otherwise 0)	-0.424 (-2.716)***	-0.359 (-2.569)***	-0.452 (-3.292)***	-0.380 (-2.733)***
Cassava bacterial blight was observed (1 if yes, otherwise 0)	0.695 (3.859)***	0.584 (3.585)***	0.622 (3.871)***	0.503 (3.032)***
Village had experienced famine (1 if yes, otherwise 0)	-0.193 (-1.189)	-0.393 (-2.684)***	-0.374 (-2.570)***	-0.307 (-2.028)**
Population density was high (1 if yes, otherwise 0)	0.021 (0.130)	-0.056 (-0.403)	-0.004 (-0.027)	-0.097 (-0.689)
Market access was by motor (1 if yes, otherwise 0)	0.590 (2.899)***	—	—	—
Market access was by non-motor (1 if yes, otherwise 0)	0.244 (0.940)	—	—	—
Market access was by foot, distance above 10km (1 if yes, otherwise 0)	0.437 (1.820)*	—	—	—
Marketing middlemen were available (1 if yes, otherwise 0)	—	0.517 (3.326)***	—	—
Credit facility was available (1 if yes, otherwise 0)	—	—	-0.033 (-0.240)	—
Grating machine was available (1 if yes, otherwise 0)	—	—	—	1.327 (3.092)***
Milling machine was available (1 if yes, otherwise 0)	—	—	—	-0.065 (-0.452)
Statistics:				
No. of observations	368	439	439	439
Chi ²	54.56	65.79	54.52	68.82
Prob > Chi ²	<0.01	<0.01	<0.01	<0.01
Pseudo R ²	0.12	0.11	0.10	0.12
Log likelihood	-208.54	-255.07	-260.70	-253.55
Observed probability	—	—	—	—
Predicted probability	—	—	—	—

Note: a Figures in parenthesis = T-ratio equivalents; b ***, **, * = significant at $P \leq 0.01$, $P \leq 0.05$, and $P \leq 0.10$, respectively

Among the market factors, the relationship between cassava production trend and availability of post-harvest handling facilities or of cassava marketing middlemen was positive and significant at a high probability level. However, there was no significant difference in the probability of an increasing trend between villages with easy market access and those with difficult access, nor between villages where traditional credit institutions were available and those where such institutions were not available.

When all the market factors were combined in one model, nearly all the variables maintained their signs and the levels of statistical significance of relationships with the probability of increasing cassava production trend (see Table 4). Estimates of change in the probability of an increasing cassava production trend that would result from a change in each explanatory variable showed that the effect of change in the status of post-harvest technology and of change in the availability of the services of cassava marketing middlemen would each be greater than the effect of change in ease of access to market centres.

Discussion

Land area under cassava was expanding in all the climate zones but fastest in the lowland humid zone. CMB did not affect the expansion because IITA and other agencies had successfully carried out biological control of CMB throughout sub-Saharan Africa. CGM appeared to have had a negative effect on expansion. It was not clear whether this was a cause-and-effect relationship because the problem was particularly important outside the humid zone. The cassava land area appeared to be expanding more rapidly in areas where problems of ACMD and CBB existed. Again, it was not clear that these were cause-and-effect relationships. These two problems were more serious within than outside the humid climate zones. However, in central Africa where cassava leaf was an important food item, leaves with ACMD symptoms were cherished for their taste. In addition, the improved cassava varieties bred at IITA, which were already widely cultivated in Nigeria and were spreading in other countries, had been shown to be highly tolerant of the four major pests and diseases, particularly CBB and ACMD.

Both population pressure and famine appeared not to affect the expansion of the area under cassava in a positive way. Nweke (1995) showed that these situations were related to the role of cassava in the cropping system. In the areas where cassava was the primary crop in the system, both demographic pressure and famine significantly affected land area expansion. Where cassava played a secondary role, demographic pressure and famine played a secondary role to market pressure as a determinant of land area expansion.

The village credit institutions did not affect land area expansion in a positive way because the credit from traditional sources carried high interest charges and the smallholders borrowed from them more for other uses than for food crop production (Nweze *et al.* 1992).

All the other market factors (ease of access to market centres, and availability of cassava marketing middlemen and cassava post-harvest handling facilities) influenced the cassava land area positively to significant degrees (see Figure 3). This was partly due to the use of certain purchased inputs in cassava production. In a separate analysis, it was shown that the number of villages which reported increased production was higher where rented farmland, hired labour or mechanized field-to-home transportation were used than where not used. Availability of land for renting or availability of labour for hire enabled farmers who did not have adequate supplies of such inputs from their own sources to expand cassava production. Mechanized field-to-home transportation saved labour which could be channelled into expanding production.

The positive correlation between the cassava production trend and the various market factors was also due to increased market demand associated with improved market access. A market link road expanded market demand because farmers could reach more consumers. In the Bandundu region of Zaire, where the completion of a new tarmac road to the capital city of Kinshasa facilitated the transport of processed cassava products, the onset of

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Table 4. Parameter estimates of combined market factor explanatory variables of the cassava production trend regression function^a

Explanatory variable	Beta coef.	ΔDep./ΔExp.
Intercept	0.284 (1.571)	—
Climate zone is subhumid (1 if yes, otherwise 0)	-0.355 (-1.643)* ^b	-0.121
Climate zone is non-humid (1 if yes, otherwise 0)	-0.265 (-1.273)	-0.090
Climate zone is highland humid (1 if yes, otherwise 0)	-0.333 (-1.151)	-0.113
Cassava mealybug was observed (1 if yes, otherwise 0)	-0.361 (-1.779)*	-0.123
Cassava mosaic disease was observed (1 if yes, otherwise 0)	0.288 (1.610)*	0.098
Cassava green mite was observed (1 if yes, otherwise 0)	-0.304 (-1.828)*	-0.103
Cassava bacterial blight was observed (1 if yes, otherwise 0)	0.564 (2.958)***	0.192
Village had experienced famine (1 if yes, otherwise 0)	-0.162 (-0.945)	-0.055
Population density was high (1 if yes, otherwise 0)	-0.102 (-0.615)	-0.035
Market access was by motor (1 if yes, otherwise 0)	0.486 (2.244)**	0.165
Market access was by non-motor vehicle (1 if yes, otherwise 0)	0.261 (0.955)	0.089
Market access was by foot, distance above 10km (1 if yes, otherwise 0)	0.485 (1.987)**	0.165
Marketing middlemen were available (1 if yes, otherwise 0)	0.532 (3.034)***	0.181
Credit facility was available (1 if yes, otherwise 0)	-0.183 (-1.111)	-0.062
Grating machine was available (1 if yes, otherwise 0)	1.277 (2.697)***	0.432
Milling machine was available (1 if yes, otherwise 0)	-0.026 (-0.156)	0.009
Statistics:		
No. of observations	368	
Chi ²	75.75	
Prob > Chi ²	<0.01	
Pseudo R ²	0.16	
Log likelihood	-197.95	
Observed probability	0.66	
Predicted probability	0.71	

Note: a Figures in parenthesis = T-ratio equivalents; b ***, **, * = significant at $P \leq 0.01$, $P \leq 0.05$, and $P \leq 0.10$, respectively

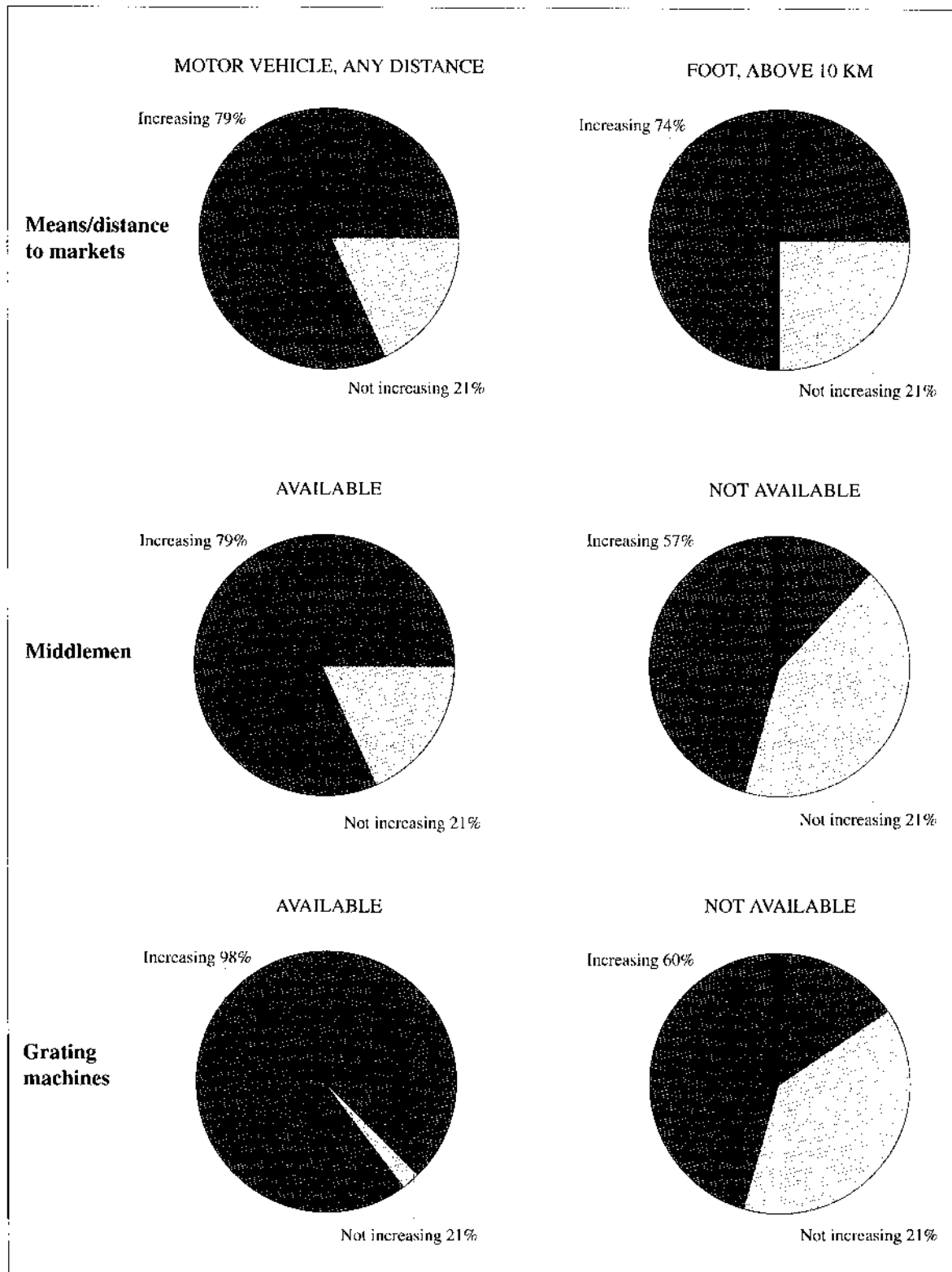


Figure 3. Percentage distribution of 463 representative villages by cassava production trend (field area) and market access factors

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several cases of Konze (a paralytic disease) was linked to the consumption of "insufficiently processed cassava roots" (Tylleskar *et al.* 1991). The resulting increased demand through improved market access caused the farmers who made chips and flour to reduce the soaking period from 3–4 days to 1–2 days.

The introduction of improved post-harvest handling facilities also increased market demand because it improved product quality. Processed cassava products can be classified into two groups in terms of convenience of preparation into food. In one group are those such as gari, attieke or chickwangue which enter the marketing system in ready-to-serve form. In the other group are such products as chips and flour which need cooking or further processing at home. The products in the first group are more competitive with food grains in the market place than the products in the second group.

Easy market access did not make as much impact on cassava land area expansion as the availability of cassava marketing middlemen or post-harvest handling facilities, which had the greatest positive impact on land area expansion. Farmers would be able to expand cassava land area under conditions of difficult market access provided that improved processing technologies were available. This was because these technologies improved product quality, reduced bulk, extended shelf life and made it possible for quality cassava products to be transported at reduced costs over poor roads to distant urban market centres. This observation was quite significant because it implied that although the agricultural research agencies could not build market link roads, they could still contribute, in a positive way, to reducing transportation costs and hence to an expansion of markets for cassava by developing improved cassava processing technologies.

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3.2

Marketing mixed grazing systems for temperate and semi-arid environments

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The objectives of research may be to investigate some new idea in an innovative manner, to add to existing knowledge on a particular subject, to test whether it is possible to repeat results or to solve problems in an existing process. In most instances the general aim is to satisfy a human need for a perceived benefit. This may vary from increasing income – the main interest of this paper and of most farmers in temperate areas – to accumulating, for example, higher livestock numbers in semi-arid areas. The perception of the problem may differ between the researcher/extensionist and the targeted adopter (the farmer), and in many instances the researcher/extensionist must explain what the problem is and why it is necessary to change. On the other hand, the researcher/extensionist must understand the perspective of the adopter. In this paper the emphasis is placed on the direct relationship between the researcher/extensionist and the targeted farmer adopter. The characteristics of this relationship may be relevant at individual, regional or global levels. The need for policy interventions to create suitable conditions for improved livestock farming is recognised but is not addressed in this paper.

Generally, the same strategy of quantifying benefits through comparative research, understanding the processes involved and developing commercially usable information packages apply. We use a particular case history of a grassland-based livestock production system (Nolan 1979) as an example where the primary objective was to improve the use of semi-natural grassland resources, mainly in the Republic of Ireland, in an ecologically acceptable manner to increase income (Nolan 1977). This, in turn, could be expected to establish production and general management targets which would improve average living standards, preserve the ability of the system to sustain production over time, and output desired wholesome products at acceptable price levels to the consumer.

Nolan and Connolly (1992) and Nolan *et al.* (1995) suggested that “no system can exist in isolation save in the context of its completeness as a set of smoothly interacting biological and management processes with a targeted output, but must interact with other systems with related objectives”. Recognition of the cultural and social milieu within which the farmer operates was considered important and they cited problems with attempts to transfer the European model to Africa as an example. Nevertheless, the underlying biological understanding must be correct, otherwise any proposed system invites failure.

It is considered that the most useful model is the integrated system approach whereby the whole system represents an embodiment of the different biotic, edaphic, climatic and socio-economic factors involved. Minimization of risk in the extension of research results to the commercial user is stressed to protect both the adopter and research credibility.

The results of research carried out mainly in temperate (Nolan 1994) and semi-arid Sahelian (Nolan *et al.* 1988a) conditions are used. In both cases, an understanding of the animal-vegetation relationships in the grazing

ecosystem was considered to be a fundamental starting point for the biological component. It is interesting to contrast the two situations, which differed mainly in the degree of animal and vegetation heterogeneity, in land tenure systems and in the urgent need to improve domestic human food supply while preserving the natural soil, vegetation and water resources in the semi-arid areas.

Objective and strategy

The broad objective is to improve the standard of living of farmers practising a defined system of production. This requires a system that has biological, economic and environmental sustainability.

Our overall strategy is to improve existing farmers' systems rather than propose new ones, based on:

- identifying the existing systems and their characteristics;
- developing these systems through literature reviews and experimentation, to produce a particular desired product with increased productivity and efficiency;
- marketing improved systems to extensionists and farmers.

We discuss here a case history of applying this approach in Ireland and relate it to work in progress in several countries in Africa.

Identifying existing systems

In Ireland the production of meat and wool is based mainly on the use of permanent pasture as the animal food source (Collins *et al.* 1977, Nolan *et al.* 1977, Nolan 1983). The research began with describing commercial farming in the area where the results were intended to be marketed. The Teagasc National Farm Management Survey (FMS) revealed widespread inefficient farming in a lowland and mainly permanent (semi-natural) pasture area of about 150 × 150 km² based on a low input/low output pattern. In this area, 75% of the farms were 20 ha or less. The FMS, Central Statistics Office, County Agricultural Advisory Offices Reports, advisory and veterinary practitioners experiences and localized surveys provided further background information on current farming practices. Almost all farmers practised mixed cattle and sheep grazing. This set the basis for planning the research programme. The primary strategic research decision taken was to develop existing mixed grazing systems rather than to attempt to introduce either mono-cattle or mono-sheep systems.

Literature reviews and experimentation

The state of knowledge was assessed and various gaps in information where new experimentation was required were identified (Nolan and Connolly 1977). The three main research objectives were:

- to identify the biological benefits of mixed grazing versus mono grazing systems;
- to understand the biological processes involved;
- to develop whole systems which would be superior to those based on mono or existing mixed grazing systems.

Essentially, the experimentation was concerned with identifying grazing, behavioural and parasitological complementarity and the vegetation responses to mixed grazing (Nolan and Connolly, 1989b). Management and environmental factors such as labour peak requirement, seasonal sales, income distribution and pollution impact were also assessed.

Experimentation included the development of a new methodology (Connolly and Nolan 1976; Nolan and Connolly, 1989a) to investigate animal-vegetation relationships over a range of animal mixes (Nolan *et al.* 1988c, Nolan 1994). The experimental design used (Nolan and Connolly 1989a) allowed the measurement of the effects of changes in the stocking rate of each animal type on animal responses, animal substitution rates and prediction of the optimal joint stocking rate. It also facilitated assessment of the effects on vegetation responses and on parasite roundworm burdens in mixed grazing compared with mono grazing. Work in the semi-arid Sahel, where almost all farmers use mixed grazing, presented an opportunity to evaluate this approach and to develop systems to meet the primary need for increased food production. Further, these systems could contribute to the solution of problems of vegetation degradation associated with inappropriate grazing practices (Nolan *et al.* 1988b, Nolan 1991). In particular, the prediction was that in more heterogeneous grazing ecosystems, the possibility of even greater complementary effects existed compared with temperate grasslands (Nolan and Connolly 1989a).

The Irish experiments showed the benefits of mixed cattle and sheep grazing to be 7% higher than individual animal growth rates at a constant stocking rate, or an increase of about 13% in carrying capacity, without affecting individual animal growth rates (Nolan and Connolly 1989a). For dairy cows, stocked at 2.5 cows/ha and yielding 4,500 litres/cow, an addition of 1.5 ewes and their twin lambs per cow did not affect milk yield or quality but increased output per unit area (O'Riordan 1990). The twin lamb growth rates were high in this system, which had a very low proportion of sheep in the total stocking rate. In sheep and suckler cow mixes, suckler calf growth rates were about 1.25 kg/day, similar to their mono grazing counterparts (Nolan 1991). Lamb growth rates were consistently higher than in mono-sheep grazing. Necropsy gastro-intestinal roundworm counts in tracer lambs indicated much lower burdens in lambs under mixed grazing. A test unit at Athenry consists of 30 sucklers cows with progeny to beef and 270 ewes, with replacements produced internally, on 46 ha of permanent pasture. Artificial N use is 146 kg/ha/annum and a one-cut silage system operates. No anthelmintics have been given to ewes in this unit over the past 4 years and their use for lambs has been halved. Other pasture and animal studies indicate that the benefits listed are attributable to complementary vegetation use and reduced roundworm infestation.

The dissimilarity in the diets of cattle, sheep and goats in the semi-arid Sahel (Connolly *et al.* 1995, Nolan *et al.* 1995) provides a compelling argument that mixed animal use of these vegetation types is better than mono grazing and that the magnitude of complementarity and benefits to animal performance may be higher than in the temperate areas.

Mixed grazing also gives a better spread of workload and income and a better fit between vegetation growth rate and animal feed requirements compared with mono grazing. Hence, it is of particular importance in efficient grazing land use. The mixed grazing benefit to individual animal growth rates of a particular type increased as its proportion in the mix decreased (Nolan and Connolly 1989a). This provides a rational basis for changing animal proportions in response to changes in relative unit output prices.

Together with the economic environment, grazing land type will eventually decide the livestock enterprise and mix which is most appropriate. In temperate areas, this relates particularly to the volume of conserved forage required for winter when vegetation growth has ceased. Nolan and McNamara (1992) showed that the amount of conserved forage for winter feeding increased from 175 to 475 tonnes with a change from an all sheep to an all-cattle enterprise at a constant overall stocking rate of about 2.5 livestock units/ha on a 20 ha farm. Therefore, the proportion of the farm which must be suitable for cutting at one time increased from 20% to at least 50%. The volume of silage effluent increased from about 875 litres to 2,375 litres/ha, assuming a spread on the grassland from animal winter quarters also increased proportionately. Gardiner and Radford (1980) showed that approximately 32%, 39% and 28% of Irish soils have wide, limited and very limited use ranges, respectively. Limitations are associated with such factors as wetness, slope and rock outcropping which restrict or preclude the use of

harvesting machinery. This means that, in many situations, it is not possible to conserve adequate winter forage for an efficient all-cattle enterprise.

Differences in selection by animal types provides a tool for the sustainable management of vegetation. In the Senegalese Sahel there is a need to increase wood species, but in Côte d'Ivoire and parts of Zimbabwe (Matobo) the opposite is true. Too high a proportion of goats in the mix places too high a grazing pressure on the tree and shrub fraction, and this tends to be followed by vegetation degradation (Nolan *et al.* 1993). This is especially critical in the dry season. The main objective, therefore, is to apply the correct balance and overall intensity of animal grazing to make efficient use of vegetation while at the same time increasing individual animal and total offtake to improve domestic food supply.

Marketing improved systems

Having established that the outputs from the improved mixed grazing systems greatly exceeded those in commercial farming practice, we decided to start marketing the research (Nolan and Connolly 1988). The Chief Agricultural Officers of the three most important lowland counties near the research station were invited to see the experiments and discuss the results. They agreed that the research was relevant to many producers in their areas and felt that the extension services could identify with it. Following a visit by two advisors from each county to the experiments, it was decided that each would identify at least two potential farmers to whom the results would be pertinent, and procure ordinance survey maps (1:1,600) of their farms for the research. The researcher and advisor would then visit the farmer and formulate a plan of action.

The outcome was that two farms were selected in one advisor's area, one relatively well developed and the other relatively poorly developed. Both were considered to cover the range of farming situations in the targeted area and were of good standing in their local area. The inclusion of at least two farms is considered important since factors unrelated to the extension project may preclude continuity in some instances. The farmers visited the research station to see and discuss the experiments.

Following a joint visit to the farms by the farmers, members of the farmers' families, the advisor and the researcher, an inventory of all land types, animals, farm buildings, equipment and current practices such as winter forage conservation measures was made. Then, an estimate of overall mixed grazing carrying capacity and income potential was put to the farmer. At first this was considered ambitious by the farmer but subsequent discussion, generally in the presence of all the family, led to a willingness to try the new approach. This was the most critical hurdle in the marketing process.

For each farm, a calendar programme was drawn up for land and animal management based on collaboration between the researcher, the advisor and the farmer. Veterinary collaboration was readily available from a colleague at the research station and local practitioners. Provision was made for animal health monitoring (through post mortem examinations and other procedures) by the regional veterinary laboratory. The gradual build up of the system as both the research and development advanced gave the farmer time to adjust to new processes, such as conserving forage for winter feeding as silage rather than as hay. This led to increased farmer confidence as the programme progressed.

Over a 4-year period, individual animal growth rates increased by about 25%. It is estimated that about half of this was due to mixing *per se* and half to improved grazing and general husbandry management. Income improvement was of a greater magnitude due to early-finishing animals attaining higher prices and lower requirements for expensive feed, especially for cattle. The first 2 years appeared to represent a "we will see what happens" period for neighbouring potential adopters, who were aware of the work but hesitant or apprehensive about the outcome.

During the second year of the extension on two farms, periodic field walks were arranged for local potential adopters, and gradually groups of them from almost every county in Ireland visited with their advisor. In this way, the two initial farms were used to promote wider development which extended to many hundreds of farms. It appeared during this process that the success of one adopter provided a very potent motivation in convincing others to follow.

Research marketing strategy

The critical characteristics in reaching agreement with the farmers were:

- identification with the system;
- confidence in the proposed changes;
- confidence in the ability of research/extension personnel to deliver the necessary guidance and support;
- the use of a low-risk strategy to move to the new system.

It was at this stage that the inclusion a sufficiently wide range of treatments to cater for the territorial differences identified from soil survey and grassland productivity maps proved valuable in that it provided a solid basis for catering for the different farm, soil and grassland types encountered.

Farmer identification with the system

The farmer must be able to envisage the system and identify with it. This is easiest to achieve if the proposal builds directly on the system currently used. The farmer must also appreciate the complete system planned for the farm and how different management components would be integrated, throughout the year.

In this regard, it is peculiar that most grazing research is organized on a commodity basis, whereas most livestock farmers use systems of production based on mixtures of animal types. This relates to the idea outlined earlier of appropriate research, where animal types are not compartmentalized and treated as if they were to be managed separately, but where the user identifies more readily with mixed production.

Farmer confidence in proposed changes

The farmer must have confidence in the changes that are being proposed. During the first visit to the farms it was made clear that no financial assistance would be given. Advice, however, would not be limiting. In addition, the agreement of the farmer was secured to allow open day visits by other interested farmers as the programme advanced. It was agreed that minimum recording would be carried out; the purpose of the recording was mainly to identify points at which the system could be improved and to help identify the causes of any difficulties that might occur.

This level of commitment of research/extension personnel increased the confidence of the farmers in the changes proposed. Each farmer required a somewhat different plan. The mixture proposed for a particular farm depended on its particular circumstances (for example, if much of the farm could be cut for conserved forage, this would tend to increase the proportion of sheep since they have lower winter feed requirements). The wide range in mixtures researched led to confidence that most mixtures proposed had actually been spanned by the range tested in the research programme.

An ongoing advisory/educational input for the farmer was necessary, especially in the early period, to gain familiarity with new processes, such as changing from traditional methods of winter feed conservation (hay to silage) or animal husbandry practices.

Farmer confidence in the abilities of research/extension personnel

The farmer must have the confidence in the abilities of the research/extension team. This was boosted by discussions, by the procedures discussed earlier and by the protocols to avoid risk in implementing the changes proposed.

Use of a low-risk strategy to move to the new system

The proposal to move to the new system through a low-risk strategy seemed to weigh heavily in the final decision to collaborate. The basic proposition at the first stage was to manage the existing animals on a much smaller proportion of the farm area (that is, in a manner similar to that used in research) during the first season of the new programme. Forage surplus to requirements could be conserved in a manner suitable for sale, to provide an additional source of income. This contained no risk because if the reduced area proved inadequate in terms of animal growth rate the position could be rectified immediately as there were no extra animals above those carried in previous years. Also, no immediate extra investment was required to initiate the plan. If, on the other hand, it proved successful, the sale of surplus hay would provide extra income to invest in the increased livestock and infrastructure required for the second year. This strategy allowed for low risk and high confidence in the programme and a transition, over a number of years, to the final stage of the development plan for the farm.

Nolan and Connolly (1992) indicated that researchers and development agencies must be conscious of the potential adopter's outlook, "usually formed by unpredictable markets, farming conditions, climate and, above all, the priority to provide for self and dependants". These fuel the inertia of the status quo. The element of risk must be minimized, as the producer will quickly uncover any weaknesses, lack of conviction on the part of the proposer, or lack of overall knowledge of the processes being marketed. A failure will, apart from doing immediate and possibly serious damage to the adopter, also adversely affect the credibility of other research colleagues and perhaps result in the passing over of good technology by other users.

In the Senegalese Sahel, Côte d'Ivoire and Zimbabwe a somewhat different extension/marketing strategy is being adopted and it is clear now that the first two critical aspects of identification with and confidence in the systems recommended are present. Because of the communal land use pattern, marketing effort is directed at the village level. A village within a pastoral unit in the Senegalese Sahel has been selected where information on farming pattern, livestock mixes and numbers and demographic characteristics were available. Forage trees and shrubs were planted and soon more detailed animal management practices will be in place. It is intended that the villagers will come into the research station and interact with researchers in a two-way dialogue and that in the future other villagers will be attracted into the group. In Zimbabwe the initial survey is under way and in Côte d'Ivoire a joint adopter/researcher approach is in progress. The problem of lack of individual adopter ownership is considered a particularly serious constraint in these areas and therefore it appears essential that central policy concurs with the extension process to achieve the desired results. It is hoped that the strategy adopted will form the basis of such policies.

Conclusion

The main aims of the work described was to market the results of mixed grazing research on commercial farms in order to improve the average farm income and to carry out minimum recording of such factors as animal performance in order to identify causes of failure should that occur. The appropriate research for a particular area depends on many factors surrounding the production system, such as grassland type, marketing and socio-economic milieu. Before embarking on specific experimentation, information on this surrounding framework is essential in deciding on the research and in formulating the marketing strategy for the results of the research. A

systems approach resulting in a “packaged system” recommendation to meet particular farm and adopter circumstances is necessary. There is also a need to inform and liaise with other agencies impacting on the adopter(s).

It was found that each farm/adopter was somewhat different in terms of grassland type and/or socio-economic circumstances, and thus blanket planning could not be carried out even for a number of farms of about the same size and in the same geographic area. For example, grassland type will largely determine the system(s) to be used, particularly the proportion of the area suitable for harvesting winter forage.

Success on the two initial farms seemed to be a powerful influence in promoting wider adoption. This reinforces the decision not to offer financial assistance as the system was seen to survive within its own resources. The farm walks also greatly fuelled wider adoption, with the farmer, extensionist and researcher seen to be collaborating closely in the success of the venture. This gave the extensionist and colleagues a natural and positive entry into the adoption process for other farmers.

Once contact with potential adopters of the research is made, the key issues are:

- Do the potential adopters identify with what the researcher/extensionist has to offer?
- Does confidence exist in the technology and in the associated personnel? Even where finance is not a constraint, the confidence of the adopter that the general management and biological processes advocated are sound is necessary. The better the adopter the more searching his examination of the proposal and the better the outcome of the proposed changes.
- Risk must be minimized. The researcher/extensionist carries the responsibility that failure may damage the adopter. This is personally serious for the adopter but also damages the research/extension process in that a failure in one programme reduces confidence in all research/extension proposals. In this respect, one-factor interventions are dangerous when proposed for systems not already well understood. It is much simpler for the researcher to propose them than a complete system, but unless there is a good understanding of the whole system the probability of failure may be greatly increased.

It is considered advisable to have more than one farm because failure or termination of the extension may occur due to factors outside the control of the researcher/extensionist and unrelated to the research. Family circumstances may alter due to a bereavement, for example, but public perception may not take this into account. Once the system uptake begins to gather momentum, there is the added problem that some potential adopters who have severe financial or biological problems (for example, diseases in animals) may view the proposed system as a solution to all problems and become eager to participate. It is clearly necessary to solve the existing problem first. All these matters can be assessed during the first visit to the farm, through discussion and by observation of the state of the livestock, the land and the farm infrastructure.

While no single discipline can adequately cater for all the factors related to the successful management of a mixed grazing system, it appears that it is better to channel communication with the extensionist and adopter through one researcher or advisor. The researcher may discuss all matters with the extensionist and adopter together on site, or following the farm visit with the extensionist only, who then transmits the recommendation to the adopter. Our view is that these matters should be at the discretion of the extensionist.

Finally, it is our belief that controlled research will continue to form the basis for sound planning at individual farm, village or regional levels.

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3.3

Implementing market orientation strategies: Roles of governments, farmers and farming organizations

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It is clear that the economies of ACP countries have performed poorly over the past two decades or more. This is true for every sector of these economies. Poverty has gained ground and, allied with this trend there is now increasing concern for the safety of the environment. The economies of ACP countries are largely agricultural in nature, and the neglect of agricultural needs has been an underlying cause of many of the problems now facing these countries. For any meaningful economic development to take place, therefore, special attention needs to be given to agricultural performance in ACP countries.

This calls for a review of the past and a focus on present and future trends in the global economic environment. Events of the past have shown that turning inward to pursue economic development behind protectionist walls is not the way to go. The indications are that trade policies and trade liberalization will be major driving forces in agriculture over the next decade. There will be more emphasis on trade, rather than aid, as an agent of development. The option for ACP countries is to give their agriculture market orientation. Pushed by the globalization of the world economy, which itself is driven by GATT and the technological revolution in the transportation, communication and computer sectors, other countries in similar situations are giving their economies various dosages of market orientation.

The average ACP farmer cannot read or write and lives in a village far away from major towns. Therefore, s/he does not interact adequately with the market and is highly dependent on the government. S/he produces staple food for the family and takes the surplus to the nearest market, if there is a good road or transport system. In the market s/he accepts the price offered for the produce. Produce quality is measured according to locally accepted standards. The farmer may not have information on the prevailing practices and prices in other markets, and therefore needs to be guided as to how, where and when to sell, to maximize benefit from the produce. Most ACP cassava farmers, for example, will probably just take their tubers to market and that is it. In the rapidly changing world this is not enough. Farmers must be helped to interact adequately with the other players in the market place – they must acquire a market-oriented approach in their farming activities.

Definition of market orientation

Market orientation means different things to different people. It could simply mean efforts to facilitate further interaction between the farmers and the other players in the food chain. It could also refer to a farmer's attempt to get more than the farm gate price through involvement in value-added activities, or it could mean getting the

farmer to produce surplus staple food or to devote all his/her land and labour to producing new crops only for the market. Efforts to ensure that the factors of production flow freely between different farmers (new and old) could be seen as market orientation. It could also be defined as the farmer's effort to consider the needs of his/her customers. Some use the term to refer to the monetarization of agriculture; this involves the idea of profit and loss in financial terms.

To a number of people, market orientation means throwing agriculture open to market forces. Similarly, it could mean getting governments to divest themselves of some duties, such as running agricultural banks and insurance companies, and the distribution of fertilizers. In essence, market orientation is about improving income.

The market-oriented food chain

The term "food chain" refers to the food supply activities "upstream" from the farmer and "downstream" from the consumer. In a market-oriented food chain, the critical role of the service group (which includes extensionists, bankers, researchers, consultants and policy makers) is also brought into focus. The service group facilitates the smooth running of the activities in the food chain (*see* Figure 1).

The message of market orientation is for customer orientation in the widest possible sense. I remember visiting a rural market and being amazed by the amount of cassava tubers in the market. I then went further to look for the amount of "gari", a West African food produced from cassava; it is yellowish or whitish, depending on whether or not it is fried with palm oil. The amount of gari in the market was small, not a reflection of the amount of cassava tubers available; it was mainly the white type, some of it clean white and some dirty white. I asked for an explanation and was told that the clean white gari came from the local varieties of cassava, while the dirty white type came from the high-yielding, improved varieties. The latter was cheaper. The message here is that the researchers who had produced the new varieties had not gone beyond the "high-yielding" factor; they had not, for example, tested the processing quality of the new varieties before recommending them to farmers. Researchers, like all other players in the food chain, need to be as market oriented as farmers.

Market orientation benefits and strategies

The objective of market orientation in agriculture is to have a healthy agricultural industry that plays its rightful role in national development and international trade. Such an industry should have a strong organizational structure, be well informed, customer oriented, capable of continuous improvement and private-sector driven.

As such, market orientation would make a positive impact on ACP agriculture in many ways. It would stimulate specialization and diversification of farming. By shifting enterprises to the right places of production (for example, shifting production from high-cost-intensive areas to low-cost-intensive areas), it would help to reduce environmental damage and improve sustainability. When supported by a strong physical and institutional infrastructure, it would have a strong impact on rural development.

The ACP countries are not homogeneous and therefore market orientation strategies and their methods of implementation will vary between countries. There are differences in colonial history, socio-political and cultural organization of society, demography, domestic policies and ecological conditions.

There are also likely to be differences in emphasis within the food chain with regard to the importance of information, communication, organizational structure, management, customer orientation and ownership (private or public sector). The formulation of market orientation strategies requires taking all these factors into account and aiming for an integrated approach, involving governments, farmers and farming organizations.

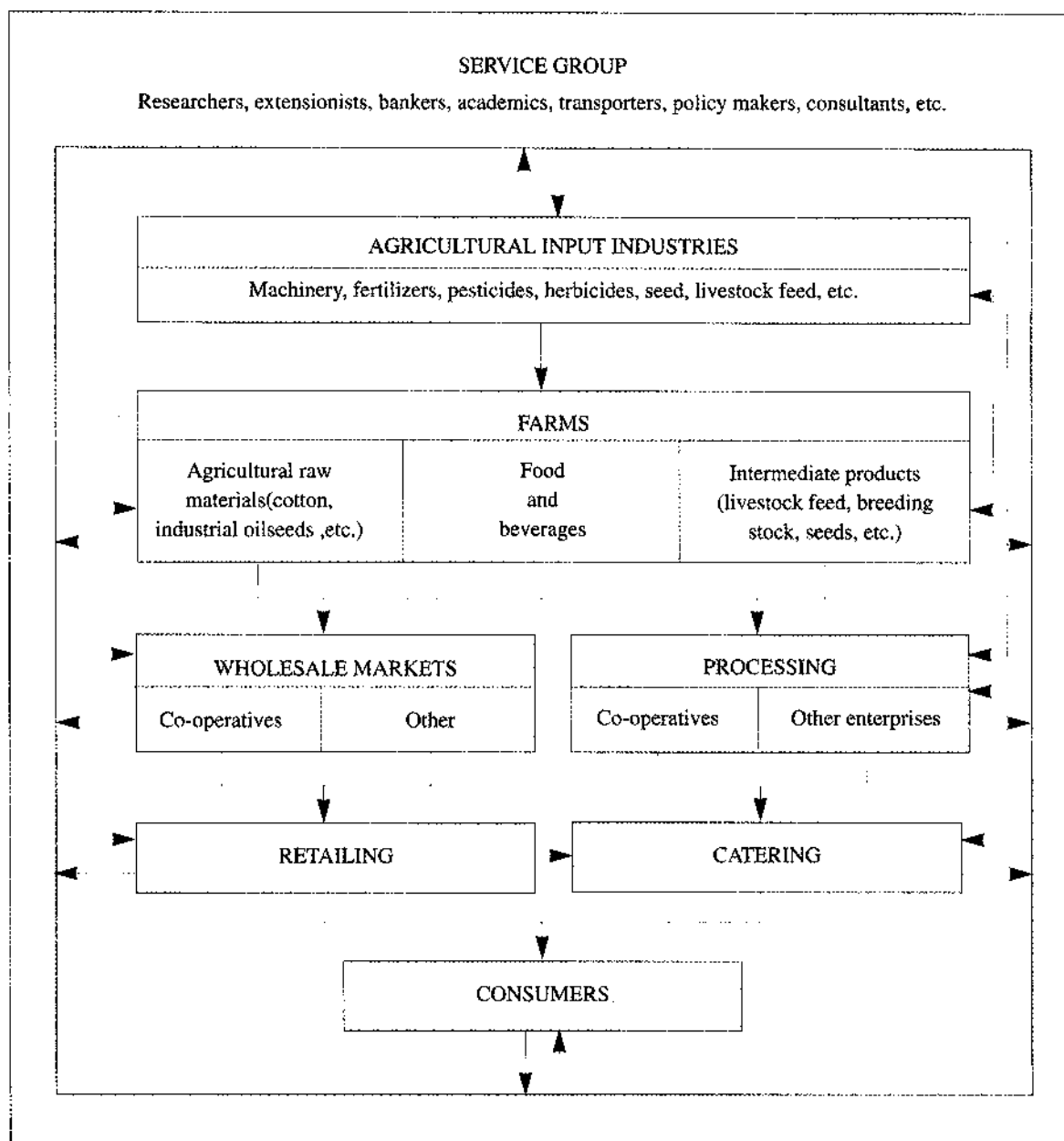


Figure 1. Market-oriented food chain

Role of governments

Although market orientation might be seen as a private sector concern, government action is crucial to facilitate the smooth operation of the driving forces of market orientation, such as trade policies, market reform, improvement of rural infrastructure and development of the legal and contractual environment within which farmers and other players in the food chain operate. Policies related to these factors will have a major impact on the nature and level of market orientation achieved. In short, the role of government should be that of facilitator or catalyst.

FARMER STRATEGIES FOR MARKET ORIENTATION IN ACP AGRICULTURE

Where possible, government involvement should be indirect, and should not compete with the private sector. Governments should have only legislative, monitoring and market-development orientation functions, and not play a supply-management role. To be effective, governments need to consider the following strategies:

- The decision for adopting a market-orientation philosophy should be taken at the political party level, before the party comes into government. The advantage of this is that all the tiers of government become committed to the policy and are ready to allocate the necessary resources.
- A simple administrative structure that allows a rapid flow of information will facilitate market orientation by enabling decisions to be made promptly and in line with the timeliness required in agricultural production. A one-ministry structure with few agencies is recommended. In a number of countries there are two or three ministries and a large number of agencies dealing with agricultural matters. In Nigeria, for example, agriculture comes within the remit of the Ministry of Agriculture and Natural Resources, the Ministry of Water Resources and Rural Development and the Department of Agro-Industries in the Ministry of Industries; there are also one or two agricultural agencies located in the Presidency.
- The increasing complexity of food production, as opposed to agricultural production, requires that ministers must understand the industry and its problems and have some commitment to the industry (possibly as investors). Such a minister will relate readily with the players in the food chain and challenge vested interests of the bureaucratic elites which would be counter productive. In too many countries, ministers responsible for agriculture have little knowledge of the sector or its needs.
- It is necessary to recognise marketing as a distinct and important function of agriculture. Kenya is one of the few countries in which there is a marketing department in the responsible ministry. Such a department would be the most appropriate agency for dealing with market information, development and monitoring, and would play an effective part in decisions on market orientation strategies.
- The commercialization of some government services would be required. A good example of this would be animal health services. In several ACP countries, the entire livestock herd is owned by nomadic pastoralists. Many animal health services, free until recently, are now no longer available because of declining resources. Pastoralists, however, appreciate good services and value for money, and are willing to pay for these services. Any government steps to encourage the commercialization of animal health services would revolutionize the livestock industry.

Several countries have World Bank facilities geared towards subsidizing farm infrastructural improvements. New agencies or parastatals are being established to deliver this service. Instead of taking this approach, however, existing private sector agencies already in the business should be engaged, whereby the farmer pays the subsidized price and the agency collects the difference between the commercial price and subsidized price from the supervising authority. When the subsidy is withdrawn (or the World Bank facility expires), the farmer will still be dealing with the agency, and it then becomes a matter of negotiating new terms of payment. This principle can be applied to other subsidy packages. Some civil servants have challenged this view, saying that private companies cannot be trusted. My answer is that many companies have a better reputation than some ACP governments when it comes to trustworthiness. And it is likely that farmers share this view.

Some people are extending the same principle to the delivery of agricultural credit and insurance. Given the dismal performance of government-owned agricultural banks and insurance companies, informed opinion favours phasing them out. Government incentives to farmers in the form of soft loans should be channelled through established commercial banks with track records and a good network of branches. This will cut down on the huge amount of money spent on servicing the lifestyles of the executives of government-owned agricultural banks and insurance companies and on building their expensive headquarters and offices. By

dealing with commercial banks, farmers will also be introduced to the banking culture. A final point here is that private commercial banks and insurance companies are easier to monitor and control.

- Governments should help establish market orientation facilitators, such as commodity exchange agencies and auction floors. This is particularly helpful with commodities that are produced by reasonably well-organized farmers and that attract strong buyers. Having achieved the objective of bringing buyers and sellers together, governments should withdraw into their regulatory and monitoring roles. The finance houses will find their way to the facilitators, to finance their operations.
- Governments should take advantage of the activities of major agro-processors to enhance market-oriented agriculture. Agro-processors play an important and special role in a number of ACP countries. To ensure the constant supply of high-quality raw materials, some of them maintain their own extension systems, and train and service the needs of their smallholder farmers in a commercial way. These farmers thus acquire a knowledge of banking culture and of value-added approaches. Governments should encourage such agro-processors by providing the enabling environment.
- Tertiary institutions for training extensionists, policy makers, planners, project managers and advisors should introduce the philosophy of market orientation into their curricula. At present, agricultural science and production dominate most agricultural curricula.

Establishing appropriate farmers' education programmes will help build market orientation knowledge at the rural level. Farmers need to be educated to take advantage of the opportunities for adding value to their products. Some training centres set up by agencies in ACP countries are now incorporating this information into their training. Such education programmes are likely to have a profound impact on farmers' attitudes, motivations and behaviour. They could be a useful way of dealing with sensitive issues, such as those relating to land ownership and use. Education in business skills and credit issues would help farmers determine the monetary value of their land and labour, which would facilitate decisions on these factors of production.

- Effective and regular communication between the government and all players in the agricultural industry should be maintained. This could be done through organizing an annual formal forum at which all the interest groups are represented. NGOs and similar bodies working with smallholder farmers should be encouraged to ensure that smallholders are represented at such meetings.

Role of farmers

The role of farmers in establishing a market-oriented culture depends to a large extent on the political context in which they operate. There must be political freedom as there is a direct relationship between human liberty and a free economy. To quote the renowned economist, Milton Friedman: "Historical evidence speaks with a single voice on the relationship between political freedom and free market. I know of no example in time or place of a society that has been marked by a large measure of political freedom and that has not also used something comparable to a free market to organize the bulk of economic activity." The converse is true – when economic freedom disappears, political freedom does so too.

Farmers should not see themselves in isolation, but as part of a team, and should facilitate communication:

- among themselves (for example, through meetings);
- between themselves and service institutions (such as extension services);
- between themselves and monitoring institutions (for example, institutions collecting farm information for political statistics or general advisory purposes).

FARMER STRATEGIES FOR MARKET ORIENTATION IN ACP AGRICULTURE

Horizontal and vertical integration should be encouraged, preferably through cooperatives. The cooperatives should, in turn, be encouraged to set up companies to engage in “downstream” and “upstream” activities. Literate farmers must take advantage of literature provided by their suppliers and other players.

Role of farming organizations

Farming organizations have a major role to play in the market orientation process. When operating on the basis of democratic principles, they will provide the “other” view to the government’s view. To do this effectively, they need to be self-supporting and have their own independent sources of information. They also require their own infrastructures, secretariat and support systems. The main hope for involving farming organizations in the decision-making process now lies in their involvement with NGOs, religious agencies and agro-processors. Farming organizations need to consider the following issues.

- They should focus on developing a good information collecting system which will bring together data relating to the entire agricultural industry. This will have to run alongside an effective communication system with the industry. The establishment of good information and communication systems will facilitate the production of such materials as newsletters, farming journals and videos.
- Farming organizations have a duty to bring issues into proper focus through advocacy. The advocacy will need to be directed at the public, with particular reference to politicians, political parties and the government. The organizations must interact with these groups, making them listen, educating them about agricultural concerns and justifying farmers’ expressed needs. Agricultural advocacy is particularly important in ACP countries if agriculture is to attract the attention it needs.
- Continuing education and training programmes initiated by farming organizations can play an important role by focusing on the real problems of business and organizational skills, marketing requirements, and so on. When such programmes are handled “in-house”, this enhances a wider customer-orientation concept, particularly when the lecturers themselves are also players in the agricultural industry. Farmers need to be educated in commercial marketing practices, the adaptation of existing technology for value added, and ways of getting into the mainstream of the national economy and world market, especially since most ACP countries are primary producers.

Message management

Three things need to be considered in the delivery of the market orientation message. The first is that it may be helpful to handle the concept itself as a marketable “product”. Market orientation is a very important philosophy, and any country wanting to make economic progress and participate in world trade has to embrace it. Its nature will have to be properly spelt out, as well as its benefits and costs and the ways in which the message should be spread.

Second, the strategies for implementing market orientation, while focusing on the farmer as the most important but weakest link, should also focus on all the other players in the food chain. The food chain is like a football team – hunger is the opposition, the farmer is either the centre-half marshalling the forces for an attack and passing the produce on to the processor and retailer, or s/he is the centre-forward delivering directly to the consumer. Many agricultural programmes pride themselves on being “farmer-focused” but this often means that they ignore the other players in the industry. This accounts for the failure of many of these programmes because the farmers are unable to carry on when the programmes are withdrawn.

Third, the implementation of market orientation strategies needs to be gradual. The biological nature of agricultural production means that farmers need a period of adjustment. The food chain is an integrated system,

and sufficient time is required to pass the message to the different players and for each of them to develop the capacity to play their particular roles.

Conclusion

In the changing terrain of the global economy, market orientation is now the way forward. For ACP countries, most of which are primary producers of agricultural products, the emphasis must be on agriculture. Strategies for promoting market orientation in ACP agriculture should focus on adequate information, communication, education and advocacy. Governments, farmers and farming organizations have complementary roles to play in implementing and sustaining these strategies. A government's role should be indirect and catalytic, while that of farmers and their organizations should be direct and active. The implementation of these strategies requires an environment of political freedom.

The emphasis in this paper has been on the importance of an integrated approach to the stimulation of market orientation in ACP agriculture. The strategies and the roles of the various players are aimed at influencing attitudes, motivations and behavioural patterns. In the long run, these changes will determine the level of market orientation in ACP agriculture. The primary objective of market orientation is to improve national economic performance. To quote from *The Competitive Advantage of Nations* by Michael Porter, in the 21st century "economic performance rather than military might well be the index of national strength".

PART 4

Working group reports

4.1

Working group report A

This report presents a summary of the discussions held and recommendations made by Working Group A during the seminar on “Farmer Strategies for Market Orientation in ACP Agriculture”. The working group met in three separate sessions, each of which addressed two themes. Through extensive discussion and debate, points of general (though not always unanimous) agreement were reached.

As a precursor to formal discussion of the session themes, time was spent on establishing a clear understanding among all working group members of the definition of “farmer strategies for market orientation”. This was precipitated by evidence of some confusion as to whether the phrase referred to strategies for orienting markets to fit the needs of small-scale farmers in ACP countries, or to strategies for helping ACP farmers cope with the realities of markets driven by competitive forces.

After lengthy discussion, the group agreed that the appropriate concept was the latter, and suggested that the following statements be adopted:

- market orientation refers to the degree to which decisions are based on market information;
- market orientation may be measured in terms of decision makers’
 - market knowledge
 - market skills
 - market attitudes and willingness to act;
- market participation represents the degree to which decisions are based on market forces.

Having agreed upon these concepts and definitions, the session themes were then discussed.

Session 1

The two themes addressed in this session were:

- building relationships in marketing channels – establishing “win-win” situations
- communication in marketing channels – market information acquisition, dissemination, use and value

Building relationships in marketing channels

Building effective relationships was acknowledged by all members of the group as critical to enhancing the degree to which decisions by small-scale farmers are based on market forces (that is, are market oriented). Indeed, it was stated that many relationships critical to improved market orientation among small-scale ACP farmers, such as those with “middlemen”, were characterized by distrust and suspicion. This distrust, however, often stemmed from a poor understanding of the economic role played by such intermediaries rather than from actual instances of exploitation.

FARMER STRATEGIES FOR MARKET ORIENTATION IN ACP AGRICULTURE

The group put forward five factors essential to building “win-win” relationships between participants in the various segments of the market:

- farmers need information to improve their understanding of how markets function;
- sustainable relationships between farmers and market operators should be encouraged;
- relationships should be developed where elements of risk are apparent;
- relationships should be nurtured in order to meet the challenges of market forces;
- relationships should build upon existing synergies.

Communication in marketing channels

The essential lubricant of markets, and hence of market-oriented strategies, is information. Free-market philosophies rest largely on the belief that markets are the most efficient mechanism for acquiring and synthesizing information on the preferences of buyers and sellers. Thus, the efficiency of markets and the benefits to market participants are directly proportionate to the amount and quality of information available.

The group considered that market information and communication were critical if market-oriented farmer strategies were to be successful. It stressed, however, that merely providing some types of market information was not sufficient to ensure the success of such strategies. The types of market information provided must meet the specific decision-making needs of small-scale farmers, and farmers also need to know how to evaluate available information. In this regard, two observations were made. First, the market information often made available to small-scale farmers does not meet their individual decision-making needs, nor is it timely enough to do so. Second, the mere provision of information neither ensures its use nor, if used, its effective use. Hence, not only do small farmers require relevant and timely market information, they also need to know how best to use it.

Following this discussion, the group made the following recommendations:

- market information is a critical element in market orientation and must be provided;
- farmer needs should be identified to ensure that the market information provided is relevant to their decision-making processes;
- improved and more rapid access to information is critical;
- farmers must be trained in the use of available market information to ensure that they make effective decisions.

Session 2

The two themes addressed in this session were:

- opportunities for adding value;
- the nature of competitiveness.

Both themes were considered critical to the successful development of market-oriented strategies and generated considerable discussion.

Opportunities for adding value

The discussion focused initially on establishing a clear definition of “value-added”. The primary concern related to potential confusion over the concept of high-value commodities (often assumed to be horticultural crops) as

opposed to the concept of adding value to a given product through the provision of additional services or improved product quality. After some discussion, the latter concept was agreed upon.

The process of adding value was considered to be product specific, occurring through such activities as improved packaging, improved product quality and the provision of alternative product forms. In this regard, and based on several case studies presented during the seminar, it was also determined that value-adding opportunities needed to be considered throughout the commodity chain (or *filière*). This was seen as a critical point because most examples of successful value-adding activities given in the seminar involved integrating traditional production activities forward in the overall market chain.

The group made the following recommendations for improving the ability of small-scale farmers to add value to their existing production activities:

- value-adding can be achieved only by responding to market needs;
- access to appropriate technology or equipment is necessary to enhance value-adding activities;
- infrastructure (such as transportation and communication) and a comprehensive legal framework are pre-requisites for developing value-adding activities;
- emphasis should be placed on developing and enhancing entrepreneurial skills.

The nature of competitiveness

The initial discussion focused on defining “competitiveness”, a term used frequently but seldom clearly defined. After considerable discussion, the group defined the term as “the ability of a firm to maintain a sustained and profitable presence in a given market at a given point of time”.

Though simple, this definition helps clarify the discussion of competitiveness in two ways. First, it emphasizes that competitiveness must operate within a clearly defined market or segment of the market chain. Second, it indicates that competitiveness is not a state of attainment, but rather a transient state that must be sustained through the realization of profits at least equal to the opportunity cost of production.

The group also distinguished between “true” and “false” competitiveness. True competitiveness occurs when a firm is competitive according to the above definition in the absence of government intervention. In contrast, a firm would be considered to be falsely competitive if it satisfied the above definition through government intervention. Such a distinction is especially important for assessing the competitiveness of small-scale farmers in ACP countries as government intervention in these countries is common. If effective market-orientated strategies are to be developed, they must be based on a clear understanding of “true” and “false” competitiveness.

After lengthy discussion, the group agreed on the following recommendations:

- unfair trade should be identified and redressed through
 - government initiatives and lobbying effort
 - creative marketing strategies;
- competitiveness should be enhanced through
 - improved price, quality and service
 - improved production and marketing efficiency;
- Competitiveness is best enhanced by encouraging operators throughout the commodity chain to address market forces.

Session 3

The two themes addressed in this session were:

- directions for research – the improvement of competitiveness and the creation of wealth;
- education and training needs of market-oriented farmers.

As these themes would provide the context within which the seminar recommendations would be formulated, the members of the group considered that the conclusions arising from the Session 3 discussions would be critical to the success of the seminar.

After a wide ranging discussion many recommendations were agreed upon and are listed below. One important element discussed by the group, however, related to an implicit overall theme and goal of the seminar – that of fostering the development process and improving the living standards of small-scale farmers in ACP countries. In this regard, it was considered that the end result of increased orientation should be not only to make subsistence farmers better subsistence farmers, but also to improve the ability of small-scale farmers to deal with the forces of competition and capitalize on the opportunities competitive markets offer.

Directions for research

The group's recommendations on future directions for research were:

- research should be holistic, and thus include all segments of the market chain;
- all market participants should participate in determining the research agenda and priorities;
- research needs must be more effectively advocated to policy makers;
- research priorities should focus on solving the immediate problems affecting the ability of small-scale farmers to meet the challenges of market forces;
- research should be more effectively transferred to participants in all segments of the market chain.

Education and training needs

The group identified three important needs: imparting knowledge; enhancing skills; and changing attitudes. It was agreed that all these needs must be addressed if effective farmer strategies are to be developed. While each is important, any one alone will not be sufficient to attain the desired results. Given this view, the group made the following recommendations:

- emphasis should be placed on changing attitudes and broadening perceptions of market opportunities;
- policy makers and planners should be sensitized to the role of governments in facilitating market orientation;
- the mere provision of market information is not sufficient; farmers need to be trained in how to use this information and analyse markets;
- service groups, especially extensionists, should be trained in the concepts of market orientation;
- all media forms should be used in a coherent manner to convey market information.

Rapport du groupe de travail A

Ci-après sont résumés les débats et les recommandations du Groupe de travail A du séminaire "Stratégies paysannes et adaptation aux marchés dans les pays ACP". Ce groupe a tenu trois sessions, articulées chacune autour de deux thèmes. Une réflexion et des discussions approfondies ont permis de dégager des points faisant l'objet d'un accord général, quoique pas toujours unanime.

Avant d'entrer dans le débat sur les thèmes des sessions, il s'est avéré nécessaire d'harmoniser la compréhension au sein du groupe de la notion de "stratégies paysannes et adaptation aux marchés". En effet, un doute existait quant à savoir si cette formulation se référait aux stratégies d'orientation des marchés en fonction des besoins des petits producteurs des pays ACP ou aux stratégies visant à permettre à ces agriculteurs de faire face aux réalités de marchés sous le jeu des forces de la concurrence. A l'issue d'un échange de vues prolongé, le groupe a retenu la seconde interprétation et a proposé les définitions suivantes :

- par adaptation aux marchés ou orientation commerciale, il faut entendre le degré de prise en compte des informations sur les marchés dans les décisions ;
- l'adaptation aux marchés ou orientation commerciale peut se mesurer par
 - la connaissance des marchés par les décideurs
 - leurs compétences commerciales
 - leurs comportements commerciaux et leur volonté d'action ;
- l'intégration aux marchés représente le degré de prise en compte des forces du marché dans les décisions.

S'étant accordés sur ces concepts et définitions, les participants ont engagé la discussion sur les différents thèmes.

Session 1

Les deux thèmes examinés au cours de la session 1 étaient les suivants :

- établissement de relations dans les circuits de commercialisation – création de situations aux bénéfices équitablement répartis;
- communication au sein des circuits de commercialisation – obtention, diffusion, utilisation et valeur des informations sur les marchés.

Etablissement de relations dans les circuits de commercialisation

Les membres du groupe se sont accordés à estimer que l'établissement de relations efficaces est un facteur influant de manière critique sur le degré de prise en compte des forces du marché par les petits producteurs (c'est-à-dire leur orientation commerciale). Il a été observé que, dans beaucoup de cas, les relations cruciales pour favoriser l'orientation commerciale des petits producteurs des pays ACP, telles les relations avec les "intermédiaires", sont marquées par la méfiance et la suspicion. Cependant, cette méfiance et cette suspicion dérivent souvent davantage d'une mauvaise compréhension du rôle économique joué par ces intermédiaires que de situations d'exploitation effective.

Le groupe a identifié cinq facteurs essentiels pour l'établissement de relations apportant des bénéfices équitablement répartis entre les intervenants des différents segments du marché :

- les producteurs doivent se procurer ou recevoir des informations leur permettant de mieux comprendre comment les marchés fonctionnent ;
- il faut veiller à ce que les relations entre les opérateurs officiels du marché et les petits producteurs aient un caractère durable ;
- il convient de développer les relations lorsque des éléments de risque sont apparents ;
- il convient d'entretenir les relations afin de faire face aux défis posés par les forces du marché ;
- les relations doivent s'appuyer sur les synergies existantes.

Communication au sein des circuits de commercialisation

Le principal lubrifiant pour les marchés, et donc pour les stratégies d'orientation commerciale, est l'information. De fait, les théories de l'économie libérale reposent toutes plus ou moins sur l'idée que le marché est le mécanisme le plus efficace pour obtenir et synthétiser des informations sur les préférences des acheteurs et des vendeurs de tout produit donné. Il en résulte que l'efficacité des marchés et les avantages que peuvent en tirer les opérateurs sont directement proportionnels à la quantité et à la qualité des informations disponibles.

Au cours de la discussion sur la communication au sein des circuits de commercialisation, les participants ont jugé que l'information sur les marchés et la communication sont des facteurs critiques pour le succès des stratégies d'orientation commerciale des producteurs. Ils ont toutefois souligné que la fourniture d'informations sur les marchés ne suffit pas en elle-même à assurer le succès de telles stratégies.

Ces informations doivent être de nature à répondre aux besoins spécifiques des petits producteurs pour prendre des décisions. Quant aux producteurs, ils doivent également être en mesure d'évaluer les informations disponibles.

A cet égard, deux observations ont été faites. Premièrement, les informations sur le marché fournies aux petits producteurs ne correspondent pas toujours à ce dont ils ont besoin pour prendre leurs décisions, et elles ne leur parviennent souvent pas en temps voulu.

Deuxièmement, le simple fait de fournir des informations ne garantit pas que celles-ci seront utilisées ou qu'elles le seront de façon efficace. Par conséquent, les petits producteurs ont non seulement besoin de recevoir des informations pertinentes et en temps opportun sur les marchés, mais il leur faut également savoir comment en faire un usage optimal.

A l'issue de cette discussion, les participants ont formulé plusieurs recommandations :

- l'information sur les marchés est un élément critique pour l'orientation commerciale et il est donc indispensable qu'elle soit fournie ;
- il importe d'identifier les besoins des producteurs pour assurer que l'information fournie sur les marchés soit de nature à faciliter leurs processus de prise de décisions ;
- il est crucial que l'accès à l'information soit amélioré et plus rapide ;
- il faut apprendre aux producteurs à se servir de l'information disponible sur les marchés de façon à optimiser leurs décisions.

Session 2

La session 2 a permis d'examiner les deux thèmes suivants :

- possibilités de valorisation ;
- nature de la compétitivité.

Ces deux thèmes, jugés critiques pour le succès des stratégies d'orientation commerciale, ont suscité des discussions approfondies.

Possibilités de valorisation

Le débat a porté en premier lieu sur la clarification de la notion de "valorisation". La préoccupation primordiale était de lever la confusion pouvant exister entre le concept de produits de forte valeur (comme c'est souvent le cas des cultures horticoles) et le fait d'ajouter de la valeur à un produit par la fourniture de services additionnels ou par l'amélioration de la qualité de ce produit. Après quelque discussion, cette dernière définition a été retenue.

Il a été noté que le processus de valorisation est spécifique à chaque produit et peut être réalisé par des activités telles que l'amélioration du conditionnement, l'amélioration de la qualité du produit ou la fourniture du produit sous une autre forme. A cet égard, et selon les enseignements tirés de plusieurs études de cas présentées pendant le séminaire, il a été estimé que les possibilités de valorisation doivent être envisagées à tous les stades de la filière. Il s'agit là d'un point crucial, comme le souligne le fait que la plupart des exemples de valorisation réussie exposés durant le séminaire impliquaient l'intégration d'activités de production traditionnelles avec des activités en aval de la filière de commercialisation. Le groupe a formulé les recommandations suivantes en vue d'améliorer les possibilités s'offrant aux petits producteurs de valoriser leurs activités de production existantes :

- la valorisation n'est possible que si elle répond à des besoins du marché ;
- l'accès à des technologies ou matériels appropriés est nécessaire au développement des activités de valorisation ;
- la mise en place d'infrastructures (par exemple, de transport et de communication) et l'existence d'un cadre légal approprié sont des conditions préalables au développement des activités de valorisation ;
- l'accent doit être mis sur le développement et l'amélioration des capacités d'entreprise.

Nature de la compétitivité

De même que pour le concept de valorisation, la discussion a tout d'abord porté sur la notion de "compétitivité", terme fréquemment employé mais rarement défini avec précision. A la suite d'un long échange de vues, le groupe a défini la compétitivité comme "la capacité pour une entreprise de maintenir une présence durable et profitable sur un marché donné et en un moment donné".

Quoique simple, cette définition a permis de clarifier le débat sur la compétitivité sous deux aspects. Premièrement, elle souligne que la compétitivité doit se situer au sein d'un marché ou d'un segment bien défini de la filière de commercialisation. Deuxièmement, elle indique que la compétitivité n'est pas un état à atteindre, mais plutôt une situation transitoire qui doit être maintenue par la réalisation de profits au moins égaux au coût d'opportunité de la production.

Les participants ont également établi une distinction entre compétitivité "réelle" et "fausse". Il existe une compétitivité réelle lorsqu'une entreprise est compétitive selon la définition ci-dessus, sans intervention ou

soutien de l'Etat. En revanche, une firme peut être considérée comme faussement compétitive si elle satisfait à la définition ci-dessus grâce à l'intervention ou au soutien de l'Etat. Cette distinction est particulièrement importante lorsqu'il s'agit d'évaluer la compétitivité des petits producteurs des pays ACP où l'intervention de l'Etat est chose courante. Pour pouvoir mettre en place des stratégies efficaces d'orientation commerciale, il est essentiel que celles-ci reposent sur une compréhension claire de la différence entre les deux situations. Après une discussion prolongée, le groupe a émis les recommandations ci-après :

- il convient d'identifier les pratiques de concurrence déloyale et d'y remédier par
 - des mesures de l'Etat et l'action de groupes de pression
 - des stratégies commerciales innovantes ;
- la compétitivité doit être développée par
 - l'amélioration des prix, de la qualité et des services
 - une plus grande efficacité de la production et de la commercialisation ;
- pour développer la compétitivité, il importe d'encourager les opérateurs à tous les stades de la filière à prendre en compte les forces du marché.

Session 3

Au cours de la session 3, la réflexion a porté sur les deux thèmes suivants :

- orientations pour la recherche – amélioration de la compétitivité et création de richesse ;
- besoins en éducation et formation pour des producteurs à orientation commerciale.

Etant donné que ces thèmes constituaient le cadre dont devaient émerger les recommandations finales du séminaire, les membres du groupe ont considéré que les conclusions des débats de la session 3 étaient d'une importance cruciale pour le succès du séminaire. Une discussion ouverte sur les différentes facettes de ces thèmes a donné lieu à la formulation de plusieurs recommandations qui sont reproduites ci-dessous. Il est à noter que l'un des éléments importants abordés par les participants concernait un fil de trame et objectif implicite du séminaire : à savoir, la stimulation du processus de développement et l'amélioration du niveau de vie des petits producteurs des pays ACP. A cet égard, il a été estimé que le résultat final d'une orientation commerciale accrue devait être non seulement de faire des petits producteurs de meilleurs agriculteurs de subsistance, mais aussi d'améliorer leur capacité à affronter les forces de la concurrence et à tirer profit des opportunités offertes par des marchés concurrentiels.

Orientations pour la recherche

Le groupe a formulé les recommandations suivantes concernant les orientations futures de la recherche :

- la recherche doit être holistique et, par conséquent, inclure tous les stades de la filière de commercialisation ;
- tous les intervenants du marché doivent être associés à la définition des programmes et priorités de recherche ;
- les besoins de la recherche doivent être plus efficacement portés à l'attention des décideurs ;
- les priorités retenues pour la recherche doivent viser à résoudre les problèmes immédiats affectant la capacité des petits producteurs à faire face aux défis posés par les forces du marché ;
- le transfert des résultats de la recherche doit se faire de façon plus effective en direction des intervenants de tous les stades de la filière de commercialisation.

Besoins en éducation et formation

Le groupe a identifié trois besoins importants : diffusion des connaissances ; amélioration des savoir-faire ; et changement des comportements. Il a été reconnu qu'il est indispensable de répondre à l'ensemble de ces besoins pour pouvoir mettre en place des stratégies paysannes efficaces. Si chaque élément a son importance, aucun n'est en lui-même suffisant pour atteindre les résultats désirés. Dans cette optique, le groupe a énoncé les recommandations suivantes :

- il convient de favoriser le changement des comportements et une meilleure perception des opportunités du marché ;
- il importe de sensibiliser les décideurs et les planificateurs au rôle devant être joué par l'Etat pour faciliter l'orientation commerciale ;
- il ne suffit pas de fournir des informations sur les marchés ; il faut apprendre aux producteurs à se servir de ces informations et à analyser les marchés ;
- les groupes à vocation de service, à savoir en particulier les agents de vulgarisation, doivent être formés aux concepts de l'orientation commerciale ;
- il convient d'utiliser les différents types de médias de façon cohérente pour diffuser l'information sur les marchés.

4.2

Working group report B

Relationships in the food chain

Guiding principles

The guiding principles for establishing effective relationships in the food chain are:

- to encourage consultation between players operating at the same level of the food chain;
- to promote consultation between players at different levels of the food chain.

Contracts formalizing the links between producers, traders and processors should facilitate efforts to find joint solutions to the problems facing players in the food chain, so that each category derives benefits from the chain without hindering the others.

It is essential, therefore, to determine clearly the role of individual operators. The government has to be involved in promoting dialogue between the various groups, and in fostering negotiations and the exchange of information on issues such as prices, product quality and quality management. In other words, its mandate is not only to set prices but also to strengthen relationships between operators (for example, by providing the infrastructure and setting up adequate credit facilities). In short, it is necessary to do away with support policies and to liberalize the economy.

Priorities

- To act on the basis of solid transactions at the grass-roots level. Marketing is not limited to sales. It is necessary to consider all stages, from production to marketing.
- To link players operating at the same level. Operators at a given level should consult regularly to act in their best interests.
- To link players operating at different levels. The aim is to prevent conflicts arising because of a lack of information from specific groups of operators.
- To deter producers from fulfilling inappropriate functions. Producers should not involve themselves in marketing, as this will dilute their efforts and the outcome will be uncertain. Each category has to assume its own, clearly defined role.
- To base commitment on the recognition of a common interest. The commitment of the various groups of players cannot be sustained unless it is built upon recognition of a shared interest.
- To establish socio-professional organizations at both the regional and national levels. Socio-professional organizations must be established at regional and national levels in order to ensure that the decision-making process is based on the interest of the players. Inter-professional organizations are required for the same purpose.

Communication within the food chain

The economic information to be disseminated to players in the food chain must provide structural information on the organization and operation of the chain, as well as information on the overall economic situation.

Structural information

This information aims at providing producers with some knowledge of their environment. In other words, it should give them insight into the strengths, weaknesses, opportunities and threats of that environment. This information can also be used during training sessions, such as those organised for producers' representatives, to illustrate the functioning of economic mechanisms in agricultural markets.

Economic information

This includes information on: prices; sources of supply; quantities required, and their timing; and quality criteria to be met for high market value. This information must be made available to the players concerned, particularly to producers as they are generally the least well informed about the market situation. Producers can use this information to gear their cropping season to market needs, to increase their bargaining power in local transactions and to identify new commercial opportunities outside the market. Data collection must cover all these aspects. To achieve this, it is necessary to define and classify agricultural markets. The data collected must be accessible to all players. The collection method should be developed by researchers and developers.

Opportunities for creating added value

The group looked at the following questions: How can "added value" be defined? How can added value be increased? Where are opportunities for higher added value to be found? How can they be tapped? Added value was defined as the difference between the production value and the value set by intermediaries in the food chain.

Production targets

It was considered that the production targets should be:

- To produce products of higher quality. This could be achieved by:
 - using the relevant technological packages (such as new varieties, pesticides, and improved cultural practices) generated by research and tested on farms;
 - improving crop management practices, such as timely harvesting;
 - packaging products to maintain their quality.
- To choose the optimal marketing period to fit the production cycle into the commercial cycle. To this end, late and early varieties are recommended.
- To preserve and store products in order to delay sales when the market is saturated.
- To manage natural resources better to reduce intermediate losses. This can be illustrated by two examples:
 - the use of legume-based improved fallow systems resulting in lower fertilizer requirements;
 - crop rotation.
- To cut production costs while preserving quality. Farmers have to consider the cost:quality ratio in making decisions.

Processing targets

To achieve processing targets efficiently and effectively, it is necessary:

- To make an inventory of available knowledge and assess it, with the involvement of the producers, in order to improve processing activities;
- To improve processing methods to meet consumers' needs.

Distribution targets

Added value can be increased by targeting the following areas:

- The distribution network has to be improved to provide consumers with the products they need, in order to reduce marketing costs and post-harvest losses;
- Producers' associations must be encouraged to allow producers to take advantage of every market opportunity for maximum profit and to protect their interests through providing relevant information;
- Preparation and observance of contracts between producers and intermediaries should make provision for the recognition of the quality of products.

Quality management has to be an ongoing concern for the operators involved. All contracts must include this vital point to enhance production.

The nature of competitiveness

Before dealing with this issue, the group noted that added value and competitiveness are intertwined. Value is added to products to make them more competitive.

Competitiveness can be seen from two perspectives:

- From the producer's perspective. To be more competitive, the producer has to:
 - produce the best quality at a low cost;
 - provide a strategic response (that is, to learn to anticipate national and international market upheavals).
- From the perspective of the food chain. Competitiveness is closely linked to the institutional environment, and therefore:
 - research institutions must be constantly guided by market trends and should adjust their research efforts based on the information they receive;
 - the main task of extension services is to make knowledge and research-generated technologies available to the various players; failure to do so will slow innovation and hinder the general performance of the chain;
 - socio-professional organizations have to be established and properly informed in order to become fully autonomous;
 - information systems and economic monitoring groups are indispensable decision tools. Systems providing market information give useful indications on such items as prices and quantities sold. Monitoring groups provide fora in which experiences can be exchanged and problems analysed by the operators' representatives with the aim of reaching relevant and timely decisions by consensus.
 - consultative bodies have to be encouraged as they contribute to the adoption of joint actions aimed at strengthening the operational capacity of the chain.

Educational and training needs of market-oriented farmers

Without a good understanding of the structure and mode of operation of the chain, it is impossible to develop a consistent strategy aimed at maximizing income while taking the consumer into account.

Various types of training can be targeted. These include:

- adaptive technical training;
- training in farm management
- training in marketing and sales;
- training in organizational management;
- training in functional literacy.

As a complement to agricultural programmes in the media, other possibilities for providing education and training include:

- decentralized rural radio;
- demonstration plots;
- audio-visual aids;
- training workshops;
- visits to research centres.

However, it must be emphasized that, to be effective and efficient, training must be based on a fully participatory approach. In other words, training must take into account farmers' knowledge.

Research directions: Improving competitiveness and generating wealth

In addressing this issue, the group raised a number of questions. What are the different types of research? What types of research should be pursued to make products more competitive? What type of funding can ensure sustainable, efficient and effective research?

Applied research

Market-oriented research is necessarily synonymous with multidisciplinary research. Problems have to be tackled in a concerted, integrated manner by several specialists in order to increase the chances of finding the appropriate solutions. Therefore, the way this research is carried out is important. Relevant types of research include:

- Research at experimental stations, where researchers conduct trials using experimental designs (for example, on varieties, yield, and pest resistance);
- On-farm (or development) research, where a participatory approach is used, involving all players, from the grass-roots level producer to the retailer and consumer.

Both types of research can be regarded as applied research, resulting in added value and increased competitiveness, provided they are closely related to the problems facing the operators in the chain. More specifically, development research consists of the identification, design, implementation, analysis and evaluation of applied technologies. Thus, it brings together several main actors – the researcher, the extensionist, the producer, the processor, the retailer and the consumer.

Some types of research also focus on production systems. Socio-economic and marketing approaches should help in better defining technical subjects and their content, and in setting priorities.

Basic research

This type research is expensive and is not necessarily market oriented. It helps improve scientific knowledge and usually requires more time than applied research. However, it complements applied research and therefore should not be rejected.

Financing

Market-oriented research cannot be financed if public authorities lack the political will to provide substantial funds. Profits generated later on by the added value of products and enhanced competitiveness should result in people making direct or indirect use of this research and also contributing to its funding. External funding should be sought only as an extra contribution.

Rapport du groupe de travail B

Relations dans les filières

Principes de base

Les principes de base sont:

- favoriser la concertation entre opérateurs de chaque maillon de la filière ;
- promouvoir la concertation entre opérateurs de maillons différents.

La contractualisation des rapports entre producteurs-commerçants-transformateurs devrait favoriser l'apparition de professions horizontales et permettre la prise en charge concertée des problèmes des filières. Chaque catégorie trouverait ainsi ses intérêts au niveau des filières, sans gêner les autres. Il est donc essentiel de reconnaître les missions assumées par chaque opérateur. A notre avis, l'Etat doit jouer un rôle pour stimuler la concertation professionnelle, ouvrir des espaces de négociation (sur la question des prix, de la qualité des produits, des procédures de contrôle de la qualité). Autrement dit, sa mission n'est pas de fixer les prix mais de faciliter les relations entre les opérateurs (mise en place d'infrastructures et de crédit adapté...). En clair, il faut éliminer toute politique administrée et mettre l'accent sur la libéralisation de l'économie.

Points principaux

- Commencer à partir de transactions concrètes (à la base). La commercialisation ne se limite pas uniquement à la vente. Il faut considérer tous les stades, de la production à la mise sur le marché.

- Alliance entre les opérateurs d'un maillon donné. Les opérateurs d'un maillon déterminé doivent régulièrement se concerter pour agir dans le sens bien compris de leurs intérêts.
- Alliances entre les opérateurs de différents maillons. Le but visé est d'éviter les conflits liés à un manque d'information de la part des différentes catégories.
- Dissuader les producteurs de s'engager dans de nouvelles fonctions. Les producteurs doivent éviter de se lancer dans la commercialisation sous peine de disperser leurs efforts. Par ailleurs, ils n'ont pas la certitude de réussir. Chaque catégorie doit assumer ses propres fonctions.
- Engagement basé sur la reconnaissance de l'intérêt commun. Pour être durable, l'engagement des différentes catégories d'agents doit reposer sur la prise en compte de leurs intérêts respectifs.
- Etablissement d'organisations socio-professionnelles à l'échelle nationale. Il convient d'avoir des organisations socio-professionnelles aussi bien au niveau régional qu'au niveau national pour que les décisions prises intègrent au mieux les préoccupations des acteurs. Il doit en être de même pour les organisations inter-professionnelles.

La communication au sein des filières commerciales

La diffusion des informations économiques doit comporter deux volets : l'information structurelle sur l'organisation et le fonctionnement de la filière et l'information conjoncturelle.

L'information structurelle

Il s'agit de donner aux producteurs une connaissance de l'environnement dans lequel ils évoluent. Autrement dit, il convient dans ce cadre d'éclairer suffisamment les acteurs de la filière sur les forces, les faiblesses, les opportunités et les menaces de l'environnement. Cette information peut servir d'illustration pour des formations sur les mécanismes économiques des marchés agricoles.

L'information conjoncturelle

Elle doit porter sur : les prix ; les sources d'approvisionnement ; les quantités débarquées et la période ; et les critères de qualité à remplir pour garantir une bonne valeur marchande. Cette gamme d'informations doit concerner tous les acteurs et plus particulièrement les producteurs car ceux-ci sont généralement les agents les moins informés sur la physionomie des marchés. En ce qui concerne les producteurs, ils peuvent, grâce à ces informations : mieux caler leur calendrier cultural par rapport aux besoins du marché ; améliorer leur pouvoir de négociation dans le cadre des transactions locales ; et identifier de nouvelles opportunités commerciales à l'extérieur. La collecte doit couvrir au mieux les différentes situations. Pour ce faire, elle doit reposer sur une bonne typologie des marchés agricoles. En outre, les données collectées doivent être sous une forme accessible à tous les acteurs. La méthodologie de collecte doit être élaborée par les chercheurs et les développeurs. Cette responsabilité doit être confiée aux organisations socio-professionnelles, pour autant qu'elles puissent l'assumer.

Opportunités de création d'une valeur ajoutée

Le groupe s'est penché sur un certain nombre de questions. Comment définir "valeur ajoutée" ? Comment faire pour augmenter cette valeur ajoutée ? Où se trouvent ces opportunités ? Comment les saisir ? La valeur ajoutée a été définie comme étant la différence entre la valeur de la production et les consommations intermédiaires.

Interventions au niveau de la production

- Obtention de produits de meilleure qualité. Cela est possible
 - en utilisant des bons paquets technologiques (semences améliorées, produits phytosanitaires, itinéraire technique) mis au point par la recherche et testés en milieu réel ;
 - en améliorant la gestion de la production (respect de la date de récolte...) ;
 - en assurant un meilleur conditionnement du produit pour préserver le niveau de qualité.
- Choix de la période optimale de mise sur le marché dans le but d'assurer une modulation entre rythme de production et rythme de commercialisation. Il convient, pour ce faire, d'utiliser des variétés hâtives et tardives.
- Conservation et stockage des produits afin de différer l'offre lorsque le marché est à saturation.
- Meilleure gestion des ressources naturelles pour réduire les consommations intermédiaires. Deux exemples illustrent ce point :
 - les systèmes de jachère améliorée à base de légumineuses qui permettent une réduction de l'utilisation des engrais ;
 - la rotation des cultures.
- Réduction des coûts de production tout en préservant la qualité. Le rapport coût/qualité doit être présent au niveau de toutes les décisions prises par l'exploitant agricole.

Interventions au niveau de la transformation

Pour agir avec efficacité et efficience, il y a lieu :

- d'une part, de faire un inventaire et une évaluation du savoir-faire existant, puis d'améliorer le processus avec la participation des producteurs ;
- d'autre part, d'améliorer les méthodes de transformation afin de répondre aux besoins des consommateurs.

Interventions au niveau de la distribution

Trois actions méritent d'être ciblées pour augmenter la valeur ajoutée :

- amélioration du réseau de distribution pour permettre aux consommateurs d'avoir les produits dont ils ont besoin, réduire les coûts de commercialisation et les pertes post-récolte ;
- meilleure organisation des producteurs pour que ceux-ci tirent le meilleur profit des opportunités du marché et défendent leurs intérêts grâce à de bonnes informations, disponibles à leur niveau ;
- établissement et respect des contrats entre les producteurs et les intermédiaires permettant une reconnaissance de la qualité des produits.

La gestion de la qualité doit être une préoccupation constante des différents acteurs. Tout contrat doit faire mention de ce point capital pour une bonne valorisation de la production.

La nature de la compétitivité

Avant d'examiner la nature de la compétitivité, le groupe a fait remarquer que la valeur ajoutée et la compétitivité étaient liées. On apporte une valeur ajoutée pour être compétitif.

La nature de la compétitivité est vue sous deux angles :

- Au niveau du producteur, pour être compétitif, il faut :
 - produire une meilleure qualité à moindre coût ;
 - assurer une réactivité stratégique, c'est-à-dire savoir anticiper les turbulences des marchés nationaux et internationaux.
- Au niveau de la filière, la compétitivité passe par une amélioration de l'environnement institutionnel :
 - les instituts de recherche doivent être constamment à l'écoute des marchés et élaborer leurs champs d'investigation à partir des messages reçus ;
 - les services de vulgarisation ont pour mission essentielle de mettre à la disposition des différents acteurs les connaissances et les technologies générées par la recherche, faute de quoi, il sera difficile d'innover dans le sens d'une amélioration des performances de la filière ;
 - des organisations socio-professionnelles doivent être constituées et informées pour se prendre réellement en charge ;
 - les systèmes d'information et les observatoires économiques sont des outils de décision indispensables pour agir en toute connaissance de cause. Il faut faire remarquer que les systèmes d'informations sur les marchés donnent des indications utiles tels que les prix, les quantités commercialisées. Par contre, les observatoires économiques sont des cadres d'échange et d'analyse des problèmes d'une filière par les représentants des divers intervenants afin que de bonnes décisions soient prises en temps réel par consensus ;
 - la promotion des cadres de concertation doit avoir lieu car ces cadres d'échange permettent de mener des actions concertées pour renforcer la capacité opérationnelle de la filière à mieux jouer son rôle.

Besoins en éducation et en formation des agriculteurs orientés vers le marché

Sans une bonne connaissance de la structure et du fonctionnement des filières, il est impossible d'élaborer une stratégie conséquente permettant de maximiser les revenus tout en tenant compte du consommateur final.

Divers types de formation peuvent être ciblés :

- formation technique adaptée ;
- formation en organisation ;
- formation en marketing et commercialisation ;
- formation en gestion ;
- formation en alphabétisation fonctionnelle.

En complément des émissions agricoles à la radio, à la télévision et parfois dans la presse écrite. On peut éventuellement considérer, entre autres :

- la radio rurale décentralisée ;
- les parcelles de démonstration ;
- les supports audio-visuels ;
- les ateliers de formation ;
- les visites de centres de recherche.

Mais il convient d'insister sur le fait que seule une approche participative permet d'avoir un système de formation efficace et efficient. Autrement dit, toute formation doit aussi tenir compte du savoir faire paysan.

Direction de la recherche : L'amélioration de la compétitivité et la création des richesses

En abordant le premier thème, le groupe s'est posé une série de questions. Quels sont les différents types de recherche ? Quelle recherche privilégiée pour une plus grande compétitivité des produits ? Quel type de financement pour une recherche durable, efficace et efficiente ?

Recherche appliquée

Des recherches orientées vers le marché sont nécessairement des recherches pluridisciplinaires. Les problèmes doivent être abordés de façon concertée par plusieurs spécialistes pour avoir des chances de trouver des solutions adéquates. Ensuite, les modalités d'exécution de cette recherche paraissent importantes. Les distinctions suivantes ont été faites :

- Recherche en station : le chercheur cherche à tester sur un dispositif expérimental, par exemple les variétés, les rendements, la résistance à tel ou tel déprédateur, etc.
- Recherche en milieu réel : elle doit être une recherche participative associant le producteur à la base jusqu'au consommateur et le transporteur (aspect conditionnement). C'est ce qu'on appelle la recherche-développement.

Ces deux types de recherche peuvent être considérés comme des recherches appliquées qui apportent une valeur ajoutée et une meilleure compétitivité si leurs problématiques sont en relation avec les préoccupations des opérateurs de la filière. Plus particulièrement la recherche-développement passe par les phases suivantes : identification, conception, exécution, analyse et évaluation des technologies appliquées. Par conséquent, elle associe plusieurs acteurs principaux, à savoir le chercheur, le vulgarisateur, le producteur, le transformateur, le transporteur et le consommateur.

Par ailleurs, on relève les recherches sur le système de production. La socio-économie et le marketing doivent permettre de mieux définir les thèmes techniques et leur contenu et indiquer aussi les priorités.

Recherche fondamentale

Ces recherches coûtent cher et ne sont pas nécessairement orientées vers le marché. Elles permettent d'améliorer les connaissances scientifiques et prennent généralement plus de temps que les recherches appliquées. Cela ne doit pas nous conduire à rejeter les recherches fondamentales car celles-ci complètent la recherche appliquée.

Financement

Enfin, pour le financement de cette recherche orientée vers le marché, il faut que les pouvoirs publics marquent une volonté politique en contribuant substantiellement à son financement. Plus tard, avec les gains dégagés par la valeur ajoutée du produit et grâce à une meilleure compétitivité, les utilisateurs directs et indirects de ces recherches devraient également prendre part au financement. Le financement extérieur ne peut et ne doit venir qu'en appoint.

4.3

Working group report C

The discussions held by Working Group C during the seminar on “Farmer Strategies for Market Orientation in ACP Agriculture” focused on three sets of themes:

- Opportunities for adding value
The nature of competitiveness
- Building relationships in marketing channels – establishing a “win-win” situation
Communication in marketing channels – market information acquisition, dissemination, use and value
- Directions for research – the improvement of competitiveness and the creation of wealth
Education and training needs of market-oriented farmers.

Opportunities for adding value and the nature of competitiveness

The main points arising from the group’s discussion of these themes were:

- The concept of “tiers of opportunity” discussed during the seminar (*see* Paper 2.4) would help farmers recognise existing opportunities and create new ones. Indeed, as the case studies showed, many opportunities now exist which could be exploited with minimal additional effort by farmers. There needs to be greater awareness of such opportunities.
- In the context of trade liberalization, production and productivity are crucial issues because they relate to competitiveness. For certain commodities, small countries may simply not be able to produce enough to be competitive in the global environment. In other cases, productivity will have to improve before “marketable yield” becomes relevant. For certain products, the critical variables that will increase competitiveness relate to marketing, and improvements will be needed in that area. Some sort of categorization along these lines will help countries decide where the emphasis should be at a particular time.
- Farmers need to recognise the importance of being market-led in determining the focus of their enterprises. For change to occur, however, they must have confidence in the stability of the market and should not have to face major changes in skills, resources or the institutional environment supporting the farm sector. Opportunities for adding value exist on the farm through the integration of different enterprises. Farmers should take this into account when deciding on such factors as type of enterprise and timing of operations.
- Comparative advantage is an important element underlying competitiveness. It should not be defined only in terms of natural resources or physical infrastructure, but should also include “people factors” – the skills, abilities and attitudes of farmers and other players in the production/marketing chain. Comparative advantage should also influence decisions on the need to promote food exports in relation to the need to ensure internal food security. Examples where countries might prove competitive are the niche markets and the tourist industry where product image is the key selling point.

- It is important to recognise that specialized professional skills are required to create a favourable product image and promote the product. Countries with little experience in international marketing will need to pay special attention to developing such skills and making others in the marketing chain aware of what is involved.

Building relationships and promoting communication in marketing channels

In the group's discussion of these themes four main issues emerged:

- It is important at the outset to understand thoroughly what currently exists – that is, to understand the traditional systems regarding marketing channels and the communication flows between players in those systems. Improvements may involve simply building on existing systems to meet certain needs. In any case, an understanding of the dynamics of existing systems will help in developing new systems that are workable and would be accepted by the key players.
- It should be recognised that farmers are heterogeneous in terms of, for example, the size of their operations, their access to resources and the nature of their enterprises. Thus, information needs and channels used vary according to the type of farmer. At one end of the continuum a farmer with large-scale investments in perishable, high-value export crops may use fax transmissions and e-mail, while at the other end indigenous communication networks may be the only way to get messages through. Special consideration should be given to small-scale farmers as they constitute a significant percentage of the population in many tropical countries.
- Almost everyone in the agricultural sector will be affected by the globalization of trade, including those who are involved only in the domestic market. Thus, an information system with a wide reach, such as the extension service, will need to be used in conjunction with the mass media and other specialized agencies. Extension systems, however, will have to be re-oriented and adequately backstopped to deal with these new priorities.
- To develop “win-win” relationships, each player needs to understand the role of others in the marketing chain. The popular perception of middlemen is that they exploit farmers, but these intermediaries often have to bear risks that farmers may not have considered at all. So frank discussion is needed and negotiation should aim at finding common ground. Information systems which promote transparency among players will help foster “win-win” relationships.

Directions for research

The discussion on this topic focused first on some key issues that needed to be addressed and then on the types of research that should be conducted.

Research issues

- Research is expected to help create more market-oriented systems and therefore it, too, has to be demand driven. It should take account of farmers' needs, interests and abilities, and other players upstream and downstream from production should also be allowed to contribute to decision making on the directions research should follow.

- With the drying up of funds from external donors, governments will have to bear the brunt in meeting the shortfall. Although initially much of the funding will have to come from central sources, governments can consider also imposing small levies on agricultural exports and tariffs on imports competing with locally produced commodities. Money generated in this way, however, must be ploughed back into research if this funding mechanism is to work successfully. Although governments will be expected to be the main source of funds, not all research needs to be conducted by government agencies; some could be contracted out where skills in these agencies are lacking.

Although, for many countries, there will be few successful models involving the private sector and NGOs in research, this funding mechanism should nevertheless continue to be explored. Financial sustainability should be a key issue in the choice of funding mechanisms.

- Given the constraints imposed by diminishing resources, the setting of research priorities based on well-defined criteria will be critical. High priority should be given to:
 - research that requires the least effort (resources, etc.) but could have a high impact (for example, only adaptive research may be required);
 - research that is likely to produce acceptable results in the near future instead of research that will take several years to complete.
- Within the research framework outlined above (that the research should involve all players, should be problem focused and should proceed with some urgency), research should be multidisciplinary and participatory where appropriate.

Types of research

- Research is needed to develop technological packages that will produce high marketable yields at low cost (for example, new varieties or breeds, new cultural and management practices, and new post-harvest practices). The technologies, however, should be compatible with sustainable agriculture.
- Research should be conducted on the nature of markets, focusing on such issues as size of markets, prices, and quality requirements.
- Research is needed to help identify and create value-added opportunities at the farm level. This usually implies technologies for small-scale processing but should also include investigating other opportunities, such as the best ways to integrate enterprises.

Education and training needs

Three main issues emerged from the group's discussion on the education and training needs of market-oriented farmers:

- The first task of education and training is to motivate farmers to become market oriented through success stories about others like themselves. The mass media (primarily radio and newspapers) can reach a large audience with such information, but activities which provide opportunities for farmer-to-farmer interaction will be the most useful.
- Education and training could span a wide range of topics. For many farmers, training will focus on the traditional topics related to production and productivity, but with the emphasis on marketable yield. In some cases, a fresh approach will be needed so that other options can be explored. Cooperatives have long been promoted as the ideal mechanism to bring small farmers together for sourcing cheaper inputs, but in general

they have enjoyed limited success; perhaps it is now time to consider more flexible but disciplined forms of cooperation. With the thrust towards market orientation, emphasis will have to shift to new areas, such as value-added activities on the farm (for example, processing) and farm and home management issues.

Different methods and media will need to be used but, in general, a combination will be best. The choice of methods and media should be based on cost, reach and available resources. Radio has the greatest reach at the lowest cost. Using group discussions on radio programmes can help to change attitudes and practices. Radio cannot really teach in an intensive way, however, and interpersonal methods will have to be used, particularly where the information is confidential. Nevertheless, radio can create a demand-oriented situation whereby people seek out those who are giving or need training. Information packages, simply written and well illustrated, are also useful.

Rapport du groupe de travail C

Les débats du groupe de travail C du séminaire “Stratégies paysannes et adaptation aux marchés dans les pays ACP” ont été articulés autour de trois thématiques :

- possibilités de valorisation
nature de la compétitivité
- établissement de relations dans les circuits de commercialisation – création de situations aux bénéfices équitabement répartis
communication au sein des circuits de commercialisation – obtention, diffusion, utilisation et valeur des informations sur les marchés
- orientations pour la recherche – amélioration de la compétitivité et création de richesse
besoins en éducation et formation pour des producteurs à orientation commerciale.

Possibilités de valorisation et nature de la compétitivité

Ci-après sont résumés les principaux points qui ont émergé de la discussion sur ces thèmes :

- Le concept de “niveaux d’opportunité” exposé dans la communication de G. Jackson pourrait aider les producteurs à identifier les opportunités existantes et à en créer de nouvelles. Comme le montrent les études de cas présentées, il existe à l’heure actuelle de nombreuses possibilités de valorisation que les producteurs pourraient exploiter avec un minimum d’effort supplémentaire. Il convient de prêter davantage d’attention à ces opportunités.
- Dans le contexte de la libéralisation des échanges, la production et la productivité revêtent une importance cruciale car elles sont au cœur de la compétitivité. De petits pays risquent fort de ne pas être en mesure de produire suffisamment de certains produits pour être compétitifs dans un environnement global. Dans d’autres

cas, il faudra améliorer la productivité pour pouvoir parvenir à un “rendement commercialisable”. Pour certains produits, les variables cruciales de l’accroissement de la compétitivité concerneront la commercialisation, et c’est dans ce domaine qu’il faudra apporter des améliorations. Le recours à ce type de catégories d’analyse devrait aider les pays à décider des domaines devant recevoir davantage d’attention à un moment donné.

- Les producteurs doivent reconnaître la nécessité de prendre en considération les forces du marché pour déterminer les axes de leurs activités et de leurs pratiques agricoles. Cependant, pour qu’une évolution dans ce sens puisse intervenir, il faut que les producteurs aient confiance dans la stabilité du marché et qu’ils ne se trouvent pas confrontés à des changements majeurs dans les savoir-faire et les ressources, ou dans l’environnement institutionnel appuyant le secteur agricole.

Il existe des possibilités de valorisation au niveau des exploitations par l’intégration de différentes activités. Les producteurs doivent en tenir compte dans leurs décisions sur des facteurs tels que les types d’activités à entreprendre et le calendrier des opérations.

- Les avantages comparatifs sont un élément fondamental de la compétitivité. Ils ne se définissent pas uniquement en termes de ressources naturelles ou même d’infrastructures physiques, mais incluent aussi les “facteurs humains” – savoir-faire, aptitudes et comportements des producteurs ainsi que des autres acteurs de la filière de production/commercialisation. Les avantages comparatifs doivent également influencer sur les décisions concernant le poids relatif à accorder à la promotion des exportations de produits alimentaires et à la sécurité alimentaire interne. Des exemples de domaines de compétitivité potentiels pour un pays sont les créneaux commerciaux et l’industrie du tourisme, où l’image du produit est la clé pour vendre.
- Des talents professionnels spécialisés sont nécessaires pour créer une image favorable d’un produit et promouvoir celui-ci. Les pays dépourvus d’expérience de la commercialisation sur les marchés internationaux doivent prêter une attention particulière au développement de ces compétences et faire prendre conscience de leur importance aux différents acteurs de la filière de commercialisation.

Etablissement de relations et promotion de la communication au sein des circuits de commercialisation

Quatre points essentiels se sont dégagés de la discussion sur ces thèmes :

- Il importe d’acquérir dès le départ une connaissance précise de la situation existante – c’est-à-dire des systèmes traditionnels de commercialisation et des flux de communication entre les acteurs qui y interviennent. Il peut s’avérer suffisant de s’appuyer sur ces systèmes en leur apportant des améliorations pour répondre à certains besoins. En tout état de cause, la compréhension de la dynamique des systèmes existants aidera à mettre en place de nouveaux systèmes à la fois opérants et acceptables pour les principaux acteurs.
- Il convient de reconnaître l’hétérogénéité des situations des producteurs, par exemple du point de vue de la dimension des opérations, de l’accès aux ressources et de la nature des entreprises. Par conséquent, les besoins en information et les canaux utilisés varient en fonction du type de producteur. A une extrémité du continuum, on peut avoir un agriculteur qui, ayant réalisé d’importants investissements dans des cultures d’exportation périssables vendues à prix fort, est un usager du télécopieur et du courrier électronique, tandis qu’à l’autre extrémité, les réseaux de communication traditionnels demeurent le seul moyen de faire passer des messages. Une attention particulière doit être prêtée aux petits producteurs, car ceux-ci représentent une part importante de la population dans beaucoup de pays tropicaux.

- Presque tous les acteurs du secteur agricole sont affectés par la mondialisation des échanges, y compris ceux qui n'interviennent que sur le marché intérieur. C'est pourquoi il est nécessaire d'avoir recours à un système d'information à large audience tel qu'un service de vulgarisation, en conjugaison avec d'autres organismes spécialisés et avec les médias. Toutefois, il sera nécessaire de réorienter les services de vulgarisation et de les encadrer adéquatement afin de faire face aux priorités nouvelles.
- Pour l'établissement de relations aux bénéfices équitablement répartis, chacun des acteurs doit comprendre le rôle des autres intervenants de la filière de commercialisation. Les intermédiaires sont généralement perçus comme des exploiters du monde paysan. Pourtant, ces intermédiaires prennent souvent des risques auxquels les producteurs n'envisageraient pas de s'exposer. Il faut donc promouvoir un débat ouvert et des négociations pour trouver un terrain d'entente. Des systèmes d'information favorisant la transparence contribueront à promouvoir des relations équitables de cette nature entre les acteurs.

Orientations de la recherche

La discussion a porté en premier lieu sur un certain nombre d'aspects ayant trait au contexte, puis sur les types de recherche devant être entrepris.

Contexte de la recherche

- La recherche ayant pour mission d'aider à mettre en place des systèmes davantage orientés vers le marché, elle doit, elle aussi, répondre à la demande. Cependant, il lui faut tenir compte des besoins, intérêts et capacités des producteurs, et les autres acteurs en amont et en aval de la production doivent pouvoir contribuer également à la définition des orientations de la recherche.
- Dans le contexte de la contraction des financements des bailleurs de fonds, il revient aux gouvernements de combler l'essentiel du déficit. Si une large part des fonds nécessaires devra venir initialement du budget central, les gouvernements pourront également envisager de prélever : (a) des taxes d'un niveau modéré sur les exportations agricoles ; et (b) des droits de douane sur les produits d'importation faisant concurrence aux denrées produites localement. Les fonds ainsi générés devront être reversés à la recherche pour que ce mécanisme de financement puisse fonctionner efficacement. Bien que les gouvernements doivent être la principale source de financement, toutes les activités de recherche ne seront pas nécessairement conduites par des organismes publics ; certaines pourront être sous-traitées dans des domaines où les compétences font défaut.

En dépit du fait que beaucoup de pays offrent peu d'exemples de participation réussie du secteur privé et d'ONG à la recherche, il faut néanmoins continuer d'explorer ce mécanisme de financement. La viabilité financière doit être l'un des critères fondamentaux pour guider le choix des mécanismes de financement.

- Compte tenu des contraintes imposées par l'amenuisement des ressources, la définition de priorités de recherche sur la base de critères appropriés revêt une importance cruciale. La priorité doit aller :
 - aux recherches nécessitant le moins d'effort (ressources, etc.) mais pouvant exercer un impact important (ainsi, dans certains cas, seules des recherches adaptatives seront nécessaires)
 - aux recherches susceptibles de produire des résultats acceptables à brève échéance, plutôt qu'à des recherches demandant plusieurs années pour être menées à bien.
- Dans le cadre défini ci-dessus (association de tous les acteurs, recherche finalisée, échéances rapprochées), la recherche doit être de nature pluridisciplinaire et faire appel, le cas échéant, à une démarche participative.

Types de recherche

- Des recherches sont nécessaires pour mettre au point des systèmes technologiques permettant de produire à un faible coût des rendements élevés et commercialisables (par exemple, de nouvelles variétés végétales ou races animales, de nouvelles pratiques culturales et méthodes de gestion, de nouvelles techniques post-récolte). Ces technologies doivent être compatibles avec une agriculture durable.
- Des recherches doivent être menées sur la nature des marchés, en s'intéressant à des aspects tels que la dimension des marchés, les prix et les exigences de qualité.
- Des recherches sont nécessaires pour aider à identifier et à créer des possibilités de valorisation au niveau des exploitations. Cela implique de manière générale des recherches sur les technologies de transformation à petite échelle, mais il faut également y inclure des études sur d'autres aspects tels que les moyens d'intégrer les activités.

Besoins en éducation et formation

De la discussion sur les besoins en éducation et formation des producteurs à orientation commerciale, trois points principaux sont ressortis :

- La première tâche, en matière d'éducation et de formation, consiste à inciter les producteurs à adopter une orientation commerciale en les informant des cas de réussite de producteurs semblables à eux-mêmes. Les médias (principalement la radio et les journaux) peuvent diffuser ces informations auprès d'une large audience. Mais le moyen le plus efficace consiste à organiser des activités permettant des échanges directs entre agriculteurs.
- L'éducation et la formation doivent couvrir une grande diversité de thèmes. Pour beaucoup de producteurs, la formation sera axée sur les thèmes traditionnels de la production et de la productivité, mais l'accent sera mis sur l'obtention d'un rendement commercialisable. Dans certains cas, il faudra reconsidérer les situations d'un oeil nouveau afin de pouvoir explorer de nouvelles options. Les coopératives, longtemps préconisées comme un mécanisme idéal pour regrouper les petits producteurs et leur permettre de se procurer des intrants à un moindre coût, n'ont eu en général qu'un succès limité ; il serait peut-être temps d'envisager des formes de coopération plus flexibles mais néanmoins structurées. L'orientation commerciale étant à l'ordre du jour, l'accent devra être mis sur de nouveaux domaines tels que les activités de valorisation au niveau de l'exploitation (notamment la transformation) et les problèmes de gestion des exploitations et d'économie rurale.
- Il convient d'utiliser différentes méthodes et différents médias, mais le recours à une combinaison de plusieurs moyens offre généralement le maximum d'efficacité. Le choix des méthodes et des médias doit reposer sur les coûts, l'audience et les ressources disponibles. La radio permet d'atteindre la plus large audience au moindre coût. Des débats radiodiffusés peuvent aider à changer les comportements et les pratiques. Cependant, la radio ne permet pas un enseignement intensif et il faudra donc avoir recours à des méthodes interpersonnelles, notamment lorsque l'information est confidentielle. Néanmoins, la radio peut créer une situation d'orientation par la demande, en facilitant l'identification des individus pouvant dispenser une formation ou ayant besoin d'une formation. Des dossiers d'information rédigés en langage simple et adéquatement illustrés sont également d'une grande utilité.

Seminar programme

Monday 23 October

9.00 – 10.00	Registration
10.00 – 11.45	<p>OPENING SESSION</p> <p>Welcome addresses <i>Dr R. Barrow, Dr J. Walsh, Mr J. Flanagan (on behalf of Mr I. Yates TD, Hon. Minister of Agriculture, Ireland) and Dr R.D. Cooke</i></p> <p>Keynote address <i>Professor Helen O'Neill</i></p> <p>Presentation of seminar programme <i>Seminar coordinators</i></p>
11.45 – 12.30; 14.00 – 15.30	<p>LEAD PAPERS</p> <p>Du producteur au consommateur <i>A. Leplaideur</i></p> <p>Market opportunities for a producer's perspective <i>J.A.O. Lieshout, B. Huijsman and J. Daane</i></p> <p>Value-added activities in small-scale agricultural production in Africa <i>E.J.M. Mgale</i></p>
16.00 – 17.00	<p>COUNTRY REPORTS</p> <p>Backyard lettuce production using nutrient film techniques (Trinidad) <i>J. Seepersad</i></p> <p>The efforts of a woman farmer to market vegetable produce (Papua New Guinea) <i>M. Dominic</i></p>
18.00	Reception

Tuesday 24 October

9.00 – 10.30	<p>COUNTRY REPORTS</p> <p>Milk processing for value added production (Kenya) <i>J. Waweru</i></p> <p>Vining pea production and marketing by a farmer group (United Kingdom) <i>G. Jackson</i></p> <p>Smallholder dairy development (Zimbabwe) <i>B. Sandamu</i></p>
11.00–12.15	<p>TRANSNATIONAL REPORTS</p> <p>Implementing market-orientation strategies: Roles of governments, farmers and farming organizations <i>E. Onucheyo</i></p> <p>One hundred years of Irish farmer co-ops <i>M. O'Dwyer</i></p>

FARMER STRATEGIES FOR MARKET ORIENTATION IN ACP AGRICULTURE

Irish agriculture in perspective
P. Kelly

13.15

Departure for field visits to Teagasc Grange Research Centre, Dunsany, Co. Meath (grassland/beef) and ancient archaeological burial site at Wewgrange

Wednesday 25 October

9.00 – 9.30

COUNTRY REPORT

Negotiations interprofessionnelles chez les producteurs maraîchers sénégalais
P.A. Seck

9.30 – 10.30

TRANSNATIONAL REPORTS

Crop production response to improved access to market: Cassava in Africa
F.I. Nweke

Marketing mixed grazing systems for temperate and semi-arid environments
T. Nolan and J. Connolly

11.00 – 12.00

COUNTRY REPORT

L'enjeu du Système d'information du marché à travers l'expérience du Mali
S.B. Diarra

12.00 – 12.30; 14.00 – 17.30

WORKING GROUPS

Briefing

Working group discussions on: "Opportunities for adding value" and "The nature of competitiveness"

Plenary session: Working group reports and discussions

Evening session

Marketing information (with display of posters, newsletters and bulletins)

Thursday 26 October

09.00 – 12.30; 14.00 – 17.30

WORKING GROUPS

Working groups discussions on: "Building relationships in marketing channels – looking for win-win" and "Communication in the marketing channels – marketing information acquisition, dissemination, use and value"

Plenary session: Working group reports and discussions

Working group discussions on: "Directions for research – the improvement of competitiveness and the creation of wealth" and "Education and training needs for market-oriented farmers"

Plenary session: Working group reports and discussions

Friday 27 October

10.00 – 12.00

CLOSING SESSION

Plenary session: Summing up

Plenary session: Looking to the future

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Acronyms

ACP	African, Caribbean and Pacific
AGRITEX	Agricultural Technical and Extension Service (Zimbabwe)
ASEPAS	Association des exportateurs de produits agricoles (Senegal)
CAM	Chambre d'agriculture du Mali
CCIM	Chambre de commerce et d'industrie du Mali
CEGPD	Centre européen de gestion de politique de développement (The Netherlands)
CIAT	Centro Internacional de Agricultura Tropical
CILSS	Comité permanent inter-Etats de lutte contre la sécheresse au Sahel
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement (France)
CIRES	Centre ivoirien de recherches économiques et sociales (Côte d'Ivoire)
CNIH	Comité national interprofessionnel de l'horticulture (Senegal)
COC	Comité d'orientation et de coordination (Mali)
COSCA	Collaborative Study of Cassava in Africa (Nigeria)
CTA	Technical Centre for Agricultural and Rural Cooperation (The Netherlands)
DAL-FMD	Department of Agriculture and Livestock – Food Management Division (Papua New Guinea)
DDP	Dairy Development Programme (Zimbabwe)
DNAE	Direction nationale des affaires économiques (Mali)
DNSI	Direction nationale de la statistique et de l'informatique (Mali)
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FPDC	Fresh Produce Development Company (Papua New Guinea)
GATT	General Agreement on Trade and Tariffs
GEPAS	Groupe des exportateurs de produits agricoles du Sénégal
ICOS	Irish Cooperative Organization Society
ICRA	International Centre for Development-Oriented Research in Agriculture
IER	Institut d'économie rurale
IITA	International Institute of Tropical Agriculture
IMF	International Monetary Fund
IRADAZT	Institut de recherche pour l'appui au développement agricole en zones tropicales
ISNAR	International Service for National Agricultural Research
ISRA	Institute sénégalais de recherches agricoles
KIT	Royal Tropical Institute (The Netherlands)
KNFU	Kenya National Farmers' Union
MSU	Michigan State University (USA)
NAARI	Namulonge Agricultural and Animal Production Research Institute (Uganda)
NAMBOARD	National Agricultural Marketing Board (Swaziland)
NGOs	non-governmental organizations
NNFU	Namibia National Farmers Union
NRI	Natural Resources Institute (UK)
OECS	Organization of Eastern Caribbean States
ONASA	Office national d'appui à la sécurité alimentaire (Benin)
OPAM	Office des produits agricoles du Mali
ORSTOM	Institut français de recherche scientifique pour le développement en coopération (France)
OSCE	Office statistique des communautés européennes (Mali)
PRMC	Programme de restructuration du marché céréalier (Mali)
SAP	Structural Adjustment Programme
SIM	Système d'information du marché
SIT	Système d'information transitoire
Teagasc	The Agricultural and Food Development Authority (Republic of Ireland)
USAID	United States Agency for International Development