

Agricultural Analyses and Design ***Analyses Agricoles et Conception***


Working Document Series No 5

HORTICULTURAL EXPORTS: PROSPECTS AND CONSTRAINTS

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March 2000

Funded by: United States Agency for International Development 

Undertaken by: **CHEMONICS INTERNATIONAL, INC.** RAISE Consortium

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PREFACE

The Agricultural Analyses and Design (AAD) activity is an eight-month design activity undertaken by the Chemonics International RAISE Consortium through funded supplied by USAID/Rwanda. USAID/ Rwanda is using this study and design effort to support its Strategic Objective Number Three (SO3) *to increase the ability of rural families in targeted communities to improve household food security*. Specifically, USAID seeks to obtain information and proposed intervention strategies, approaches and activities suitable for USAID/ Rwanda's support in achieving the second Intermediate Results under SO3 (IR3.2) of *creating and enhancing internal production / marketing chains that promote broad-based economic growth*. The purpose of AAD, therefore, is to provide USAID/ Rwanda directions and information for their use in future development and eventual funding of a project that seeks to revitalize agribusiness in Rwanda and recreate links between the rural sector and private sector traders and processors. This USAID project will achieve its objective by addressing identified constraints and opportunities within the commodity chain for increasing economic growth via agricultural production and agribusiness. The principal task of AAD is to identify these constraints and opportunities.

The Agricultural Analyses and Design activity is divided into three phases. The first phase (two months) is to identify and recommend for in-depth study to USAID/ Rwanda those commodity chains and interventions that have the most potential for creating increased economic growth, internal and external trade, opportunities for employment and increased income. The second phase (four months) will consist of a number of in-depth studies. Some studies will look at crosscutting issues such as transportation, finance and economic policy. An additional study will look at the creation of Agribusiness Support Centers. The remaining studies will be in-depth analysis of interventions related to commodity chains identified in phase one and selected for study by USAID/ Rwanda. The results of these studies will provide the basis for phase three of the activity, the synthesis of the studies done in phase two and development of a technical proposal and supportive design components for USAID/ Rwanda's use in developing a request for proposal (RFP) for a project to support IR3.2.

Mr. Ricardo Frohmader completed this study on *Developing High Value Horticultural Exports* during a visit to Rwanda from 15 March to 1 April 2000. He would like to acknowledge both Dr. David Picha and Mr. Anastase Murekezi who contributed substantially to this report. Dr Picha reviewed early drafts and added comments and suggestions. He also suggested some crops for trial and these recommendations have been adopted in this report. Mr. Anastase Murekezi gathered vital information concerning the importation of fertilizers and agricultural chemicals, the availability of certain agricultural inputs, and concerning coffee. In that regard, they are co-authors, although the consultant, as the main author takes responsibility for any errors of fact or opinion.

EXECUTIVE SUMMARY

The horticultural export study recommended that the development of Rwandan horticultural exports be based around four main themes:

- Capitalizing on existing strengths
- Assisting new exporters to enter the export business
- Making regional alliances
- Assisting in development of value added product lines.

The report noted that there are existing exporters of small farmer-sourced product such as apple bananas, physalis and passion fruit that could be expanded. Transferring technology to improve the quality of these products should be a first step in this direction. Differentiating these products in the marketplace is also an important option. Complementarities should also be looked at to expand export of varieties and products related to existing exports.

Exporters need to expand their volume and improve their packaging and presentation. New entrants into the market should be looked upon as colleagues increasing the volume of exports and not as competitors. The Agribusiness Center should seek out new products and markets appropriate for local exporters.

There are real possibilities for regional alliances with exporters in Kenya and Uganda. Many of them have experience that would be useful in Rwanda. Some of them are looking to diversify their operations, and Rwanda could be well suited to this purpose.

It is important to consider how to increase value added for exported products. Present processing in Rwanda is generally too rudimentary to compete in either regional or international markets. There are some exceptions to this. Market studies are needed in areas such as passion fruit to find better varieties and to gain a better understanding of consumer demand and taste.

In addressing the question of what crops to export, the study recommended the following considerations:

- Proven ability to produce the crop in sufficient quantity and quality
- If not grown here, how easy is it to grow the crop?
- Ease of transporting the crop from production areas to final destination
- Availability of suitable packaging
- Need and availability of a cold chain
- Local or regional markets to serve as an outlet for surplus or second grade products
- Availability of technical information on the crop and training requirements

The study also looked at a number of potential **constraints** to development of horticultural exports from Rwanda. These included transportation, agricultural supplies, packing material, cold chain, and market considerations.

1. Transportation

Major potential constraints in the transportation area, related to horticultural exports, are:

- Costs – the high cost of surface/sea transportation precludes its use for most horticultural products. The rates for overland transport to regional ports are excessively high by North American and European standards on a Kilo/Km basis.
- Refrigerated containers – There are no refrigerated containers in regular use within the country. The present volume of exports is too small for large-scale container operation. In the near term, most products will have to be shipped by air.
- Regional horticultural trade – Rwanda has an inherent advantage in supplying high value temperate zone crops to the coastal tropical zones in the region. This requires more market studies. Refrigerated trucks would be needed to reduce costs and prevent spoilage.
- Available air cargo space – Exports of horticultural crops to Europe are strongly limited by the lack of reliable and frequently available air cargo space. The present two flights a week to Brussels are badly spaced for continuous export operations. This makes it difficult to assure quality products and adequate consumer product life for floral and other horticultural products. In addition, the present schedule of flights means that Rwandan exporters miss the main weekend shopping period used by European consumers. A possible third flight through Addis Ababa may help to solve this problem. Until very recently, available air cargo space was also a limiting factor.
- Air cargo rates – From available information, it appears unlikely that airfreight rates will fall in the near future. Increased competition would be useful in encouraging lower rates.
- Transshipment of products through third countries – The shipment of perishables through third countries is fraught with risk. There is no guarantee of proper onward loading or of appropriate handling of the products to assure that the cold chain is maintained.

2. Agricultural Supplies

Regardless of whether one engages in conventional or organic farming, high value agriculture requires agricultural supplies. These supplies include planting material, fertilizer, other farm chemicals, and irrigation equipment.

- Planting material – The procedures for importing new plant material need to be efficient and expedient, while assuring phytosanitary standards. Quality certified planting materials for many potential crops are not locally available and will have to be imported. Relevant legislation must be monitored to avoid unnecessary constraints

that would impede the introduction of quality plant material. Competitiveness depends on quick and easy access to these materials.

- Fertilizers – The production of high yielding crops of good quality depends on the use of fertilizers, either chemical or organic. Surprisingly, there is no consistent private sector commercial supply of fertilizer in Rwanda. Most fertilizer imports are through donors or parastatals. Donated fertilizer has severely distorted the market. In addition, much of the donated fertilizer is not well suited to Rwanda's acid soils. *Ad valorem* and ICHA taxes further increase the costs of already expensive fertilizer. If organic production is to be used, then organic fertilizers will be needed in the country.
- Weed suppressants – Only limited use of herbicides occur in the country. Most of it is used on tea. Locally made black plastic mulch is a useful weed control item that is compatible with organic production.
- Irrigation equipment – For many high value crops, irrigation is needed for consistent production. Drip irrigation is the preferred method.
- Plastic tunnels and houses – Because the main rainy season in Rwanda coincides with the counter-season in Europe, plastic tunnels and houses to protect against rain damage needs to be considered to assure a high quality product for this market niche.
- Pesticides – The pesticide market is also distorted by donations. This may now be changing. High cost of inland transportation makes most pesticides very expensive. Significant amounts of both pesticides and fertilizer are smuggled into the country from neighboring countries. Few, if any, biological pesticides are seen in the market.

3. Packaging Materials

Proper packing and presentation is critical for success in the export market of high value horticultural crops. There are a number of relevant factors to consider, including the quality of the packing material and its source.

- Quality of packaging material – In general, Rwandan packaging materials are of inferior appearance and quality. Some materials in use from neighboring countries are also of poor quality. Poor quality packaging and presentation will damage the effort to develop the export sector.
- Sources of packaging material – With current low volumes of exports, it is not economically viable to develop a local packaging industry. Uganda and Kenya have existing export service industries producing products that meet international export standards. Efforts should be made to obtain duty-free or drawback status for packing material used for produce exports.

- New packing material – New crops, being considered for export, will require new types of packing materials. Plastic or plastic foam trays are needed for products like snow peas, and berries require the use of E-Containers and plastic envelopes of frozen gel.

4. Cold Chain

Most high value horticultural crops require a cold chain from harvest to the final consumer.

- Present state of the cold chain – At present, there are no pre-cooling or cooling facilities for fruits and vegetables in Rwanda. The only exception is the sole flower producer. MAGERWA has some refrigerated containers, but they are not set up for horticultural crop use.
- Future needs for cold chain – As Rwanda’s horticultural exports expand, an efficient cold chain will need to be developed. This could best be done by private enterprise or by grower / exporter associations.

5. Market Considerations

Horticultural exports are strictly demand driven. Production that is not related to an identified market demand will not sell. Market considerations, therefore, are of paramount importance to the horticultural export business. Included among these considerations are the local market’s capacity to absorb surplus and second quality products, regional markets, market information, and market linkages.

- Local markets – Local markets play a critical role for export operations in mitigating risk for the exporter, in case there are problems with his / her exports. This market can be both for fresh and processed versions of the product.
- Regional markets – There are pockets of wealth and potential markets for high value horticultural products within the region and the continent. These pockets should be exploited to the extent possible.
- Market information – There is a general lack of market information within Rwanda. This is particularly true for the lucrative European market. There are, however, several Market News Services that offer subscriptions for weekly and daily price and shipment information for major horticultural markets.
- Market linkages – As vital as the “know-how” is in the produce business, the “know-who” is as vital to the export business. Knowledge of the relative strengths and weaknesses of markets and the people who run those markets is essential. There are a number of organizations, meetings and trade fairs that help the exporter to gain this knowledge.

LE SOMMAIRE EXECUTIF

L'étude de l'exportation des produits horticoles recommande que le développement de l'exportation des produits horticoles se base sur 4 grands thèmes. Ces thèmes sont :

- Exploitation des forces existantes
- Aider les nouveaux exportateurs à entrer dans le secteur de l'exportation
- Constituer des associations régionales
- Aider à développer les opportunités du produit sur la valeur ajoutée.

L'étude révèle qu'il y a des exportateurs des produits issus de petites exploitations agricoles tels que les bananes, le physalis et les fruits de la passion, pour lesquels l'exploitation pourrait être renforcée et élargie. Le transfert des technologies dans le but d'améliorer la qualité de ces produits pourrait constituer un premier pas dans cette direction. La différenciation de ces produits sur les lieux de vente est également une option importante à prendre. La complémentarité devra également être examinée en vue d'élargir l'exportation des variétés et des produits de même nature que les produits existants d'exportation.

Les exportateurs ont besoin d'augmenter le volume des produits d'exportation, améliorer leur emballage et présentation. Les nouveaux venus dans ce secteur d'activité devront être considérés comme collègues participant à l'augmentation des exportations et non comme agents compétiteurs. Le centre agro-industriel devra effectuer un travail en ce qui concerne l'identification de nouveaux produits et des débouchés que les exportateurs locaux devraient exploiter.

Il y a des possibilités d'association évidentes au niveau régional avec les exportateurs du Kenya et de l'Ouganda. Beaucoup d'entre eux ont une expérience que le Rwanda pourrait mettre à profit. Certains d'entre eux envisagent la diversification de leurs opérations et le Rwanda pourrait être mieux placé pour ce genre d'activité.

Il est important de voir comment on peut augmenter la valeur ajoutée quant aux produits exportés du pays. Les procédures de fabrication actuellement en usage au Rwanda sont généralement rudimentaires pour pouvoir conquérir les marchés tant régionaux qu'internationaux. Certaines exceptions existent pourtant. Les études du marché sont nécessaires dans certains domaines tel que les fruits de la passion en vue de trouver de meilleures variétés et d'avoir une meilleure connaissance de la demande et du goût du consommateur.

En essayant de répondre à la question « Quel produit doit être exporté du Rwanda », l'étude indique un nombre de facteurs à considérer. Parmi ces facteurs, l'on peut citer ceux-ci :

- Capacité évidente à donner un produit satisfaisant, tant en quantité qu'en qualité.
- Si la denrée n'est pas cultivée dans le pays, comment est-ce facile de la cultiver ?
- Facilité de transport du produit à partir du lieu de production jusqu'à sa destination finale.
- Disponibilité d'emballages convenables.

- Nécessité et disponibilité de conservation frigorifique.
- Les marchés locaux et régionaux devant servir de débouchés pour les produits excédentaires ou de second grade.
- Disponibilité de l'information technique sur le produit et nécessité de la formation.

L'étude a examiné un nombre de contraintes potentielles pouvant s'opposer au développement de l'exportation des produits horticoles à partir du Rwanda. Celles-ci comprennent notamment le transport, fournitures agricoles, matériel d'emballage, conservation frigorifique et les considérations du marché.

1. Le Transport.

Il y a un certain nombre de contraintes potentielles dans le secteur du transport en ce qui concerne l'exportation des produits horticoles. Parmi celles-ci on peut mentionner les suivants :

- Coût : le coût élevé du transport maritime et terrestre exclu son usage en ce qui concerne la plupart des produits horticoles. Les tarifs de transport 1 kg/km par voie terrestre vers les ports régionaux sont excessivement élevés par rapport à ceux de l'Amérique du Nord et de l'Europe.
- Les conteneurs frigorifiques : Il n'y a pas de conteneurs frigorifiques utilisés de façon régulière dans le pays. La quantité actuelle des exportations est trop petite pour des conteneurs réservés aux opérations à grande échelle. Dans une période assez proche, la plupart de produits devront être transportés par voie aérien.
- Commercialisation des produits horticoles régionaux : le Rwanda a un avantage inhérent quant à la fourniture des produits de grande valeur des zones tempérées, aux autres zones tropicales de la côte dans la région. Ceci demanderait néanmoins une étude plus approfondie du marché. Les camions frigorifiques seraient nécessaires afin de réduire les coûts et prévenir la détérioration des produits.
- Disponibilité des cargos aériens : les exportations des produits horticoles vers les marchés européens sont strictement limités à cause du manque de cargos aériens sûrs et régulièrement disponibles. Les 2 vols hebdomadaires actuels vers Bruxelles sont désavantageusement programmés pour des opérations continues d'exportation. Ceci rend difficile le maintien de la qualité des produits et la vie des vases à fleurs et autres produits horticoles. En plus, le programme actuel des vols fait que les exportateurs rwandais ratent les périodes d'achats du week-end auxquelles les consommateurs européens sont habitués. Un 3^e vol éventuel via Addis Ababa pourrait aider à résoudre ce problème. Il n'y a pas longtemps la disponibilité des cargo aériens constituait également un facteur limitatif.
- Tarifs pour les cargos aériens : de source d'information disponible, il est peu vraisemblable que le coût du transport aérien baisse dans un proche avenir. Une compétition croissante serait utile, en ce sens qu'elle pourrait provoquer une baisse des tarifs.

- Le transbordement des produits dans un pays tiers : le transbordement des produits périssables dans un pays tiers est plein de risques. Il n'y a aucune garantie que le prochain chargement sera effectué comme il faut, ni celle d'une manutention adéquate capable d'assurer le maintien de la conservation frigorifique.

2. Fournitures agricoles

Sans tenir compte de ce que l'agriculteur opte pour une agriculture conventionnelle ou l'usage d'engrais, une agriculture de très bonne qualité nécessite l'usage d'intrants agricoles. Ces intrants comprennent le matériel nécessaire à la plantation, les engrais, autres produits chimiques ainsi que du matériel d'irrigation.

- Matériel de plantation : Les procédures d'importation du nouveau matériel de plantation demande une certaine efficacité et opportunisme tout en assurant les niveaux phytosanitaires requis. Le matériel de plantation de qualité n'est pas disponible sur les marchés locaux en ce qui concerne la culture de plusieurs produits agricoles qui présentent une potentialité de production au Rwanda ; ce matériel doit être importé. Il s'avère important de suivre de près la législation du pays en cette matière pour être certain que les contraintes inutiles ne sont pas introduites et n'entravent pas l'introduction du matériel de plantation de qualité. La compétitivité dépend de l'accès facile et rapide à ce matériel.
- Les engrais : la production d'un rendement élevé de produits de bonne qualité dépend de l'utilisation des engrais, tant chimiques qu'organiques. Ce qui est étonnant, c'est qu'il n'y a aucun secteur commercial privé qui soit consistant dans la fourniture des engrais dans le pays. La plupart d'importations d'engrais sont faits par les donateurs ou les entreprises parastatales. Les engrais fournis comme dons ont sérieusement affecté le marché. En plus, la plus grande partie d'engrais cédés comme don ne conviennent pas aux sols rwandais qui sont généralement acides. Le tax *Ad valorem* et l'ICHA ont augmenté davantage les coûts des engrais qui sont par ailleurs très élevés. Si les méthodes de production organique doivent être utilisées, alors les engrais organiques seront nécessaires dans le pays.
- Destruction des mauvaises herbes : Il y a seulement l'usage limitée d'herbicides dans le pays. Le paillis noir plastique localement préparé est un élément utile de contrôle de mauvaises herbes. Ce paillis est compatible à la production organique.
- Matériel d'irrigation : pour plusieurs produits de très bonne qualité, l'irrigation est nécessaire en vue d'une production consistante. L'irrigation à quantité d'eau réduite est la méthode préférée.
- Maisons et corridors en plastique : Les corridors et les maisons en plastique sont nécessaires pour la protection contre les dégâts que peuvent occasionner les pluies et assurer ainsi une production de bonne qualité pour ce secteur du marché.

- Pesticides : le marché des pesticides est également déformé par les dons. Cette situation est actuellement en voie de changement. Le coût élevé du transport intérieur fait que la plupart des pesticides soient très chères. Des quantités considérables des pesticides et engrais sont introduits frauduleusement dans le pays à partir des pays voisins. Peu, si pas du tout, de pesticides biologiques sont trouvés sur le marché.

3. Matériel d'emballage

L'emballage et la présentation appropriés sont des éléments importants pour la réussite dans le marché des produits horticoles de grande qualité. Il y a un nombre de facteurs à considérer dans ce secteur d'activité, y compris la qualité du matériel d'emballage et de sa provenance.

- Qualité du matériel d'emballage : en général, le matériel d'emballage rwandais est de qualité et d'apparence médiocre. Certains matériaux en usage dans les pays voisins sont également de qualité médiocre. Une qualité médiocre d'emballage et de présentation du produit détruira tout effort de développement du secteur d'exportation.
- Les provenances du matériel d'emballage : avec un volume assez bas des exportations, ce ne serait pas économiquement rentable de développer une industrie locale d'emballage. L'Uganda et le Kenya disposent des facilités industrielles qui mettent sur le marché des produits répondant aux standards internationaux d'exportation. Des efforts doivent être effectués pour obtenir une levée de taxe ou des réductions pour le matériel d'emballage utilisé dans l'exportation des produits.
- Nouveau matériel d'emballage : de nouveaux produits destinés à l'exportation nécessiteront de nouveaux genres de matériel d'emballage. Des plateaux en plastique sont nécessaires pour les denrées telle que les snow peas. Les baies demandent l'usage de conteneurs en forme de E tandis que les enveloppes en plastiques pour les gels congelés.

4. Chaîne Froide

La plupart des produits horticoles de grande valeur nécessitent une conservation frigorifique à partir de leur récolte jusqu'à leur livraison finale au consommateur.

- Situation actuelle de la chaîne froide : Actuellement, il n'y a pas de facilités de conservation frigorifique des fruits ou des légumes au Rwanda. La seule exception est de l'entreprise de production de fleurs. MAGERWA dispose de quelques conteneurs frigorifiques mais ils ne conviennent pas à l'usage des produits horticoles.
- Des besoins futurs pour la chaîne froide : Comme l'exportation rwandaise des produits horticoles est en expansion, une conservation frigorifique appropriée devra être développée. Ceci pourrait être mieux fait par les entreprises ou les agriculteurs privés, ou alors les associations privées d'exportateurs.

5. Considérations du marché

Les exportations des produits horticoles dépendent strictement de la demande. La production qui n'est pas liée à une demande du marché identifié ne sera pas écoulee. Les considérations du marché sont donc d'une importance capitale pour les activités d'exportation des produits horticoles. Parmi ces considérations on peut mentionner les marchés locaux qui absorbent l'excédent de production et les produits de qualité secondaire, les marchés régionaux, information du marché et enfin les connexions du marché.

- Marchés locaux : les marchés locaux jouent un rôle important pour les opérations d'exportation en minimisant les risques que peut encourir l'exportateur au cas où il y aurait des problèmes liés à ses exportations. Ce marché peut convenir en même temps aux produits frais et convertis.
- Marchés régionaux : il existe des zones de marché potentiel pour les produits horticoles de première qualité dans la région et le continent. Ces zones devraient être exploitées au maximum. Information du marché : il y a un manque général de l'information du marché à l'intérieur du pays. Ceci est particulièrement vrai si l'on considère le marché lucratif européen. Il y a plusieurs services qui offrent les facilités d'information sur les prix quotidiens et hebdomadaires et celles du transport en ce qui concerne les marchés des produits horticoles.
- Connexions des marchés : de même que le « savoir-faire » est essentiel dans les activités de production, le « qui contacter » (know-who) est un élément essentiel pour l'activité d'exportation. La connaissance de la force et la faiblesse des marchés ainsi que des personnes qui les gèrent est essentielle. Il y a un nombre d'organisations, de rencontres et foires commerciales qui aident l'exportateur à obtenir cette connaissance.

SECTION I. ASSUMPTION AND APPROACHES

In making recommendations on areas of focus for an export development program, the consultants are assuming that assistance to exporters, and the technology transfer process in general, will be funneled through an Agribusiness Center, led by a core expatriate staff supported by Rwandan technical personnel, and by the recurring services, on a short term basis, of experts in the crop and thematic areas identified and discussed in the following pages.

The recommended approach to the development of Rwandan Horticultural Exports is laid out below, and consists of four main themes:

A. Capitalize On Existing Strengths

The consultants agree that it makes sense for Rwanda to focus initially on strengthening performance in the crop areas where exports already exist. These are apple bananas, and roses on a continuing basis, and physalis and passion fruit on an intermittent or sporadic basis. The actions for the Agribusiness Center to consider in support of these exports could include the following:

- ! ***Work with the existing exporters of small farmer sourced product to increase the exported volumes of apple banana, physalis and passion fruit.*** The recent increase in airfreight lift capacity makes it possible to triple and quadruple volumes that are being exported. At present the main constraint appears to be that distribution is limited at the market end. Assisting the exporters in identifying and accessing new markets, such as France, the United Kingdom, Germany, Scandinavia etc for their products should be given the highest priority. Other complementary actions include familiarizing the exporters with prices in the other markets, as well as with the sources of competition in the marketplace.
- ! ***Assist the exporters in transferring useful technology to their small farmer suppliers.*** Physalis may need to be grown under cover at certain times of the year when there are intense rains (February-May of each year). Or physalis may need to be grown at more than one location in order to obtain the consistency of supply that is needed to compete in the market. Passion fruit may need to be grafted in order to avoid root diseases, and it may need to be irrigated in order to avoid the supply gap that comes after the big dry period. The Agribusiness center should be able to provide the technical assistance that makes these trials and technology transfers feasible, on a cost-sharing basis with the exporter.
- ! ***Assist existing exporters in differentiating their product in a credible way.*** If it is true that the production of apple banana, physalis and passion fruit is largely organic in Rwanda, then assist the exporters in obtaining and maintaining certification for their product in Europe. While it is probably true that the exotic market is so small and so high priced that very little price differentiation may occur between an organic product and a conventional one, the knowledge that a product is organic could serve

as an effective sales tool in gaining market share for the product against competitors from Colombia, Kenya and Zimbabwe in the market

- ! ***Assist existing exporters to add complementary products to their existing export lines.*** Along these lines, the physalis exporter has announced her intention of exporting tamarillo. The Agribusiness Center should assist her in this endeavor by identifying importers and centers in which this fruit is consumed. The apple banana exporter could be assisted in identifying other varieties that also would command a very high price in Europe and could be grown and shipped to Europe.
- ! ***Assist the rose exporter in identifying complementary exports*** such as papyrus and other similar that can help provide increased cash flow without new investments in production infrastructure. Assist him also in identifying cut flowers already grown locally that he could purchase and pack for export. The Agribusiness Center could assist in identifying the market opportunities, and in helping existing producers bring their production up to export standard.

B. Assist New Exporters To Enter The Export Business

- ! ***The Agribusiness Center should work first with existing exporters to increase their volume and their coverage of the market.*** To the extent practicable, the center should also work with them to ensure that their packaging and presentation generally is the best possible. However it seems likely that not all of these exporters will want or be able to take on additional volumes or products. This then opens the door for new entrants into the business. Passion fruit and apple banana are likely products where markets are sufficiently large so as to permit entry by more than one exporter.
- ! ***The Agribusiness Center should be involved in the introduction of new crops to Rwanda, with a view to these becoming export items.*** Selections should focus on crops likely to be adapted to Rwanda, and for which there are niche markets in Europe.
 - # Attention should be paid to issues such as likely prices in Europe, since the cost of airfreight means that only the more expensive products can be profitably shipped. As an example, existing European prices for papaya of around \$3.00 per Kg indicate that air shipment would represent 50-65% of the cost of getting this product to market from Rwanda. Papaya is therefore a product that should be approached with caution, although the introduction of improved cultivars such as Solo Sunrise, Kapoho, Waimanalo or Maradol could improve the quality and flavor of the fruit on the local market. A more likely success as an export niche crop might be the Pepino, (*Solanum muricata*)
 - # Certain high value crops such as raspberry and blackberry could be introduced, although care must be taken to think through a strategy for

dealing with the rainy season, which will coincide with the main window of market opportunity for both of these crops. Another serious impediment with these crops might be the lack of well-spaced aircraft departures, which would require product to be stored here for 4-5 days before being marketed. A processing component would be indispensable to the successful establishment of these crops as part of commercial horticulture in Rwanda, since berries picked during times of heavy rain would not have the consistency to enable them to go to market. Jam and jelly makers have limited markets in Rwanda, so their ability to absorb production cannot be entirely trusted. The manufacture of syrups could be one partial solution, as could a juice making operation. However the question of getting the berries to the processor in reasonable condition for processing into juice could be fairly daunting.

- ! ***It is evident that there is room for several flower-growing operations in this country.*** It may be that higher elevations should be sought for expanded rose production (the larger hybrid tea roses generally prefer a cooler climate, while the sweetheart and intermediate roses such as those produced in Uganda prefer a warmer climate). The main barrier to entry into this business is of course cost.

C. Make Regional Alliances

There are various operations in Kenya serving the market with specialized products that are at capacity where they currently operate. Ugandan flower growers have difficulty producing good quality hybrid tea roses. One Kenyan exporter is looking for a better climate to grow runner beans. Some Kenyan exporters are looking for additional suppliers of extra fine French beans. The opportunity exists for Rwanda to team with these operations for marketing, and to supply them with part of their product mix.

The advantage of working with existing regional exporters is that technology transfer in the areas of production and post harvest handling will be expedited, and the marketing risk will, at the outset at least, be borne by the Regional partner. The Agribusiness Center could play a key role in fostering joint ventures between existing producers in neighboring countries looking to diversify their product lines, and investors in Rwanda willing to take their fair share of the risk.

D. Assist In Developing Value Added Product Lines

There are several juice, nectar and jams and jelly making operations in Rwanda. With one exception, they are a cut above home processing type operations. They use wood fires as their main source of heat, and buy used beer bottles and soft drink bottles to bottle their own product. Their processes are generally lacking in hygiene and good quality control procedures. They mainly work with passion fruit, strawberry, papaya and pineapple, all of which are locally sourced from farmers or bought from middlemen.

Nonetheless it is easy to envision the development of certain exportable product lines that build on existing products. Among these would be dried apple banana. Since these can be produced in neighboring countries, the production of dried organic apple bananas would provide a ready

entrée, to overseas markets. Physalis is a fairly uncommon product, and the ability to make physalis preserves could possibly lead to the opening of an export market for this product.

A lot of work will be necessary to bring Rwandan processing up to standard. Only one dairy appears to have the capacity to also produce juices and fruit based drinks in a modern and hygienic way. For the time being most of the local processors appear to be operating at a level of technology that is appropriate to the local market, but which will never withstand the scrutiny involved in an export process.

There is a lot of interest in developing passion fruit processing capability. A market study will be necessary to determine whether there is any chance of Rwandan juice from *Passiflora flavicarpa* competing on international markets with the juice of *Passiflora edulis*. It may be worthwhile determining whether there could be a premium for an organic juice. The consultants also think, based on experiences in highland areas of Panama and Ecuador that Naranjilla, a solenaceous shrub, should be introduced since the drink derived from its juice greatly resembles orange juice in flavor and vitamin content. The introduction of this crop could also provide the basis for expanding the fruit drink industry in a region where disease has largely wiped out formerly existing orange plantations.

SECTION II. KEY CONSIDERATIONS ON SELECTION OF HORTICULTURAL EXPORTS

In addressing the question of what crops to export from Rwanda, a number of issues have to be taken into consideration in determining whether a product holds the potential for successful export. Among the factors to be taken into consideration the following can be included:

- Proven ability to produce the crop locally in sufficient quantity and quality to meet export market standards, either through the adoption of proper production techniques or through appropriate harvesting methods.
- If there is no history of the crop in Rwanda, one needs to ask “Is the crop easy to grow?” Is it grown successfully in neighboring countries? Are there any major constraints to its production, such as the existence of insect, nematode or fungus pests? In either case, there needs to be an understanding of the crop’s production and appropriate pest management requirements, within the parameters for agricultural chemical use of the country of export, or of the particular buyer. Private buyers often have requirements that are more stringent than those of the country in which the product is being marketed. This is especially true of the UK.
- The crop can be successfully transported from its production area its final export market destination. For the foreseeable future, fresh horticultural crops will have to be transported by air. However, the use of air transport has cost implications that eliminates all but a very few crops. The frequency of air service further imposes constraints on what can be shipped. Successful use of air shipment also will require pre-cooling and cold storage facilities, as well as insulating air-cargo containers.
- Availability of suitable packaging. Can the market-required package be produced locally? If not, can it be imported cost-effectively? Where are the nearest sources of packaging material? What are the materials and test strengths required by the market? What are the requirements with regard to recycling of the packaging materials in the destination market?
- A Cold Chain must be available for pre-cooling the products soon after harvest. Cold storage must be available while the product is awaiting transport. Complementary materials, such as insulated master packaging (e-containers) will be needed on certain of the exports (*e.g.* small fruits) to avoid heating of the product in transit. In this case gel packs will be needed, which will also be of use in the export of certain cut flowers.
- Is there a local or regional market for the crop that can serve as an outlet either for surplus or for second grade product? If so, in what form? This is an important issue in a country where the fate of an exporter is likely to be in the hands of a single transport and /or import company. This consideration will probably result in a prioritization of apple bananas, passion fruit and physalis. Each of the preceding can be processed, the bananas

as wine, the passion fruit as drink, and the physalis as preserves, and put on the local market. Local fresh consumption is likely to remain low, so there needs to be an exploration of regional markets. Kenya and Tanzania come to mind. South Africa is another possibility. Cameroon is another. An example of developing local markets is local demand for Valentine's Day roses in Kigali, as well as in Nairobi. (John Nkera and Walt Verweij- personal communication). These developments are promising, since they offer hope that Rwandan exporters will have alternate markets in addition to the European ones they now serve.

- Technical information about the crop is made available, and is transferred. There is a necessary education process in which the owner (investor) becomes aware not only of the potential profit to be made, but of the critical pathway along which his product must travel in order to successfully reach the market, and recover his investment. In addition to the owner, the managers and supervisors must be educated, since it is not always likely they will have prior experience with this crop. They also may not have experience with the variety or cultivar, or with the market requirements with regard to harvest maturity, quality etc. Finally, workers must also be trained in appropriate crop management and harvesting techniques.

Each crop varies in its requirements, and therefore will need to be addressed separately, including the technology transfer and training process.

- Other vital information needs to be gathered and made available for export crop development to proceed successfully. Appropriate packaging must be used, in accordance with market requirements. The law in most countries requires the labeling of products as to their content, net weight, grade and origin. There are legal requirements, which must be gathered and known. Packages must be recyclable in Europe.
- Price information for horticultural markets is available from various sources. Availability and dissemination of this information can act as a powerful catalyst in the development of export consciousness, and of the ability to make market decisions. In visits to two leading exporters in Rwanda, we found that they had no knowledge of available market information services, and were relying entirely on their importer for price. We believe the Agribusiness Center can take action as soon as it is established to acquire and disseminate market information that is relevant to Rwandan exporters. This information also serves to get Rwandan entrepreneurs interested in, and involved with the development of exports from their country.

CONSTRAINTS TO DEVELOPMENT OF HORTICULTURE EXPORTS IN RWANDA

A. Background

Overall, the infrastructural constraints to the development of horticultural exports from Rwanda appear to be manageable. During the consultant's stay in Rwanda, there was a significant improvement in air cargo lift capability, with the introduction of twice weekly service with MD-11 aircraft from Kigali to Belgium, which replaced smaller A-300 airplanes. Cargo lift capability from Rwanda increased from 6 tons per week via SABENA to 24-30 tons per week. The arrival of the SABENA planes still needs to be better spaced, to avoid the current Tuesday through Friday lack of direct air service to Europe

The local road network is reasonably good, and access to the airport is no more than 5 hours from the more distant potential origins such as Cyangugu, which is on the Congo border across from Bukavu. Yes, potholes need to be filled and repaired, but the roads are basically good, and produce can be moved to market and to the airport

Inputs are more expensive in Rwanda than in neighboring countries, due in part to lack of competition, and due also to aberrant inland freight rates from the coast to Kigali. Recent rises in fuel prices have exacerbated this problem. However leading exporters appear to be buying their supplies in Uganda and Kenya, where there is competition, and where there are more developed export horticulture support services. Local prices for exportable products such as apple bananas and passion fruit in Rwanda are less than they are in neighboring countries, and the airfreight rate is competitive with that of other neighboring countries.

Other constraints, such as an alleged lack of ready financing for agricultural activities seem to be more related to the lack of bankable projects and the absence of the human capital needed to run them, than to an unwillingness to lend. The consultants do not address the issues of bank financing in detail, since that is the subject of other reports commissioned by AAD. During the consultant's time in Rwanda, they did not see any bankable projects that had requested and had been denied financing. They did see at least one that did not merit financing due to its weak and unfocused management. The Agribusiness Center should certainly cooperate in the sponsorship of courses in entrepreneurship, and lend assistance in the formulation and analysis of business plans.

Those projects that purchase fruit from small farmers do not need large amounts of capital at their present scale of operation, and their cash flows from export sales should be sufficient to convince bankers to lend to them for purposes of expansion of their businesses. It is in floriculture that capital requirements are very high. Bank financing is going to be very helpful, since costs are more than \$250,000 per hectare. Nonetheless the success of the first rose project in Rwanda should, in two to three year's time, lead to copycat projects that will build on this earlier success. This success could attract investment from both Kenya and Uganda, where there are climatic limitations in rose production that can be overcome in Rwanda.

The consultants observe that a number of horticulture export businesses in Kenya are running up against constraints in so far as expansion of their businesses are concerned. They need the climate that Rwanda has to expand certain product lines, and they could bring with them the know-how and technical expertise needed to develop the horticulture export sector. Eventually they could also bring the ability to charter aircraft on a regular basis that would do away with the transport constraints that are currently experienced. This is an area that the new project needs to explore.

A discussion of the limitations and the constraints in the area of export infrastructure follows. The Agribusiness Center will want to target these areas for improvement, and strike alliance with users and interested parties in order to lessen their impact on the economy and the development of the country. The Agribusiness Center will need these alliances also as a mean of engaging the government in a policy dialogue focused on reform and resolution of these constraints. The Agribusiness Center will seek to mobilize participants and new entrants into this field of endeavor, and work with them for a resolution of the constraints holding back the development of Rwanda's horticultural exports.

B. Transport

1. Cost

Transport availability by surface/sea is not an option presently for fresh horticultural products due to the cost of inland trucking to the nearest ports (Mombassa in Kenya and Darussalam in Tanzania). At present the cost for the 1500 Km trip to Mombassa, and for the 1200 Km trip to Dar es Salaam fluctuates between \$3000 and \$4000 per forty-foot container. This is extremely expensive by North American or European standards, given the relatively short distance involved. As an example, it is equivalent to the rate that a container of melons would pay from Central America all the way to Europe.

2. Refrigerated Containers

There is no availability in Rwanda of refrigerated containers belonging to regularly scheduled carriers. Even if there were, the scale of production in Rwanda makes trailer load quantities of all but a few staples such as potatoes unlikely. For the near future, therefore, Rwanda will have to look to air transport to move horticultural crops to market, and to those markets that, in addition to being accessible, have the purchasing power to acquire the products that Rwanda ships by air.

3. Regional Horticultural Trade

The consultant believes that there are natural advantages inherent in Rwanda's position as a predominantly highland country which will eventually permit it to serve as a source of higher value temperate zone crops that can be sold into Kenya and Tanzania, which have large populations located in coastal tropical areas. These products would move by refrigerated truck in order to reduce costs and prevent spoilage. Further study along these lines is recommended under the follow-on Project to identify the products, the times of the year and the potential volumes of produce that could be moved. Potatoes, cauliflower, peas, carrots,

beets, garlic, onions, cabbage, and green beans are suggested as possible items that might be looked at in such a study.

4. Likely Export Destinations

Export Destinations are presently pre-determined by very limited airspace availability. Not only do transportation costs help to determine what can be grown for export, but the destination of the existing service also determines what can be marketed in the country or area of destination of the existing services. There are no dedicated, regularly scheduled cargo flights from Rwanda. Certain cargo lines arrive occasionally and even regularly, but on a sporadic and unplanned basis. These varying arrivals cannot be used as a basis for moving perishable products to market, since marketers and their clients demand regularity and reliability in merchandise arrivals.

At present the only reliable way of moving perishable horticultural products out of the country to export markets is provided by SABENA. There is a MD-11, which flies between Kigali and Brussels on Saturdays and Mondays only. There is no other direct flight to Europe. The freight rate for shipments in excess of 500 Kg. is between \$1.45 and \$1.70, depending on the customer and the type of product- apple bananas pay less than do flowers.

Connections to other European destinations can be achieved through SABENA, at a price, which brings the freight rate effectively to between \$1.70 and \$2.00 per Kg. for nearby destinations not Brussels, such as Amsterdam and Frankfurt.

The short interval between the two flights (2 days) followed by the 5 day interval to the next one does not work to the advantage of the fresh produce industry, such as it is, in Rwanda. Perishable commodities must often be picked on a daily basis. Once pre-cooled, they have a set shelf life, which, in the case of Rwandan perishables, is being consumed in Rwanda waiting for the airplane. Roses, which must be picked on Tuesday or Wednesday, cannot be shipped before Saturday. These will arrive at market on Monday, and will have already spent 5-6 days in transit. Vase life, and therefore customer satisfaction, will not be as good as for those roses picked Sunday and Monday, and shipped on Monday evening. Only the Monday shipment will contain the freshest roses. It will be difficult under such circumstances to build and maintain a reputation for reliable quality.

This spacing of flights also would appear to inhibit the viability of export of the more highly perishable products such as raspberries and blackberries, since these must move to market within 24 hours of picking due to their extreme perishability. Any new horticulture export segment will have to take account of and devise a strategy for dealing with this problem.

5. Other Existing Air Services

There are occasional flights of cargo aircraft to Kigali. These however are not regularly scheduled, and are consequently of no use to a horticulture industry which is required to be consistent, and to arrive at market in predictable quantities at regular intervals.

Most other existing passenger service airlines are flying either Boeing 737s, or even smaller craft such as the DASH-7. Neither of these aircraft types has much reliable cargo capacity. The Regional Manager for Cameroon Airlines estimates that 300 Kg of air cargo could usually be accommodated on the weekly flight from Kigali to Douala (Thomas Tadah, personal communication). Alliance Express told us that their DASH-7 could perhaps carry 100 Kg of cargo to Kampala or Nairobi. Neither of these quantities is sufficiently large to be attractive to an exporter of horticultural products.

The one exception to the situation described above may be Ethiopian Airlines. They fly from Rwanda on Wednesdays and Sundays. The Sunday flight is a Boeing 737, and has no freight capacity. The Wednesday flight however is a 757, and can carry as a minimum 8 tons of cargo in addition to a full passenger load. Flight #838 leaves Kigali at 0500Hrs for Addis Ababa via Bujumbura and Entebbe. It arrives in Addis Ababa around 11:30 AM, connecting there with an onward flight to Frankfurt that departs at 1300Hrs, arriving Germany around 1800hrs. Freight rates Kigali-Frankfurt for flowers are \$ 1.37 for 500 Kg or more, and \$ 1.57 for 250 Kg or more. The rate for 500 Kg of fruits and vegetables or more from Kigali to Frankfurt is \$ 1.32.

Since the flight from Kigali to Addis Ababa is a feeder flight for the flight to Frankfurt, it seems reasonable to assume that cargo as well as passengers will be quickly and efficiently transferred. That is the opinion, in any case, of the airline's Area Manger for Rwanda (Mr. Girma Tilahun, personal communication).

6. Prospects For Reduced Air Cargo Rates

Freight rates are not likely to fall in the immediate future, given the increasing impact that higher aviation fuel prices are going to have on the air industry in the near term. The SABENA airplanes stop also in Nairobi, where larger amounts of cargo are available for loading. Sources told us that, while there was no published space allocation for Kigali cargo, an informal availability of 3 pallets per flight was a reasonable estimation. This means that total lift capacity to Europe is currently on the order of 10 to 12 tons per week. The authors estimate that current exports of fresh product already take between 3000 and 3500 Kg of the available space, leaving 26,500 to 27,000Kg available for expanded existing and new exports from Rwanda. This is a significant improvement over the situation in February of 2000, when the informal allocation of freight space to Rwandan cargoes was on the order of 6000 Kg per week, of which 3000 to 3500 Kg were already taken by existing exports.

7. Prospects For Expanded Air Cargo Services

The consultant's visit to Rwanda appears to have coincided with a mini-boom in wolfram and tantalum exports from the area. Because of the high value of these ores, movement tends to be by air rather than by surface/sea, where the risk of theft cannot be disregarded. This unconventional mineral ore export in turn has set the rumor mill buzzing about new entrants to air transport. Much of this is just talk. The consultant spent considerable time tracking down rumors concerning new air services, and found most of them to be unfounded

SABENA did begin to provide passenger service starting March 26 with MD-11 Aircraft, increasing the total cargo capacity of these flights considerably. Of this increased capacity, 3 pallets capable of holding 4 to 5 tons each are expected to be available for Rwandan exports. (Alexis Bizimungu, SwissCargo, personal communication) The scheduling of the flights will continue to be as is: Saturday and Monday. The consultant suspects that wolfram and tantalum may use at least a part of this added capacity. In any case, the lift capacity will expand from 6 tons a week to 24-30 tons. This is good news.

No other expanded service or new service appears to be planned at this writing.

8. Shipping Through Third Countries

The consultant is of the opinion that the possibility of shipping perishables through third cities, such as Addis Ababa, Entebbe and Nairobi is fraught with risk. There is no guarantee of onward loading, or of appropriate handling that will permit a cold chain to be maintained. In the case of Kenya and Uganda, freight from Rwanda would be competing for airspace with the exports of both of those countries.

Because of the high altitude of the Addis Ababa airport, it is possible that this could be the least inadequate transit airport, because temperatures are likely to be on the cool side, especially in the shade. Certain products such as apple banana, passion fruit and physalis are less susceptible to the lack of refrigeration than others such as raspberry and blackberry, and therefore more likely to survive a transfer in a cool environment. It is important that this route be tried, possibly with some sort of risk sharing from the Agribusiness Center, and that its adequacy be investigated.

In any case the Wednesday flight (#838) from Kigali by Ethiopian airlines does appear to offer some hope of arriving in Europe at a more strategically important time in the weekly marketing cycle (a majority of supermarket food sales occur at the end of the week, when people are preparing for the following week, or more likely to entertain). This service could also cut the time that produce must spend in cold storage awaiting the next flight, as is currently the case.

Were this service to prove adequate, it would also add 8 tons of air cargo lift capacity to the limited availability of air cargo space that exists in Rwanda.

The consultant concludes that the restricted availability of air transport options is the single greatest constraint facing the rapid development of a horticulture export sector in Rwanda. Nonetheless recent improvements in space available indicate that the time is ripe to push for significant increases in the volume of product exported from Rwanda.

C. Agricultural Supplies

Regardless of whether Rwanda intends to engage in conventional farming or organic farming, enterprises engaged in high value agriculture are going to need planting materials, soil disinfectants, fertilizers, weed suppressants, irrigation equipment, crop protection equipment, pesticides and agricultural tools.

1. Planting Materials

On paper, there are a lot of rules and regulations, concerning the importation of planting materials, and the introduction of new varieties. However there is currently no apparatus to put these rules and regulations in place. In practice, it is possible to enter planting materials with relatively few restrictions. Nonetheless, quality or certified planting materials for most of the crops that have potential for production in this country are not available, and will have to be imported. Local selections of passion fruit, physalis, tamarillo, hot peppers and apple banana are probably adequate for export cultivation.

Other crops such as strawberry, raspberry, blackberry and most vegetables crops will require importation for each new planting, or to establish the first plantings. Some other crops with export or local market potential appear not to exist in Rwanda, such as Pepino and Naranjilla, and will have to be brought in.

At least one firm imports vegetable and flower seeds from Holland and Belgium, some of this in small packets appropriate for a poor country of small farmers like Rwanda. In the aftermath of 1994, there was considerable donation of seeds by NGOs and Relief Organizations.

It will be important to monitor legislation in the area of agriculture to make certain that policy area constraints are not put on the introduction of new and improved planting materials. A country's horticultural competitiveness depends on quick and easy access to these materials.

2. Fertilizers

The production of high yielding crops of good quality very often depends on the use of fertilizers, either chemical or organic. One of the amazing discoveries of this mission was to learn that there is no consistent private sector commercial supply of fertilizer in this country. Import data reveals that imports are increasing, but for 1999 only 5521 MT were brought into the country. Private sector distributors have been buying from donor programs, and at times from government parastatal organizations such as OCIR-CAFE.

Importers of fertilizer 1995-1999 were either donor programs or parastatal organizations such as OCIR-THE. A private sector entity called the Business Center did make an importation of 1250 MT in 1999, but this entity has since closed down, and its former manager has fled to Belgium leaving behind a lot of questions, and not a few bills. Therefore, as of this writing, there is no private sector commercial channel for the importation and distribution of fertilizer in Rwanda. Donated fertilizer from both the EU and Japan has severely distorted the market, making it very difficult for commercial importers to enter the market. European Union imports are reported) to have been discontinued since April of 1999(Giancarlo Davite, personal communication), but there appears to be some backlog still present on the market. Recent price rises especially in the cost of nitrogen will further upset the market.

The one flower grower/exporter in Rwanda imports the specialty fertilizers he requires for his drip-irrigated roses from Uganda (John Nkera, Highland Flower, personal communication). Other entrants into the horticultural export business will also likely have to import their fertilizers so long as this situation persists. This could be a future function of a Rwandan horticulture advancement association, or of a Rwandan exporters association, which would be membership driven and controlled, and function entirely within the private sector.

Donated fertilizers consist mainly of 17-17-17, and of urea. This latter can contribute to the acidification of already acid Rwandan soils, with resulting problems of aluminum toxicity. Calcium nitrate is available commercially from South Africa, where Norsk Hydro has a plant. However, so long as fertilizer importation is donor driven, it is unlikely that there will be an opportunity to import products based on their merits and appropriateness to the country's agriculture.

Commercial importations of fertilizer are made more expensive by a 4% *ad valorem* MAGERWA fee, and the Rwandan VAT called ICHA (Impot sur le Chifre d'Affaires) of 15%, in addition to the very high inland transport rates currently in effect.

There appears to be some use of compost and manures, but on the whole livestock numbers are not sufficient to provide an adequate supply of natural fertilizer. There does not appear to be any widespread composting either. Some of the more productive horticulture is located in the bottomlands or so-called *marais* of Rwanda. These low-lying soils are often marshy. Some have peat deposits underlying them. Seasonal flooding with siltation does appear to occur in some locations, and this adds to the fertility of the areas.

There are currently two exporters of horticultural products claiming to be organic. Both of these firms could be helped if organic fertilizers were available to their fruit suppliers, or if their contracted suppliers were trained in the making and use of organic fertilizers. If organic agriculture is to become a credible and viable alternative to conventional agriculture, attention needs to be given to the matter of organic supplies and inputs for this agricultural sector.

3. Weed Suppressants

A visit to the leading supplier of agricultural chemicals in the country, Agrotech, indicates that demand for chemical herbicides is limited to Roundup, which is a product used by Ocir- The for the control of weeds in tea plantations. It is possible that other products are smuggled in from Uganda for use in other extensive industries, but there is no firm data.

One firm, Sulfo Rwanda Industries, is able to make black plastic mulch suitable for agricultural production. This is a key input in the control of weeds in horticultural production, which eliminates the need for herbicides. Its use is compatible with organic production.

4. Irrigation Equipment

Export horticulture in Rwanda should not rely on rainfall- if it does, it will not be consistent, and there is a likelihood of severe recurrent crop losses with negative impact on the ability to export either from excesses or deficits of rain. While furrow irrigation is perhaps possible in the *marais*, drip irrigation is probably the best way to ensure a high quality crop, and to protect the crop from damage. The only such system at present in the country is at Highland Flowers, and was assembled in Kenya. Equipment suppliers exist in Kenya, and both the U.S. and Israel are leading manufacturers of such equipment.

5. Plastic Tunnels And Plastic Houses

Because the main rainy season coincides in part with the winter and spring counter-season in Europe, serious consideration needs to be given to growing crops that enjoy favorable prices at that time under plastic tunnels or plastic greenhouses. The consultant notes that heavy rains have forced the suspension of physalis exports to Europe. Consideration should be given to growing these in low tunnels that could be opened in good weather, and closed in times of rain. Success would permit an uninterrupted presence of Rwandan product in the market.

6. Pesticides

Pesticide supply is also distorted by donations from the European Community and the Government of Japan. A pesticide importer consulted said that much of this was now in the past, although some of the lesser-known donated products had yet to clear the market. In his particular case, he had two containers of Dithane in customs at that moment, which indicates that he is confident that this best-selling product will not encounter competition from donated product (Giancarlo Donate, personal communication).

Pesticide costs are driven-up by the high cost of inland transport- the two containers of Dithane cost \$700-800 each to ship from Durban to Darussalam, and \$3200-3300 each from there to Kigali (a distance of 1200 Km). Pesticides also pay additional taxes from which fertilizers are exempt, namely a 5% entry tax, in addition to the 4% MAGERWA tax and the 15% ICHA, or 24%. In addition, since these products are purchased in locally bought U.S. currency, a rise in the value of the dollar *vis a vis* the Rwandan Franc is also certain to be reflected in the sale price of the product.

Because pesticides and fertilizers are exempt from taxes in Uganda, there is considerable smuggling of these into Rwanda. There have been recent cases in which the smuggled products were adulterated or entirely counterfeit.

No natural or biological pesticides were observed on sale in Rwanda. This is surprising, since the country is a producer (albeit a small one) of pyrethrum daisies. An importer of agricultural chemicals I consulted had very little knowledge of commercially formulated biological and alternative pesticides. The Thompson Handbook of Agricultural Chemicals was recommended to him for purchase. He was also apprised of the availability and uses of

Bacillus thuringiensis var kurstarkii commercially, as well as of some of the trade names of this biological pesticide.

It is recommended that the Agribusiness Center have information on pest control methods and tools, with emphasis on those that are biological and acceptable in organic farming whenever possible. Annex ---- of this report shows pesticide importations by year over the past three years. It also identifies the leading commercial importers and distributors of these materials.

Consideration should be given to removing all taxes from fertilizer and pesticide importations. An increase in affordability will encourage use, and bring higher agricultural yields. Increased availability will also make it easier to produce successfully for export.

D. Packaging Materials

1. Poor Quality

In general Rwandan packaging materials are of inferior appearance and quality. Their use in connection with horticultural export would be damaging to the effort to develop the sector. The few existing exporters import their materials from Kenya, Uganda and Europe. A banana exporter, Emballages, is also a maker of packing materials, but does not use his own products, other than plastic liners for the cardboard box, and plastic bags for the banana bunches while they are still on the tree.

In addition to cardboard cartons, punnets or small plastic baskets are used to pack fruit such as physalis. These are made in Kenya, and are not attractive. A possible alternative might be to use hand woven baskets made from locally growing reeds. The consultant saw attractive samples. The cost may be higher, though, than the cost of the plastic ones.

2. Import Packaging Materials For The Immediate Future

With the current low volume of exports, it does not make sense to insist on the manufacture or use of local packaging manufacturers, especially when their quality is so poor and their costs so high. Countries such as Uganda and Kenya have much better developed horticulture export service industries. It makes sense to import from those countries the relatively low volumes of cartons and other materials required locally. The materials made there already meet export standards for strength, and European standards for recyclability. In addition, the dies for many of the boxes required here have already been made in connection with similar exports in Kenya and Uganda. The same is true of moulds for punnets and so-called clamshells. The moulds are expensive, and it is best to source materials from a country where they are already being manufactured.

Efforts should be made to obtain either duty-free or drawback status from the government for packaging materials that will be used in connection with produce exports. This properly should be the task of a future Rwandan Exporters' Association, or of a Rwandan Agricultural Export Promotion Association. The Agribusiness Center can help lobby for these policies to be instituted by the government.

3. Other Packing Materials Not Presently In Use

The development of a pre-packing segment will be indispensable in connection with the export of snow peas, sugar snap peas and extra-fine beans. This service requires the availability of the plastic or plastic foam trays as well as of the specialized film used to over-wrap them. Kenya is a likely source for these materials, since there are various operation already pre-packing vegetables for their clients.

If strawberries and other berries are to be exported from Rwanda, in addition to punnets the use of bubble pack liners in the punnets will be required to prevent bruising and bleeding of the product.

The cold chain used for raspberries, blackberries and blueberries usually requires the use of E-Containers. These are insulated master carton, holding a certain number of flats of berries. The advantage of their use is that they can keep product cool far longer when they are exposed to ambient temperatures.

Thin plastic envelopes of frozen gel, or at times water, are commonly placed in the E-Container between the product and the sides of the container, or between the layers of product. The use of these materials also enhances the maintenance of the low temperatures needed for the successful shipment and arrival of these products. These are commonly used in Latin America also when packing roses. The Rwandan rose grower should be advised to use these during the summer when his product will be exposed to much warmer temperatures in Europe.

E. Cold Chain For Fruits, Flowers, And Vegetables

1. State Of The Cold Chain

As of this writing, there are no pre-cooling or cooling facilities for fruits or vegetables in Rwanda. Highland Flowers, the sole flower producing and exporting company in Rwanda, does have a cold chain consisting of a fast cooling and a cold holding room, as well as a second-hand refrigerated truck used to carry the packed flowers to the airport. This is adequate for their operation

As nearly as we can ascertain, the remainder of the available cold chain for fruits and vegetables in Rwanda consists of five venerable 20 foot containers that are the property of MAGERWA, a parastatal company that acts as the freight forwarder and customs agent for all Rwandan imports and exports. Four of these containers are located at the Kigali airport airfreight yard. Two are used for the storage of veterinary products and vaccines, as well as for dairy products and other fresh products requiring refrigeration. These operate at a temperature set at 10C, we were told, but during our visit we observed frequent entry and exit by stevedores and other people, which makes it likely that the temperature was higher. Another of the containers is used for the storage of frozen merchandise, while a fourth is also suited to frozen cargo but is in disuse due to low import volumes of frozen goods. This unit

could be made available on a lease basis we were told. A fifth unit is currently leased, but is being used as a dry container.

Weekly rental fees for the MAGERWA containers are expensive- we were quoted a rate of Rwf 150,000 per week for the rental of a 20 foot refrigerated container. This rate is in excess of \$400.00 per week at the official exchange rate, somewhat less at black market rates. An annual rental would amount to \$20,800, an exorbitant fee considering that used equipment of this sort can often be bought for \$3000.00 and less.

Cold chain does not appear to be critical for Rwanda's other current horticultural exports, which are bananas picked green and ripened in Belgium, passion fruit picked before abscission of the fruit from the stem, and physalis. These products are moderately hardy, and Kigali temperatures in the shade and at night are not extreme. In any case fruit is picked and packed the day before shipment, or that very day, and arrives at destination no more than 48 hours after picking, and sometimes quite a bit less. Highland Flower's roses picked Saturday and Monday leave on the same day they were picked, and arrive in Europe less than 24 hours after picking

2. Future Needs For A Developed Cold Chain

The expansion of Rwanda's horticultural exports will require the development and expansion of a cold chain. The likelihood is that this cold chain will be enterprise based, and will consist of pre-cooling and cold storage facilities such as those that are in place at Highland Flowers. In addition to these facilities, it will be necessary for exporters to also have a refrigerated means of conveying their product to the airport.

As exports develop, it may be useful to build a refrigerated storage system at the airport to accommodate the different types of product being shipped from Rwanda. Care will need to be taken to ensure that the various temperature requirements of different products are accommodated, as well as to separate the ethylene generating from the ethylene sensitive products. There have been successful cases in Central America in which the horticultural exporter's federation took over the operation of these refrigerated warehouses to ensure that product handling was optimal for the products being exported. (Guatemala and Nicaragua) These operations also become a source of income and sustainability to these federations. There is no reason why this could not be done also in Rwanda at some point in the future.

There appears to be little call for cold storage networks to be built at public expense in Rwanda, since there is very little demand for crop storage of perishables. Many vegetables appear to be in continual supply. This appears to be true of root crops such as cassava and sweet potato as well.

Potatoes might be the one crop in which cold storage could be justified. There is considerable price fluctuation between harvest and non-harvest times. The authors' position is that these price differentials of themselves may eventually result in the construction of private sector or cooperative owned storage for the express purpose of capitalizing on these price differentials.

If a garlic or storage onion industry developed, storage could also be of use in the keeping of these products.

There appears to be substantial promise of Rwanda's becoming a supplier of certain highland vegetables and fruit to the lowland and coastal areas of East Africa. Elsewhere the authors have recommended that attention be paid to discovering and defining Rwanda's competitive advantage in these areas. As these advantages become clear, and the opportunities are defined, there will be a need to develop the cold chain for the assembly, grading, packing, cooling and storage of products that then will be transported by refrigerated truck to market destinations like Nairobi, Mombassa, and Darussalam. In the consultants' opinions this could begin to happen in 2-3 years time, with potatoes being the likeliest product to move in volume at the outset.

F. Market Considerations

1. Local Markets

Local markets for the products recommended for export production in this study can play an enormous role in mitigating the risk of the exporter who has an outlet for his product in case there is a problem with his export. Perhaps one of the greatest vulnerabilities an exporter might face would be the possibility of a strike at SABENA, which then resulted in a suspension of service between Kigali and Europe. This certainly is the biggest risk faced by the exporter of roses here, since the local market for flowers is minuscule, and already supplied from Kenya.

Of the other horticultural products currently exported, apple bananas have a local market. Their name in Ikinyarwanda, kamaramasenji means, "they make you spend all your money", indicating that they are well appreciated. They are also usable in the manufacture of guagua, the Rwandan banana wine.

Passion fruit is also appreciated on the local market, and there is substantial demand from processors who are making passion fruit beverages out of single strength juice fortified with sugar, water and preservatives.

Only physalis, which is often found growing wild in Rwanda, appears to lack an established local market. In local custom, it is a fruit to be gathered and enjoyed by children in rural areas. It is not regularly seen in the markets of Rwanda. Physalis preserves are sometimes in evidence at one of the two major hotels in Kigali, but these preserves are not available commercially. The consultants' feel that physalis preserves are more likely to be bought as a souvenir of a visit to Rwanda because they are unique and seldom encountered in either the United States or Europe.

Of the products recommended for trial export by the consultants', raspberries and blackberries appear to have the greatest prospects of success in the local market, because they can easily be converted into jams and preserves, or made into juice or syrup. They also are likely to encounter difficulty in being available regularly and consistently from Rwanda, due to the heavy rains that coincide with a part of the European market window.

2. Regional Markets

During the consultants' stay in Rwanda discussions were held on the subject of regional markets as a possible outlet for Rwanda's high value produce. There are indeed pockets of wealth and substantial expatriate populations in countries such as Gabon, Cote D'Ivoire, Cameroon, and South Africa, which might in the near future constitute markets for high value Rwandan products. The present difficulty is with access to those markets. There is no airplane to Gabon, or to Cote D'Ivoire. There is only one airplane a week to Cameroon. There is a weekly flight to Johannesburg, by South African Airways. As with Air Cameroon, it operates a 737, which has no cargo space available. The development of air transport links with other African countries could be an important part of the development of the country's exports.

The consultant's have elsewhere stated their belief that the impediment to the development of overland vegetable and fruit trade from Rwanda is the lack of knowledge of what the opportunities are, when they occur, and how best to take advantage of them. The Agribusiness Center will play a lead role in getting this process started. A Rwandan Exporter's Association, or a similar organization can later carry on the work. It is important to note that at the outset, it will be important to involve the government in the development of these activities, especially as a facilitator of the export process from Rwanda, and of the import process into neighboring countries. Care must be taken, therefore to put the commercial relations of Rwanda with its neighbors on a solid and transparent footing.

3. Market Information

The consultants' found that Rwandan's generally lack market information concerning the possibility of exporting products to Europe. Several Rwandans spoke to us of their intention to export avocados and pineapples to Europe. Not only did these persons lack any idea of what was acceptable in European market, but they also lacked knowledge of how uncompetitive they would be with these two particular products that are largely sea-freighted to market in Europe.

- ! The Market News Service of the International Trade Center of the World Trade Organization in Geneva, Switzerland publishes weekly bulletins on the markets for flowers, fruit, and vegetables in Europe. The yearly cost of these subscriptions (2) would be approximately \$1100. It is further recommended that a subscription to their monthly newsletter on fruit juice and fruit puree prices also be made. While this information must also be interpreted, it does serve to establish reference prices against which price expectations can be measured. It will also be a useful tool for rapidly telling people whether their idea is viable commercially or not.
- ! These subscriptions, and possibly others such as to the price sheet published by COLEACP, to the **Fresh Produce Journal** and to **Eurofruit**, should be part of the information library offered by the Agribusiness Center to its users. During the 3-4 year life of the Agribusiness Center, considerable historical reference information

will be built up concerning prices. At a later date, a Rwandan (horticultural) exporter's federation could take the responsibility for continuing these information services to its members, and inherit the data bank built by the Agribusiness Center.

Preliminary discussions have already been held with FOOD NET for a regional study of potato marketing. The opinion held by the consultants is that an intra-regional trade in potatoes, onions, garlic and carrots is possible, and that Rwanda can be an important source of these for the rest of the area. It is expected that these hypotheses will be tested out in cooperation with FOOD NET and IITA.

4. Market Linkages

As vital as know-how may be in the produce business, the question of "know who" is as important. It is knowing who the leading importers are of a given commodity in each market, and what their relative strengths and weaknesses might be. It is choosing one's importer well, looking for stability and reputability, rather than taking chances with a new entrant to the business, or with someone whose credentials are tarnished.

It is expected that each Rwandan exporter will eventually seek to have at least two market outlets for his product, in different markets. Having two outlets for the same product in a single market is likely to result in self-competition, not a desirable outcome. Under present circumstances, it does not seem likely that any of the exporters has sufficient volume yet to be able to export to two markets in Europe at the same time. The exception to this is possibly Emballages Rwanda, the apple banana exporter, who is drawing from an extensive supply base in the Kibungo Prefecture adjacent to Tanzania.

The Agribusiness Center is expected to play an important role in helping Rwandan exporters meet the leading importers of their products, and to make new linkages. Current market linkages are centered in and around Belgium and Holland, whereas some of the better markets for exotic produce Rwanda has to offer will be in the UK and Scandinavia. The market for runner beans, for example, exists only in the United Kingdom.

In addition to maintaining a database of market information, the interventions the Agribusiness Center could consider for enhancing the market capability of Rwandan entrepreneurs could be along the following lines:

- ! Hire consultants familiar with the market for exotics to work with Rwandan exporters in developing their market linkages;
- ! Invite selected reputable marketers currently not sourcing product from Rwanda to visit the country on a cost sharing or cost covered basis.
- ! The Dutch center for the promotion of Third World exports, CBI, has a number of programs designed to assist new exporters discover their market and get it into market-acceptable form. The Agribusiness Center should seek linkages with the CBI on behalf of existing as well as new exporters.

- ! Organize and lead one or more trips by Rwandan entrepreneurs to markets in Europe. Preferably these expeditions should be organized in conjunction with major trade fairs in the fruit, flower and vegetable area in Europe, which will permit the Rwandan exporters to see the competition they face, and the standards, which they must meet.
 - a. In the fruit and vegetable area, AGF-Totaal in Holland in 2001, ANUGA in Cologne, Germany in 2001, or SIAL in Paris, France in 2000 are events to consider attending.
 - b. In the area of flowers, the Alsmeer Flower Show is the premier event in this area. It takes place yearly in November, in Holland.
 - c. In the area of organic foods and medicinal products, BIOLOGICA in Germany is the event to attend. The growing European market for organic foods should be taken advantage of in Rwanda.

It is recommended that the Agribusiness Center cost share with participants in these trips, for example by paying for either their air ticket or their per diem. Cost sharing would be limited to a single trip. Participation in more than one trip would be at the participant's entire expense (in so far as travel and per diem expense are concerned- the repeat traveler would still benefit from the facilitation services of the Project). Presumably the value of these will be sufficiently appreciated so as to make it worth their while to pay their way.

The consultant is also familiar with projects where the Project paid all costs of participation in a trade fair or mission, and the participants cost share went to the Exporters Association to create and strengthen a core endowment fund meant to sustain activities after the close of the donor support period.

Opinions vary as to whether one of the outcomes of the new Project should be the establishment of an association of (horticultural) exporters. The consultant would favor such an approach, with the caveat that the association should exist to engage in policy dialogue with government, advance the common interests of its members, gather and share information, help promote the country as a source of products, and serve as conduit for technical services and technology transfer. Certain associations in the Region should be looked to for lessons learned, and for caveats as to what not to do or become (do not build a large bureaucracy, or buy a large fleet of cars, for example).

ANNEX A: COMMENTS ON EXPORTS BY DR. DAVID PICHA

A. Horticulture Exports Industry in Rwanda

Currently, bananas, cape gooseberries, passion fruit, and roses are the only fresh horticultural crops exported from Rwanda on a regular basis. They are all sent by air, usually on the twice-weekly Sabena flights to Brussels. Only one company, Umballage Rwanda is involved in exporting fresh bananas (small fruited type). They source the fruit from about 650 small growers with an average farm size of 1 hectare in the southeastern part of the country near Kibungo. The fruit is harvested mature green, packed in 2.5 kg cartons at a local packing station, and trucked up to Kigali in an unrefrigerated vehicle. Two tons (800 boxes) are put on an air pallet several hours prior to the Monday evening Sabena departure. A company representative indicated they exported 85 metric tons in 1999. Umballage Rwanda is planning to soon export 100 to 200-gm dried organic banana consumer packs to Europe.

Cape gooseberry is a new export crop from Rwanda, beginning within the last year. Currently, about 200 kg per week are exported. Production is mostly in the north near Byumba at 1900-meters elevation. A number of small growers are involved in production. The fruit is exported to Brussels by Gaperi Fruits in 100-gm plastic mesh punnets overwrapped with a plastic film. Typically, 10 punnets are placed in a 1-kg export carton. The farmer receives between 100 to 200 francs per kg. Gaperi Fruits periodically export fresh passion fruit to Brussels. Approximately 48-50 fruits are packed in 2-kg cartons.

Roses are another new export crop from Rwanda. Exports began last year. The single company involved in exporting, Highland Flowers, currently has 3 hectares in production, with plans to double the area this year. They exported slightly less than 7 million stems over the last year, all to Europe. However, a small local market in Kigali is also beginning to develop.

B. Export Opportunities

Opportunities exist for further export market development of the existing horticultural crops in Rwanda, in addition to establishment of new export markets by introducing additional high-value crops.

More aggressive marketing coupled with a higher quality product would expand the export market penetration of bananas. Europe is a strong market for organic bananas, which Rwandan growers should take advantage of. In addition to fresh product, Rwandan growers should also diversify into organic dried bananas. This value-added product has definite niche market opportunities in Germany and other EU countries. Potential also exists in developing an export market for other dried fruits (e.g. pineapple, papaya, mango).

Improved packaging and higher quality of fresh cape gooseberries would help to increase export market volume of this crop. However, this is a specialty crop that has a rather limited market potential in Europe. Colombian gooseberries have been exported to Europe for many years and Rwandan product quality must be higher in order to gain further market share. Utilization of

hand-woven reed baskets during special holiday periods (i.e. Christmas) would add value to the gooseberries and likely position Rwandan product ahead of the competition. The reed baskets would be desirable as a stand-alone mini-container and could be advertised as organically grown and fabricated by underprivileged women.

Continued emphasis on high quality product and improved postharvest temperature management will be necessary for further expansion of the rose export industry. It is recognized that Rwanda possesses excellent microenvironments for cut flower production, perhaps superior to Kenya and Uganda. Attention must be given to improving crop yields along with maintaining shelf life. There are many sources of competition for the lucrative European cut flower market and Rwandan exporters will have to fine tune their production practices while minimizing costs in order to successfully compete. Production of additional colors of roses along with the introduction of other types of cut flowers to the portfolio will help strengthen Rwanda's marketing position.

A significant amount of limes is grown in the country, although there are no exports. A potential value-added lime product would be dried peels for the production of pectin. Denmark is a leading importer of dried lime peels from Peru and other countries for the manufacture of pectin. The technology of preparing dried lime peels as a source of pectin is fairly simple. The peel is separated from the pulp, dried, chopped into fine pieces and put in large 40-50 kg sacks.

Passion fruit is widely available throughout the country. The purple species (*Passiflora flavicapa*) is the only type grown, as it is adapted to higher elevations than the more acid yellow species (*Passiflora edulis*). Improvements in passion fruit juice consistency coupled with a reduction in sedimentation of the fluid in the bottle will improve quality and market penetration of this product, but most likely on a domestic or regional basis. Production of organic passion fruit juice or concentrate would help expand export market opportunities. Uganda represents a potential export market for passion fruit juice. Currently, Ugandan buyers come to Rwanda to obtain raw product to process in Uganda. Improved packaging materials (e.g. new glass bottles and TetraPaks) will allow the Rwandan juice to compete successfully for the regional export market.

Several new high-value horticulture crops likely to be well-adapted to Rwandan production which have a solid export market potential in fresh and processed forms are suggested for development. These include raspberries and blackberries. These small fruit crops are fast maturing and can be harvested less than a year after planting. They are also amenable to production by smaller holder farmers. These berries have strong demand as fresh products, juices, preserves, and frozen fruit. Many EU importers believe sales of raspberries and blackberries will go through a massive growth cycle during the next few years.

Papayas represent a potentially strong export market crop, both in fresh and processed forms. Solo-type varieties have a solid demand as a fresh fruit in Europe. Popular papaya-based processed products are juices, jams, jellies, and dried fruit rolls. In addition, papaya fruit are a source of papain, one of the more important enzymes used in the food, cosmetic, leather, and drug manufacturing industries. The two major uses for papain are as a meat tenderizer and a beer-stabilizing agent. Papain is obtained from the latex of the immature fruit.

ANNEX B: COMMENTS BY MR. JAMES CARTWRIGHT, KENYAN EXPORTER

James Cartwright is originally from the UK where he started his career in the agrochemical business. Since 1981, he has worked in 29 countries mainly on private sector horticultural export development projects. He now considers Kenya home and works there as a director of one of the main production and exporting horticultural companies, growing and shipping over 100 tonnes/week of a wide range of vegetables and flowers destined for the European market.

The following views are contained in a visit report to Agriculture Analyses and Design, from his visit to Rwanda 27 –29 March 2000.

Background

The USAID Agricultural Analyses and Design (AAD) activity is an eight month effort to study and then recommend interventions within specific commodity chains to implement a project to support IR3.2 which seeks to “Create and enhance internal production/marketing chains that promote broad based economic growth. As part of this effort the consultant was asked to visit Rwanda and provide AAD with a brief report on the feasibility of producing selected horticultural commodities for export from Rwanda. James Cartwright visited from March 27th to 29th and this report represents the opinions and findings from that visit.

Export opportunities

Exports to be sustainable must be based on some competitive advantage and also on resource availability within the country. Horticultural exports in particular are placed within a highly competitive market place where only the best survive. Factors such as quality and reliability are paramount and these can only be achieved with a highly professional approach at all levels within the supply chain. This cannot be supplied by small-holder farmers and indeed is very rarely achieved where these are grouped within a cooperative set-up. The history of co-ops within horticulture in Africa has been dismal. The first constraint that, therefore, has to be addressed to make the project successful is to identify the entrepreneurs that have the interest and are capable of picking up the ideas and running with them. This can only be done by identifying and educating people who are currently successful in other areas of business. A whole package can be put in place to help such people, but nothing will be successful without the correct identification in the first place. Entrepreneurship, risk taking and judgment, three essential assets are difficult to teach, they need to be there from the outset. How many people fall in this category in Rwanda? Probably few, but enough to make a number of successful starts in the horticultural business, so long as the opportunities are correctly identified. This will be paramount. To lead Rwandan entrepreneurs down the wrong path would be unforgivable. Opportunities, therefore, have to be carefully analyzed at the outset of the project and once these have been carefully identified, most of the resources of the project be geared towards them.

The crop opportunities

The main analyses of crop opportunities has to be based on market opportunities i.e. they have to be market led and concentrate on crops that that can be grown and shipped at a profit. These will naturally fall into two categories; those that are non-perishable and can be shipped by sea and higher value items that may be airfreighted. There are many crops that grow well in Rwanda such as avocados, mangoes and pineapples. However, these are items that because of their perishability could only be airfreighted from Rwanda and the freight costs would be prohibitive. A good example would be pineapples which grow extremely well in central Africa, but growers cannot compete with West Africa, where they can be either airfreighted at half the airfreight cost of Rwanda or with only a 10 day sea time to Rotterdam, sea freighted.

It is also suggested that it would be easier and it would have a wider impact to start;

- ! with crops that are already grown in Rwanda, but the potential has not been maximized e.g. tea, coffee and in a smaller way passion fruit, or
- ! with crops that have been historically grown, but due to a lack of market in the past or processing capacity are no longer grown e.g. pyrethrum, or
- ! with crops that are similar to crops already being grown e.g. extra fine french beans.

A number of the opportunities have been highlighted, although they require a lot of further investigation.

Tea and coffee

Both tea and coffee have been grown in Rwanda for many years and continue to be produced. However, quality has fallen as a result of civil unrest and associated infrastructural problems. Effort should be put into strategies that would upgrade the production both in terms of quality and quantity to the level of which Rwanda is capable, by virtue of its excellent altitudes and climate. It should also be noted that this will only happen if the primary producer receives a fair return for his labors. Greater transparency is needed within the industry in order for it to recover and grow.

Pyrethrum

Another crop that needs thorough investigation is pyrethrum. Historically it was grown in Rwanda, but farmers lost their market owing to civil unrest and the break-up of the processing factory. It was also a crop that was losing its market due to synthetic alternatives. This situation has now dramatically changed with the upsurge of consumer interest and heightened awareness in natural products. There is currently a shortage of pyrethrum, even Kenyan manufacturers of pyrethrum based products such as tick grease and mosquito coils have had to temporarily close their factories due to a lack of pyrethrum supply. The lack of a processing plant may also not be such a problem in the short term as the plant in Kabale just over the border in Uganda is also currently running under capacity. The success of this would depend to some extent on the ability

to import new improved planting material with a much higher content of pyrethrins than was the case in the past.

Birds's eye chili

Bird's eye chili is a crop that requires a very high labor input and due to the indeterminate nature of the planting material cannot be grown for machine picking. The very high oleoresin content of this chili type makes them very highly regarded in certain markets. In the past the two countries that dominated supply were Malawi and Zimbabwe. However, there may be room for a new entrant if the market is secured. The problem in the past with this product has been the erratic nature of the supply, particularly from countries such as Uganda, making dealers in Europe very cautious about committing to new suppliers. The big advantage of bird's eye in the Rwandan context is its non-perishability making it suitable for sea freight shipment. An important factor in a country with limited air freight links.

Cut flowers

A number of strategies may be adopted, the first of which is the "high tech" project such as Highland Flowers, where all inputs including the higher management and technical expertise are brought in. This would be true of all flower ventures until such time as critical mass is established to sustain local management expertise and a supply industry. To give regional examples this has only just been achieved by Kenya after 30 years in the business and after having achieved exports of over 40,000 tonnes of flowers per year. Uganda with about 10 successful flower projects is still far from achieving this critical mass. This means that start-up flower projects will require a high level of help in all aspects and putting this together with the high capital requirement, typically US\$1,300,000 for a 3 hectare project, means that there will be very few takers for such a venture.

Other flower types to be considered would include lilies and alstromeria, both loving the cool highland climate that Rwanda has to offer. Alstromeria may be of particular interest as it is a flower, one of the few, that may be grown in a small holder environment, as has been proven over many years in Kenya, on the Kinangop plateau above Lake Naivasha. However, quality still has to be tightly controlled by the exporter, but it may be grown with little capital input unlike almost all other species.

Another point to note is the strong trend in the region for new rose projects to be located at higher and higher altitudes in order that a higher quality product is grown. The trend away from the very short stems and small buds, sweethearts, that are produced at lower altitudes, the typical Ugandan product, to higher latitude intermediates is strong and needs to be considered when choosing production sites. The Ugandan model is not one to follow in Rwanda.

Extra fine beans and passion fruit

Flower projects are a laudable objective for the project as they achieve two important objectives, foreign exchange inflows and job creation. However, at the same time, effort must be placed in interventions that would create a wider impact both geographically and through creating

improved incomes within the smallholder production base. It is suggested that crops that would lend themselves to this approach would be french beans, particularly extra fines and passion fruit. Both of these have established overseas markets and the production parameters are already fairly well understood by the farming community. Passion fruit having been grown for many years and extra fine beans are not so dissimilar from growing the beans that are currently grown in the country. Both these crops are also relatively safe in that total crop failures rarely happen, unlike crops such as snow peas, which are much more climatically sensitive. Extra fines also have the distinct advantage of being very labor intensive, which gives Rwandan farmers a strong competitive advantage over countries with higher wage rates.

Snow peas and sugar snaps

Both snowpeas (mangetout) and sugar snap peas have been mentioned as possible export crops from Rwanda. These are crops grown particularly in Kenya, Zimbabwe and Guatemala for export to the European market, the UK being the dominant importer, particularly with snaps where there is almost no continental European demand. The opportunity is there for a new entrant, but only with excellent quality over a reasonably prolonged season. It may be argued that this will be difficult to achieve from Rwanda. Both these crops have a very low tolerance to getting wet. Rain encourages ascochyta or black spot which when it occurs on the pod makes the crop unsalable. This disease is poorly controlled by chemical means and the Rwandan climate is not ideal for these crops. It is possible that a very good grower may be able to grow them in the drier periods, but this would then require investment in irrigation, which may not show an economic return if the production period is short. To introduce this crop to smallholders would require a very cautious approach, because it would be a high risk crop for them. Once crops such as extra fine beans, a much safer crop, were established it may then be possible to work on the pea crops, but not before.

Other crops

Berries have been mentioned in the context of the proposed project. This needs to be considered carefully as these are technically difficult, require importation of expensive planting material and certainly in the case of strawberries are unlikely to be economic, as Rwanda would be competing with cheaper senders for all but a few weeks of the year.

There may be other opportunities which could be put in the “niche” category, such as essential oils and papain, but it is suggested that these should not be part of the project activities, unless an entrepreneur is particularly able to start such a venture, has the market, finance etc and only need some small intervention to get started.

Constraints

Without wishing to dwell on the constraints in the context of this report there are a number that will have to be addressed.

Freight. There is sufficient airfreight at a competitive cost to other regional shippers for it not to be a constraint in the short term. However, the cost of shipping containers to the seaports of East Africa seems very high and needs investigated.

Policy. Although policy is not a part of the project, issues such as duty on inputs such as fertilizer needs monitoring and if possible pressure brought on the decision-makers. During the visit there were assurances from some political quarters that this situation would change. However, the point is that policy issues that directly affect exports should be monitored by the project.

Irrigation. There appears to have been little irrigation used in the past. The entrance of Rwanda into the horticultural export market, if it is to be successful and sustainable, will require investment in irrigation systems for some crops. Horticultural crops to be produced in consistent volumes and quality, two prerequisites for success, will depend on irrigation. French beans, for instance, will not be produced consistently by rain fed methods.

Expertise. There is little expertise in the country. This can be provided by the project. There is, therefore, a need for a large short term technical assistance budget within the project.

Interventions

A package of assistance can be put in place through an agri-business center established by the project. It is suggested that the long-term sustainability of such a center should not be a concern of the project. The center should be established to help with private sector start-ups and the further development of already established companies. It is the long-term sustainability of these companies that should be the primary objective of the project. Although many interventions will be geared to the needs of individual companies, some more generic activities could be;

- ! Crop/market profiles for the major identified crops
- ! Importer/market profiles for European market destinations
- ! Direct assistance with locating markets by personal contact with overseas buyers/wholesalers
- ! Help with sending trial shipments to new markets
- ! The tracking of shipments through to European market traders/wholesalers and inspection of produce in Europe the with feed back of quality remarks and advice to the exporter
- ! The provision of a European arbitration service to be used in the event of a dispute between the exporter and the importer – any shipment could be inspected within 24 hours of receipt by the importer

- ! Hands-on technical i.e. production/packaging/marketing advise to producers/exporters
- ! A crop trials program covering the crops and varieties targeted for export development
- ! Advise on financing business start-ups or expansions in the sector
- ! The provision of short term i.e. overseas assistance to help with specific problems encountered by private sector export ventures
- ! Encouraging interested parties to establish a Rwandan Export Growers Association and then helping with the development of that association.

Summary

Rwanda has a number of export opportunities that need to be clearly understood and defined. Success in the development of private sector export projects is not easy, but may be achieved with a clearly defined strategy that encompasses all the relevant aspects, but in particular must be market led.

ANNEX C: POSSIBLE EXPORT CROPS FROM RWANDA

Possible crops for development under Rwandan high value horticultural development program as suggested by David Picha and Ricardo Frohmader

1- Fruit Crops

- For export
- For introduction, local market, and possible export

FOR EXPORT FRESH

- 1- Strawberries
- 2- Raspberries
- 3- Blackberries
- 4- Physalis (some export exists)
- 5- Tamarillo
- 6- Passion fruit
- 7- Solo sunrise and kapoho papaya
- 8- Apple banana (some export exists)

FOR EXPORT PROCESSED

- 1- Dried organic bananas
- 2- Dried organic papaya
- 3- Dried organic pineapple
- 4- Organic single strength passion fruit juice
- 5- Organic raspberry and blackberry juice (pasteurized)
- 6- Organic physalis preserves (the lack of organic sugar is a serious constraint).

FOR INTRODUCTION, LOCAL MARKET, AND EXPORT DEVELOPMENT

- 1- Pepino (*Solanum muricata*)
- 2- Naranjilla (*Solanum quitoensis*)
- 3- Cherimoya (there is some local production)
- 4- Macadamia nuts
- 5- Seedless watermelon

2- Vegetable Crops

- For export
- For introduction, local market, regional export

FOR EXPORT

1. Sugar snap peas/snow peas
2. Fine and extra-fine french beans
3. Baby squashes (mini-courgettes)
4. Asparagus (june-septemeber market window)
5. Plastic-house vegetables
6. Hot peppers (habanero types)

FOR INTRODUCTION, LOCAL MARKET, AND EXPORT DEVELOPMENT

1. Edamame (edible green soybeans)
2. Chayote (*Secchium edule*)

3-Flower and ornamental crops

- For Export
 1. Bromeliads for cut flower
 2. Statice
 3. Lisianthus
 4. Watsonia
 5. *Asparagus sprengeri* (tree fern); other ferns
 6. Cut tropical foliage (papyrus and others)
 7. Alstromeria
 8. Zantedeschias- white and colored

4 - Herbs and Spice Crops

- For Export
 - 1- Cardamom
 - 2- Basil
 - 3- Mint
 - 4- Coriander
 - 5- Rosemary
 - 6- Fenugreek