ATDT-CIAT/ISAR/IITA-FOODNET/CRS

Marketing survey of the Banana sub-sector

Rwanda

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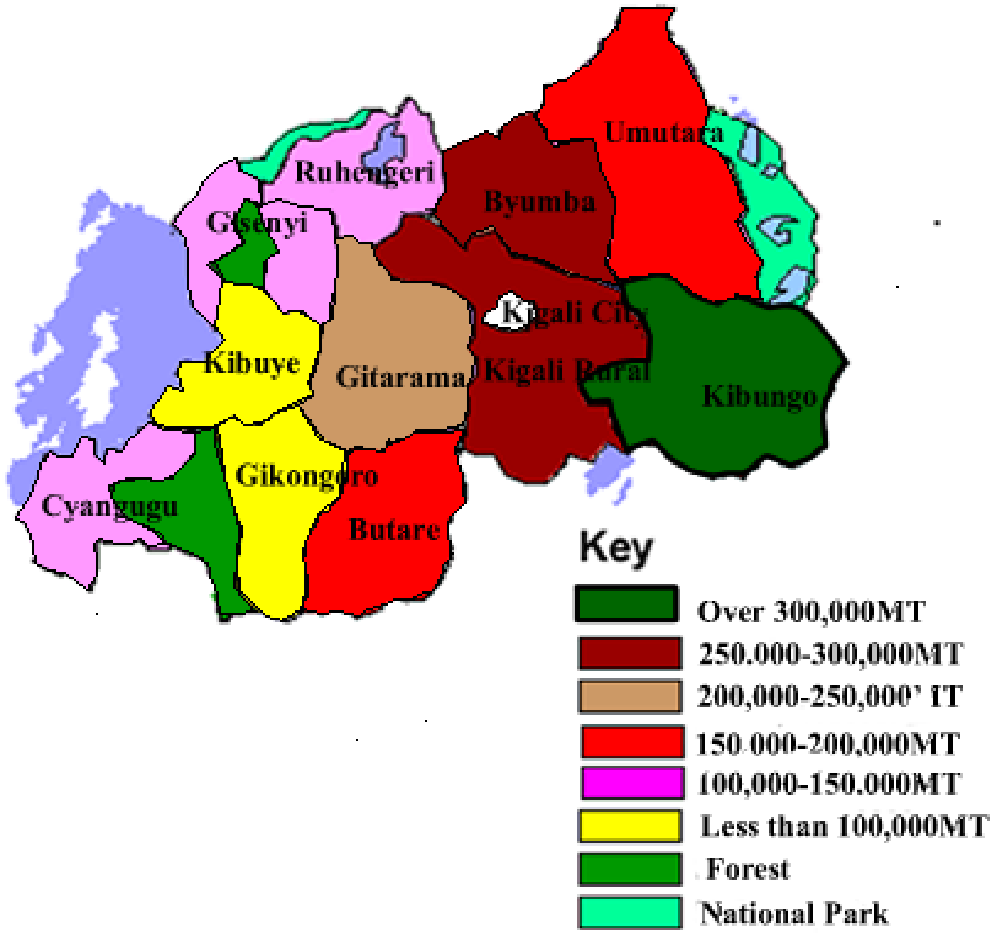
Acronyms and abbreviations

BW	Bacteria Wilt
CPI	Consumer price index
DRC	Democratic Republic of Congo
DS/MINECOFIN	Statistical Department, Ministry of Economy and Finance
FAO	United Nations Food and Agriculture Organisation
FSRP	Food Security Research Programme
Frw	Rwandan francs
Ha	hectare
HLCS/EICV	Household Living Condition Survey/Enquête Intégrale sur les conditions de vie des ménages
Kg	kilogramme
MINAGRI	Ministry of Agriculture, Livestock and Forestry
MINIPLAN	Planning section of MINECOFIN
MT	metric ton
PASAR	Projet d'Appui à la Sécurité Alimentaire au Rwanda (Food Security Support Project to Rwanda)
Ush	Ugandan shilling
US$	United States dollar
ISAR	Rwanda's Institute of Science and Agriculture

Figure 1.1: Map of banana production zones in Rwanda



Executive Summary

This report provides an overview of the banana sub-sector in Rwanda. It specifically examines production, processing, utilization and consumption trends given the changing macro-economic and trading environment both within the region and globally. It covers banana and banana based products in local, regional and international markets.

The study aims at identifying constraints to and opportunities for market led growth within the banana subsector, a major backbone in the country's rural economy. It therefore aims to provide benchmark data for ISAR's research agenda as a means of increasing food security and household incomes currently being threatened by the changing socio-economic conditions in Rwanda. The country has a low per capita GDP (260 US $) and a large subsistence economy. Its population is rural based (over 90%) with one of the highest growth rates in the world (2.9%).

The methodology used was that developed by Holtzman. It focuses on the entire sub-sector, using rapid reconnaissance techniques. The data was collected from both secondary and primary sources. Primary data was collected from participants along the marketing chain using the informal interview technique while secondary data, which partly guided the survey, was collected through wall to wall research covering Government departments, NGOs, research and development organisations and academic reports.

The study highlights several important issues. Although data from MINAGRI indicates a drop in the acreage under banana by about 13% over the period 1997-2000 due to factors such as war and the current government policy of reducing the dominance of the crop, Rwanda is a major grower of bananas in the world with production averaging 2.7 million tonnes per annum (1984,1986-90). The estimated per capita output (2000) is approximately 270 kg per year.

Despite being a major producer, Rwanda is also a major importer of bananas due to economic and technical reasons. An estimated 20,000 tonnes of bananas are imported annually from both Uganda and the DRC, suggesting marketing constraints for Rwanda's production. While imports from the DRC involve both brewing and cooking bananas, those from Uganda mainly consist of cooking bananas.

Demand for bananas has been increasing in recent years with the influx of people from countries where banana is a staple crop and also due to the increasing rate of urbanisation, which has heightened the reliance on food markets. The estimated total demand (traded volume) for bananas as food is about 82,000 tonnes (2000), comprising about 12,000 tonnes and 70,000 tonnes for dessert and cooking bananas respectively.

The Rwandan people attach considerable value to the banana crop beyond economic gain. It is associated with many cultural ceremonies and forms an important part of the diet. It also plays a crucial role in the country's farming system in terms of soil protection given the many steep slopes. Bananas will therefore remain important in the rural livelihoods for many years.

Demographic pressure and declining soil fertility have forced farmers to shift production towards beer bananas which at the moment predominated production, accounting for more than 70% of the acreage under bananas. Cooking bananas, dessert bananas and plantain respectively follows it.

Although bananas and plantains have forward linkages with the production of miscellaneous products such as soap, biogas, industrial alcohol and animal feed, fibre products are the only major non-food items from banana. Food processing is limited to beer products although preliminary attempts are being made to process chips mainly for the export market.

Transport is a major constraint to banana trade. Analysis of trading margins along the chain reveal that it accounts for the biggest proportion of marketing costs. It also contributes to the shift away from cooking bananas as transport gets scarce deeper into rural the rural areas.

Beer banana

Brewing bananas have formed the largest share of production for many years, accounting for over 60% of banana production per annum over the period 1984-90. The expansion in beer bananas has largely been market driven and in response to consequences of acute demographic pressure coupled with declining soil fertility and poverty.

Beer banana is a high value beverage, which commands a large and stable rural and urban market. Unlike cooking banana, its marketing is less affected by perishability. It simply acts as a raw material, enjoying a different marketing arrangement. Also, its price does not fluctuate as much as that for cooking bananas.

Although beer banana is the dominant type of banana in Rwanda, the country still imports beer banana from the DRC estimated at around 4,000 tonnes per annum, suggesting poor marketing infrastructures and organisation. The Congolese traders have a well established marketing organisation which enables them to enjoy economies of scale and supply a cheaper product.

From a nutritional, income and food security angle, beer banana plays a very important role for the farmers in Rwanda, providing up to double the nutritional requirement and income compared with cooking bananas. Apart from being used for beer making both for own consumption and marketing, beer banana acts as a food security crop. It does not require high management practices and in times of famine it is eaten as food.

Cooking banana

Cooking banana has been experiencing market growth in recent years especially in urban areas and this growth is expected to continue increasing. Total market demand is estimated at about 70,000 tonnes per annum. Urban per capita demand is estimated at about 39 kg (2000), representing about 30,000 MT per annum. For the rural areas, traded volume is estimated at 40,000 MT per annum (2000), having increased from about 17,000 MT in 1990 (DSA/MINAGRI 1990 survey). This increase in market size is explained by the increasing rate of urbanisation and the influx of communities from neighboring countries where banana is a major staple.

Although the main producing areas within Rwanda are trying to increase the production of cooking bananas in response to growing market opportunities, Government policy and efforts from the national and international research scientists, Rwanda is a major importer of cooking bananas. Import volume (2000) is estimated at about 19,000 tonnes per annum with supplies from Uganda accounting for about 80% of total imports. Similarly, an estimated 80% of the market in Kigali (about 19,000 tonnes) is supplied through imports from Uganda.

The failure for Rwanda to supply the cooking banana market stems from the fact that the country does not at the moment enjoy a comparative advantage in the production of cooking bananas compared with Uganda and the DRC. Declining soil fertility, poor management, high transport costs, low availability of the preferred or identified commercial market varieties and the purchasing power parity with its neighbours are some of the factors explaining this.

Cyangugu area produces the best quality bananas within Rwanda. However, marketing opportunities are limited mainly due to lack of good marketing infrastructures in the region and the high cost of transport to the main market in Kigali. Kibungo is the main producer and seller of cooking bananas to the Kigali urban market, being near the capital. However, this too is not competitive compared with Ugandan bananas due to the smaller size of bunches from Kibungo.

Key identified market quality parameters include size and appearance while preferred varieties are *Injagi, Incacara and Barabehya.* Although incentives to produce commercial varieties in terms of market premiums exist, the survey shows a disparity between varietal promotion by ISAR in the major production area of Kibungo and general demand suggesting lack of market biased research and extension programs.

The market for cooking banana is competitive with its price exhibiting high fluctuations almost on a daily basis in response to market forces. It is very much influenced by supplies from Uganda and by perishability. While traders seem to agree on a uniform selling price in the morning, there is price competition later in the afternoon in order to avoid losses.

Current market facilities constrain trading efficiency. While formal gazetted markets exist traders prefer selling in the numerous informal markets with poor facilities much as they incur more costs. Some of the reasons for this include poor location of most formal markets, a factor that reduces market volumes.

Opportunities for Rwandan bananas exist due to the cooking habits of the people. Consumers prefer bunches being harvested before maturity as this makes fingers soft when boiled. Also, this pre-maturity harvest gives Rwandan bananas a longer shelf-life compared with bananas from Uganda. This preference however is not for Rwandans who were living in Uganda.

The reconnaissance survey reveals a much more extensive marketing system, which is complex and well developed. It involves a large number of intermediaries and comprises many distinct regional marketing channels cutting across boundaries. Most activities still occur within the informal sector and there is no association to articulate trading issues concerning the sub-sector.

Dessert banana

Production of dessert banana is small, accounting for about 10% of the entire banana production. However, this market is growing especially in the urban areas and also it is of a much higher value than that of cooking bananas.

Dessert banana mainly consists of apple banana, although actual current figures for the distribution between Gros Michel and apple banana are not available.

There is importation of both apple and Gros Michel. Apple banana is mainly imported from Uganda for the brewing industry while Gros Michel is imported from the DRC. Again it was not possible to estimate the quantities of apple banana imported into the country.

Opportunities for exports to higher value markets in Europe exist and are currently being tapped. Two farmer groups in Kibungo are producing for the export market with an estimated capacity of about 10 tonnes per week. The cumulative quantity exported over the period 1998 – mid 2002 amounts to about 200 tonnes. Exports mainly consist of fresh unprocessed apple banana although there are attempts at adding value through processing.

There is a premium price for high quality apple banana. Farmers receive a premium price of 400 Frw per bunch compared with about 150 Frw on the local market. At present there is minimal competition for high quality export produce. Increased competition in the future would most likely lead to high production levels of a quality product and also to increased returns for farmers in Rwanda.

Apple banana is popular with "ethnic consumers". Rwanda could thus explore this market as such consumers may be prepared to pay a higher price for this type of banana (from a home country) rather than the Cavendish type. Moreover, the Rwandan apple banana is said to be of very good taste.

Plantain

Production of plantain is the smallest compared with all the types of bananas produced in the country. It is mainly concentrated around Bugarama. Like, apple banana, real production figures are not available.

The market for plantain is very small because it is not a major food for the Rwandan people, although its size cannot be determined due to lack of quantitative data. However, it is of a much higher value compared with cooking bananas and margins are much higher. Most of the plantain consumed in Kigali is imported from the DRC.

Fibre products

There exists a wide range of consumer fibre products made from banana stems and leaves by rural women who have formed associations to help with marketing arrangements. However, the local market for these products is relatively small and of low value. This is mainly attributed to the low purchasing power of the local market.

The export market for fibre craft products commands significantly higher values. However, it is currently small partly due to the limited marketing promotion in foreign markets with local sellers relying on a few marketing agents for orders.

The high cost of air transport is a major hindrance to high returns on fibre products. This is compounded by the low volume of trade currently going on.

Recommendations

Beer banana

High yielding and disease resistant brewing/juice cultivars should be introduced. This will increase the return per acre thereby optimally utilizing scarce resources. It will further release land for other enterprises without reducing the income of the farmers.

Commercialization of brewing banana should be encouraged through industrial processing. Also, new and higher value markets should be sought in the region and beyond through fiscal and other measures so as to increase foreign earnings. Increased commercialization will provide the resources needed on the farm for soil conservation.

Cooking banana

It is important to address causes of soil fertility decline in order to increase competitiveness of Rwandan bananas. It is also vital to conduct research into reasons why farmers are not investing in soil conservation and just substituting for cooking bananas which require high management practices.

The collection of market information needs to be strengthened and expanded to include not only prices but also volumes traded to help track economic trends and allocate resource investments optimally. Also, improving the flow of market information would increase banana marketing efficiency thereby reducing both the absolute levels and instability of consumer prices, and transaction costs throughout the marketing chain. In effect this would increase marketing opportunities for farmers inside Rwanda.

There is need for improved market facility planning with the ultimate aim of reducing marketing costs and improving trading efficiency. Such an activity should engage urban planners and traders in a collaborative manner in order to identify suitable market areas with consumer accessibility in mind.

Dessert banana

Rwanda's National Research System needs to identify commercial varieties for promotion. It also needs to conduct research into early maturing varieties in order to improve the viability of export marketability.

There is a strong need to initiate and strength linkages with the private sector to assist identify research projects with the greatest impact on the market. It is important that ISAR starts to work with exporters and farmer organized groups for the adoption of improved technologies.

To improve quality produced by the existing units, it is important to have a shorter collection marketing chain involving 3 partners ie exporter, producer and research institution. Through such a system information on quality and technological improvements can quickly and easily flow to the producers with an instant feedback mechanism.

To increase the value of the apple banana export industry there is need to design a market development and technical assistance program for the export of fresh fruits and having the transformed products selected by quality.

Rwanda could get more value (5-6 times) through the export of improved and processed apple banana and also through acquisition of organic certification. At the moment this product is not exported under organic certification.

Plantain

There is need to estimate the market size of plantain along with its requirements. Also, this should involve market information about prices and margins and constraints to increased trade.

There is need to identify current varieties and introduce new and improved ones to maximize returns on investments.

Fibre products

There is need for more effective marketing to be carried out so as to widen the foreign market of these products. Local associations need to be assisted by development organisations with the use of the internet for marketing.

1 Introduction

1.1 Background

As with many developing countries, Rwanda relies on sales of a narrow range of traditional primary exports i.e. tea and coffee for her income. Prior to market reforms this strategy was effective when a limited number of countries supplied these commodities. However as markets have globalised other countries have started to produce traditional export crops and this has led to a situation of oversupplied commodity markets.

For countries as Rwanda this has led to steadily declining terms of trade with meager farm gate earnings and wide spread poverty. The Gross National Product currently stands at US$ 260 per person. Globalisation, policy reforms, privatization and liberalization are currently creating a rapidly changing competitive market environment.

Parallel to these trends the country has experienced one of the fasted growing population rates in the world. It has a rural density is 929 persons per km2 of arable land reducing the average farm size to approximately 0.71 hectares and per capita arable land to about 0.10 hectares.

Food security is therefore a major issue for Rwanda and has been of particular concern over the last fifteen years as per capita calorie intake has been consistently declining. Moreover, with the failure of agricultural policies and practices to provide adequate nutrition for its growing population, the country has increasingly become dependent on food imports since 1985.

1.2 Methodology

This study was designed to analyze the market options for banana, which is a major food crop, occupying over 50% of the cultivated area. It relied on rapid reconnaissance methods to conduct a diagnostic study of the banana sub-sector in Rwanda (**Appendix 30**) with the objective of identifying potential improvements in existing practices and includes recommendations on how these might be achieved. It identified issues for follow-up research.

The study specifically aimed at assessing the importance of the crop in terms of food security; economic growth; potential market growth in relation to identified markets; comparative/competitive advantage for Rwanda in developing the banana crop; key interventions needed in order to transform banana from subsistence to a more commercially oriented sector, and the potential of the commodity or sub-products in regional and overseas markets.

2. The Marketing Environment

2.1 Rwandan economy status

Rwanda's per capita income is still low and currently stands at US$ 260 while the population living below the poverty line is estimated at 65%. Life expectancy is also low at 49 years and so is the literacy rate, which is put at 48 %.

The country has few exploitable natural resources and suffers from high transport costs due to its landlocked position. Thus, given this particularly narrow economic base, external trade integration is vital for Rwanda in order to reduce its large trade deficit and also decrease reliance on donor funds.

Economic growth has declined, stabilizing at 6.0% in real terms (2000 and 2001), having grown at an average of 12% per annum during the reconstruction period (1995-1998). And although the year 2000 marked the complete economic recovery to the prewar 1990 level, with growth in some sectors surpassing the 1990 level, growth was still below the vision 2020 target of 8.5%. Factors such like localized drought and high oil prices explained this situation.

Agriculture contributes the largest share of this growth at 7.7%, industry (mainly mining and construction) 7.2% while the services sector (mainly hotels, restaurants, banking and insurance) accounts for 4.2% (**Table 1.1**).

Table 1.1: Sectoral growth rates

Growth rates (%)	2000	2001(projected)
Agriculture sector	9.1	7.7
Industry sector	3.6	7.2
Service sector	3.5	4.2
GDP	6.0	6.0
GDP price deflator	1.8	4.9
CPI	2.1	4.0

Source: Rwanda Development Indicators, MINECOFFIN

The Inflation rate substantially increased to 2.1% in 2000 in response to external shocks that caused higher food and fuel prices, while the country's parallel market exchange rate stood at Frw 495 to the US$ at the time of the survey, thereby making imports more expensive.

The balance of payments deficit reduced to US$ 234 million in 2000 partly due to the depreciation of the currency, which reduced imports and increased the resultant cheaper exports. For the first time the country exported beans and maize to Uganda averaging 20 tonnes per day since December 2000.

The country's international reserves as months of imports (cif) declined from 8.1 months in 1999 to 7.5 months in 2000, which is still high while the fiscal overall deficit (excluding grants) was

significantly larger than programmed, amounting to 9.2% of GDP, compared with the programmed 7.8% of GDP. This shortfall was due to a 10% drop in the programmed revenue performance, which translated into revenue realization of Frw 68 billion instead of the targeted Frw 76 billion.

2.2 Macro-economic developments

The new government of Rwanda in December 1994 spelled out its economic agenda, which was committed to creating a liberal, market-based economy with a reduced role for the state. Macroeconomic and structural policies broadly focused on reviving economic activity, restoring macroeconomic stability and rebuilding the capacity for macroeconomic and budget management. Several structural reforms to liberalize trade, develop the private sector, privatize public enterprises, and improve public administration and governance have been implemented.

Table 1.2: Indicators of structural reform

Indicator	1993	1996	1998	1999
Non zero trade tariff range	(10-100)	(10, 20,40)	(10, 20, 40)	(5, 15, 25)
Average tariff rate	34.8	31.9	18.1	11.3
Tax restrictiveness index	10	8	3	2
Surrender requirements for tea & coffee export proceeds	100	50	0	0
Civil service employment	42,027	34,882	37,353	37,694
Govt. wage bill in percent of GDP	5.7	4.4	4.6	5.3
Cumulative number of public enterprises Privatised or brought under liquidation	0	0	3	25

Source: World Bank, Rwanda data

The country's trade regime has been progressively liberalized. Surrender requirements for coffee and tea export receipts have been eliminated while the coffee tax was eliminated in early 1999. The maximum tariff rates have been reduced from 100 percent to 25 percent. Consequently, Rwanda's trade restrictiveness index has fallen from 8 in 1995 ("restrictive") to less than 3 ("relatively open"). The foreign exchange market regulations have been simplified and liberalized.

In an effort to promote private sector, business licensing has been made easier. Formerly state-owned enterprises have been privatised, the state-controlled Chamber of Commerce abolished while the Rwanda Private Sector Federation has been formed as an apex body of various private sector organizations to articulate private sector interests. Also, the Rwanda Investment

Promotion Agency has been set up to facilitate investment and business development. The labor code has been revised to remove restrictions on the movement of labor and the employment of females. Efforts to build a leaner civil service were hampered by new recruitment to replace those lost in the genocide.

Reforms have also aimed to increase revenue and control expenditures. Key fiscal measures for increasing revenues include improved tax administration by the Rwanda Revenue Authority (established at end of 1997 with technical and financial support from the UK-DFID). Import duty exemptions have been progressively eliminated while the turnover tax has been increased from 10% to 15%. Excise tax rates have also been increased.

Currently the government is endorsing the Vision 2020 document, which aims to enable Rwanda exit the category of the least developed countries by the year 2020 through the eradication of widespread poverty and assurance of equitable growth. In order to achieve this goal, Rwanda is targeting:

- A GDP average growth rate of 8.5% per annum;
- A GDP per capita increase to US$ 960 at the present value (currently US$ 260);
- Reducing the population living below the poverty line to 25% (currently 65%);
- Increasing life expectancy to 65 years (currently 49 years); and
- Increasing literacy rate to 90% currently 48%.

To achieve 8.5% GDP growth per annum requires high investment rates, which can be realized in the context of social, political and macroeconomic stability.

2.3 Trade and Export Competitiveness: Recent Reforms, Performance and Market Access

Rwanda faces an unfavourable trade balance, relying on imports for most of her needs. It has mainly relied on primary products like coffee and tea for her exports. Market growth for these commodities is very slow due among others to the quota system.

Trade or export of improved processed products is very minimal due mainly to high costs of production and poor quality, making the country a net importer of consumer goods. **Appendix 1** indicates trends in the country's trade balance.

In the recent past the country has made persistent efforts to promote trade competitiveness through macro-economic reforms aimed at opening up the economy, increasing efficiency and promoting private entreprenuership. Liberalization of the exchange rate regime has made the country more competitive by reducing the price of its exports. This enabled the country to export for the first time commodities like beans which had been imported before. As a result the country has made positive developments in its trade balance position, reducing the deficit to an estimated US$129 million.

3. Overview of the banana sub-sector

3.1 Importance of the sub-sector to earnings, rural livelihoods, poverty alleviation and economic growth

Banana is of great strategic importance in the rural sector in Rwanda and has been the dominant traditional crop for many years. Over 80% of Rwanda's farms/households (710,280) grow bananas. Its cultivation has for a long time been a feature of great socioeconomic importance from the point of view of food security and job creation. It is associated with several cultural ceremonies. Within the traditional sector of the rural economy, it is used mainly to shade coffee and is an essential component of the diet.

Banana makes a significant contribution to food security in Rwanda and the tropics at large. It has a privileged position in urban food distribution and this role has grown over time. Delicate and highly perishable, bananas are produced all year round. The fruit is nutritious, easily digestible and a rich source of carbohydrates, phosphorus, calcium, potassium and Vitamin C. It is eaten both green and very ripe and is prepared using different recipes in the various regions of the country. It can made into different forms such as meal, chips and snack foods and can also processed industrially.

Under demographic pressure, Rwandan households have overtime been expanding cultivation at the expense of pasture and fallow and increasingly relying on four crops: bananas, beans, sweet potatoes, and maize (Jaako Kangasniemi 1998). In order of the land share, the main crops in Rwanda are, bananas, beans, sweet potato, cassava, sorghum, maize, coffee, white potato, peas and taro (colocase). This study also reveals that banana production is closely related with demographic changes. While beans, sweet potatoes and maize are staples grown mostly for subsistence consumption, the expansion of bananas has largely been a market-driven process.

Appendix 2 gives the national mean yield estimates of major crops during the six seasons of 1989-1991(Kangesmie 2000). All yields are also expressed per six-month seasons so as to have cross-crop comparability. Only the average yield estimates for total bananas is computed in this study as beer bananas and cooking bananas enjoy the same land use.

Banana is a major provider of household income and this has been pointed out by ealier surveys. Looking at the role of bananas in household consumption and income and using data from Minagri's Division des Statistiques Agricoles, Jaako Kangasniemi's study finds bananas to be the most remunerative smallholder cash crop at 1990 farmgate prices (**Appendix 2**), coming next to potato. This study reveals that rural sectors sell very large quantities of traditional beers, especially beer both within the rural and urban areas. Sales to far away urban areas usually occur after brewing, which greatly increases value to weight.

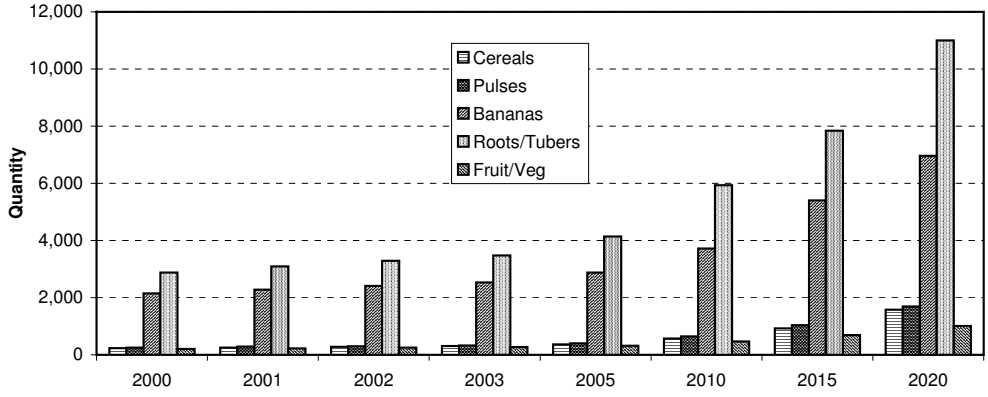
In 1990 bananas gave more cash to Rwandan farm households than coffee and that the exchange of banana beer for food helped many poor households achieve food security. In some of the areas with high productivity monthly income from banana alone may reach 60-80% of the whole household income (**PRA report, 2000**), while in remote areas with poor road network and market facilities brewing banana is almost the only cash crop. Where the size of the banana plantation is small and farm gate prices as low as 10-12 Frw per kg, the amount of income derived is comparable with off farm unqualified labor earnings (30,000 Frw per month).

Cooking banana also provides much more in terms of food energy. The study also shows that consumed directly, banana is a high-yielding subsistence crop while if turned into beer, its yield in terms of calories or proteins is low. However, the crop provides a cumulative total of 436 kcalories per capita per day on average over the period 1984 to 1990, making it the single most energy provider in the country (**Appendix 3**).

According to this study, banana intercropping already accounts for more than half of the erosion-prone hillsides in much of Rwanda. And that soil loss on fields intercropped with bananas varies greatly depending on crop management practices, but are generally well below those recorded on fields without bananas. During the field survey, farmers re-echoed this role that bananas played in the farming system of the country. Farmers attach more importance to the banana crop beyond just monetary gains.

Thus, despite the policy of de-emphasizing more banana production in preference for more nutritional and higher value products, agricultural production forecasts indicate that the crop will remain important relative to other crops. Forecasts reveal that in 2010 banana will be second to roots and tubers accounting for about 40% of total agricultural production (**Figure 1.2**).

Figure 1.2: Agricultural production forecasts ('000 tonnes) 2000 – 2020, Rwanda



Source: Rwanda Development Indicators 2001, MINECOFIN

3.2 Principle production and marketing constraints limiting the sub-sector export expansion

Banana has the marketing characteristics specific to perishable foodstuffs whose distribution is difficult to organize. Being a fruit that is generally eaten fresh, marketing of banana should be immediate. In Rwanda its production and marketing of banana currently faces several biotic and abiotic constraints along the marketing chain. These include, soil degradation, poor level of technology at cropping level, poor harvesting, inefficient handling of produce from production to consumption sites and poor product conformity.

Declining soil fertility has been a major constraint to increased productivity especially for cooking banana. Factors responsible for this include agricultural intensification due to demographic pressures. Over half of the banana crop is currently estimated to be under marginal soil conditions where only brewing bananas can be sustained under the existing management practices. In fact, this fertility decline has been one of the reasons for the heavy reliance of brewing bananas.

Pests & diseases are limiting banana productivity. The most dangerous disease is the rapidly spreading fusarium wilt (race 1) which is affecting brewing banana, apple banana as well as *Gros Michel*. Moreover, to sustain the demand for beer banana and satisfy the most urgent family needs farmers are trying to expand their fusarium affected banana plantations, further spreading the disease to new fields through infested planting material.

There is lack of seed distribution system for banana while new resistant varieties are not available. This aggravates the disease situation.

Poor marketing infrastructure in terms of roads in banana production zones reduces the volumes traded. Lack of market denies farmers the resources need to invest in soil fertility improvement thereby creating further loss of yields.

Transport is a major constraint to the marketing of banana. It accounts for the biggest cost proportion within traders margins and also makes traders incur others costs in a bid to reduce on the unit cost through over and poor loading.

Small farmers with very limited resources produce bananas in Rwanda. Small traders and women who also lack resources also dominate trading activity. Credit availability to these producers and traders is lacking and is a constraint to increased production and marketing.

There is poor market information flow along the marketing chain. Although wholesalers are not numerous, there is no information flow between them making it difficult for them to predict market conditions such as prices and quantities. This lack of detailed market information is a barrier to efficient trade and the optimal allocation of resources.

Poor loading during transportation affects the quality and the appearance of fruits as travelling traders try to maximize the load in order to reduce their marketing costs. No attention is paid to the proper packaging procedures for fruit transport, resulting in bruising and scarring and hence poor appearance and decreased quality. Bunches are vertically stacked in vehicles with no protection, which easily damages the fruit and leads to losses. Furthermore, such physical damage may lead to the blackening of both the unripe and ripe bananas and where severe causes the breakdown of the edible pulp.

Although banana is a crop with permanent production, harvesting periods and supplies are influenced by external factors such as coffee production which limits transportation opportunities thereby worsening perishability problems of the harvested fruits. This also contributes to the upward and downward price trends in relation to supply and demand volumes.

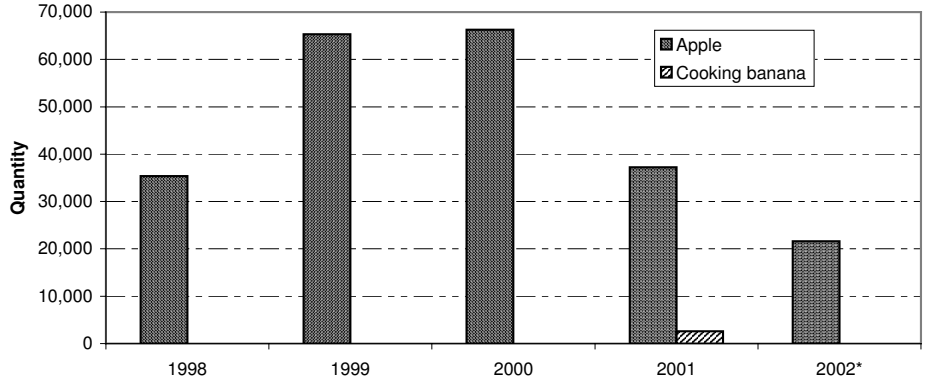
3.3 Medium and long term market outlook for exports and the sub-sector

Opportunities that exist at the moment for the export of apple banana need to be exploited to the full to realize the potentialities of the export market. In the recent past the country has exported apple bananas to the EU market. Official statistics are not conclusively collected and monitored and there are discrepancies between different sources. Also, findings reveal that exports have not been consistent mainly due to transport constraints, the low level of private sector-growth and efforts to improve production structures and penetrate the high value organic market for this commodity.
Data from MINAGRI's department of crop protection gives higher figures (**Figure 1.3).** This seems to tally with the opinions of the few traders who are at the moment involved in the export of bananas. As can be seen from the table below, apple bananas seem to offer viable opportunities for export. The two main competitors revealed that there was an untapped potential with apple bananas.

One of the main exporters of apple bananas is at the moment trying to secure organic certification with the assistance of ADAR project. Through the acquisition of organic certification, the value for this market will increase five fold, thereby providing impetus for further growth in the medium to long term.

Although official statistics below failed to show the export of a wide range of consumer durable goods made from banana bark, there exists a small but high value export market for such commodities. Again this was mainly due to poor marketability, low level of entrepreneurial abilities, low capital and high transport costs.

Figure 1.3: Exports of bananas from Rwanda (kgs), 1998-2000



** data is from January to April,2002.*
Source: MINAGRI, Crop protection department,

At the moment there is no export of banana beer despite the high production potential that the country enjoys. The modern banana beer factory in the country (COVIBAR) with a capacity of

over 2 million liters per annum has already been privatized. With government efforts to promote private sector efficiency the company is planning to enter the regional market of COMESA, which offers more opportunities than the much smaller domestic market.

4. Demand analysis

4.1 Volume

The survey makes a serious effort to estimate market size and growth for the different types of banana and banana products. It relies on data from the household expenditure survey, secondary price data from the PASAR project and also results of the market study across the banana zones of Rwanda. The household survey provides data for both urban households (October 1999 to 2000) and rural areas (July 2000 to July 2001) and by type of product.

4.1.1 Banana beer

Beer brewing is carried out extensively throughout the entire country. Using data from the household survey and the market study an attempt was made to estimate the demand of banana beer.

Market demand per capita is estimated at about 0.8 kg per year. Total demand in Kigali is about 500 MT per annum. Per capita demand in rural areas is estimated at about 3 kg, representing about 24,000 tonnes per annum.

Apart from traditional processing that is carried out at household level, banana beer is also processed by the formal industrial sector. The main industry in this sector is COVIBAR with an installed capacity of about 7,000 tonnes per annum. However, current production is about 80 tonnes per month (960 tonnes per annum), representing about 14% capacity. The major reason for this is lack of market for the beer products within Rwanda due to availability of cheaper substitutes from the informal sector, the high tariff rates and lack of an aggressive export promotion drive. Also, the factory has high overhead production costs, which contributes to highly priced products.

Household income from the sale of fruits to COVIBAR is about Frw 62 million (US$ 126,000) per annum. This figure includes imports from Uganda. If the target of 7,000 tonnes is fulfilled, income from this market segment will increase to about Frw 500 million or US$ 130,000. These estimates are conservative as they represent data from COVIBAR and exclude data from other smaller firms.

4.1.2 Cooking banana

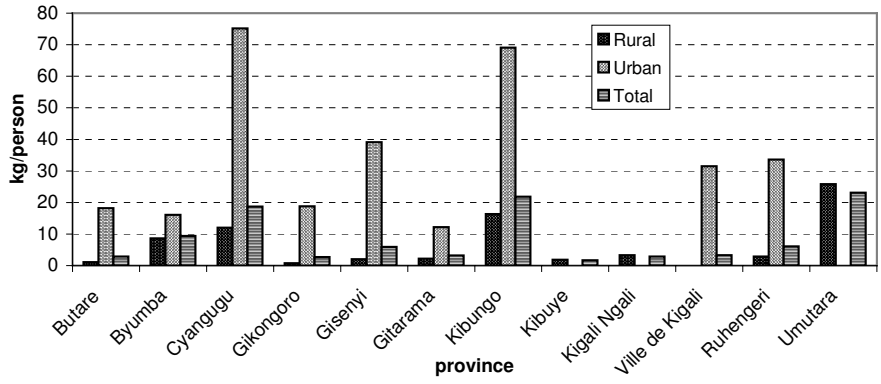
Findings from the survey show that the role of banana as a staple food in Rwanda has increased in recent years with the influx of people from countries where banana was a major staple crop. The crop has experienced market growth especially in the major urban areas and this is expected to increase further with improvements in infrastructures, urbanization and the standard of living.

The annual average per capita demand for urban areas is estimated at about 39 kg (2000/01). Gitarama, with a per capita demand of about 12 kgs has the lowest while Cyangugu has the

highest per capita demand of about 75 kgs. Kibungo, Gisenyi and Ruhengeri have relatively high per capita demand levels of about 69kg, 39kg and 37 kg respectively.

Demand variation reflects the distribution of production, growth in economic activity and improvements in market facilities. **Figure 2.1** below gives the distribution of per capita demand for cooking banana by province and area. Kibungo is the largest producer of cooking banana and is the main supplier to Kigali. It also has more developed market centers. On the other hand, Cyangugu produces the best quality bananas. Like Gisenyi, Cyangugu is also a border town and both of these are experiencing fast economic growth. Gitarama has one of the least production figures and attracts few trading opportunities.

Figure 2.1: Annual average per capita demand (kg) by province and total, 2000



Source: HCLS 2000

Per capita demand in rural areas is about 5 kg. Within the rural areas, Umutara province has the highest per capita estimated at about 29 kg while Gikongoro exhibits the least at about 0.8kg. The high figure for Umutara is partly due to the relatively low crop production in the area. This province has the highest number of livestock and is inhabited by large numbers of people who formerly lived in Uganda where bananas was a major staple.

The lower average per capita for rural Rwanda is due to the high levels of subsistence production, which still pervades the rural provinces. This scenario is enhanced by the poor marketing infrastructure in rural areas and also by low incomes due to the declining farm size.

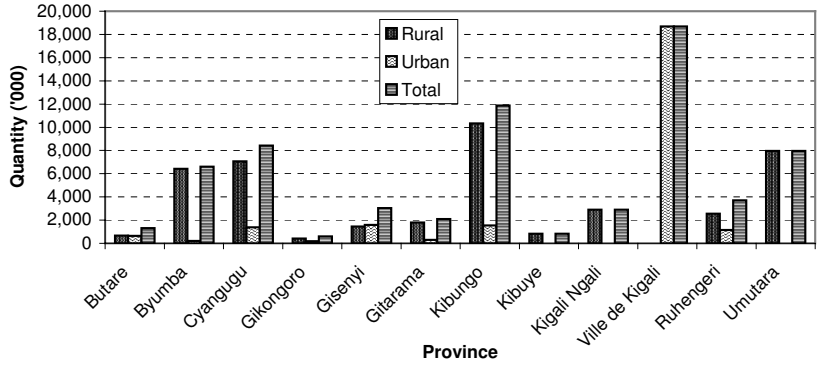
Given the predominantly rural nature of the population, total demand in rural areas is much higher than that in urban areas. **Figure 2.2** below shows the variations in market size for cooking banana by area.

Total demand (market size) in rural areas is estimated at about 37,000 MT per annum (2000), varying between about 400MT (Gikongoro) and 10,000MT (Kibungo). The market size in Byumba, Cyangugu, Umutara is estimated at about 6,000MT, 7,000MT and 8,000MT respectively. Kibungo and Cyangugu are major producers of cooking banana.

Urban demand currently stands at about 32,000 MT. However, this national average figure masks the differences in consumption and market size within the urban centers across the country. Kigali City is the main urban market and accounts for over 50% of the growth in demand.

Most of the marketing agents interviewed indicate that there is a decline in sales volume of banana products over the past few years. Although decline in disposable income is cited as a major reason, survey findings also reveal that increased competition may have led to low sales of the individual traders.

Figure 2.2: Annual demand of cooking banana by rural, urban and total (MT), 2000

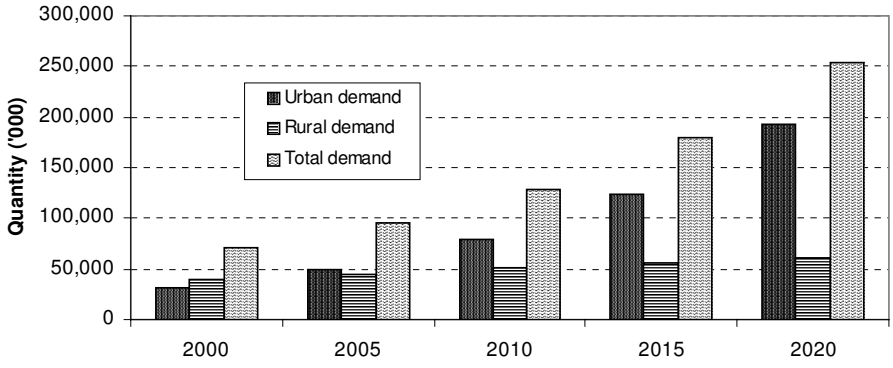


Source: HCLS results

The growth in urban market for bananas has been remarkable and has taken place within the confines of the informal sector. This increase in demand has mainly been due to population growth, urbanisation and changes in consumer preference as a result of inflows of people living in Uganda before. This new business opportunity has also had forward linkages in terms of employment creation especially for vulnerable groups such as the youths and women.

Figure 2.3 below gives a simple indicative estimate of market growth by area and total. It takes into account both the population and urbanisation effects and assumes other factors to be constant. Urban market size is expected to grow at a higher rate surpassing rural demand by 2005. The total market size is estimated to be about 130,000 tonnes by 2010 with a present value of about US$ 9 million.

Figure 2.3: Demand growth for cooking banana in rural, urban and total (MT)



Source: Own calculations

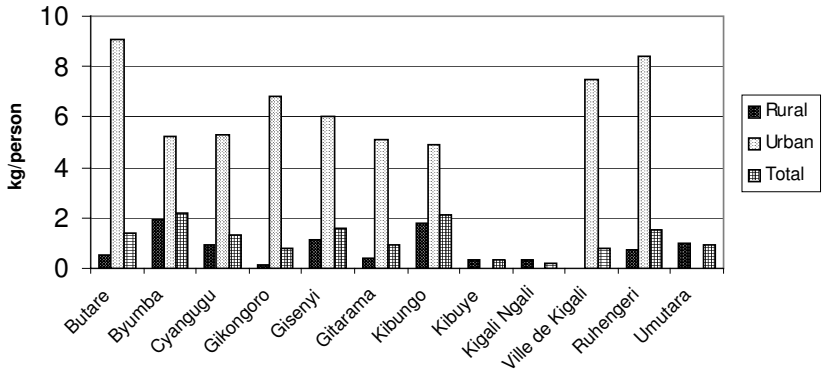
Demand is expected to increase due to increased urbanisation. Over half the developing world's population will reside in cities by the year 2025 (Bongarts 1995). Mushrooming urban areas, particularly in Sub-Saharan Africa, mean that more and more consumers will depend on agricultural marketing for their daily food requirements.

4.1.3 Dessert banana

Urban demand is estimated at about 8 kg per person per year (2000). It ranges from about 5 kg per capita in Kibungo to about 9 kg per capita in Butare, the second largest town (**Figure 2.4**). Ruhengeri has the second highest per capita of about 8 kg just about the same as the capital, Kigali. This is partly due to the high production of other crops in Ruhengeri such as potatoes with farmers exchanging these for other foodstuffs such as bananas through market sales. On the other hand Kibungo is the largest producer of dessert banana and due to the big subsistence rural economy household purchases are relatively low. On the other hand Ruhengeri produces better quality fruit banana and enjoys a bigger market. The high per capita in Butare is partly due to the relatively high social class of the population.

In rural areas, average per capita consumption of fruit is estimated at about 0.7 kg per annum. Gikongoro has the lowest figure of about 0.1 kg per capita while Byumba has the highest (1.9kg).

Figure 2.4: Annual average demand per capita (kg) of dessert banana by urban, rural and total

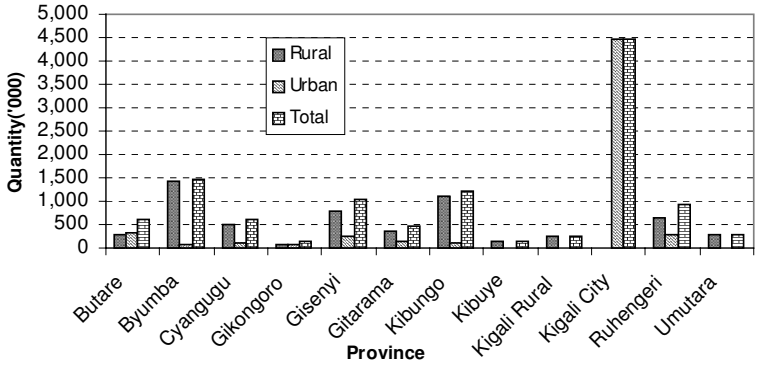


Source: Calculated from HCLS data

Figure 2.5 gives the estimated total demand for fruit banana in Rwanda (2000). Total demand (market size) is estimated at about 12,000 MT per annum (2000). According to an earlier survey by DSA/MINAGRI in 1990, rural demand (purchases) for dessert amounted to about 3,000 tonnes (**Appendix 13**). Rural demand in 2000 is estimated at about 5,000 tonnes per annum, representing an increase of about 200 tonnes per year over the period 1990-2000.

The production figure for fruit banana in 2000 was not obtained and so it was not possible to compare market demand with internal production. However earlier figures for 1986-90 put the average production at 10 % of total banana production. Assuming there has been no major changes fruit production for 2000 stands at about 200,000 tonnes. This figure is much higher than market demand even after taking into account subsistence consumption. This suggests importation of fruit banana may not be due to production deficits but rather quality and marketing related problems.

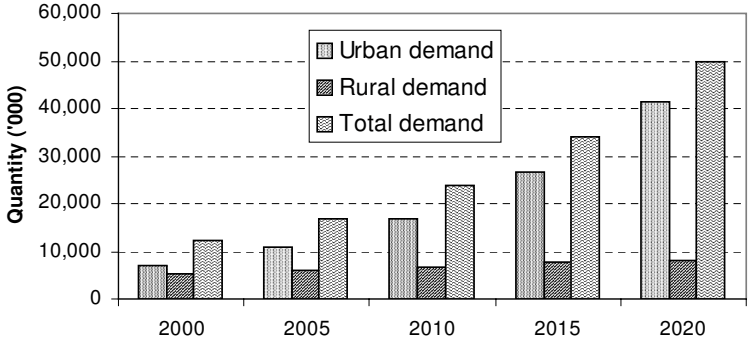
Figure 2.5: Annual demand of dessert banana by rural, urban and total (MT)



Source HCLS, 2000

Demand for dessert banana is expected to increase, with increased urbanisation and disposable incomes. The estimated market growth for dessert banana by urban, rural and total is shown in **Figure 2.6** below. By 2010 urban demand is expected to be about 24,000 tonnes spread between about 17,000 tonnes in urban areas and 7,000 tonnes in rural areas. The main reason for the relatively small market size in rural areas, despite the predominantly rural population, is the large size of the subsistence production and low incomes in the rural areas.

Figure 2.6: Demand growth for dessert banana by urban, rural and total (MT), 2000-2020 in Rwanda



Source: Own calculations

4.1.4 Plantain

Demand for plantain is small and represents only a small section of the population where plantain is consumed widely. No estimates for plantain are made due to lack of data. Expenditure figures in the household survey have no plantain information and hence it is therefore not possible to estimate demand.

4.1.5 Fibre products

There are about 4 associations promoting the production and marketing of a wide range of consumer durables made from dry banana leaves and stems. Sales outlets for these associations are found in Butare, Kigali Ngali, Kibuye and Gisenyi. Producers of these goods are mostly women who determine the price of their products while the associations retain a percentage of the sales price to cover overhead costs.

The associations sell a wide range of goods, which include chairs, suitcases, photo frames, office equipment and an array of boxes, mats and containers. Prices received for these goods in the local market are approximately 2-3 times lower than export prices, for example the cost of a chair is about US$7 whereas the export price for the same item is US$ 21.

This export market is however irregular and these associations have to wait for orders from their customers who are very few. Each association currently deals through 1 or 2 stores usually in Italy and Belgium. The combined export market value is in the range of about US$ 30,000 per annum. However, this figure should be regarded with caution given the sensitivity of income data.

The potentiality of this market has not been fully exploited due mainly to limited marketing. With increased market promotion, the value of this market segment could increase substantially.

4.2 Demand for Quality

4.2.1 Cooking banana

Different quality bananas in the Kigali markets attract different prices. Good quality bananas are those with big and long fingers. For the best quality bananas there is a premium price of 5 to 10 Frw per kg compared with other varieties at the retail level. However, there is no payment of a premium price at the wholesale level as retailers buy in bulk at the market price. There is thus a clear indication that consumers are not satisfied with the commercial quality bananas from Rwanda-smaller bunches which mostly came from Rwanda's high production area of Kibungo.

4.2.2 Dessert banana

For the export market too there is a premium price paid for high quality apple bananas to producers. Given the requirements of the export market, production is justified if a premier-quality apple banana fetches a higher farm gate price. At the moment, one company promoting quality production for export is paying about Frw 400 per bunch of about 10 kgs, which is about 167% more than what farmers would get on the local market.

The higher price should compensate farmers for the increased costs as a result of improved crop husbandry and technologies. The market segment of export-quality is being developed by Embaragge Rwanda in close collaboration with the USAID funded business development project, ADAR.

4.3 Consumer preferences

4.3.1 Cooking banana

Banana fingers are boiled and then either mixed with legumes or eaten alone. Also, they are boiled and eaten as snack in the evening especially in urban areas. Rwandan bananas are typically harvested before maturity and this makes them suitable for this method of cooking as they remain soft once boiled.

Also, due to the ealier harvest time, bananas from Rwanda and the DRC enjoy a longer shelf-life compared to those from Uganda. While the shelf life for both Rwandan and DRC supplies is 5 days that for Ugandan bananas is from 2 to 3 days.

Injagi variety is the most preferred type of cooking banana and it commands a premium price of about 5–10 Frw per kg at the retailing market. No premium price is paid at the wholesale market. It is also apparent that there is no difference in price at farm level. Generally, big bunches with long and big fingers are preferred by consumers. Also, at farm gate no premiums are paid according to variety.

4.3.2 Dessert banana

The quality for dessert banana is generally poor although there is a slight premium for good quality bananas. The size of most bananas is small and in most cases the appearance of the bananas on the local market is poor.

As already indicated, the quality for the export market is better as exporting firms are making a serious attempt to improve the quality of the banana through improved agronomic and post harvest technologies and by offering a premium price to farmers.

4.3.3 Beer banana

The quality of beer banana is poor. The size of bunches is small and the appearance is poor. Quality here is also similar to the one for dessert banana where it is used for beer.

There are differences in the quality of bananas within the country with brewing companies preferring those that are produced in Gisenyi and Ruhengeri. These have a high sugar content compared with those produced in Kibungo.

4.4 World market

This section aims to identify trends and issues in the global banana economy that might offer opportunities for increased participation by the major banana and plantain growing economies. It estimates the size and shows trends in global trade, production structures within major world producers and the changing trade policies within the major world consumers.

4.4.1 Size and trends in world trade

Banana is the world's most popular fruit. Its world trade value, estimated at more than US $ 3bn each year, is higher than all other tropical fruits combined. World import demand is estimated at around 12 million tonnes, representing about 14% of bananas and plantains production. The rest, estimated at about 65 million tonnes is eaten locally, implying that only a small proportion of production is being traded. Global trade is in fresh bananas, banana products being of limited importance.

Exports are essentially to the richer countries and they exclusively consist of Cavendish bananas, which account for about 15% of global output. The rest, over 85% of production, is made up of a wide range of banana and plantain varieties grown by peasant farmers or smallholders and their families mainly for own consumption or sale in local and regional markets. This presents problems of estimating actual production volumes.

The world market for bananas is not a single unit. It consists of a number of distinct trade groupings. Trade flows within this environment are, to some extent, explained by geographic and economic factors such as proximity to markets which minimizes transportation time and costs. Examples include exports from Central America, the Caribbean and Africa to Europe; exports from Central and South America to North America and exports from the Philippines to Japan.

Trade policies of importing countries too have divided the world into preferential and open markets thereby influencing the flow of trade. However, in the recent past there have been policy changes towards a freer trading environment.

Figure 2.7: World banana trade balance ('000 tons) 1970-1998

Source: FAO and World Bank

The world export market for bananas is becoming increasingly competitive. More than two thirds of international trade in bananas is on the open market and is free of tariffs and quantitative restrictions.

Table 1.3: World balance annual growth rate (%)

	1970-80	1980-90	1990-98
Production	1.31	3	2.93
Gross exports	0.43	2.23	5.79
Net exports	0.87	1.75	5.67

Source: FAO and World Bank

Consequently production has shown a steady increase in all regions with production rising by about 88% over the period 1970 – 1997 (**Figure 2.7**). However, growth has slowed in late 1990s. **Appendix 4** shows output data for selected years by region and country.

This growing over-supply of bananas on the world market, the corresponding price reductions and trade liberalization might be good for consumers, but they create challenging problems for small producers, such as those in the Caribbean and Africa. These farmers will have to compete with the cost-saving measures, low wages and heavy use of chemicals applied by the big plantation companies, which currently dominate the open market.

4.4.3 Major buyers

World demand for banana has been increasing more than doubling over the period 1970-1998. The main importers of this fresh fruit are the US, the EU and Japan (**Appendix 5**). Out of an estimated world demand of 12 million tonnes, the EU accounts for about 38%, representing about 3 million tonnes. The US has a market share of about 33% while the rest is shared between the rest of the world with Japan being the major importer.

The US is the world's leading consumer with an estimated demand of slightly over 3 million tonnes per annum. US demand has increased by about 33% over the period 1980-90 and by about 23% over the period 1990-98, according to FAO data. The EU is the next big consumer closely following the US figure. EU total demand is estimated at close to 3 million tonnes (1998). Within the EU, Germany has been the major consumer with a demand volume of about 1 million tonnes per annum, accounting for about 34% of the EU market. Other major consumers within the EU include the UK, France, Spain and Italy. Japan is the third largest consumer in the world with a market size of about 800,000 tonnes.

Germany and the US obtain all their supplies on the open market from Latin America with supplies into Germany entering duty free. Other countries which buy from the open market include Belgium, Denmark, Ireland, Luxembourg and the Netherlands. On the other hand France, the UK and Japan markets have offered preferential treatment.

Bananas are usually imported green and ripened by application of ethylene gas, under refrigeration in purpose-built rooms. Dessert banana of the Cavendish sub-group is the main product consumed. The market for apple bananas is still very small totaling about 1500 tonnes in the entire EU market. Of this the UK consumes about 400 tonnes of apple bananas.

There is a growing demand for apple banana. Demand for this fruit is predominantly from ethnic customers who are familiar with it and are prepared to pay a higher price than for Cavendish. However, Europeans are also now being introduced to it through supermarkets, which promote the better flavour of the baby banana.

Differentiated market segments exist depending mainly on quality. In the UK, for instance, about 50-60% of the import market is controlled by the ethnic specialist wholesalers and is characterized by non-banana specialists often with no ripening facilities. This is a low value, less stringent market, which is not expected to expand. The remaining 40-50% of the market in the UK is characterized by premium quality fruit and is handled by banana specialists with artificial ripening facilities. This is a high value market with stringent quality requirements. It is popular for marketing the baby banana (apple banana).

4.4.4 Major competitors and the advantages they enjoy

Although the geographical spread of production is wide, bananas and plantains are grown almost exclusively in the developing countries of the tropics and subtropics. Out of an estimated global

production of over 76 million metric tonnes (FAO, 1993), banana accounts for about 50 million tonnes while plantain production is nearly 27 million tonnes.

Over 70% of plantain output is in Africa, especially in Uganda and Rwanda while the major banana producing regions are Asia with around 40% of world production in 1991 and South America with around 26% of world production. India, Ecuador and Brazil are the biggest producers, accounting for about 19%, 11% and 10% of world production in 1999 respectively. Outside the major production zone there is some output by Cyprus, the Canary Islands, Madeira and Greece, but the volumes involved are relatively small.

Appendix 6 gives FAO estimates of banana exports and by region and country. Worldwide, export production represents only a small proportion of total production, estimated at around 21% in 1998. Most banana and plantain production is on small holdings and mainly grown for subsistence needs or for sale in local markets. There are few big producers who are also exporters. They include Ecuador, Costa Rica, Colombia and the Philippines, which is the only major exporter outside Latin America. Big producers that are not major exporters include India, the largest producer, Brazil, Indonesia and China, which in fact does import instead. In 1990 while Brazil exported about 50,000 tonnes, its total production reached 5.5 million tonnes.

Three basic export groups exist with the dollar banana suppliers of Latin America being the main group. These are followed by ACP producers of Africa and the Caribbean and finally the Far Eastern producers.

Production in Latin America is biased towards the export market, accounting for about 75% of world exports. Ecuador is the largest exporter within this region and also the world. It acts as the world's 'residual supplier', meeting shortfalls in exports from other countries to satisfy world demand. Costa Rica is the second largest exporter while Colombia comes third followed by the Philippines, which is the most important in the Far East.

Colombia, Kenya, Uganda, Mexico, Malaysia, Cote d'Ivore, Thailand, Cameroon, Venezuela, Mauritania and Ecuador are the main suppliers of mainland Europe. Colombia is the dominant supplier to the UK and receives a premium for its better quality apple banana product.

Although banana exporters share the characteristic of being poor countries with low per capita incomes significant differences between them do exist regarding production systems, the organisation of export marketing and distribution, and the particular export markets served.

In Latin America production systems are based on large plantations, dominated by vertically integrated transnational trading companies whose activities cover not only production but also shipping, importing, ripening, marketing and distribution. They are supported by extensive technical infrastructures and over-use of chemicals thereby producing high quality fruit at a lower cost.

In contrast cultivation systems in the Caribbean (Windward Islands, Jamaica, Martinique, Guadeloupe) and West Africa (Ivory Coast and Cameroon) are very similar to those in Rwanda and are based on smaller farms, regular replanting, topographical variations and less permanent infrastructures though still emphasizing fruit quality for export.

Dessert banana of the Cavendish subgroup (Musa AAA) predominates world trade. Cavendish bananas are about the same size as Gros Michele but more curved and uniform in shape, which also makes them easier to pack in boxes. They also possess long storage properties and can be shipped around the world by sea in refrigerated ships for a fraction of the transport costs from countries such as Rwanda.

For Rwanda varietal production differs and mainly consists of brewing types (AAA-EA, AB, ABB), with Pisang Awak ABB predominating for many decades (PRA 2000). East African Highland cooking types (AAA-EA) and dessert bananas (AAA, AB) follow in that order. Cultivation systems are based on organic fertilization, replanting and rotation cropping, weed control, and inter-cropping combinations to increase cash flow. There is a general absence of chemical farming or other inputs of capital and technology and organic fertilization is on the decline.

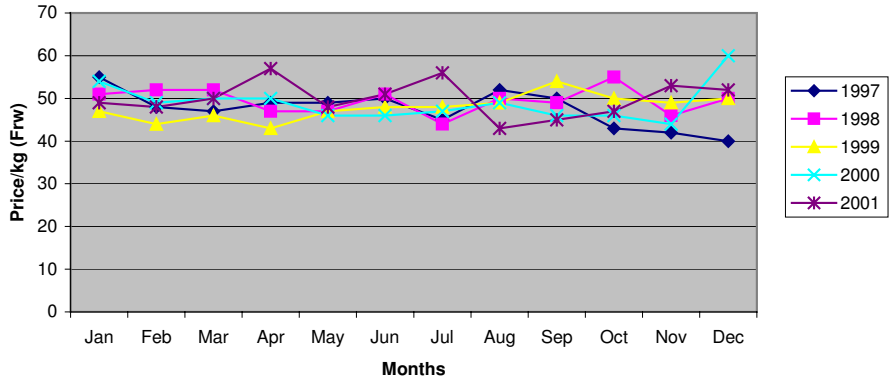
Over the years increases in export production have been depressing prices and against this background, important changes in the trade policy of importing countries are happening. These are making the trading environment more competitive with major challenges for small and poor producers like Rwanda.

For Rwanda issues of quality, limited product supply, limited cargo space and high freight rates will have to be resolved so as to compete effectively on the world market and take advantage of the changing trading environment.

4.5 Market price trends

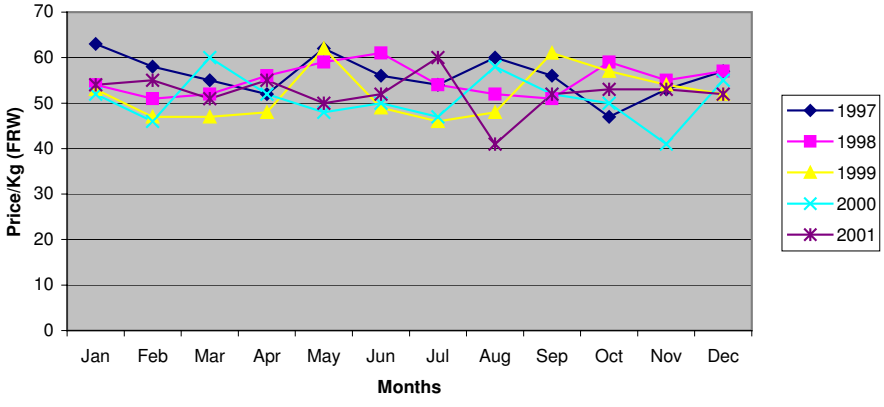
Figures 2.8 and **2.9** below show nominal price trends for cooking banana in rural and urban Rwanda. These are collected by the PASAR project across the country in the major provincial markets. Generally prices show high fluctuations in response to market forces and the perishable nature of the crop. However, despite the high fluctuations, prices generally increase towards the Christmas and Easter holidays due to high demand. On the other hand July to September, prices are generally low due to increased supply.

Figure 2.8: Cooking banana rural prices 1997-2001



Source: PASAR data

Figure 2.9: Cooking banana urban prices, 1997-2001



Source: PASAR data

International

Although good production has put some downward pressure on banana prices, they have been strong in the major importing economies. Prices in the US have averaged US$ 514/ton during the first quarter of 2000, showing a 52.9% increase over the previous quarter's average of US$ 336.4/ton, and 11.6% higher than a year before.

Wholesale prices in the UK for the period January 1997 to March 1998 have varied between US$ 5 to US$ 7.6 per kg. In the rest of Europe prices are generally similar with fluctuations being less since apple banana is not grown in any European country in commercial quantities and established suppliers being few.

Table 1.4: World banana prices (US$/ton)

	Actual					*Forecast*			
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2005**	**2010**
Current	469.6	517.1	489.5	373.2	468.5	496	518.1	556.7	567.7
Constant 1990	411.2	477.1	469.8	360.4	441.3	455.9	464.1	465.8	420.2

Source: FAO and World Bank

4.6 Overview of market potential for banana and banana based products

This section summarizes the potential for banana and banana based products in local, regional and international markets.

Areas with good potential to increase banana sales in the near future (<5 years)

International export markets for fresh and organic fruit

Products that are healthy, environment-friendly and organically grown are becoming increasingly important in European markets. Their demand is said to be growing at 40% per year with 69% of organic produce being sold in supermarkets (Carlton 2001).

Rwanda is currently exploring ways to increase its sales to European markets. One of the two main exporters is trying to obtain organic certification with assistance from the ADAR project. All the current exporters suggest that there is a high potential to increase their trade volumes. Exports of fruits show an increase of about 100% from 1998-2000 and although they decline in 2001, they seem to have picked up once again in 2002.

As pointed out in the Ugandan component of the study, initially focusing on wholesale markets might be a good strategic approach before entering the retail and supermarket outlets through which about 70% of organic produce is marketed.

International export markets for naturally dried bananas

An earlier survey points out the existence of opportunities in European health snack markets especially if naturally dried fruits can be marketed in an appealing way (**Carlton et al 2002**). Similarly current exporters in Rwanda suggest that there is a high potential for Rwanda to supply this market and one of them is producing chips.

This market offers higher value necessary for further investments in improved production and processing techniques, which are major problem areas for Rwanda at the moment. The Ugandan banana survey indicates prices ranging from US$ 15 to US$ 19 per kg.

Local market for banana beer and juice

Banana beer is widely consumed in the country and as already pointed out production is dominated by brewing bananas. A larger part of production is utilized in the informal sector and survey estimates put total demand to be around 24,000 tonnes per annum.

Processing is done both in the informal and formal sectors. One of the major problems in the formal sector production and marketing is the relatively inexpensive availability of the local brew although of a poor quality. As incomes increase in the near future, it is expected that consumption of the improved and better quality brewed banana will increase.

Local market for dessert banana

The fresh fruit market is said to be gradually growing with increased urbanisation and disposable incomes. At the moment this market segment is small and is being supplied mainly from the DRC for Gros Michele.

Although the market is growing Rwandan production will have to grapple with problems of poor quality and low production if it is to increase sales of dessert banana.

Local market for matooke

This market segment has been increasingly. Supplies into this market are mainly from Uganda and also the DRC. Opportunities for Rwandan supplies exist from the Lake Kivu area but like dessert banana major interventions at improving quality and quantity are a pre-requisite. Also, improvement in marketing infrastructures aimed at reducing costs is an important prerequisite

Areas viewed as having moderate potential for growth in the future (5-10 years)

International market for fibre products

This market is also small but traders talked to suggest it is most likely to increase if increased advertisements are carried out. Also, prices in the foreign market seem attractive given the high-income levels in the more developed countries. Increased sales volume in this market is thus not dependent upon incomes unlike in the home market.

Local market for fibre products

The local market is small and is expected to grow more slowly due to the growth in income and urbanisation.

Local market for Plantain

Local sales volume for plantain is very small. Its production is not widespread and demand may increase slowly if further promotion activities are carried out by research and development institutions. This product does not seem to be a major food item.

Areas with low potential for growth in the foreseeable future (>10 years)

International markets for cooking banana

Sales growth opportunities in this market are very minimal, as Rwanda does not enjoy a comparative advantage in the production of cooking bananas at the moment.

Banana flour

Although banana flour is used a partial replacement for more expensive flours in the bakery industry, it has not yet been produced in the country.

5. Supply Analysis

5.1 Production

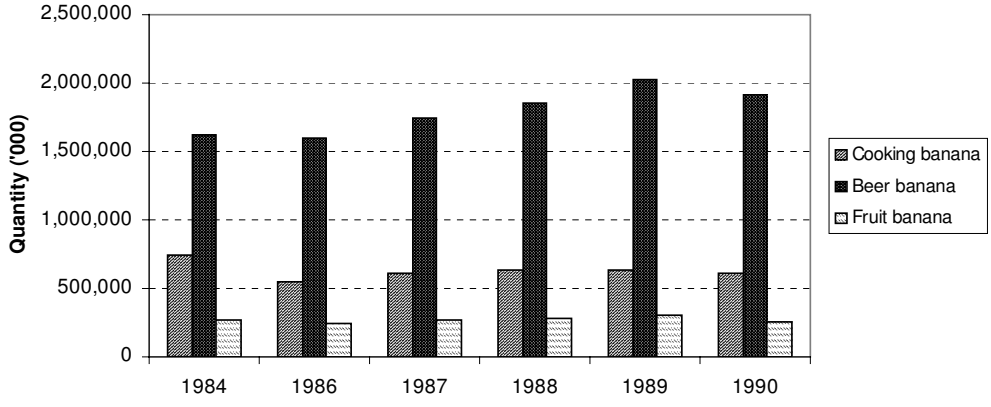
Rwanda is a major producer of banana. Much of the country is around 1500 meters where bananas yield well. Most of the country receives sufficient rainfall apart from a very small area in eastern Rwanda, which is too dry for banana production. **Appendices 7, 8 and 10** show the relative importance of banana.

Bananas are harvested throughout the year with the average number of bunches and bunch weight increasing in the June-September period. Highest yields are obtained during the period August-October, 4–5 months after the peak rainfall in April further depressing prices (**Figures 2.8 and 2.9**).

In the recent past, rapid population growth and associated food security concerns have led to changes in land use and cropping patterns, making banana the single most important crop. In the 1960s and 70s cultivated area grew approximately as fast as the population and by 1970 one-fifth of the cultivated land was estimated to be under bananas. According to data from Ministry of Agriculture, the area under banana grew by 27% over the period 1984-90.

Average production over the period 1984-90 is estimated at 2,690,000 MT per annum, representing about 59% of total agricultural production. Total banana production grew from 2,691,911 MT in 1984 to 2,776,766 MT in 1990, representing a growth rate of about 5%. According to data from MINAGRI production decreased to 1,489,000 MT in 1994. Thereafter, production consistently increased up to 2,897,433 MT (1999) and again declined in 2000 to 2,212,250 MT (**Figure 3.1**).

Figure 3.1: Production trends (MT) by type 1984, 1986-90



Source: MINAGRI

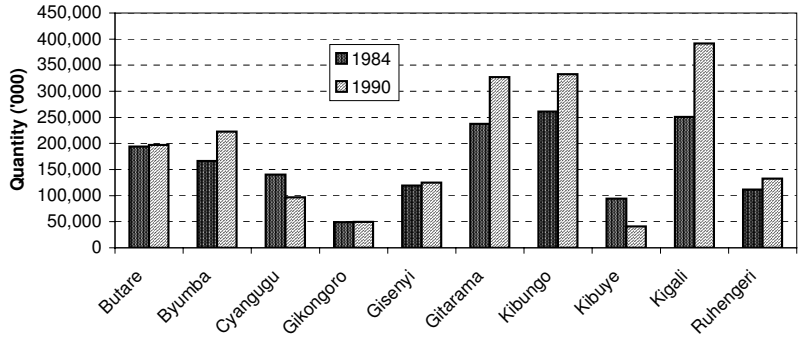
Brewing banana is the major type, followed by cooking banana and dessert banana. There have been changes within these percentages as can be seen from available data. For the period 1984-90, beer bananas grew by about 18% while both cooking and fruit banana production declined by about 20% and 5% respectively. Unfortunately disagreggated figures from 1991 are not available and hence it is not possible to quantitatively track trends in production by type.

5.1.1 Beer banana

This is still the major type of banana produced in the country, accounting for about 70% of total banana production, dominating output in all of the provinces. Beer banana has better yields than cooking bananas as soil fertility declines. Production ranged from 1.5 million MT in 1986 up to 2 million tonnes in 1989 (**Figure 3.2**.) Production consists primarily of AAA-AE, AB and ABB.

The importance of brewing bananas has increased during the last 30 years as farmers abandoned coffee. Farmers have responded to earlier famines and declining soil fertility by planting more beer bananas, which can be eaten in times of distress.

Figure 3.2: Production variation in beer banana 1984, 1990 by province (MT)



Source: MINAGRI

Brewing banana is mainly grown for the market and it is a major cash crop for rural households with an estimated 80% output being marketed. Thus despite government efforts to encourage farmers to shift from brewing bananas and, where possible to increase production of cooking types or other crops, brewing banana are a major crop in the rural economy of Rwanda.

5.1.2 Cooking banana

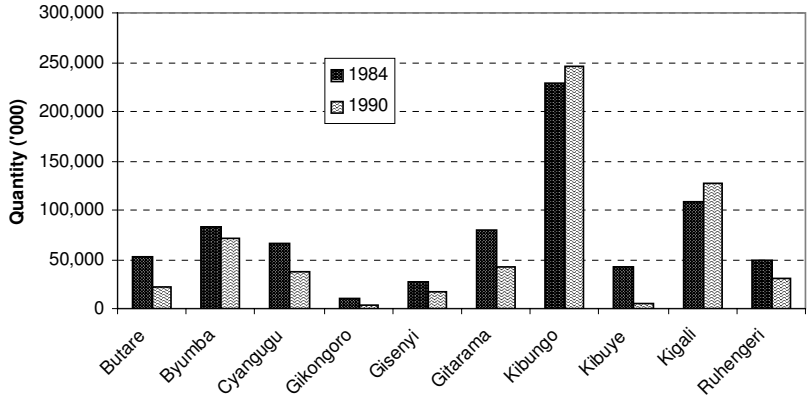
Cooking banana production consists primarily of AAA-AE. In 1984 production was about 700,000 MT but this dropped by about 25% to about 500,000 MT in 1986. From 1986

production of cooking banana gradually increased up to 1989 and thereafter dropped again in 1990. Average production over the period 1986-1990 was about 600,000 MT, representing about 20 % of total banana production in the country.

The expansion in cooking banana production has been due to the increased demand especially in urban areas and the efforts to shift away from brewing banana.

Kibungo province is the major producer of cooking banana followed by Kigali Rural. More than half of cooking bananas produced are consumed on-farm. Both of these provinces are near to the major urban market in Kigali and enjoy marketing infrastructures.

Figure 3.3: Production variation in cooking banana by province 1984, 1986-90 (MT)



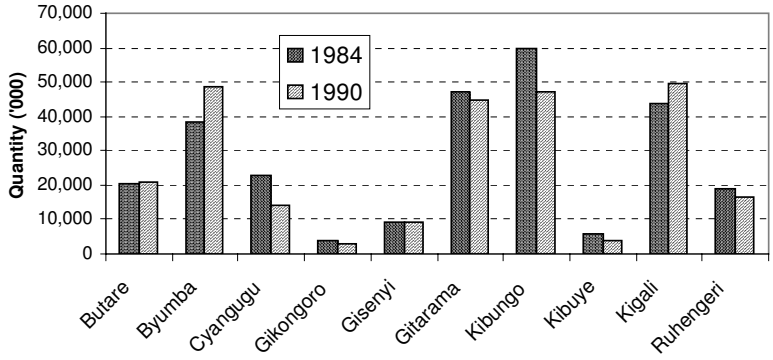
Source: MINAGR

However, production of cooking banana is still insufficient and or of poor quality and the country depends on supplies from outside mainly Uganda for the urban market of Kigali. This trade is informal, which partly explains why it is little understood. Actual figures of cooking banana imports are not available officially and estimates from earlier studies looked at do not have data for the entire year. They also do not differentiate the type of banana. However, they do indicate that the quantities involved are quite substantial.

5.1.3 Dessert banana

Dessert banana production is still small accounting for about 10% of total banana production in Rwanda. It consists primarily of AAA and AB types (**PRA 2000**). Average production over the period 1986-90 was about 270,000 MT. Production dropped by about 9% between 1984 and 1986 according to available statistics. From 1986 up to 1989 production persistently increased but thereafter dropped again in 1990 reflecting a general decline in all banana production across the country.

Figure 3.4: Production of fruit banana by province 1984, 1990 (MT)



Source: MINAGRI

Dessert is mainly produced for the market, with about 60% being sold. There is a small export market of AB apple dessert bananas to Belgium currently fluctuating between 30 and 70 tonnes per annum for the period 1998 to 2001. Dessert is also used in the beer making due to its high sugar content. There are imports of dessert too from mainly Uganda for the brewing industry. Ugandan dessert is of a much higher sugar content. It is comparable to dessert banana from northern Rwanda. Ugandan dessert is favoured because it is cheaper.

5.2 Production zones

Much of Rwanda has a mild climate that is favourable to banana production. Banana is grown in all the regions of the country and is found in areas ranging from 800 meters above sea level to the highland zones as high as 2000 meters above sea level.

Although production spans most of the country, high production areas are found between 1300 and 1800 meters above sea level. These areas also benefit from optimal rainfall conditions that range from 1300 to 1600 mm per year. Rainfall intensity diminishes to between 1100 and 1200 mm per year in the central zones and further to less than 1000 mm per year in the eastern part of the country.

According to available statistics from MINAGRI, major producers in 2000 include Kibungo, Kigali rurale, Byumba and Gitarama. Kibungo accounts for about 22% of banana production and it is the major producer and seller of cooking banana into Kigali market.

5.3 Production costs

Estimating production costs is still a tedious exercise in many of the developing countries. Much of the production is subsistence and on a small scale. Farmers in many cases rely on own inputs which are not costed. The fact that farmers do not keep records further compounds the problem. Production costs are therefore only estimates and should be treated with caution.

Table 2.1 below shows estimated farming margin for cooking banana in Ntongwe district, Available results suggest the existance of a net margin of about 17%, depending on the yield.

Labor is the most expensive item. Although many of the household depend on household labor, others use hired labor at times. Also, there is low application of chemical fertilizer and other capital organization. Planting material accounts for the largest proportion of production costs, followed by ploughing.

There is an indication that the margin can be increased with an increase in productivity. The data below assumed a yield of about 10 tonnes per hectare which is even lower in other areas.

Table 2.1: Estimated production costs for cooking banana

Farmer	Frw/kg	% of selling price
Ploughing	5.0	
Digging	1.5	
Manure purchase	2.0	
Manure application	0.5	
Purchase of planting material	10.0	
Planting	1.0	
Weeding	0.8	
Total costs	20.8	
Selling price	25.0	
Net margin	4.2	16.8%

Field data

5.4 Production constraints

Despite the growth in acreage, productivity has declined in recent times **(Appendix 9**) thereby failing to benefit from increasing market opportunities and also further threatening food security. Production increased from 1995 up to 2000 when it drastically fell, leading to an increase in prices. The decline in output in 2000 is estimated at about 29% compared to the1990 figures.

This decline in productivity is due to several factors, which include poor agronomy, declining soil fertility, pests and diseases, drought, wind and changes in the socio-economic environment.

5.4.1 Poor agronomy

Generally, the standards of farm management are low leading to low productivity. There is limited use of manure or mulches due to lack resources. While banana has been traditionally inter-cropped with annuals especially beans, some farmers have found this to impact negatively on banana production (PRA 2000). Traditionally, banana is intercropped with annual crops (predominantly beans). However, according to some farmers this also contributes to the low productivity.

5.4.2 Declining soil fertility

Soil fertility levels have declined due to continuous cultivation, without the use of fallow, fertilizers, or crop rotation. Continuous cultivation has over time resulted in nutrient exportation through harvested crops while land pressure has greatly reduced or eliminated the use of fallow and crop rotation. Poor soil conservation measures have also contributed to loss of fertility through erosion. The use of organic fertilizers is very limited given the small number of livestock.

Cooking bananas is more sensitive to soil fertility levels and it is one of the reasons it is not the dominant type of banana grown in the country.

5.4.3 Pests and Diseases

Cooking banana is more susceptible to pests. The leading pest on cooking banana was banana weevil while brewing banana (type ABB) was most affected by Fusarium wilt. This was both reported by the PRA study of 2000 and repeated by farmers in Cyangugu.

Given the dominance of beer banana, fusarium wilt is the most damaging and rapidly spreading disease across Rwanda. Other diseases are limited to certain areas. Banana streak virus is limited to Kibungo, banana bunchy top and bacterial wilt to Cyangugu, cigar end rot to Gisenyi and banana weevil to Kibungo and Kigali rurale. Nematodes are widespread. Pesticides are not used at all as well as mineral fertilisers.

5.4.4 Planting material

Use of high yielding cooking banana varieties is not widespread. Producers generally use their own planting material or those from their neighbours. Cyangugu area is an exception here as the best cooking variety (injagi) dominates supply. There is no planting material supply system running in force within the cooking banana market at the moment.

Banana planting material was obtained primarily from own old banana plantations in all sites. Sometimes farmers also got planting material from neighbors. Suckers were usually given out for free, with exception of one site, Kanombe, (which is very near to capital) where suckers were

sold. Suckers were also sold in Rukira, but the difference with Kanombe was that it was only sold to those from outside the village.

5.5.5 Labour

Production largely depends on family labor (>60%) (PRA findings, 2000) except in commercialized areas like Kayonza in Kibungo region where more than 50% of labor is hired. It is also labor that is more skilled than the rest of the country.

6. Banana trading

6.1 Regional trade

While official data on cross-border trade is not conclusive and consistent, survey findings reveal the existence of highly organized, complex and dynamic regional trade flows. This regional trade is happening within the informal sector, which partly explains why these markets are less understood and also why reliable data is not available. Nevertheless, attempts have been made to understand these trade flows and **Table 2.2** shows results from the Joint Crop Assessment survey.

During the second season of 1999 imports of bananas are estimated to be about 1,300 MT while this figure shows an increase to about 11,000 tonnes in the first season of 2001, according to results from the Joint Crop Assessment survey. Also, this data confirms that the DRC and Uganda are the two main suppliers of bananas to Rwanda at the moment.

Table 2.2: Regional imports of banana by origin

Country	1999(second season)	2001 (first season)
Burundi	6,000	0
DRC	2,436,000	1,848,000
Tanzania	0	5,000
Uganda	1,351,070	11,261,300
Grand Total	**3,793,070**	**13,114,300**

Source: Joint Crop Assessment survey

As already mentioned, data on imports is not consistently collected and there seems to be no body that is specifically charged with its collection and monitoring. For instance, data from the Department of Statistics, Ministry of Economy and Finance below does not contain regional banana trade and instead captures information about overseas markets.

Table 2.3: Overseas imports of banana and banana products into Rwanda, 1999-2001

Type of banana	1999		2000		2001	
	Value Frw (cif)	Weight (kg)	Value Frw (kg)	Weight (kg)	Value Frw (kg)	Weight (kg)
Dessert banana including plantain	0	Nil	0	Nil	0	Nil
Fresh banana	0	Nil	0	Nil	0	Nil
Banana beer	947,330	230	0	Nil	0	Nil

Source: DS/MINECOFIN, 2002

As can be seem from the table above, only about Frw 947,000 worth of banana beer was imported into the country over the period 1996 to 2001 and this was from China.

The survey therefore makes a serious attempt to estimate the market size of imports for banana by product. Field analyses and interviews reveal that there seems to be an increase in recent years of regional banana trade and this is confirmed by earlier attempts to estimate cross-border flows.

6.1.1 Cooking banana

The market size for cooking bananas is about 70,000 tonnes per annum of which urban areas account for about 30,000 tonnes annually (HLCS, 2000). Kigali is the main urban center and its market size is about 19,000 tonnes annually representing about 60% of urban market size.

Field data indicates that total cooking banana imports amount to about 19,000 tonnes annually and that most of these imports are consumed in urban areas. About 15,000 tonnes, representing about 80% of imports is consumed in Kigali.

The major supply countries are Uganda and the DRC with Uganda being the main supplier of cooking banana (about 15,000 tonnes). The DRC on the other hand supplies about 4,000 tonnes annually. Also, while supplies from Uganda end up in Kigali, DRC imports are mainly consumed in the urban areas of the Lake Kivu region, mainly Gisenyi and the sorrounding areas. This was due to the long distances involved and the time lost during packaging and repackaging of the bananas from DRC.

6.1.2 Brewing banana

Brewing banana is being imported from the DRC. The survey estimates that about 4,000 tonnes is imported annually. It was not possible to estimate the quantities consumed in Kigali but unlike cooking bananas, brewing banana imports seem to be transported to many areas including Kigali. This is due to the fact that it is used as a raw material and hence its markets and channels are different and not affected by perishability and time constraints.

6.1.3 Dessert banana

This is also currently being imported. There are direct supplies by traders to the main brewing industry of COVIBAR in Kigali. According to officials of this company this happens during times of scarcity within Rwanda. It was not possible to estimate the quantities involved. Also, dessert bananas are imported through the informal marketing channels eventually ending up in the food markets in the country including the capital Kigali.

6.1.4 Plantain

Although this is also being imported, it was not possible to estimate the quantities. However, they seem to be small compared with other types of banana imports.

6.2 Description of the supply chain

Banana producers are small and scattered and generally sell the fruit at the farm gate.
Marketing therefore involves a few wholesalers distributing bananas to consumers on a large scale. This has contributed to the development of complex marketing channels with middlemen playing an essential role in the coordination of purchases of banana, transport and sale, thus being able to pocket a larger proportion of the value added along the chain.

6.2.1 Cooking banana

Trade in cooking banana is dynamic and driven by the perishability of the fruit, which necessitates swift movement from farm to consumer, with a minimal number of transactions. The market starts very early in the morning hours with travelling traders competing to get to the market as early as possible. Prices are determined by the quantity supplied each day and it is difficult for traders to pre-determine the quantities that will be supplied. On the other hand, the days supply is mainly influenced by the closing price of the previous day. Traders are forced to discount their prices if supplies get to the market days after harvest or late in the morning.

Figure 3.5 indicates the trading chain. The role of farmers is restricted to production and price negotiation either with the, travelling traders or their agents. In the case of Ugandan supplies, travelling traders contact their local agents on returning from Kigali and arrangements are drawn up for the next day's business. The decision to transact business depends on whether margins for the previous transaction were good or not.

After sampling for yield, rural assemblers and farmers generally agree on one price for all the supplies from a particular farmer unless in case of extreme cases where farmers would then top up in terms of more bunches.

Usually, buying starts very early in the day with supplies being collected from various locations. Loading is done quickly and thereafter the trucks drive into Rwanda where they spend the night. All this is done to enable the traders get to Kigali very early in the morning.

Rural assemblers hire the labor to harvest and carry the supplies to collection points from where travelling traders collect them. Local agents merely provide a service and at no point do they take possession of the supplies.

Traders hire labour to load bananas on the truck. Despite their desire for good quality bananas, many traders clearly take a risk as purchases are done for them by a third party-their local agent. In this case bunches may be smaller than anticipated.

Bunches are loosely loaded onto trucks. In most cases big bunches (the most marketable size) are loaded on top. Travelling traders normally want to load the truck to the full in order to reduce the unit of transport. The requirement to check supplies through unloading on the Ugandan side of the border implies that traders would not only loose time but also incur more expenses through loading and unloading. According to travelling traders, this leads to quasi-official payments in order to be let through.

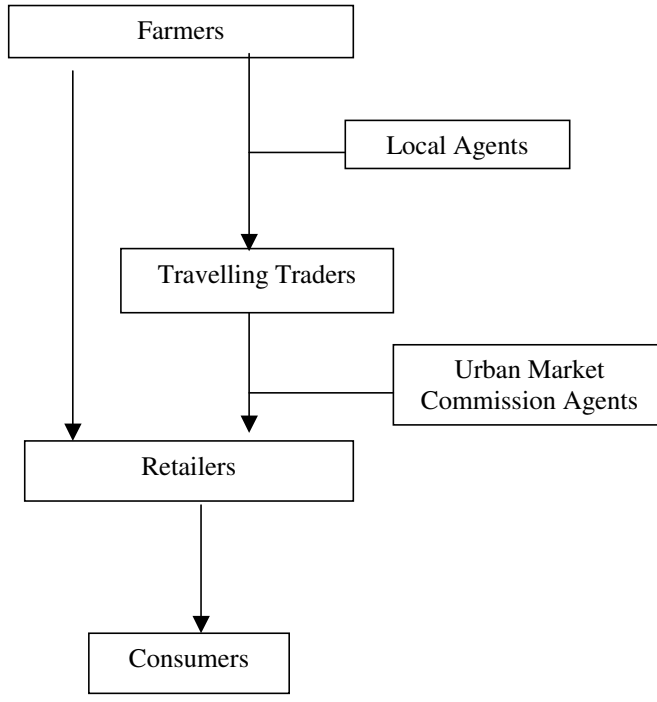
Travelling traders usually hand over the responsibility for selling the bananas to commission agents, who, in return for a fee, use their knowledge of local market conditions to sell to retailers.

The latter sell to the public either within the confines of the market in which the bananas have arrived, or transport the fruits to outlets scattered throughout the city.

Banana prices vary on a daily basis. While demand is usually constant, the arrival of a large number of travelling traders can drive down prices. Conversely, a lower than average number of travelling traders will cause prices to rise. This daily variation creates price risk for traders, who can not predict market prices when they negotiate purchase prices with farmers. Another problem that unpredictable market conditions create for travelling traders is uncertainty over the ability to sell before the banana spoils. If many traders arrive at a market, several will be obliged to find alternative markets within Kigali. This increases both the cost of transport and the possibility that the trader will be forced to discount his sales due to deterioration. Ntungamo supplies the largest share of cooking bananas to Kigali markets.

Generally, post harvest losses are minimal given the high demand for banana and they may occur due to delayed sales. Bananas may stay for a few days just before consumption and/or sale. Such losses are reflected in lower prices.

Figure 3.5: The Banana Trading Chain



6.3 Trading margins

6.3.1 Cooking banana

Table 2.4 is constructed using data collected during fieldwork in Kigali. Margins for travelling trading are for the chain from Uganda, which is the main source of cooking banana in Kigali.

Table 2.4: Costs and margins within the trading chain (cooking banana)

Marketing agent	Frw/kg	% of selling price
Farmer		
Selling price	7.9	
Village assembler		
Purchase price	7.9	
Selling price	10.4	
Gross margin	2.5	24.0%
Costs		
Miscellaneous labor	0.9	
Transport/collection	0.9	
Net margin	0.7	6.7%
Travelling trader/wholesaler*		
Purchase price	10.4	
Selling price	33.0	
Gross margin	22.6	68.5%
Costs		
Loading	0.6	
Truck fee	5.7	
Fuel	4.2	
Customs duty	1.9	
Weighing (labor & equipment)	0.1	
Unloading	1.0	
Commission	0.4	
Miscellaneous	0.7	
Total costs	14.8	
Net margin	7.8	23.6%
Retailer		
Purchase price	33.0	
Selling price	35-45	
Gross margin	2-12	5.7%-26.7%
Costs		
Overheads	0.3	
Variables	0.3	
Total costs	0.6	
Net margin	1.4 -11.4	4%-25.3%

* Margins for wholesalers represent Ugandan supplies
Source: Field data

The only variables that change according to season are the farm gate buying price and the cost of harvesting, both of which are higher in the dry season. However, there was indication that these too may at times change due to competition. An attempt was made to include average annual values in the table.

Although data in the table reveals that travelling traders enjoy a large gross margin, profitability is quite modest, once their numerous costs have been deducted. In addition, their net returns should be put in the context of the high risk they face, especially in terms of uncertain market prices. According to the travelling traders, market prices are highly volatile and may vary by as much as the traders margin on a daily basis.

Table 2.5 Costs and margins for trading activities from the DRC (cooking banana)

Marketing agent	Frw/kg	% of selling price
Farmer		
Selling price	6.7	
Travelling trader/wholesaler*		
Purchase price	6.7	
Selling price	16.7	
Gross margin	10.0	59.9%
Costs		
Loading	0.3	
Transport	5.0	
Unloading	0.3	
Customs duty	0.3	
Total costs	5.9	
Net margin	4.1	24.6%
Wholesaler-Rwanda		
Purchase price	16.7	
Selling price	26.7	
Gross margin	10.0	37.5%
Costs		
Transport	6.7	
Miscellaneous	0.3	
Total costs	7.0	
Net margin	3.0	11.2%
Retailer		
Purchase price	26.7	
Selling price	30.0	
Gross margin	3.3	11.0%

** Margins are for congo trade*
Source: Field data

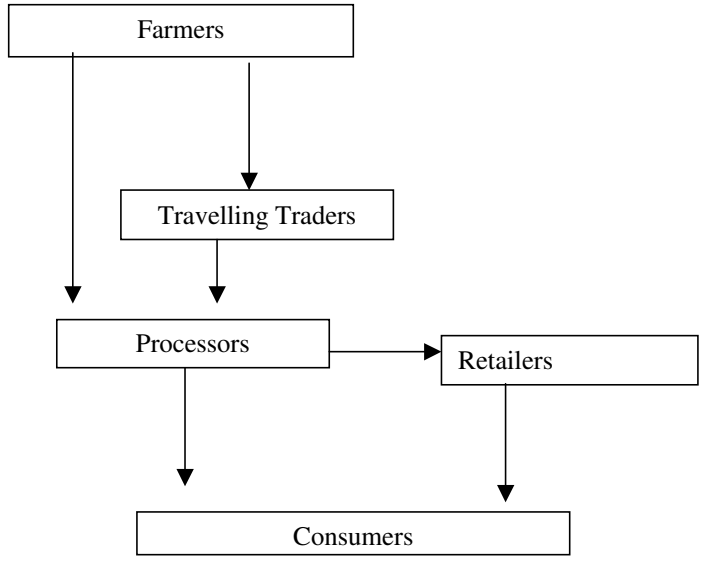
Margins for urban retailers should also be put in the context of the risks they undertake especially perishability which reduced both the price and weight of the bananas with time. Thus there seemed to be an attempt to put in an allowance for weight loss during the time of purchase. More so, the relatively small volumes sold by the average retailer severely limits overall net income.

Table 2.5 shows estimated margins for cooking banana from the DRC. Some wholesalers in a bid to increase their margins do retail the product in far away markets in the Lake Kivu region. For traders who transport the bananas into Kigali, they have to sell the next day due to the distance involved. This explained the poor appearance of the congo bananas as they spend more days in transit unlike the bananas from Uganda or Kibungo.

6.3.2 Beer brewing

As already mentioned, much of the production in the country is beer banana with local brewing being dominant. It is mostly used in beer making although in severe drought cases it is also used as food. It is one of the most traded commodities in rural areas. **Figure 3.6** below gives the trading chain for beer banana. It is sold to processors either directly by farmers or through travelling traders. It thus provides a ready source of income to rural households. Processors also either sell the transformed product directly to consumers or to retailers.

Figure 3.6: The Beer banana trading chain



Unlike cooking banana, trade in beer banana takes place at any time and is thus not affected by market uncertainties as much as cooking banana. It is sold to processors with permanent processing sites, which are scattered throughout the country. According to the PRA 2000 over 80% of beer banana is sold.

Table 2.6 gives an estimate of the margins along the brewing chain. The margin increases from about 11% in rural areas through 38% and to about 180% in higher value urban markets. Moreover, the turnover for beer marketing is much higher. Returns from banana beer are higher with rural brewing where costs are lower and thereafter transporting the less bulky product to urban markets. The price per liter in most urban areas was about Frw 130 compared to about Frw 50 in rural areas.

Table 2.6: Costs and margins for banana beer processor

Item	Frw/lt	% of selling price
Beer banana (450kg)	33.8	
Sorghum (30kg)	5.2	
Firewood	1.2	
Grasses	1.2	
Brewing	4.6	
Water	0.7	
Frying/grinding sorghum	1.2	
Total cost	48.7	
Selling price	54.1 - 135.1	
*Margin	5.3 -18.8 - 86.4	10.9% - 38.6% - 177.3%*

*Margin ranges from about Frw 5 in rural areas to Frw 86.4 in urban areas
Source: Field data

7. Major findings

The survey made a number of major findings, which might offer opportunities for market led growth. It also highlights constraints to developments in the banana subsector in Rwanda. Some of the major findings regarding the major banana commodities are highlighted below.

7.1 Brewing banana

Results suggest declining soil fertility and productivity for brewing bananas. Farmers have reacted to this situation by shifting to the production of more brewing bananas and away from other crops like coffee and cooking bananas. This has made beer banana to predominate and play a crucial role in the farming system of the country.

Farmers' reaction to the declining soil fertility suggests disturbing trends in the farming system as farmers are not investing in soil conservation measures. If soil fertility is continually eroded it will have serious negative food security implications related to this staple crop.

Implications of declining soil fertility and the demographic pressure have also meant that brewing banana is now the main crop in the rural economy, playing a major role in food security, household income and soil protection. In times of famine, its eaten as food.

Although beer production predominates, the country still imports beer bananas from the DRC. Imports are estimated at about 4,000 tonnes or more. The actual figure is difficult to determine due to the big informal sector and the fact that internal agricultural markets have not drawn equal attention in reaserch and development. Several factors are responsible for the importation and they include:

- The availability of low cost production in neighboring DRC compared with Rwandan production. Congolese bunches are bigger.

- Congolese traders have a well- established marketing organisation, which enables them to enjoy economies of scale and supply a cheaper product, and

- The poor infrastructure in rural Rwanda which makes transport costs very high.

Banana beer has a high margin and turn over. For processors in the rural areas the margin is about 11% while those in urban areas enjoy over double this margin. Thus banana beer is the most profitable banana related enterprise at the moment. In addition, due to the poor infrastructure cheaper and easier to transport beer than bunches which are bulky. It is a major provider of incomes to rural households.

Marketing of banana beer is less risky and has fewer channels than other bananas. It is not driven by perishability like cooking banana and supplies are ferried directly to processors.

7.2 Cooking banana

This is the second major banana commodity sub-group or market. Production of cooking banana is failing to keep pace with the growth in market demand. The market for cooking banana is growing and is estimated at about 70,000 tonnes, reflecting the fact that is a major staple food. However, Rwandan bananas are less competitive although efforts are being made to improve farm management mainly in Kibungo. Imports of cooking banana are estimated at about 19,000 tonnes annually.

The main reason for Rwanda's failure to supply the growing banana market is the declining soil fertility and poor farm management that is wide spread on many rural farms. The other contributory factor, which is related to low fertility, is the shift away from commercial varieties like injagi. This has meant that this commercial variety is in low production in Kibungo which is the main cooking banana area near the major market. On the other hand, Cyangugu area does produce good quality injagi bunches. However, here too the high cost of transport makes internal supplies uncompetitive on Kigali markets.

Key identified market quality parameters include size and appearance while preferred varieties are *Injagi, Incacara and Barabehya* . Although incentives to produce commercial varieties in terms of market premiums exist, the survey shows a disparity between varietal promotion by ISAR in the major production area of Kibungo and general demand suggesting lack of market biased research and extension programs.

Current market facilities constrain trading efficiency. While formal gazetted markets exist traders prefer selling in the numerous informal markets with poor facilities much as they incur more costs. Some of the reasons for this include poor location of most formal markets, a factor that reduces market volumes.

Transport is a major constraint in the marketing and distribution of supplies. It accounts for the biggest cost proportion and is responsible for the high prices. It is also the main reason why poor handling or loading is carried out as traders try to reduce the unit cost. Associated with this is the poor rural infrastructures in terms of roads, which become impassable in the rainy seasons leading to higher losses, delayed supplies and higher prices. For the export market also, air transport is expensive.

7.3 Dessert banana

The internal market for dessert banana is small. Several reasons explain this. Dessert banana is not a major food item while incomes are low. Subsequently, production is mostly for subsistence and is also small (about 10%) while the quality is poor.

Although Cavendish bananas are hardly grown in Rwanda, the small apple banana is grown and offers export opportunities if quality issues are resolved. The closest and most accessible markets for Rwanda are Europe, the Middle East and South Africa.

The apple banana "baby banana" is increasingly becoming attractive as an exotic banana to an increasing number of consumers. Also market surveys have indicated that European consumers would prefer to buy smaller bananas if they were readily available.

Though this presents a good opportunity for Rwanda in theory, sales are currently limited by the very high cost of airfreight, making apple bananas more expensive than Cavendish bananas. Lack of big production and packing facilities are also major obstacles to obtaining sales contracts in Europe.

7.4 Fibre products

There is a potential to increase investments in fibre products. At the moment production is still small. This is due to the small internal market. Expansion of this sector seems available with the international market. And for this to be realized, there is need to market these products on the international market.

The export market for fibre craft products commands significantly higher values. However, it is currently small partly due to the limited marketing promotion in foreign markets with local sellers relying on a few marketing agents for orders.

8. Recommendations

Although the banana sub-sector in Rwanda is facing limiting constraints and the country is seeking increased value from its resource base, banana farming system has an important role to play in the ecology and economy of the country. This role can be furthered if strategies are pursued to increase productivity and earnings to farming households. Although banana productivity has been declining in the recent past, discouraging its production across the board in preference for annual crops could have irreversible consequences on the country's ecology. The study proposes the following intervention areas:

The crop is important in the rural livelihoods besides playing an important role in the country's farming system in terms of soil conservation.

While at the moment brewing banana is still dominant due to the technical environment, there are opportunities for increasing the contribution of cooking and dessert bananas and plantain with improvements in soil fertility, management practices and marketing efficiency.

Rwanda needs to guarantee sustainable banana production systems in order to contain the declining productivity levels.

Productivity in all the commodity sub-groups ie. Brewing, cooking and dessert has been on a downward trend and there is an urgent need to reverse this trend. Several factors have been responsible for this downward trend thereby similarly requiring multiple intervention measures, which might be specific to commodity groups or general for all commodities.

- There is need to promote and improve commercial varieties. The existing demand for cooking banana resulting in significant imports from neighboring countries, the booming market in existing cooking banana production zones and the high banana prices provide an opportunity to promote commercial cooking varieties

- There is need for research to introduce and promote new improved cooking banana clones which are tolerant to drought in the main banana production zones. Such high yielding varieties will improve returns to rural investments

- High yielding and disease resistant brewing/juice cultivars should be introduced. This will increase the return per acre thereby optimally utilizing scarse resources. It will further release land for other enterprises without reducing the income of the farmers.

- Also, new and higher value markets should be sought in the region and beyond through fiscal and other measures so as to increase foreign earnings. Increased commercialization will provide the resources needed on the farm for soil conservation.

- A participatory approach involving researchers and farmers through on-farm research and technology transfer should be initiated to convince farmers to apply modern methods of banana management in order to achieve maximum yields and thereby reduce costs per unit of output.

- Rwanda's National Research System needs to identify commercial dessert varieties for promotion. It also needs to conduct research into early maturing dessert varieties in order to improve the viability of export marketability.

- There is a strong need to initiate and strength linkages with the private sector to assist identify research projects with the greatest impact on the market. It is important that ISAR starts to work with dessert exporters and farmer organized groups for the adoption of improved technologies.

- To improve quality produced by the existing units, it is important to have a shorter collection dessert marketing chain involving 3 partners ie exporter, producer and research institution. Through such a system information on quality and technological improvements can quickly and easily flow to the producers with an instant feedback mechanism.

Alongside improving productivity, the country also needs to increase the efficiency of the banana marketing chain from rural production areas to urban consumption zones.

- For cooking banana the collection of market information needs to be strengthened and expanded to include not only prices but also volumes traded to help track economic trends and direct resource investments optimally.

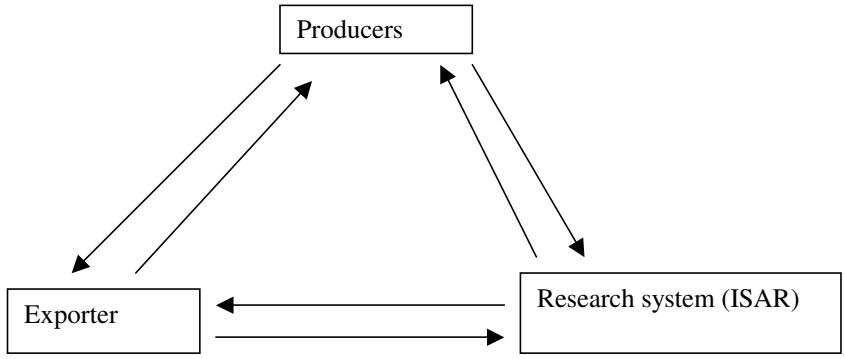
- Improving the flow of market information would increase cooking banana marketing efficiency thereby reducing both the absolute levels and instability of consumer prices, and transaction costs throughout the marketing chain. In effect this would increase marketing opportunities for farmers inside Rwanda.

- Market research and planning aimed at improving trade flow from remote but high potential areas like the Kivu Lake border region and other rural areas to lucrative urban markets in Kigali should be done. This will increase the trade margins and thereby help promote the adoption of cooking bananas.

A second priority is to capture international market opportunities that currently appear for dessert bananas in Europe and for banana fibre products

At the moment exporting firms are working directly with farmers, offering incentives a quality product. However as private entrepreneurs they are limited in research activity, as this would increase their costs. It is therefore important for ISAR scientists, with support from international research centers, to directly work with such farmers and exporters for improved dessert quality (see figure below). There should be both forward and backward linkages with each of the units in terms of information gathering for planning intervention measures aimed at improving the economic and technical processes.

Figure 3.7: Proposed organizational structure for improved export quality product



There is need to explore the current potential of overseas markets for fibre products. The current export volume is small thereby leading to higher marketing costs per unit. According to firms involved in this business, this might be due to lack of an aggressive marketing approach. Development organisations need to assist these exporters especially in marketing their products via the internet. This will require technical assistance in designing their websites

Rwanda's research system together with international research centers needs to find improved and quick maturing varieties for the export market.

The Government of Rwanda also needs to explore ways of creating conditions that would lead to reduced costs of operations especially during transportation and acquire cold storage facilities for use by the exporters.

Finally regional market opportunities should be explored for banana beer as the country has the largest resource base within the East African region.

- Brewing banana is still the major type of banana in the country with a potential to increase the export base. Processing of banana into beer for the export market should be encouraged as it yields higher returns.

- For fibre products, there is need for aggressive marketing to be carried out so as to widen the foreign market of these products. Local associations need to be assisted by development organisations with the use of the internet for marketing.

References

MINECOFI/DS (2001). Rwanda in Figures

MINECOFIN/DS (2001). Rwanda Development Indicators

MINECOFIN/DS: (2002). National Poverty Reduction Program: A Profile of Poverty in Rwanda

IDA and IMF. 2000. Preliminary Document on the Enhanced Initiative for Heavily Indebted Poor Countries-Rwanda.

Kelly, Valerie, Edson Mpyisi, Emmanuel Shingiro and Jean-Baptiste Nyarwaya (2001). Agricultural Intensification in Rwanda: An Elusive Goal. Fertilizer use and conservation investments. FSRP/DSA Policy Brief. MINAGRI and USAID: Kigali, Rwanda

Daniel C. Clay (1996). Fighting an Uphill Battle: Population Pressure and Declining Land Productivity in Rwanda. MSU International Development Working Paper No. 58, Department of Economics.

Dr. Paul O. Ogazi (1996). Plantain: Production, Processing and Utilisation, Paman and Associates Limited, Nigeria

S. Gowen (1995). Bananas and Plantations, Chapman and Hall, London, UK

R Shaun B. Ferris (1998). Postharvest Physiology of Plantain and Banana, IITA

Scott Loveridge, Edson Mpyisi and Machael T. Weber (2002). Farm-Level Perspectives in Rwanda's Coffee Supply Chain Coordination Challenge, FSRP,MINAGRI

Appendix 1: Balance of payments (trade competitiveness) million of US$

Item	**1990**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000(est)**
Exports (fob)	103	51.2	61.7	93	64.1	62	66.2
Coffee	65.7	38.2	43	45.3	28.1	26.5	22.5
Tea	21	3.8	9.3	20.6	22.9	17.5	24.3
Imports (fob)	227.7	198.1	218.7	277.4	232.6	202	195.7
Trade balance	**-124.7**	**-146.9**	**-156.9**	**-184.4**	**-168.5**	**-140**	**-129.5**
Services (net)	-104.6	-118.4	-143.1	-160	-148.3	-116.8	-135.6
Non factor services	-93.4	-123.8	-128.5	-145.6	-141.5	-106.3	-119.3
Credit	42.5	16.2	21.5	51	46.9	51.1	61.7
Debit	135.9	140	150	196.6	188.4	157.4	181
Factor service	-11.2	5.4	-14.6	-14.4	-6.8	-10.5	-16.3
Credit	4.1	21.9	5.5	9.2	9.9	7.8	11
Debit	15.3	16.5	20.1	23.6	16.7	18.3	27.3
Private transfers(net)	5.9	15.8	26.5	25	18.3	18.1	11
Credit	23.9	15.8	28.9	48.8	33.7	29.7	27.3
Debit	18	0	2.4	23.8	15.4	11.6	16.3
Current account balance (excl.official transfers	**-223.4**	**-249.5**	**-273.5**	**-319.4**	**-298.5**	**-238.7**	**-254.1**

Source: Rwanda Development Indicators, 2001, MINECOFIN

Appendix 2: Characteristics of main crops (National Average)

Crop	Caloric cost (Frw/1000 kcal)	Yield per hectare per season				Index of crop cover (c-value) (%)	Sales price (Frw/kg)
		Weight (kg)	Value ('000 Frw)	Energy (mill.kcal)	Protein (kg)		
Beans	13	838	29	2.50	164	19	31
Peas	19	272	16	.90	56	15	62
Sorghum	9	1,016	23	3.10	73	40	19
Maize	9	1,010	23	3.30	86	35	19
Sweet Potato	9	4,527	40	4.20	65	23	8
Cassava	7	2,185	17	2.20	11	26	9
White potato	26	6,102	78	3.50	73	22	10
Taro	15	1,580	20	1.30	22	35	12
Cooking banana	10	6,788	51	5.40	48	4	7
Beer banana	6	6,788	31	5.40	48	4	4
Banana beer	41	6,788	47	1.30	9	4	27
Coffee	n.a.	256	21	n.a	n.a.	2	83

Note: Mean banana yield used for all bananas
Source: yields: 1989-1991 means computed from DSA/MINAGRI farm survey data
C-values: Lewis (1986) ; Prices: 1990 means computed from DSA/MINAGRI data

Appendix 3: Average Kcalories per capita per day for 1984, 1986-1990-Rwanda

Province	BANAC	BANAB	BANAF	HARC	SORG	MAIS	PATD	MAN	PMDT	POIS	TOTAL	+SEASON C
Butare	97	151	44	332	267	42	549	264	13	12	1772	1985
Byumba	241	143	80	422	403	101	419	62	25	27	1923	2153
Cyagungu	218	128	72	178	20	147	229	153	11	13	1170	1310
Gikongoro	26	66	15	159	142	102	700	102	16	33	1359	1523
Gisenyi	66	128	21	207	24	345	284	53	130	22	1279	1432
Gitarama	149	201	90	310	165	46	379	309	14	13	1675	1876
Kibungo	984	274	150	394	232	55	204	129	8	15	2443	2736
Kibuye	61	70	19	210	84	606	483	76	56	59	1723	1930
Kigali	221	186	61	377	318	66	243	222	9	8	1712	1917
Ruhengeri	121	100	40	306	143	251	469	26	279	27	1762	1973
Rwanda	221	153	62	306	198	156	381	150	57	21	1703	1908

Source: Joint Crop Assessment Report/MSU/MINAGRI

Appendix 4: Annual average per capita demand (kg) for cooking banana by province and total, 2000

Province	Rural	Urban	Total
Butare	1.1	18.2	2.9
Byumba	8.6	16.1	9.4
Cyangugu	12.0	75.2	18.7
Gikongoro	0.8	18.8	2.7
Gisenyi	2.0	39.1	5.9
Gitarama	2.2	12.2	3.2
Kibungo	16.3	69.1	21.8
Kibuye	1.9		1.7
Kigali Ngali	3.3		2.9
Ville de Kigali		31.5	3.3
Ruhengeri	2.9	33.6	6.1
Umutara	25.8		23.1
Total	**5.2**	**38.5**	**8.7**

Source: HCLS 2000

Appendix 5: Annual average demand per capita (kg) of dessert banana by urban, rural and total

Province	Rural	Urban	Total
Butare	0.5	9.1	1.4
Byumba	1.9	5.2	2.2
Cyangugu	0.9	5.3	1.3
Gikongoro	0.1	6.8	0.8
Gisenyi	1.1	6.0	1.6
Gitarama	0.4	5.1	0.9
Kibungo	1.8	4.9	2.1
Kibuye	0.3		0.3
Kigali Ngali	0.3		0.2
Ville de Kigali		7.5	0.8
Ruhengeri	0.7	8.4	1.5
Umutara	1.0		0.9
Total	**0.7**	**8.3**	**1.5**

Source: HLCS data

Appendix 6: Annual demand of cooking banana by rural, urban and total (MT), 2000

Province	Rural	Urban	Total
Butare	675	641	1,316
Byumba	6,411	202	6,613
Cyangugu	7,055	1,374	8,429
Gikongoro	409	193	602
Gisenyi	1,456	1,586	3,042
Gitarama	1,790	304	2,094
Kibungo	10,323	1,547	11,870
Kibuye	836		836
Kigali Ngali	2,889		2,889
Ville de Kigali		18,679	18,679
Ruhengeri	2,554	1,147	3,702
Umutara	7,961		7,961
Total	**37,175**	**32,130**	**69,304**

Source: HLCS data

Appendix 7: Annual demand of dessert banana by rural, urban and total (MT), 2000

Province	Rural	Urban	Total
Butare	288	319	607
Byumba	1,415	65	1,481
Cyangugu	507	97	603
Gikongoro	70	70	140
Gisenyi	793	241	1,034
Gitarama	352	128	480
Kibungo	1,113	111	1,223
Kibuye	126	0	126
Kigali Rural	243	0	243
Kigali City		4,462	4,462
Ruhengeri	630	288	918
Umutara	303	0	303
Total	**5,231**	**6,967**	**12,198**

Source: HLCS data

Appendix 8: Demand growth for cooking banana in rural, urban and total (MT)

	Urban demand	Rural demand	Total demand
2000	32,117	39,041	71,157
2005	50,248	44,783	95,031
2010	78,617	50,690	129,306
2015	123,000	56,272	179,272
2020	192,441	60,656	253,097

Source: HLCS data

Appendix 9: Demand growth for dessert banana in rural, urban and total (MT)

	Urban demand	Rural demand	Total demand
2000	6,924	5,255	12,179
2005	10,833	6,028	16,861
2010	16,949	6,824	23,772
2015	26,517	7,575	34,092
2020	41,487	8,165	49,653

Source:HLCS data

Appendix 10: World production of banana in '000 tonnes

	1980	**1989**	**1990**	**1991**
World	**40,051**	**44,970**	**46,923**	**47,660**
Africa	**4,108**	**6,076**	**6,127**	**6,141**
Central America and the Caribbean	**7,010**	**7,304**	**7,865**	**8,049**
Costa Rica	1,092	1,512	1,740	1,550
Honduras	1,330	1,092	999	1,100
Mexico	1,501	1,185	1,591	1,868
Panama	1,050	1,254	1,166	1,170
South America	**11,618**	**11,624**	**12,361**	**12,460**
Brazil	6,721	5,505	5,502	5,630
Colombia	1,030	1,450	1,600	1,630
Ecuador	2,269	2,576	3,055	2,954
Venezuela	890	1,134	1,167	1,170
Asia	**15,458**	**18,136**	**18,678**	**19,090**
China	276	1,602	1,657	2,105
India	4,830	6,056	6,655	6,400
Indonesia	1,977	2,192	2,360	2,400
Phillipines	3,977	3,733	3,409	3,545
Thailand	2,014	1,610	1,613	1,620
Europe	**512**	**439**	**422**	**448**
Oceania	1,086	1,386	1,465	1,466
Papua New Guinea	916	1,150	1,200	1,200

Source: FAO data

Appendix 11: Banana production trends ('000 tons) 1996 – 1999

	1996	**1997**	**1998**	**1999**
India	10,299	10,982	11,000	11,000
Ecuador	5,727	7,494	4,563	6,392
Brazil	5,844	6,095	5,506	5,592
China	2,677	3,097	3,734	3,996
Philippines	3,304	3,774	3,561	3,561
Indonesia	3,023	3,057	3,177	3,177
Costa Rica	2,400	2,300	2,098	2,101
Mexico	2,210	1,714	1,526	1,737
Thailand	1,750	1,700	1,720	1,720
Colombia	1,491	1,607	1,517	1,570
Burundi	1,544	1,543	1,399	1,511
Vietnam	1,300	1,310	1,315	1,243
Venezuela	1,026	1,123	948	1,000
Cameroon	986	986	1,000	990
Honduras	1,022	946	862	861
Tanzania	465	904	778	752
Guatemala	681	730	880	733
Papua N.G.	665	670	670	680
Panama	838	800	650	650
Bangladesh	634	628	625	625
Egypt	570	635	656	600
Uganda	590	590	595	600
Malaysia	530	530	535	535
EU	432	525	525	525
Dominican R	383	389	359	432
World	**55,970**	**59,832**	**55,989**	**58,434**

Source: FAO and World Bank

Appendix 12: World imports by region and country ('000 tonnes)

	1980	1988	1989	1990
World	***6,782***	***7,753***	***8,197***	***8,713***
EEC	***2,361***	***2,754***	***2,983***	***3,281***
France	446	455	455	459
Germany	610	807	901	1,117
Italy	301	381	400	430
Portugal	32	79	108	137
Spain	405	360	382	382
UK	328	388	434	470
Other Western Europe	***356***	***462***	***519***	***593***
Austria	77	110	122	130
Sweden	70	127	138	143
Eastern Europe and USSR	***189***	***159***	***177***	***152***
Canada	246	230	322	341
US	2,147	2,750	2,760	2,850
Japan	726	760	774	758
Near East	***198***	***247***	***261***	***312***

Source: FAO data

Appendix 13: Net import trends by country ('000 tons) 1995-1998

	1995	1996	1997	1998
US	3,266	3,368	3,354	3,505
EU	3,125	3,164	3,139	2,983
Japan	874	819	885	865
China	160	513	547	539
Russian Fed.	503	307	881	475
Canada	400	408	417	417
Poland	227	238	242	277
Argentina	201	248	252	243
F.Yugoslavia	117	155	195	169
Saudi Arabia	167	153	147	144
Chile	145	151	137	135
World	**10,536**	**10,787**	**11,466**	**10,979**

Source: FAO data and World Bank

Appendix 14: World banana exporters by region and country

	1980	1988	1989	1990
World	6,904	7,882	8,129	9,032
UPEB countries	3,427	3,863	4,026	4,368
Colombia	692	922	877	991
Costa Rica	888	1,027	1,225	1,344
Guatemala	352	309	349	348
Honduras	867	871	819	864
Nicaragua	110	61	70	72
Panama	504	670	682	738
Other Latin America	1,452	1,762	1,879	2,363
Belize	15	26	27	30
Brazil	67	77	84	53
Ecuador	1,318	1,535	1,649	2,160
Mexico	17	89	90	90
Surinam	34	36	29	30
Caribbean	231	614	580	650
Jamaica	33	28	43	63
Guadeloupe	57	131	94	95
Martinique	73	185	193	215
Windward Islands	68	270	250	278
Far East	959	901	885	892
Philippines	923	867	851	850
Africa	222	186	230	248
Cameroon	60	36	58	75
Cote d'Ivore	121	82	93	94
Somalia	32	64	76	75

Source: FAO data

Appendix 15: Gross exports trends by country ('000 tons) 1995-98

	1995	1996	1997	1998
Ecuador	3,737	3,842	4,446	3,848
Costa Rica	2,033	1,933	1,835	2,101
Philippines	1,213	1,253	1,143	1,147
Guatemala	646	611	659	632
Panama	693	634	602	463
Honduras	522	637	557	433
Mexico	110	163	240	280
Cote d'Ivore	173	193	191	200
Cameroon	171	191	179	132
Nicaragua	54	78	70	103
World	**11,375**	**11,712**	**12,124**	**11,489**

Source: FAO and World Bank

Appendix 16: Exports of bananas from Rwanda (kgs), 1998-2000

Type of banana	Exporter	1998	1999	2000	2001	2002*	Grand Total
Green Banana	Nibagwire Donatille				200		200
	Nzamwita Omary				400		400
	SORECO				1,970		1,970
Total					**2,570**		**2,570**
Apple banana (*Kamaramasenge*)	BINAMUNGU G	100					100
	Emballage Rwanda	23,451	65,290	66,301	23,149		178,191
	Nibagwire Donatille				13,815	21,593	35,408
	Nzamwita Omary				100		100
	S.G.A c/0 NDEBERI	11,795					11,795
	SORECO				170		170
	Tropifruits International		14				14
Total		**35,346**	**65,304**	**66,301**	**37,234**	**21,593**	**225,778**
Grand Total		**35,346**	**65,304**	**66,301**	**39,804**	**21,593**	**228,348**

** data is from January to April,2002.*
Source: MINAGRI, Crop protection department,

Appendix 17: Crop production 1986-2000

Crop	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Sorghum	193,197	150,217	145,564	126,885	142,603	32,300	21,000	19,500	110,000	77,300	102,076	122,204	120,533	107,566	155,106
Maïze	89,590	90,182	95,399	93,954	95,685	86,100	73,400	74,200	14,300	55,600	66,595	83,427	58,618	54,912	62,502
Blé	5,504	6,294	8,100	7,920	6,976	3,000	5,000	6,000	3,200	6,000	6,814	5,997	4,140	3,607	6,444
Rice	8,440	6,581	6,892	11,660	9,305	5,000	6,500	3,000	4,500	2,300	6,596	9,805	7,935	8,919	11,654
Beans	270,972	26,590	253,977	210,317	204,708	166,600	136,100	84,800	34,800	126,300	174,347	133,715	153,917	140,426	215,347
Petit pois	20,148	19,567	18,241	15,672	10,948				0		4,350	10,678	8,563	8,115	15,342
Arachide	17,213	16,233	15,548	9,804	8,276	18,800	10,500	15,300	16,200	8,300	7,220	5,049	4,882	4,706	7,032
Soja	5,697	6,928	7,092	9,205	180,96				0	900	3,302	6,779	9,831	8,898	13,922
Banana	2,265,699	2,262,596	2,287,596	2,966,466	2,776,764	2,120,000	2,316,000	2,136,000	1,489,000	2,001,500	2,105,397	2,248,419	2625,485	2,897,433	2,212,250
Pomme de terre	268,668	275,377	232,367	238,605	283,673	136,800	128,800	204,200	114,900	137,700	195,381	229,625	181,138	175,889	957,198
Patate douce	892,890	878,191	878,631	771,460	817,738	364,500	542,600	424,000	739,300	550,500	664,601	741,624	751,141	862,568	1,032,916
Cassava	469,562	498,653	450,705	45,193	81,613	145,700	171,000	144,100	140,800	44,800	62,384	71,716	83,743	90,247	90,945
Colocase & igname	47,926	44,348	44,037	310,550	265,190		20,900	31,100	212,000	148,000	220,638	202,994	188,182	316,934	820,992
Cultures mar. et fruit.	92,950	75,721	99,110	96,028	73,496								78,350	82,982	205,675
TOTAL	**4,648,456**	**4,357,478**	**4,543,259**	**4,913,719**	**4,795,071**	**4,035,000**	**4,568,000**	**4,011,000**	**2,747,000**	**3,018,000**	**3,437,620**	**3,650,599**	**4,085,232**	**4,588,198**	**5,571,619**
Banana %	**48.7**	**51.9**	**50.4**	**60.4**	**57.9**	**52.5**	**50.7**	**53.3**	**54.2**	**66.3**	**61.2**	**61.6**	**64.3**	**63.1**	**39.7**

Source: FAO, MINAGRI, PASAR

Appendix 18: Average production, 1984,1986-90, MT

Prefecture	BANAC	BANAB	BANAF	HARC	SORG	MAIS	PATD	MAN	PMDT	POIS	TOTAL
BUTARE	29,182	189,317	20,611	26,286	21,075	3,158	124,395	63,072	5,485	950	483,531
BYUMBA	75,024	183,761	38,462	34,948	33,178	7,842	97,489	15,271	10,923	2,192	499,088
CYANGUGU	44,391	107,212	22,682	9,510	1,091	7,465	35,274	24,556	3,259	677	256,117
GIKONGORO	4,779	50,137	4,121	7,657	6,865	4,696	96,688	14,648	4,169	1,588	195,346
GISENYI	19,268	153,603	9,286	15,884	1,799	25,277	62,199	11,873	53,012	1,597	353,797
GITARAMA	50,268	282,387	47,176	27,648	14,676	3,830	96,197	82,314	6,547	1,118	612,160
KIBUNGO	257,397	294,022	60,000	27,243	16,121	3,576	39,619	26,055	2,962	994	727,989
KIBUYE	10,712	52,571	5,604	10,206	4,119	28,168	67,057	11,029	14,540	2,828	206,834
KIGALI	102,199	354,585	43,587	46,056	38,516	7,471	82,856	80,093	5,585	983	761,929
RUHENGERI	36,874	125,851	19,087	24,996	11,596	19,131	108,000	6,337	120,414	2,044	474,328
RWANDA	**630,092**	**1,793,445**	**270,616**	**230,433**	**149,035**	**110,612**	**809,774**	**335,248**	**226,895**	**14,970**	**4,571,119**

Source: MINAGRI

Appendix 19: Production trends (MT) by type 1984, 1986-90

Type	1984	1986	1987	1988	1989	1990	% change
Cooking banana	747,112	554,636	609,769	629,726	635,272	604,035	-19.2
Beer banana	1,624,183	1,596,035	1,747,291	1,850,667	2,027,133	1,915,360	17.9
Fruit banana	270,616	247,405	265,637	278,608	304,059	257,371	-4.9
Total	2,641,911	2,398,076	2,622,697	2,759,001	2,966,464	2,776,766	5.1

Source: MINAGRI data

Appendix 20: Production of beer banana 1984, 1986-90 by province and total (MT)

Province	1984	1986	1987	1988	1989	1990
Butare	193,993	168,449	178,698	194,438	203,330	196,996
Byumba	166,603	168,504	165,701	172,107	206,983	222,669
Cyangugu	140,340	94,839	99,462	101,142	110,807	96,680
Gikongoro	49,088	44,055	51,575	64,035	44,456	49,613
Gisenyi	119,162	189,870	170,401	187,649	129,696	124,842
Gitarama	237,618	232,557	265,362	311,751	319,964	327,067
Kibungo	260,863	265,912	279,517	265,654	359,626	332,560
Kibuye	94,134	48,195	47,039	47,381	37,945	40,729
Kigali	250,687	278,063	344,731	384,643	477,711	391,673
Ruhengeri	111,695	105,591	144,805	123,867	136,615	132,531
Total	**1,624,183**	**1,596,035**	**1,747,291**	**1,852,667**	**2,027,133**	**1,915,360**

Source: MINAGRI

Appendix 21: Production of cooking banana by province 1984, 1986-90 (MT)

Province	1984	1986	1987	1988	1989	1990
Butare	52,874	24,248	21,644	24,885	28,577	22,863
Byumba	82,705	73,423	75,811	74,305	72,487	71,412
Cyangugu	66,371	36,018	36,794	40,644	49,476	37,040
Gikongoro	10,211	3,220	3,452	5,139	3,652	3,001
Gisenyi	26,337	16,966	19,419	19,568	16,721	16,598
Gitarama	79,866	39,666	41,745	46,854	50,506	42,969
Kibungo	229,346	251,240	280,281	283,446	254,016	246,050
Kibuye	41,942	4,351	3,608	3,240	5,394	5,734
Kigali	108,604	72,529	88,820	94,488	121,283	127,470
Ruhengeri	48,856	32,975	38,195	37,157	33,160	30,898
Total	**747,112**	**554,636**	**609,769**	**629,726**	**635,272**	**604,035**

Source: MINAGRI

Appendix 22: Production of fruit banana by province and total 1984,1986-90 (MT)

Province	1984	1986	1987	1988	1989	1990
Butare	20,611	18,062	18,548	22,236	23,427	20,783
Byumba	38,462	33,273	33,833	30,842	45,908	48,453
Cyangugu	22,682	24,330	25,811	32,651	16,474	14,145
Gikongoro	4,121	6,405	2,952	5,151	3,278	2,819
Gisenyi	9,286	8,894	10,157	9,940	8,356	9,083
Gitarama	47,176	41,620	45,189	47,952	56,519	44,600
Kibungo	60,000	62,060	66,815	63,158	60,726	47,243
Kibuye	5,604	6,222	5,992	6,723	5,113	3,969
Kigali	43,587	29,109	34,591	39,163	65,390	49,681
Ruhengeri	19,087	17,430	21,749	20,792	18,868	16,595
Total	**270,616**	**247,405**	**265,637**	**278,608**	**304,059**	**257,371**

Source: MINAGRI

Appendix 23: Banana production trends by province 1990, 1999 and 2000 (tonnes)

Year	Butare	Byumba	Cyangugu	Gikongoro	Gisenyi	Gitarama	Kibungo	Kibuye	Kigali R	Ruhengeri	Umutara	Total
1990	240,642	284,303	147,864	55,433	150,522	414,637	575,786	50,431	568,823	180,024	108,299	2,776,764
1999	202,473	324,307	137,191	52,337	136,176	192,467	672,702	47,786	644,079	111,777	164,363	2,897,435
2000	146,640	271,530	161,438	54,675	151,200	208,138	480,250	93,160	294,640	185,580	103,250	2,150,501
% change	-39.1	-4.5	9.2	-1.4	0.5	-49.8	-16.6	84.7	-48.2	3.1	-4.7	-29.1

Source: MINAGRI

Appendix 24: Agricultural production forecasts ('000 tonnes)

Crop	2000	2001	2002	2003	2005	2010	2015	2020
Cereals	235	257	280	305	362	573	923	1,584
Pulses	252	290	300	330	399	643	1,036	1,692
Bananas	2,150	2,279	2,415	2,530	2,877	3,720	5,400	6,961
Tea	15	17	18	20	24	37	60	101
Coffee	18	20	21	23	28	43	71	119
Roots/Tubers	2,881	3,097	3,286	3,479	4,136	5,938	7,845	11,003
Fruit/Veg	205	227	249	273	319	468	688	1011
Total	5,772	6,185	6,569	6,953	8,145	11,423	16,022	22,471

Source: Rwanda Development Indicators 2001, MINECOFIN

Appendix 25: Production per capita (kg) 1984, 1986-90 by province and total

Prefecture	BANAC	BANAB	BANAF	HARC	SORG	MAIS	PATD	MAN	PMDT	POIS	TOTAL
BUTARE	44	281	25	40	32	5	186	94	8	1	717
BYUMBA	109	266	45	51	48	11	142	22	16	3	714
CYANGUGU	99	238	41	21	2	17	77	55	7	1	560
GIKONGORO	12	122	8	19	17	12	236	36	10	4	477
GISENYI	30	238	12	25	3	39	96	19	82	3	546
GITARAMA	68	374	51	37	20	5	128	110	9	2	804
KIBUNGO	448	509	85	47	28	6	69	46	5	2	1,245
KIBUYE	28	130	11	25	10	69	163	27	36	7	505
KIGALI	100	346	35	45	38	7	82	79	5	1	740
RUHENGERI	55	185	23	37	17	28	159	9	177	3	694
RWANDA	**101**	**284**	**35**	**37**	**24**	**18**	**129**	**54**	**36**	**2**	**718**

Source: MINAGRI

Appendix 26: Estimates of informal cross-border imports – second season 1999 (kg)

POSTES	Month	Haricot	Petit pois	Soja	Arachide	Maïs	Sorgho	Blé	Farine de Blé/Maïs	Riz	Pomme de terre	Manioc	Huile	Sucre	Banane	Poids total
GATUNA	Jul	160,000	0	14,200	0	21,200	8,000	0	16,760	20,000	0	0	5,760	0	461,650	707,570
	Aug	119,000	0	7,200	0	0	0	0	1,000	0	0	0	0	0	169,820	297,020
	Sept	349,800	0	5,000	0	0	0	0	7,000	0	0	0	2,736	0	125,650	490,186
	Oct	318,000	0	28,800	0	0	0	0	1,024	0	0	0	0	0	4,900	352,724
	Nov	1,598,000	0	0	0	0	57,600	0	300	0	0	0	120	0	0	1,656,020
	Dec	2,117,000	0	0	0	80,000	163,200	0	300	0	0	0	4,358	0	0	2,364,858
	Total	**4,661,800**	**0**	**55,200**	**0**	**101,200**	**228,800**	**0**	**26,384**	**20,000**	**0**	**0**	**12,974**	**0**	**762,020**	**5,868,378**
KAGITUMBA	Jul	1,000	0	0	0	200	0	0	200	0	3,000	0	883	0	325,150	330,433
	Aug	1,700	0	0	0	0	0	0	0	0	1,500	0	168	0	201,950	205,318
	Sept	0	0	0	0	0	0	0	0	0	0	0	0	0	46,900	46,900
	Oct	300	0	0	0	0	0	0	0	0	0	0	0	0	6,300	6,600
	Nov	31,000	0	0	0	0	20,200	0	0	0	0	0	48	0	4,200	55,448
	Déc	4,000	0	0	0	0	5,000	0	0	0	2,500	0	0	0	4,550	16,050
	Total	**38,000**	**0**	**0**	**0**	**200**	**25,200**	**0**	**200**	**0**	**7,000**	**0**	**1,099**	**0**	**589,050**	**660,749**
RUSUMO	Jul	0	596,400	0	0	1,394,000	0	0	0	2,009,100	0	0	401,700	3,482,000	0	7,883,200
	Aug	0	64,300	0	0	723,700	0	97,150	65,000	933,000	0	0	253,800	2,481,600	0	4,618,550
	Sept	0	0	388,000	0	295,050	0	120,000	25,000	288,800	0	0	182,000	365,350	0	1,664,200
	Oct	0	0	0	0	2,669,500	0	0	20,000	1,517,000	0	0	122,975	0	0	4,329,475
	Nov	0	893,300	0	0	2,403,850	0	0	106,250	1,757,450	0	0	210,600	54,000	0	5,425,450
	Déc	0	1,074,350	0	0	1,668,700	0	0	502,750	3,109,900	0	0	20,000	721,250	0	7,096,950
	Total	**0**	**2,628,350**	**388,000**	**0**	**9,154,800**	**0**	**217,150**	**719,000**	**9,615,250**	**0**	**0**	**1,191,075**	**7,104,200**	**0**	**31,017,825**
GISENYI	**J-D**	**2,862,000**	**0**	**0**	**132,000**	**644,000**	**1,109,000**	**0**	**0**	**0**	**1,431,000**	**927,000**	**182,000**	**3,000**	**1,376,000**	**8,666,000**
CYANGUGU	**J– D**	**960,000**	**0**	**0**	**58,000**	**96,000**	**120,000**	**0**	**0**	**480,000**	**173,000**	**8,400,000**	**1,325,000**	**288,000**	**1,060,000**	**12,960,000**
AKANYARU	Jul	0	0	0	0	0	0	0	0	195	0	0	40,124	0	0	40,319
	Aug	0	0	0	0	1,400	0	0	0	11,790	0	0	88,398	750	6,000	108,338
	Sept	0	0	0	0	0	0	0	0	700	0	0	114970	0	0	115,670
	Oct	0	0	0	0	0	2500	0	0	0	0	0	101163	200	0	103,863
	Nov	0	0	0	0	0	0	0	0	300	0	0	80157	0	0	80,457
	Déc	0	0	0	0	0	76600	0	0	0	0	0	82049	0	0	158,649
	Total	**0**	**0**	**0**	**0**	**1,400**	**79,100**	**0**	**0**	**12,985**	**0**	**0**	**506,861**	**950**	**6,000**	**607,296**
TOTAL		**8,521,800**	**2,628,350**	**443,200**	**190,000**	**9,997,600**	**1,562,100**	**217,150**	**745,584**	**10,128,235**	**1,611,000**	**9,327,000**	**3,219,009**	**7,396,150**	**3,793,070**	**59,780,248**

Source: Joint Crop Assessment Report, 1999

Appendix 27: Estimates of informal cross-border imports, first season 2001 (kg)

	Haricot	Petitpois	Soja	Arachide	Mais	Sorgho	Farine de mais	Riz	Manioc	Farine de manio	Autres huiles	Huile palme	Sucre	Banane	Pomme de terre	Total
Gatuna	86,800	0	0	69,700	8,732,400	2,730,600	225,240	11,880	108,170	836,340	174,932	513,464	11,025	1,809,800	12,500	25,548,351
Gatuna T eqcer	90	0	0	119	9,666	2,870	254	13	113	874	298	1,433	12	758	3	27,834
Kagitumba Kgs	3,300	0	0	750	1,828,830	184,440	0	2,566	5,600	0	1,400	2,380	6,528	9,451,500	0	13,005,690
KagitumbaTeqcer	3	0	0	1	2,024	194	0	3	6	0	2	7	7	3,956	0	7,884
Rusumo kgs	19,525	54,100	1130	816,670	188,685	37,065	1,331,117	402,370	9,050,320	0	0	0	120	5,000	0	12,037,157
Rusumo T eqcer	20	57	1	1,390	209	39	1,502	453	9,456	0	0	0	0	2	0	13,275
Gisenyi kgs	60,000	0	0	72,000	0	792,000	0	180	0	192,000	2,167	96,000	7,087	1,848,000	0	3,074,647
Gisenyi Teqcer	63	0	0	123	0	832	0	0	0	201	4	268	8	774	0	2,277
Gikondo/Kanombe kgs	0	190,000	0	0	78,580	0	5,814,760	12,685,423	0	0	888	3,575,293	10,251,019	0	0	32,972,501
Gikondo/Kanombe Teqcer	0	200	0	0	87	0	6,562	14,277	0	0	2	9,977	10,933	0	0	42,454
Cyangugu kgs	150,000	0	0	0	1,000	0	95,500	0	1,800,000	700	0	270,000	98,800	0	0	2,417,600
Cyangugu Teqcer	156	0	0	0	1	0	108	0	1,881	1	0	753	105	0	0	3,007
Akanyaru kgs	0	0	0	0	0	0	0	366,000	0	0	0	265	5,101,540	0	0	5,467,805
Akanyaru Teqcer	0	0	0	0	0	0	0	412	0	0	0	1	5,441	0	0	5,854
Total kg	319,625	244,100	1130	959,120	10,829,495	3,744,105	7,466,617	13,468,419	10,964,090	1,029,040	179,387	4,457,402	15,476,119	13,114,300	12,500	94,523,751
Total Kcal x 100	1,073,940	827,499	4577	5,265,569	38,661,297	12,692,516	27,178,486	48,890,361	36,948,983	3,467,865	984,835	40,116,618	53,237,849	17,704,305	10,250	330,861,462
Total T eq cer	333	257	1	1633	11,987	3,935	8,427	13,582	11,456	1,075	305	12,438	16,506	5,489	3	102,586

Source: Joint Crop Assessment Report, 2001

Appendix 28: Rural Transaction quantities

Millions of units	Sales	Gifts given	Purchases	Gifts received	Net sales and gifts
Beans	16.11	5.47	75.91	5.39	-59.71
Peas	0.63	0.21	2.35	0.30	-1.81
Peanuts	0.86	0.11	1.03	0.07	-0.13
Soybeans	1.07	0.25	1.50	0.25	-0.44
Sorghum	25.42	1.93	50.57	3.31	-26.53
Maize	4.84	3.62	7.71	2.82	-2.07
Wheat	2.11	0.19	0.98	0.15	1.16
Finger millet	0.11	0.09	0.05	0.08	0.07
Rice	2.23	0.24	3.54	0.22	-1.29
Cassava	42.71	4.57	68.25	2.80	-23.77
White potato	77.95	5.99	52.85	3.23	27.86
Sweet potato	58.04	17.22	48.15	8.60	18.51
Taro	4.96	1.48	6.06	1.11	-0.74
Cocoyam	0.05	0.02	0.11	0.04	-0.08
Cooking banana	47.02	7.63	16.99	4.87	32.80
Beer banana	59.01	10.42	61.71	5.93	1.79
Fruit banana	7.26	0.54	2.53	0.41	4.86
Coffee	41.13	0.00	0.00	0.00	41.13
Banana beer	207.08	39.97	6.99	12.71	227.35
Sorghum beer	67.62	15.32	8.75	11.05	63.13
Milk	0.06	0.00	0.00	0.00	0.05
Cattle	0.13	0.02	0.05	0.03	0.07
Pigs	0.19	0.01	0.07	0.01	0.12
Sheep	0.28	0.02	0.09	0.02	0.20
Goats	0.65	0.05	0.20	0.07	0.43
Chicken	0.64	0.10	0.38	0.14	0.22
Ag. Labor	23.68	N.R.	34.30	N.R.	-10.63
Non-Ag. Unsk. Labor	15.02	N.R.	8.20	N.R.	6.82
Skilled Labor	41.43	N.R.	4.12	N.R.	37.31

Source: DSA/MINAGRI, Agricultural Survey 1990; 1184 households; Units are kilograms, except for beer, milk (litres), livestock (heads), and labor (mandays). N.R. = Data not recorded.

Appendix 29 List of people contacted/interviewed

Nyirazaninka Ram, cooking banana retailer, pour lourd market (hard weight), Kigali

Immaculate Mama Yaya, cooking banana retailer, pour lourd market, Kigali

Wimana Mariam, cooking banana retailer, Kiruhura market, Kigali

Mukabarikaye Calarisa, cooking banana retailer, Kiruhura market, Kigali

Mukarugwiza Jose, cooking banana retailer, kiruhura, Kigali

Estera Uwimanzi, retailer, cooking banana - Joki market, Kigali

Gakwenzire Marie, cooking banana retailer, Joki Market, Kigali

Kaitale Emmanuel, cooking banana retailer, Joki Market, Kigali

Kahiga (08458611), cooking banana traveling trader from Uganda

Wimana Julienne, cooking banana retailer, Joki market, Kigali

Sengiyumva Benoit, travelling trader

(086 20353) travelling trader/wholesaler from Uganda

Kamugwera Anonsiata, cooking banana retailer, Joki market, Kigali

Mukarusangwa Koret, plantain retailer (imishabe/gonja), Nyarugenge market, Kigali

Mukakarimbizi Grace, dessert banana retailer, Nyarugenge market, Kigali

Abdu Rumanzi (077-664724), travelling trader from Uganda

Moses Rwabishari (084-26766), truck driver

Isa Busulwa, banana trading broker, Joki market, Kigali

Therese Mama Jeannette (08413283) cooking banana retailer, Nyamirambo, Kigali

Mr. Garry, General Manager Covibar SARL, Kigali

Mukamugema, dessert banana retailer, Nyarugenge market, Kigali

Mukankundi Nkawa, dessert banana retailer, Nyarugenge market, Kigali

Evase Nsengimana (0850442), Directeur General, Volcano Export Emballage,Rwanda, e-mail: nsengimanaevase@hotmail.com, Kigali

Mukarutaban also popularly known as mamagikumi, banana retailer, Gikondo market, Kigali

Mujawamariya Ivete, banana retailer, Nyamirambo market , Kigali

Moses Tigurirwa, banana retaier, Nyamirambo market, Kigali

Twagiramariya Mamazuzu, dessert banana retailer, Nyamirambo market, Kigali

Uwamariya Stephania, retailer, Kicukiro market, Kigali

Uwilingiyimana Peter, broker, Kimirongo market, Kigali

Gitegetsi Sitaria, retailer, Nyarugenge market, Kigali

Mukarugamba Serafina, retailer, Nyarugenge market, Kigali

Juvénal Ndayisenga, Director- ASSOABI -Association Abusunganye pour la volarisation Industrielle de fruits, de plantes, Oléagineses, d' Apiculture et de leurs dérivés, beer processor, Kibungo

Rwagatare Jean, retailer, Rwamagana market, Kibungo

Butare (08457261), travelling trader, Rukara market,Umutara

Tugume Medad, traveling trader, Kitwe-Ugandaa

Masengesho Emmanuel, traveling trader, Kibungo

Driver for Mugagali Damascene, traveling trader

Munyakazi Xavier, farmer, Rusumo-Kibungo

Kabera John Chrysostome, banana broker, Gatore market, Rusumo-Kibungo

Mboneza Felicien (08422712), traveling trader, Gatore market, Kibungo

Mukotanyi Viji, traveling trader, Kibungo

Celine Kampirwa, Eveline Mkamabano & Abizera Mariya (566087), Kibungo small processor association, (economat)

"Excutif" (08430448), traveling trader, Rukira district

Bwanzongera Noel, travelling trader, Rukira/Gitwe, Kibungo

Alex Nyendahayo, travelling trader, Butare

Nyirabenda Beatrice, cooking banana retailer, Butare market

Nyiramisago Beransira, producer, Butare

Hilary Izabiriza, dessert banana retailer, Butare market

Nyiranshuti Froncioise, Dessert (apple) banana retailer, Butare market

Nyirabiraki Alfonsine, cooking banana retailer, Butare

Mukankandi Beatrice, plantain retailer, Masango market, Gitarama

Zikamusoni, banana beer transporter , Gisenyi market near Gisenyi town

Orocella, banana beer transporter, Gisenyi.

Uwimana Consolee Nyirasafari, banana producer and processor, Gisenyi/Gisa

Abbe vincent, banana processor, Gisenyi

Nyirakimonyi Golette, Dutera n'inkunga association, processor, Gisenyi Rubavu

Izekias Ndyamiyebenshi, processor, Gisenyi town

Modest, banana beer retailer, Nyakabungo market, Gisenyi

Aubert, banana beer retailer, Nyakabungo market, Gisenyi

Nyirakamana Devota, plantain retailer, Nyakabungo market, Gisenyi

Francine Kankundye, cooking banana retailer, Nyakabungo market, Gisenyi

Uzamunkunda Emeldia, dessert banana retailer, Nyakabungo market, Gisenyi

Biyingoma J. Baptiste, banana beer retailer, Gihumba market, Nyamyumba district, Gisenyi

Munazi Ezman, transporter from DRC

Bakaza Bavon, travelling trader, Gihumba market, Gisenyi near Bralirwa

Nyirabugoyi Zayana, ooking banana retailer, Gihumba market near Bralirwa, Gisenyi

Munyamategeko Cyprien, banana producer, mutobo district, ex-commune Nyakinama, Ruhengeri province

Nzitabimfura Focas, beer trader, Ruhengeri

Hatekimana Clotilde, dessert banana retailer, Ruhengeri market

Mukagatara Claudia, cooking banana retailer, Central market, Ruhengeri

Kamugwera Annonciate Gisakura, traveling trader and retailer of cooking banana, Nyamasheke-Cyangugu

Nkuruziza Fredrick, beer processor, Bugarama, Cyangugu

Uzamukunda, plantain retailer, Cyangugu market

Nyirahabimana Halima, plantain retailer, Cyangugu market

Zainabu Kanakuze, plantain retailer, Cyangugu market

Mwajuma, dessert banana retailer, Cyangugu market

Ayihamiye, dessert banana retailer, Cyangugu market

Yabarajuye Jacline, dessert (apple) banana travelling trader, Kamembe urban market-Cyangugu

Kantarama Salima, dessert banana retailer (apple), Kamembe market, Cyangugu

Nsengimana, traveling trader/retailer of beer banana and banana juice, Nyamasheke market, Cyngugu

Bahati Ntunguka, traveling trader from DRC

Emmanuel Albere, traveling trader from DRC

Sanvura Rubambura, traveling trader from DRC

Mama Fifi, dessert bananatraveling trader, Kibuye market – Kigali

Theodomire Muhungeyisoni, President of COPABU (08487607)

Riberata Mukamana (530762), COPABU (Cooperative Des Producteurs Artisanaux de Butare).

Beatrice Musanabera, 571139 or 08538215 e-mail: beamusa@yahoo.fr, ASAR – fibre products

Nikuze Pascasie, fibre products, GTZ shop, Butare

Uwizayimana Christine, fibres products, GTZ shop, Butare

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Evase Havigumana – Rural Sector Support Project, Rwanda

Gashaka Jacques, DS/MINECOFFIN

Uwamahoro Regina, MINAGRI

Nibagwire Donatile(085-27886), banana exporter

Appendix 30: Checklist for Producers

Topic	Sub-topics	Questions/comments
Personal information	1. Name 2. Physical location 3. Experience	
Production	1. Quantity 2. Trends	1. Estimate acreage planted of the commodities in question and the trend of in acreage planted 2. Find out the reasons for the trend 3. Estimate the the trends in output of each of the commodities in question 4. Find out the reasons for these trends
Sales	3. Quantity 4. Type of buyer 5. Seasonality 6. Variety 7. Consumer preferences 8. Price data	5. How much do you normally sell eg. per day, per week, per month 6. Who do you sell to 7. Are there changes in volume sold over time 8. Are their different varieties sold 9. If so, which ones and what is their respective demand/preference 10. What is the price you sell at by variety (get unit measure) 11. Are there changes in price over time (short term & long term changes) 12. If so, what are the reasons 13. Do you find problems selling your products. Which problems 14. Where do you sell from and why?
Supply of inputs	1. Source by area 2. Source by type of person 3. Price 4. Quality	1. What inputs do you use 2. What inputs do you buy 3. How much seed do you usually plant 4. From whom do you buy your inputs 5. From where do you buy (meeting point) 6. At what price do you buy by variety/input 7. Does the price change over time. If so, why and how 8. Do you have problems getting the inputs. If so, which ones 9. What is the quality of the inputs (for seed eg improved or not) 10. Do you get technical advice about inputs/farming
Quality	1. Quality of output 2. Post-harvest issues	1. What is the quality of your produce 2. How do you dry ? 3. What quality problems do you face during and after harvest
Storage	3. Quantity 4. Time 5. Storage problems	4. How much do you usually store 5. For how long do you usually store 6. Do you have storage problems 7. Do you experience storage losses
Production costs	1. Type 2. Proportions	1. What are your production costs 2. What is their proportions
Grading / sorting	1. Grading incentive	1. Do you grade or sort 2. Does better grade fetch higher price 3. If you don't sort/grade why?
Market information	1. Sources 2. Spatial arbitrage	1. Do you get market information eg. on price 2. If so, from whom and how 3. Is there a relationship between prices in different areas at a given time
Price formation	1. Market power	1. Who determines the price 2. How is the price determined 3. If farmer/individual is a price taker, find out why 4. If you negotiate the price what factors do you consider
Institutional and legal framework	1. Associations	1. Do you have an association 2. Are there any market regulations. If so, which ones and how do they affect your business
Market structure	1. Competition	1. No of sellers 2. Is there price competition 3. Is there non-price competition. If so, how eg. interlocking markets
Credit availability	1. Sources 2. Types	1. Are there credit institutions 2. Do you use them. If no, why 3. What are their rates

Checklist for traders

Topic	Sub-topics	Questions/comments
Personal information	4. Name 5. Address physical 6. Telephone 7. experience	NB: For better established firms exchange of business cards saves time. For small traders market place is enough. Note: if a trader has a mob. Phone it might be useful to get it for future follow up.
Type of Business	1. Value addition 2. Physical functions	1. How does the respondent add value along the marketing chain? Does he change the form of the product (**Processor**) or just move the product (**Travelling trader**) or store (**Wholesaler**) or is he **Retailer** or is he **Consumer. NB:** There might be overlap as firms try to maximise profit through vertical integration
Demand *(For consumer substitute consumption for sell in the probe)*	9. Quantity 10. Type of buyer 11. Seasonality 12. Variety 13. Consumer preferences 14. Price data	15. How much do you normally sell eg. per day, per week, per month 16. Who do you sell to 17. Are there changes in volume sold over time 18. Are their different varieties 19. If so, which ones and what is their respective demand/preference 20. What is the price you sell at by variety (get unit measure) 21. Are there changes in price over time (short term & long term changes) 22. If so, what are the reasons 23. Do you find problems selling your products. Which problems
Supply	5. Source by area 6. Source by type of person 7. Price 8. Quality	11. Which are your supply areas (geograghical) 12. From whom do you buy 13. From where do you buy (meeting point) 14. At what price do you buy by variety 15. Does the price change over time. If so, why and how 16. Do you have problems getting the products. If so, which ones 17. What is the quality of the supplies
Quality	6. Perishability 7. Post-harvest issues	8. What is the quality of products along the chain 9. What is the shelf-life of the products
Storage*(Relevant to wholesaler) NB: For others it's not intentional but still get the impact of not selling quickly)*	8. Quantity 9. Time 10. Storage problems	10. How much do you usually store 11. For how long do you usually store 12. Do you have storage problems 13. Do you experience storage losses
Transaction costs	3. Forms 4. Proportions	3. What are your transaction costs 4. What is their proportions
Grading / sorting	2. Grading incentive	4. Do you grade or sort 5. Does better grade fetch higher price
Market information	3. Sources 4. Spatial arbitrage	4. Do you get market information eg. on price 5. If so, from whom and how 6. Is there a relationship between prices in different areas at a given time
Price formation	2. Market power	5. Who determines the price 6. How is the price determined 7. If firm/individual is a price taker, find out why
Institutional and legal framework	2. Associations	3. Do you have an association 4. Are there any market regulations. If so, which ones and how do they affect your business
Market structure	2. Competition	4. No of sellers 5. Is there price competition 6. Is there non-price competition. If so, how eg. interlocking markets
Credit availability	3. Sources 4. Types	1. Are there credit institutions 2. Do you use them. If no, why 3. What are their rates