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Africa's Development (NEPAD)

Comprehensive Africa Agriculture
Development Programme (CAADP)

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Investment Centre Division

GOVERNMENT OF THE REPUBLIC OF MAURITIUS

SUPPORT TO NEPAD–CAADP IMPLEMENTATION

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Volume VII of VII

BANKABLE INVESTMENT PROJECT PROFILE

Strengthening the Agro–Processing Capacity of Rodrigues

February 2005

MAURITIUS: Support to NEPAD–CAADP Implementation

Volume I: National Medium–Term Investment Programme (NMTIP)

Bankable Investment Project Profiles (BIPPs)

Volume II: Agricultural Diversification (Integrated Processing and Marketing)

Volume III: Mauritius Agricultural Information System (MAIS)

Volume IV: Sustainable Land and Water Management

Volume V: Community Development and Poverty Alleviation Project

Volume VI: Mauritius Agricultural Biotechnology Institute (MABI)

Volume VII: Strengthening the Agro–Processing Capacity of Rodrigues

NEPAD–CAADP BANKABLE INVESTMENT PROJECT PROFILE

Country: Mauritius

Sector of Activities: Agribusiness

Proposed Project Name: **Strengthening the Agro–Processing Capacity of Rodrigues**

Project Area: The Island of Rodrigues

Duration of Project: 5 years

Estimated Cost: **Rs88,000,000**

Suggested Financing:

Source	***US$ million***[1]	***Rs million***	***% of total***
Government	0.24	7.0	8
Financing institution(s)	2.71	80.0	91
Beneficiaries/ Private sector	0.03	1.0	1
Total	***2.98***	***88.0***	***100.0***

[1] Exchange rate:
Currency: Mauritius Rupee (Rs)
US$1 =Rs29.5
Rs1 = US$0.0339

MAURITIUS:

NEPAD–CAADP Bankable Investment Project Profile

"Strengthening the Agro–Processing Capacity of Rodrigues"

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Abbreviations

ACP	African, Caribbean and Pacific [Countries]
AMB	Agricultural Marketing Board
AREU	Agricultural Research and Extension Unit
BIPP	Bankable Investment Project Profile
CAADP	Comprehensive Africa Agriculture Development Programme
CDE	Centre for the Development of Enterprise
CoA	Commission of Agriculture of the RRA
DBM	Development Bank of Mauritius
DoA	Department of Agriculture (falling under the CoA)
EDF	European Development Fund
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FEPER	Fédération des Eleveurs et Planteurs de Rodrigues
IFAD	International Fund for Agricultural Development
MAFTNR	Ministry of Agriculture, Food Technology and Natural Resources
NEPAD	New Partnership for Africa's Development
NFYFC	National Federation of Young Farmers Clubs
NHPA	National Handicrafts Promotion Authority
NMTIP	National Medium–Term Investment Programme
NSSSP	Non–Sugar Sector Strategic Plan
PMU	Programme Management Unit
PROINVEST	Partnership Programme for the Promotion of Investment and Technology
RRA	Rodrigues Regional Assembly
RTMA	Rodrigues Trade and Marketing Agency
SMEs	Small– and Medium–scale Enterprises
SMIDO	Small and Medium Industries Development Organisation
TFSIVG	Trust Fund for the Social Integration of Vulnerable Groups
UNDP	United Nations Development Programme
WEDCO	Western Development Company

I. PROJECT BACKGROUND

A. Project Origin

I.1. In stark contrast to the national economy of Mauritius, which is characterized by a wide diversity between industrial and agricultural activities, the case of the Island of Rodrigues is very specific in that it is a typical example of an agricultural economy based on traditional farming systems, using little inputs, and suffering from similar constraints faced by typical poor developing countries. The Government of Mauritius, and more recently the *Rodrigues Regional Assembly* (RRA), have recognized the need to create the necessary enabling conditions to modernize the agricultural sector of the island. The need to shift from subsistence to cash crop farming and to give greater value–added to Rodriguan agricultural produce have also been emphasized in several studies during the past decade but very little has been done and the sector does not appear to be progressing at a satisfactory pace. Rodrigues is still heavily dependent economically on the main island of Mauritius.

I.2. In its *Non–Sugar Sector Strategic Plan 2003–2007* (NSSSP), released in 2002, the *Ministry of Agriculture, Food Technology and Natural Resources* (MAFTNR) devoted a separate section on Rodrigues entitled "*A Sustained Programme for Agricultural Diversification*." The report proposed that an appropriate strategy for Rodrigues should firstly provide for the rehabilitation of the traditional sectors, and secondly, value–addition to agro–products for export. Amongst the immediate major products identified in the report are the typical Rodriguan lime/lime and chilli.

I.3. Prior to the NSSSP, at least four other high–profile reports[2] had emphasized the need to help the Rodriguan agricultural economy to take advantage of those commodities for which it stands comparative advantages, through properly organized production, processing and marketing chains. They all recognized that properly introduced agro–industries could be instrumental in the proposed revitalization process.

I.4. It is in this spirit that the current project has been prepared, in close collaboration with the *Commission of Agriculture* (CoA) of the RRA. The project is geared towards the need to give a strong impetus to an agricultural sector that is still at a rudimentary stage in terms of organization, production, processing, supply, and marketing. This will be achieved mainly by developing and strengthening its agro–processing capacity through the establishment of three core *"filières"* in areas where the island has been found to possess non–negligible comparative advantages, namely:

- Lime and lime–based products;
- Chilli and chilli–based products, and
- Pork and pork–related products (such as Rodriguan ham and sausages).

I.5. The project has been designed in a way that it will have spillover effects on other produce such that a greater number of people could be expected to return back to agricultural sector of Rodrigues.

B. General Information on the Island of Rodrigues

I.6. ***Geography and Population.*** Rodrigues is the main outer island of the Republic of Mauritius. Situated at some 653 km to the North East of Mauritius (one–and–a–half hour by airplane), the island

[2] See Appendix 4.

extends over 104 km^2 and is around 7.5 km North to South and 16.5 km East to West. Rodrigues has a lagoon that extends over some 200 km^2.

I.7. The resident population of the island stood at 36,539[2] in 2003, with the male and female population estimated at 18,098 and 18,441 respectively. The population has a stable growth rate estimated at 0.5 percent Rodrigues has a relatively young population with more than half of its total population aged between 15 to 45 years old. The coastal region around Port Mathurin, the capital, has a population estimated at some 7,000. About 4,000 inhabitants are found on the other coastal regions while the majority of the inhabitants, estimated at 15,000, are found on the higher grounds.

I.8. ***Political Evolution.*** A pivotal development in the identity construction and administration of Rodrigues is the decentralization of services from the central government to a *Rodrigues Regional Assembly* (RRA) that came into operation in January 2002. The island of Rodrigues has evolved from the old order where the affairs of the territory and its people were managed from the capital of the Republic (Port Louis) by the central administration to a new order where a democratically elected RRA has maximum autonomy to make policy decisions, manage and develop the island for the well being of Rodriguans. This autonomy has recognised the lack of sustained development and the special needs of Rodrigues in terms of accelerated development.

I.9. The RRA, excluding the Chairperson, consists of eighteen members — twelve Local Region Members for six Local Regions and six Island Region Members. It involves Commissioners with specific responsibilities for various portfolios, and the *Commission of Agriculture* is one of the various units of operation within the RRA. The *Department of Agriculture*, which is equivalent to a ministry, operates under the CoA and is one of the most important departments of the RRA.

I.10. The RRA is empowered to initiate legislation that, however, has to be ushered into the National Assembly to become law for Rodrigues. The Assembly prepares and adopts its annual budgetary estimates. These are then considered by the *Cabinet of Ministers* before being incorporated in the National Appropriation Bill. According to the Amendment (Act No.32) to the Constitution of Mauritius in 2001, there are established a "Rodrigues Consolidated Fund" which shall consist of funds yearly appropriated by the National Assembly in Mauritius for the recurrent expenditure of the Regional Assembly, and the Rodrigues Capital Fund which shall consist of such funds as may be specified for the purposes of development.

I.11. ***Economic Conditions.*** The main pillars of the Rodriguan economy are agriculture, forestry and fishing, trade and services. The agricultural and fishing sectors have the highest employment rate estimated at 35 percent of the active population. The drastic fall in the area under cultivation (from 1,294 ha in 1990 to 173 ha in 2003).is partly responsible for the alarming unemployment problem in Rodrigues.

I.12. However, tourism has since the last decade emerged as a growing sector of the Rodriguan economy. With the operation of the newly refurbished airport at Plaines Corail in November 2003, and the subsequent opening of regional flights from Reunion Island, the sector has been given an added boost, with some 64,000 tourists in 2003. However until the tourism industry becomes the main income earner and employment generator on the island, the Rodriguan economy remains primarily dependent on its largely traditional agricultural sector.

I.13. External trade of Rodrigues is characterised by the export of agricultural commodities to its main market, Mauritius, via the sea. The ship connects Rodrigues to Mauritius twice a month on

[2] Provisional estimates.

average. Amongst the agricultural exports of the island, there are live animals (pigs, cattle, fowls), fish products and foodcrops (chillies, coconuts and lime).

I.14. ***Social Conditions.*** The social conditions prevalent on the island reflect the relatively underdeveloped state of the Rodriguan economy. As an example, the economic structure does not augur well for creating jobs or stimulating the right employment conditions for the unemployed. Although no official rate of unemployment is published, unemployment is high in Rodrigues and estimates suggest that 8 percent of the total population were unemployed in 2003.

I.15. A study by the World Bank estimated that 37.6 percent of households in Rodrigues lived in poverty between 2001 and 2002. Rodrigues was considered as the territory within the Republic of Mauritius with the highest incidence of poverty. Furthermore, infant mortality rate remained high at 23.4 per thousand live births in 2001, a decline from 32.9 in 1991. The figure for infant mortality is still much above the level for the island of Mauritius, although the gap is being bridged.

I.16. According to the *Sub–National Report on Millennium Development Goals in Rodrigues* (2003), the real challenge about poverty in Rodrigues is to devise a strategy for economic development that is capable of generating direct and indirect employment. The Commissioners of Rodrigues are fully committed to the fight against poverty. They propose a series of measures that will help to curb this problem in the island. One of them is an agrarian reform. It is proposed to encourage the people to cultivate lands situated near their houses and to market their products. Low–cost housing being provided by the government will include a small plot of land to encourage such practices. In fact, since the establishment of the RRA in 2002, policy makers and the population in general are eager for a new impetus to improve the social and economic status of the island.

I.17. ***Land Allocation and Utilization.*** In Rodrigues, many lands have been abandoned and this is reflected in the declining trend of agricultural production over the past decades. Land degradation is a severe problem in Rodrigues and the situation has worsened due to the wide extent of abandoned lands which are prone to soil erosion.

I.18. The fertile areas are relatively more heavily populated than the less fertile ones, which suffer from lack of water. Land tenure is an important factor limiting economic development of the island. Some 90 percent of the land belongs to the state but no clear land–allocation policy has been implemented yet, even though there are indications the RRA has started to consider the matter.

C. Status of the Three Proposed Sub–sectors to be Developed

(i) Pig Farming

I.19. General aspects of pig farming in Rodrigues are detailed in the table below.

Table 1: Aspects of Pig Farming in Rodrigues

Description of pig farming	It is an old and normal activity in an island where (i) pig rearing is not restricted by cultural or religious considerations; and (ii) the population is a popular consumer of pork.
Operation of pig farming	There is widespread backyard rearing and breeding of pigs. Most breeders are reluctant to undertake this activity on a larger scale due to problems such as lack of water, feed, scarcity of piglets, marketing, etc.

Table 1: Aspects of Pig Farming in Rodrigues	
Pig farmers involved in breeding and fattening	Less than 10% of farmers are involved in breeding. The majority (more than 90%) are involved in fattening, as it is simpler and less technical than piglet production. About half of farmers also do breeding in addition to fattening. Pig production units are scattered all over the island. In 2001, AREU estimated the pig population of the island at some 8,700. The Pig Breeding Station in Baie Topaz supplies farmers with sows for breeding and piglets for fattening.
Types of pig farmers	• More than half of farmers are small–scale producers rearing between 1–3 piglets in their backyard in order to supplement income or for household consumption. • A relatively small proportion of farmers has between 10–20 pigs and, so, represents the large–scale producer group.
Type of feed	Commercial feed is used in small amounts and complemented with less expensive food types like manioc, flour, kitchen wastes, etc.
Slaughtering	There are no slaughterhouses in operation. Farmers have recourse to on–farm slaughtering. They buy piglets from the Baie Topaze Livestock Production Unit and put them on a fattening regime for 5–8 months, and then sell them to the few registered butchers of Rodrigues. Due to low price of live pigs on the market, the farmers slaughter the animals on the farm, and sell the meat to neighbours, as it is more profitable than selling on the market.
Sanitation and health aspects	• Few farmers use liberal flushing with water. Cleaning of sites is done mainly through dry scraping. The solid waste is segregated so as to be used as manure. In the absence of absorption pits, the small volume of effluent produced is disposed through surface drains.

(ii) Lime Production

I.20. The Rodrigues lime, more popularly known as *Ti Limon*, originates from the Mexican lime. The latter was introduced in Rodrigues back in the 1750s. It has become acclimatized to local conditions and, over the years, it has been made unique in terms of characteristics like size, taste, colour, etc compared to lime grown in other countries. In terms of processing, the produce is used as raw materials and transformed into pickles which are well appreciated by Rodriguans and tourists alike.

I.21. Production is done mostly on a small scale. Planters typically have 5 trees on average in their backyards (most of them old–bearing trees). Large orchards of lime are not common. Cultural practices have remained very traditional with little post–harvesting activities. Production is undertaken mostly in coastal regions where the high temperature is conducive to the development of trees and fruit production.

Table 2: Quantity of Limes Exported to Mauritius (1994–2003)

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Quantity exported (t)	97	93	81	92	82	86	152	151	287	62

Source: Digest of Central Statistics

(iii) Chilli Production

I.22. Similar to the case of lime, chilli cultivation is done in backyards. Several varieties of chillies are grown in Rodrigues namely the small pungent ones, long pungent, salad type and sweet peppers. The most famous one is the small chilli traditionally known as *Piment Martin*. Agro–processors (mostly households and small cooperative societies) usually source their chilli requirements

directly from growers. Middlemen are also active in collecting fresh chillies for export to Mauritius. During the past 10 years, there has been a considerable decrease in chilli production, and exports have registered a fall of some 6,200 kg. This is due mainly to (i) adverse climatic conditions like droughts; (ii) pests and diseases; and (iii) cross breeding, with imported varieties causing a fall in market value. It is noteworthy that there has been a slight change in cultural practices from backyard gardening to pure stand cultivations since the recruitment of additional agricultural officers in 2002.

II. PROJECT AREA

II.1. The project is about developing the agro–processing capacity of the island of Rodrigues. Evidence gathered from other similar countries shows that a key success factor is to develop linkages in the producer–processor supply chain, both formal and informal linkages. The project area, therefore, covers the whole island, starting with backyards of households, even though specific areas have been earmarked by the DoA for each *filière* as detailed below.

II.2. The different areas, zones, regions and sites highlighted below have been identified in collaboration with the DoA. They cover all aspects of the producer–processor supply chain whereby agents such as individuals, households, cooperative societies, farmers' associations and enterprises will find the necessary facilities to operate.

A. Areas Earmarked for the Lime and Chilli Filières

II.3. ***Areas for Cultivation of Lime.*** The proposed project area is found in the catchments areas in the coastal regions all around the island, covering some 5 km inland (see Appendix 2). The hot sub–humid climate of these regions is conducive to lime production. In addition to these identified areas, the land on abandoned terraces will also be considered for their crop suitability. Amongst the targeted project beneficiaries, consideration will be given to the planters who grow lime only during rainy seasons. The land tenure of these specific regions will have to be reconsidered by the RRA. The proposed areas of intervention will ultimately be refined and approved by the Head of Dept./Commissioner and the Council of the RRA in collaboration with the planters' community.

II.4. It is noteworthy that the catchments areas in the coastal regions comprise slopes that are being used for grazing by wild animals, making them prone to soil erosion and degradation. Apart from lack of water, this remains a key reason why many of the agricultural lands have been abandoned by farmers. Lands that are not fenced in an appropriate way become easy targets of hungry or stray animals. This situation is such that farmers, who cannot invest in fencing, have chosen to abandon the lands altogether rather than control the invasion of their farms.

II.5. ***Areas for Cultivation of Chilli.*** The chilli plant grows better in the coastal regions of Rodrigues but fares well on the higher grounds also. Taking into account the crop specificities, five growing areas namely Piment, Nassola, Mt. du Sable, Baie Malgache and Eau Clair have been identified for large to medium scale cultivation in pure stands (see Appendix 2). Of the chosen areas, three are located on the higher grounds whilst the remaining are found in the coastal regions. Chilli production, which is undertaken mostly in mixed vegetable gardens using traditional cultural practices, will constitute an important part of total production.

II.6. ***Areas for Construction of Water Harvesting Structures and Other Irrigation Equipment:***

- Five water–harvesting structures of a capacity of 1,000 cubic metres will be necessary to support both lime and chilli production. Construction is expected to be completed within the first two years. The exact locations of the structures will have to be determined after a careful study of the different sites mentioned above;
- The following will also be made available to lime and chilli growers:
  - Drip irrigation covering 25 hectares over five years (consisting of small water pumps, water basins, and piping systems); and
  - Fencing (to prevent animals from grazing on the lands).

II.7. The optimal operation of the irrigation facilities will be supervised by the officers of the Agricultural Services even though training will be provided to individual farmers.

II.8. ***Areas for Agro–processing of Lime and Chilli.*** For those not engaged in cultivation, the possibility to start an agro–processing enterprises will be offered. No specific sites have been earmarked but participants will be free to group themselves into cooperative societies or companies and rent space to conduct their activities. The *Development Bank of Mauritius* (DBM) will offer loans to those who have viable projects whilst the *Small and Medium Industries Development Organisation* (SMIDO) and the *National Handicrafts Promotion Authority* (NHPA) will help interested parties set up their businesses.

II.9. ***Areas for Development of Inputs (Seeds, etc.).*** The DoA's Agricultural Services already manages several sites in Rodrigues but these centres often operate at sub–optimal capacity. With the implementation of the project, these sites will be called upon to play a pivotal role in ensuring that appropriate inputs are used by farmers. Most of the inputs will be developed by the Agricultural Services and will be sold at affordable prices to farmers.

B. Areas Earmarked for the Pork Filière

II.10. ***Areas for Breeding, Fattening, Slaughtering, and Agro–processing.*** Participants operating within the pork filière can be categorized into *Breeders*, *Fatteners*, *Butchers*, *Agro–processors*, and *Traders*. Whilst it is expected that, in the short–term, participants will be using their own facilities (including their backyards), it is noteworthy that the RRA has already earmarked the sites or zones as shown in the table below, especially for medium–scale pig breeding (see also Appendix 2).

Table 3: Areas of Physical Implementation of Pig Farming Strategies – Characteristics of Zones Identified

Zones identified	Reasons for choice of location	Facilities/support systems
1. Bay Malgache 2. Anse Baleine 3. Tamarin (South) 4. Pt au Sel (East) 5. Mt Plate/Plaine Mao (West)	These sites are near to pasture/agricultural land, and are quite far from the residential areas where future intensification will not interfere with the day–to–day life of the population and visitors.	• Water supply and electricity • Effective road system • Composting technique for waste disposal • Slaughterhouse and food laboratory • A timely and adequate supply of subsidized pig feed from Mauritius and distributed through Government agricultural services.

II.11. ***Area for the Construction of a Slaughterhouse and a Chilling Cabinet.*** A fundamental component of the pork *filière* will be the establishment of a slaughterhouse and a chilling cabinet in the South of the island. Currently, there is no slaughterhouse in Rodrigues and the authorities have

been lenient with regards to slaughtering of animals. This situation is expected to change with the operation of new slaughtering facilities and the establishment of new rules and regulations regarding farming and slaughtering.

II.12. ***Agro–processing.*** Like in the case of lime and chilli, agro–processing will be conducted by private parties supported by the DBM, SMIDO and NHPA.

II.13. ***Areas for Composting.*** A study recently carried out by the University of Mauritius in Rodrigues has found that pig wastes with suitable amendment can compost well. The report shows that effective degradation does take place given the temperature profile and the change in volatile solids. However, the final characteristics have not yet been determined. It is proposed to start composting of pig waste in several areas of Rodrigues once the project gets fully rolling. A recent experience at Rivière Bananes has shown that applications of the compost to selected crops did lead to significant increases in yields.

C. General Infrastructure Development

II.14. ***Setting up of a Rodrigues Trade and Marketing Agency (RTMA).*** The RTMA will comprise a Head Office situated in Port Mathurin (within the compound of the DoA) but will have several tentacles throughout the island. It will be responsible for the Slaughterhouse as mentioned above and will manage the expanded Cold Storage and the Pilot Laboratory and the Certifying Body.

II.15. ***Implementation of Cold Room Facilities for Crops at the Agricultural Services Division.*** This will carried out at Citronnelle, where the Agricultural Services is currently situated.

II.16. ***Pilot Laboratory and Certifying Body.*** The structure will be situated in Port Mathurin and will be under the responsibility of the RTMA. The RRA has already identified several sites where the facilities could be established but a final choice has yet to be made.

II.17. ***Record–keeping and Statistical Division.*** This new Division will be situated within the compound of the DoA in Port Mathurin. It will liaise with the RTMA and the Agricultural Services on a permanent basis and compile statistics that will be disseminated for free to participants.

III. PROJECT RATIONALE

A. Strategic Framework

III.1. This project is in line with the medium–term strategy for agriculture in Rodrigues which aims at arresting the decline in the production of agricultural products, promoting value addition and improving their marketability. The project holds a key part in shaping the destiny of a territory in which the agricultural sector, as a crucial economic activity, has remain largely under–exploited in its full plenitude and left without plausible reform packages.

III.2. Developing and enhancing the island's agro–processing capability will help facilitate, accompany, model and orientate the transition from the *"social function"* to attain a full–fledged *"economic function"* — from production to transformation, from research to innovation, and articulated around a certified Rodriguan Label for selected products. In the case of chilli, for instance, preservation is done with the use of vinegar commonly available on the market. There is no control on the strength of the preservative used. Each processor has his/her own way of using vinegar for

preservation. The project aims to enhance the means and ways food is transformed and marketed. Rodriguan food would be characterized by its distinct labelling and packaging with a view to intelligently search for outside markets. Research studies have shown that there is high potential for productivity and acreage in Rodrigues to be substantially improved over the years if right conditions prevail.

III.3. A whole spectrum of strategies will be developed in terms of infrastructure, marketing, institutions, production techniques and capacity–building so as to create the right enabling conditions for all stakeholders in Rodrigues.

III.4. In a recent study, the World Bank has estimated that 37.6 percent of households in Rodrigues lived in poverty between 2001 and 2002. The finality of the project would be to use the development of a strong agro–industry as a stepping–stone to eventually work towards the socio–economic development of the island. The population in general and women in particular depend heavily on pig farming and the strengthening of the agro–processing capacity can improve their revenue and enhance their economic well–being.

III.5. A solid justification of the agricultural project in Rodrigues is that important market sources already exist for the product. Additionally, other markets can be found and maintained for the produce by emphasizing on the ***"Rodrigues Label"*** as a mark of quality for products manufactured in Rodrigues under agreed and established standards of quality.

III.6. Mauritius is already an important market for Rodriguan agricultural produce in particular honey, chillies, lime and livestock. Other agricultural products, which are shipped to the main land, include frozen octopus, red beans and salted fish. Despite a general rise in the demand for chillies, lime and pigs in Mauritius, production has not been able to fulfil the export requirements.

III.7. The erratic export figures for pigs, lime and chillies (small) in the table below reflect the inconsistencies in production attributable to several constraints in particular prolonged drought conditions.

Table 4: Exports of Selected Commodities to Mauritius (1994–2002)

Year	Pigs (units)	Lime (t)	Chillies, small (kg)
1994	2,160	97	7,697
1996	836	81	235
1998	65	82	1,250
2000	8	152	820
2002	1,711	286	1,765

Source: Customs and Excise Department (Rodrigues)

III.8. ***Expanding Market in Rodrigues for all Three Filières.*** The tourism sector in Rodrigues has developed considerably along the years. The passenger traffic between Mauritius and Rodrigues has increased ten fold during the last 20 years (60,355 of arrivals in 2002). Emphasizing on the typical Rodriguan Label can help to exploit this important market potential. Processed forms of Rodrigues pork (sausage, ham, etc.), lime and chillies are perceived as exotic products and visitors are ready to pay higher prices for them.

III.9. ***Rural Development and Poverty Alleviation.*** The agricultural sector is the main economic pillar in the island, providing employment to some 35 percent of the active population. The livelihoods

of many households depend on agriculture and it is proposed in this project that rural development and poverty alleviation be centred around agricultural activities. Poverty alleviation programmes in Mauritius have focused on a participatory approach whereby the vulnerable groups are encouraged to take up income–generating activities in agriculture such as livestock keeping and crop growing. The same approach to rural development and poverty alleviation is proposed in this project for Rodrigues. Given that a significant part of production comes from backyards, the project wants to encourage this practice amongst the vulnerable groups. However, improvements will be made to the traditional farming practices which are predominantly used in such cultivations, through training programmes.

III.10. ***Capacity Building.*** One fundamental aspect of the project is its ability to help the Rodriguan farming and agricultural community learn from modern and more efficient production techniques. Without discarding traditional methods, they will learn to change with time and embrace the myriad of reformative measures and infrastructure frameworks established to better serve their interests. Not only will they improve their working standards through on–the–job experience and training, but lessons and advices from professional people will allow them to move in tune with the passage of time.

III.11. ***Judicious Utilization and Allocation of Lands.*** One fundamental problem besetting the agricultural sector in Rodrigues is the drastic reduction in the area under cultivation. In recent years, only up to about 350 ha of land have been exploited compared to about 975 ha of land from the 4,000 ha available some 10 years ago. The explanations include (i) Unfavourable climatic conditions like cyclones and droughts that affect seriously traditional activities, (ii) Technical inaccessibility of modern agricultural techniques that reduce the impetus to join the sector by youngsters. As Rodrigues has a land surface area of 104 km^2 and sustains a population of about 36,000, land could be identified to undertake pig farming and food production on a larger scale and in a more professional manner. It follows that agricultural development will create the necessary zeal to make more quantitative and qualitative use of a vital resource as land.

B. Pig Farming

III.12. ***Rising Demand for Pork for Consumption and Processing.*** Pork production is the dominant activity of the livestock sector in Rodrigues. Up to now pigs have been exported live to Mauritius which represents a major market for meat and processed pork products. Exports of pigs on hoof to Mauritius picked up in 2001 and onwards in response to rising demand for fresh meat for consumption and processing. The only export market of pig hoof is Mauritius, and the exports of pork and pork–related products rose by 17 percent from 2001 to 2002.

III.13. The table below shows the import figures for pork and pork products from Rodrigues for the period 1997–2002.

Table 5: Imports of Pork and Pork Products from Rodrigues (1997–2002)

Year	1997	1998	1999	2000	2001	2002
Rodrigues (Units)	444	65	23	8	1,458	1,711
Rodrigues ('000 kg)	33.3	4.88	1.73	0.6	109.35	128.33
Rodrigues ('000 Rs.)	999	146.3	51.75	18	3,280.5	3,849.8
Foreign ('000 kg)	282.6	371.9	390.9	561.8	465.7	638.5
Foreign ('000 Rs.)	15,271	22,274	26,649	33,928	34,469	42,337

Source: CSO; Customs Services (Mauritius)
Note: Assumption of 75 kg per pig exported to Mauritius at an average FOB price of Rs30 per kg.

III.14. The above table indicates that in 2001 only 19 percent of the requirements of Mauritius came from Rodrigues and this figure stood at some 16 percent in 2002 although the quantity exported to Mauritius increased by 17 percent. There exists therefore significant opportunities to expand production in Rodrigues to supply a larger proportion of the Mauritian market.

III.15. ***High Quality of Meat and Competitive Prices.*** Pork meat has a high nutritious value when produced in a controlled environment and the meat can be further processed into value–added products. Unlike Rodrigues, the production system of small farmers in Mauritius does not generally yield the quality lean meat expected by top market clients such as hotels, supermarkets and processors. Consequently, a significant amount of choice cuts and processed pig meat products are still being imported.

III.16. The major suppliers of swine carcasses to Mauritius are South Africa and Zimbabwe. The kilo price of swine carcasses imported from South Africa was around Rs54.2 in the year 2001 and around Rs39.0 in 2002 while that imported from Zimbabwe stood at around Rs84.5 in 2000 and at around Rs81.4 in 2001. These import prices compare against a lower average price of Rs30 per kg for the Rodriguan carcasses.

III.17. ***Development of Agro–processing Industry***. Not only will the necessary conditions be created for effective pig breeding and fattening, but, also, the processing of pork meat into secondary products will be an important source of income for the pig industry. In Rodrigues, only a few processed meat products like Chinese sausages and Creole sausages are found on the local market. These products are very rare, and, during period of festivities and at the end and beginning of the year, they are generally absent on the market.

III.18. A UNDP/FAO study on the *"organisation and marketing of Rodrigues traditional agricultural products"* highlighted the market potential of the *Jambon de Rodrigues* or Rodriguan Ham. The latter has a special consumer appeal and is reputed to have won international awards on account of its quality and organo–leptic characteristics. The commercial prospects for the product were later confirmed by a SWOT analysis which recommended that the commercial development of the Rodriguan Ham would require investments in swine production, processing equipment, cold storage, and training in pork processing and marketing. According to the study, there is a potential for bringing the volume of production of Rodriguan Ham to 100 kg[3] per month. This quantity could be doubled within a 6–month period if the appropriate conditions are met.

C. Lime Production

III.19. ***Market Potential in Mauritius.*** Fresh limes have an important market in Mauritius where it is very well appreciated because of its unique features like size, taste, juice content, etc, and its use in religious festivals. Also, there is a high demand for this commodity during end of year periods and during religious festivals in Mauritius. The quantity exported to Mauritius has been severely affected by the persisting drought conditions that prevailed on the island for some years, and a drastic reduction was noted in 2003 due to Cyclone Kalunde that visited the island in March 2002.

III.20. ***Inefficiencies in production and supply chain.*** The project proposes to reduce/remove the constraints and inefficiencies that prevail in the production and distribution of Rodriguan lime. These include absence of proper tree husbandry, poor harvesting methods causing damage of foods, absence of clear marketing strategy, lack of quality in processing standards. Agro–processing is done by

[3] 1997 figures.

individuals and associations involving mainly women at their home place. The system is not legalized and there is no control on the whole chain of agro–processing: from harvests to fruits until the transformed produce reach the market and consumers. There is no post–harvest treatment, no refrigerated lorries, and no cold rooms. There is also poor quality of the fresh fruits on the local market and in Mauritius due to factors like (i) no selection, grading, sorting and packing, (ii) no proper timing for harvesting, etc.

III.21. ***Value addition.*** Over the years, Rodriguans have developed exclusive recipes of 'piment–limon' and 'aigre–doux limon', which are nowhere else to be found and are highly appreciated by many. Such recipes hold promising potential for export, provided they are produced in accordance with international norms and standards, taking into account the increasing customer exigencies and emphasis on food safety. Pickled limes are also in high demand and hold good marketable potential in Europe. Vacuum packaging of pickled lime for export also provide promising opportunities.

III.22. The rationale for concentrating on lime production, processing and exportation can be viewed in terms of:

- Uniqueness/exotic nature of the fruits that can be made into jam, jelly, marmalade, and pickles;
- All year round production; and
- High local, regional and international demand.

D. Chilli Production

III.23. ***Market Potential in Mauritius.*** Preserved and fresh chilli are very popular in Mauritius, and the high demand for chilli in Mauritius from various foreign sources means that the country can absorb almost any amount of chillies that can reasonably be produced in Rodrigues, thus stimulating the need for much further production. Despite the decline in the percentage of imports into Mauritius from 9.6 percent in 1997 to 1.2 percent in 2002 (due to adverse climatic conditions, pests and diseases, lack of quality in preservation techniques, packaging and labelling), proper crop management coupled with attractive marketing strategies could give a well needed boost to its sales and, hence, production. The Ministry of Rodrigues has set up a *Rodrigues Export Freight Subsidy Scheme* to promote the production and export of products, including chilli, produced in Rodrigues. The scheme offers 100 percent remission on outward freight charge on export of any quantity of chillies to Mauritius.

III.24. ***Value addition.*** With the increase in number of visitors and with the increasing demand of preserved chillies, more transformation is being carried out. Concerning chilli production, some 25 percent of the crop is processed as preserves and used in lime pickles. At present several types of chilli products are offered for sale and they include:

- Chilli preserved in vinegar;
- Lime and chilli;
- Green chilli paste;
- Red (ripe) chilli paste;
- Other preparations containing chilli — octopus/chilli; shrimp/chilli, etc.

III.25. ***Packaging, Marketing and Exports.*** The marketing of exotic products of Rodrigues does not follow a planned strategy and is done in a rather amateurish manner. Moreover, the supporting infrastructure and the institutional environment are not fully developed to support commercial activities on a medium to large scale. Very often, the presentation of the products leaves doubts as to quality of the products in the minds of buyers. Exotic products of Rodrigues including honey, lime, fish, octopus, pork products, pickles, chillies, red beans, handicraft items, etc. have gained considerable popularity among tourists mainly coming from Mauritius. However, the production and exports of these commodities have been quite erratic for various reasons. Traditional production techniques, inadequate distribution facilities, inappropriate packaging and labelling, inconsistency of product quality, unorganized marketing, absence of producer associations and lack of information on institutional support are some of the factors that have caused the wide fluctuations in external trade.

IV. PROJECT OBJECTIVES

IV.1. Overall, the project would comprise two inter–related agricultural development philosophies in terms of:

- Distinct strategic development actions for each of the three *filières*, with a proper selection of participants and with the deployment of the necessary resources to strengthen farmers' capabilities. These strategies will include investments in the necessary logistics and infrastructure support, capacity building, reorganisation of production, marketing and distribution; and

- A stronger, diversified and commercially viable agro–processing industry in Rodrigues, especially for lime, chillies and pork (including pork products) through the development of linkages in the producer–processor supply chain.

<u>Short–term Objectives:</u> Investment in Infrastructure and Development of the Primary Production Base

IV.2. During the first two years, considerable attention would be devoted to the food supply chain, i.e., the basic patterns of growing crops and rearing of animals. The short–term objectives of the project are multi–fold and include the following:

- Grouping of farmers in three filières to centralize, organize and professionalize cultivation, harvesting and marketing of the produce.

- Encouraging the vulnerable groups to engage in agricultural production, as part of the project's objective of rural development and poverty alleviation.

- Development of infrastructures during the first two years, namely (i) the setting up of a Slaughterhouse together with a boning room and a chilling cabinet; (ii) the construction of a *Pilot Food Laboratory* and a *Certifying Agency*; (iii) the construction of full–fledged cold storage facilities for crops; (iv) the establishment of the RTMA that will guarantee, among others, a regular market price throughout the year for products of the three filières; and

- Creation of a *Rodrigues Label* to be awarded to products that meet essential chemical, micro bacterial and sensorial tests conducted at the *Pilot Food Laboratory*.

Medium–term Objective: Enhancing the Agro–processing Capacity of Rodrigues

IV.3. The project is oriented towards transforming the agricultural landscape of an island whose dependence of the sector needs to be fully tapped by rendering an optimum utilization of the myriad of resources available. This aim can be broken into the following:

- Rodrigues would be equipped with the necessary support systems so as to develop and enhance its agro–processing capacity. The setting up of a food laboratory and a slaughterhouse would be crucial aspects of this move.
- By providing capacity building in terms of human resource training and institutions to enhance the way agriculturists and farmers perform their activities and by improving post–harvesting practices (transportation, sorting, grading, export quality, etc), the prospective enabling framework will aim at transforming the chain from the simple production–supply system to a more value–added and versatile production–processing–marketing–supply setting.
- One related objective is the creation of typically contrived Rodriguan Labels, associated with quality, freshness and exotic tastes and flavours.

IV.4. The performance targets are set as follows:

Table 6: Key Performance Targets – Lime and Chilli

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
For Lime						
Number of producers	60	80	120	160	200	300
Production (t)	150	250	560	840	1,400	1,890
Acreage (ha)	5	7	15	25	40	50
Yield (t/ha)	19.5	25.0	28.4	28.6	29.8	32.1
Losses/damage (%)	35	30	24	15	15	15
For Chilli						
Number of producers	200	225	260	320	400	500
Production (t)	7	11	22	38	53	68
Acreage (ha)	2	3	6	10	14	18
Yield (t/ha)	2.8	3.0	3.1	3.2	3.3	3.4
Losses/damage (%)	20	18	15	15	12	12

Long–term Objectives

IV.5. ***Rodrigues as an Organic Production Base.*** With organic food items gaining momentum throughout the world, particularly in Europe, in the USA and even in Mauritius and with growing concern regarding food safety and quality, new opportunities exist for the farming community. The proposed *Food Laboratory* can act as the local *Certification Agency* to certify 'organic' products. In a speech by the Minister at the launching of the 2nd phase of the *Compost Project* run by the *National Federation of Young Farmers Clubs* (NFYFC) with the collaboration of the University of Mauritius and the UNDP in March 2003, it was said, *"Rodrigues, in my view, can be developed as an Organic Production Base. The island has a rich heritage of traditional food items, which can be produced and marketed with an organic label."* Already, the normal cultural practices used in Rodrigues may qualify the chilli product for an 'organic' label.

IV.6. ***Integrated Pig Farming.*** In Mauritius, in February 2005, the Prime Minister said that the feasibility report on a study on integrated pig farming at St Martin is going to be completed by mid 2005. Accordingly, farms will be constructed around a principal breeding activity on a site, from which three expansion channels could be developed: food production, recycling of wastes and energy generation. Given the popularity of pig farming in Rodrigues, the project of integrated farming could eventually be established using experience from Mauritian farmers. Integrated development could include 10–15 farms constructed for new breeders in different sites.

V. PROJECT DESCRIPTION

A. Background

V.1. In order to give back to Rodrigues the *"breadbasket of Mauritius*[3]*"* reputation it once enjoyed, it is proposed to develop three *filières* in areas where the island has been found to possess non–negligible comparative advantages. These are chilli, lime and pork production. In the medium term, it is expected that the benefits of this new approach to agriculture in Rodrigues will have spillover effects not only on the entire agricultural sector but also on the economy as a whole, especially once farm–agribusiness linkages become fully functional.

V.2. Within each filière, three types of businesses will be nurtured, namely:

- small–scale/traditional/backyard production;
- medium–scale ventures (such as cooperative societies and small enterprises); and
- large–scale businesses.

V.3. This implies that anybody interested to join the agricultural sector will find the necessary support from project formulation to implementation, including not only agro–industries but also household members of any generation as well as the poorest of the poor.

B. Project Components

V.4. The project will comprise several main components including:

- ***Setting up of a Programme Management Unit*** (PMU);
- ***Setting up of a Rodrigues Trade and Marketing Agency*** (RTMA) comprising Transport, Storage, Distribution and Logistics Departments as well as a fleet of refrigerated vehicles;
- ***Formal establishment of the filières*** through grouping of farmers in organisations;
- ***Modernisation of the DoA's Agricultural Services*** and setting up of new support services to develop and strengthen farm–agribusiness linkages;
- ***Infrastructure development***, namely:
  - A *Pilot Food Laboratory*, including a *Certifying Body* to award the "Made in Rodrigues" label to selected products;

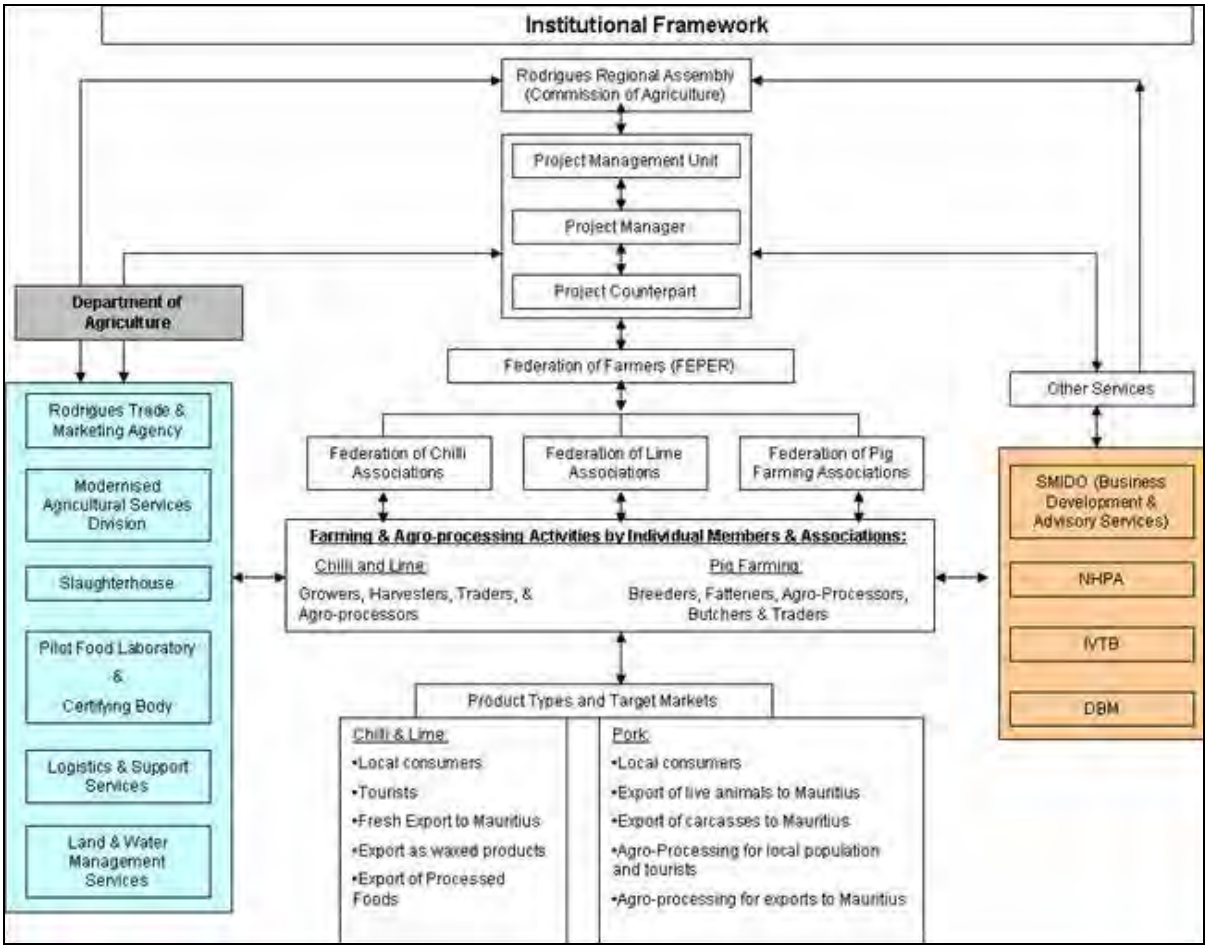
[3] Mauritius Research Council (1999), *"Research Needs Analysis: A Preliminary Report"*

- A modern mini slaughterhouse, including a chilling cabinet;
- Cold storage facilities;
- Water harvest structures and irrigation equipment;
- An *Administration and Record–Keeping Centre*, comprising a *Statistical Unit*;

- ***Capacity building***, including:
  - Training at all levels;
  - A *Business Development and Advisory Services* division that will also coordinate all activities between financial institutions, individual farmers and business enterprises.

V.5. The exhibit below summarises the new framework to strengthen the agricultural sector of Rodrigues.

Institutional Framework and Implementation Arrangements



The Programme Management Unit (PMU)

V.6. The PMU will have a pivotal role during the transition phase from rudimentary agriculture to a more scientifically–organised one. It will ensure a formalised and structured method of managing change in a rigorous manner. It will focus on producing specifically defined output by a certain time,

to a defined quality standard and with a given level of resources so that planned outcomes are achieved. The PMU will be the project implementation organization that will deal with all strategic, financial, administrative, human resource aspects of developing the fields of lime, chilli and pork meat production.

Setting up of a Rodrigues Trade and Marketing Agency (RTMA)
(comprising Transport, Storage, Distribution and Logistics facilities as well as a fleet of refrigerated vehicles)

V.7. Given the specificities of Rodrigues and the acute problem of frequent market failures, it is of cardinal importance to have a centralized authority to ensure the efficient running of the system of markets throughout the year. The RRA also has recognized the need to establish such a body and the drafting of a bill is currently under way. It is recommended that the RRA speed up the procedures to enact the law and to set up the RTMA, or a version of it, in the shortest possible delay failing which the whole programme might not work.

V.8. The proposed RTMA is expected to have a key role to:

- maintain a reference or benchmark price; and
- ensure ready availability of the products concerned on the market throughout the year.

V.9. Many of the studies on Rodrigues have singled out the seriousness of the market failure problem. Farmers do not find it profitable to get involved in the agricultural sector since the price the market offers is unattractive. Households who have lime trees in their yards, for instance, prefer to let the fruit rot rather than harvest them because of the low market prices. Yet, on the other hand, there is a high demand for the products on the market, especially in Mauritius during specific periods of the year. The RTMA will be called upon to play a leading role in maintaining a reference price on the market, a key measure to prevent market failures.

V.10. As an example, it is recommended that the RTMA fulfils the same mission as the *Agricultural Marketing Board* (AMB) of Mauritius. It will purchase all lime and chilli production from farmers at a pre–determined, guaranteed price (provided they are properly certified by the proposed *Pilot Laboratory* and *Certifying Authority*) and will, in turn, sell/market the products in Rodrigues or export to Mauritius. Farmers, however, will be free to sell their products to third parties at any price they desire. It is expected that the guaranteed price will act as a significant incentive measure to attract farmers back to their lands or to harvest the existing trees in their backyards.

V.11. The RTMA will ensure that surplus production is stored in the proposed cold rooms either fresh or waxed according to the required standards.

V.12. For pig farming, the RTMA will initially set up and run the proposed modern slaughterhouse and chilling cabinet but management is expected to shift to private hands within the first year to ensure its commercial viability.

V.13. Apart from storage facilities, the RTMA will also provide logistics solutions to farmers in all nooks and crannies of the island. Three small refrigerated vehicles (two for pig farming) should be included in the fleet of vehicles. Transport charges will be levied but it is expected that the burden will be minimal on farmers since they will be organized under properly–managed associations, which will coordinate all logistics activities.

Formal establishment of the Filières through Mandatory Grouping of Farmers in Organizations

V.14. For the project to be successful, it is crucial for farmers to be grouped under one umbrella. This has already been done in Rodrigues, with the setting up of the *Fédération des Eleveurs et Planteurs de Rodrigues* (FEPER), but membership is still limited given that it is on a purely voluntary basis. FEPER also needs to be equipped with appropriate structures in order to be able to play a key role in the new agricultural system.

V.15. In the context of this project, three separate associations will be created (one for each filière) but they will all be required to register with, and operate under, FEPER, which will act as the apex federation. The law will need to be amended so that membership becomes compulsory. As illustrated in the above exhibit, members of each association will be further categorized into small–, medium– and large–scale businesses.

V.16. Each member association will have responsibility for ensuring that production/farming takes place in line with procedures and farming techniques recommended by the DoA. The latter's *Agricultural Services* will be called upon to play a key role to support the federations of farmers. The associations will become the fundamental pillars for smallholders and, with the support of the *Agricultural Services*, will provide a diverse range of services such as input supplies, training and technical assistance, technology transfer and so forth. They will also offer market information, support in production and marketing planning, laboratory services, access to transport facilities for those situated in remote regions, and legal and accounting support.

Modernisation of the DoA's Agricultural Services and Setting up of New Support Services to Develop and Strengthen Farm–Agribusiness Linkages

V.17. The project proposes to set up several additional support services to manage the new infrastructural developments and to help farmers acquire and familiarize themselves with the latest agricultural techniques. They will fall under the DoA's *Agricultural Services* division, which will be called upon to play a pivotal role in supporting implementation of the project. The immediate actions to be taken will be the development and dissemination of pest–free seeds by the officers of the *Agricultural Services*. The plant propagation and seed production units will be modernized and properly staffed during the early stages of the project. The officers will also provide advices on:

- Crop management;
- Selection and propagation of elite varieties (to be provided initially by nurseries of the Agricultural Services);
- Land preparation, pegging and holing;
- Design, purchase and installation of low–cost but efficient irrigation systems;
- Using modern harvesting and post–harvesting techniques; and
- Fencing of identified plots/zones and planting of windbreaks.

Infrastructure Development

V.18. *Pilot Food Laboratory, including a Certifying Body to award the "Rodrigues Label" to selected products* It is proposed to set up a *Pilot Food Laboratory* (that will be state–owned, but commercially operated) which will ensure that the food produce satisfy a minimum of essential

chemical and microbiological tests. Its main responsibility will be to act as a testing and certifying body to ensure that the products conform to established standards. It will also be the sole authority to grant the *"Rodrigues Label"*.

V.19. Before the processing methods undertaken on the products mentioned in the previous table gain an official seal of approval and satisfy the elementary and necessary standards for food contents, quality and hygiene, several types of testing operations need to be carried out. The testing procedures (categorized below) carried out will try to ensure that the Codex Standards are satisfied (Appendix 3):

Table 7: Some Testing Operations and Related Equipment to be Used

Testing operations	Testing Equipment
Basic operations	• Portable electronic scale • Analytical electronic scale • Standard forced circulation oven • Forced circulation incubators • Portable/bench type pH–meter
Chemical testing	• Moisture analyzer with inbuilt printer • Water still to produce distillated water • Refractometer for Brix measurement • Honey refractometer • Salinity refractometer
Microbiological testing	• Total coliforms & *E. Coli* (membrane filtration method) • Bacterial and coliform count equipment • Automatic autoclave

V.20. The following are expected about the management of the food laboratory:

- Lime, chilli and processed ham are the main products that will be sent to the laboratory which will, nevertheless, be flexible enough to extend its testing to other Rodriguan products like honey.
- As the certification body, the laboratory will establish a national logo for the Rodriguan products in terms of testing, food content and safety and labelling. This logo with an easily recognizable and beautifully presented seal and design will help to give a distinctive cachet to Rodriguan products to establish brand names and maintain consumer loyalty.

V.21. *A modern mini slaughterhouse, including a chilling cabinet and a boning room.* An important observation in Rodrigues is that, although 2,411 pigs were slaughtered in 2002 under the supervision of the Sanitary Services, more than double the official figures are slaughtered without approval every year.

V.22. The proposed full–fledged slaughterhouse (abattoir) will provide the necessary logistics and technical capabilities necessary for slaughtering, preserving and cutting animals in conformity with legal and sanitary standards. According to EC directives, all pigs must be slaughtered in an inspected slaughter establishment approved for export to the EU. If carcass meat is boned or stored in the country of production, this process must be carried out in an EU approved cutting plant and/or cold storage facility. Each establishment must have a written control program and procedures in place that will ensure the production and shipment of products derived from hogs that have not been fed ractopamine.

V.23. In the short term, Rodrigues will not seek to export to countries other than Mauritius. However, a medium–term objective is to prepare the slaughterhouse to provide export certification. The DoA will need to ensure that there are effective controls at all levels from fattening to slaughtering.

V.24. The specifications attached to the slaughterhouse are explained in the table below.

Table 8: Understanding the Operation of the Slaughterhouse	
Mission	To provide a legal, professional and clean environment for the orderly slaughtering, disposal, cutting and storage of pigs and their related products.
Operational structure	The person in charge will be conversant with all aspects of pig slaughtering, including modern practices. The slaughterhouse will offer affordable rates for registered farmers who will bring in their animals and take back the carcasses or meat cut into desired pieces. A boning and a chilling room will also form an integral part of the building. The proposed RTMA will buy most of the products from the farmers at a guaranteed price.
Forefront equipment/logistics used	• Hydraulic horn and leg–cutters • Balancers • Electrical stunners • Skin–and–glut cleaning machines • Injectors • Refrigerated transport, etc.

V.25. In Rodrigues, the cooperatives sector, helped by the *Trust Fund for the Social Integration of Vulnerable Groups* (TFSIVG), operates a cutting room ("salle de coupe") at Pointe–La–Gueule but this will not sufficient to cater for the expected boost in production during implementation of the project.

V.26. *Cold storage facilities.* The negligible prices of cash crops (such as chilli and lime) on the market is due to an inappropriate marketing system causing imbalances between demand and supply. It has been found that proper management of trees and storage of limes during the peak production period can help to stabilize price of the produce and control quantity on the market. To this extent, therefore, it is proposed to build a full–fledged cold room within the compound of the *Agricultural Service*s at Citronnelle. Crops will be preserved either fresh or waxed depending on the target markets. It is also proposed to keep a minimum stock level (in waxed state) throughout the year to prevent shortages and unnecessary market distortions. Appropriate selection, sorting, and grading, of food crops will be undertaken by the officers of the DoA before sending to the Food Lab for testing.

V.27. *Water harvest structures and other irrigation equipment.* Five water harvest structures of 1,000 cubic metres will be constructed in specific regions of the island. It is also proposed to invest in drip irrigation to cover some 25 hectares over the next five years.

V.28. *Administration and Record–Keeping Centre, comprising a Statistical Unit.* No proper records are kept in Rodrigues implying that economic or statistical analysis of the agricultural sector remains a daunting task. Production figures are inaccurate since there are no incentives for farmers to keep records of their activities. It is proposed to set up a unit at the *Agricultural Services* department to make it mandatory for all stakeholders to keep proper records and file them with the authorities concerned.

Capacity Building

V.29. The Rodriguan farmer is generally perceived as having conservative and traditional perceptions which make him risk–averse and disinclined to exploit market opportunities. Training courses that relate to the scientific management of production techniques to maximize yield will be provided throughout the year to interested parties. Courses will include orchard management, weed control, pesticide education, pest control, crop development, etc. A proper crop management culture will be inculcated among Rodriguans so that they adopt the latest and more efficient methods of production. Assistance from FAO will be sought to achieve these capacity building objectives.

VI. INDICATIVE COSTS

VI.1. It is estimated that around Rs88 million will be necessary to fully support implementation of the project during the first five years. This includes massive capital expenditures amounting to nearly 90 percent of total project costs. The slaughterhouse alone (that includes a boning room and a chilling cabinet) will cost some Rs16 million.

VI.2. A breakdown of the project costs is shown below (all figures in Rs):

Table 9: Indicative Costs for Strengthening the Agro–processing Capacity of Rodrigues

Project Components		Year 1	Year 2	Year 3	Year 4	Year 5	Total
A	Investment in Infrastructure (Capital Expenditure)						
A1	*Pilot Food Laboratory*						
1	Refurbishment and renovation of building	800,000	100,000				900,000
2	Laboratory equipment (including 4 incubators, 2 autoclaves)						0
3	Refractometres, centrifuges, moisture analysers,						0
4	Glasswares, chemicals, etc.	3,000,000	1,000,000		100,000		4,100,000
5	Other equipment (office, administration, etc.)	150,000	50,000				200,000
	Sub–Total	*3,950,000*	*1,150,000*	*0*	*100,000*	*0*	*5,200,000*
A2	*Certifying Authority (« Rodrigues Label »)*						
1	Renovation of building and basic equipment	400,000	100,000				500,000
2	1 vehicle		700,000				700,000
3	Other equipment and consumables	50,000	100,000				150,000
	Sub–Total	*450,000*	*900,000*	*0*	*0*	*0*	*1,350,000*
A3	*Slaughterhouse, Boning Room and Chilling Cabinet*						
1	Construction costs	600,000	600,000				1,200,000
2	Equipment for slaughterhouse, boning and chilling	5,000,000	5,000,000				10,000,000
3	Tools and equipment (balances, etc.)	500,000	500,000				1,000,000
4	2 trucks to transfer live animals	1,000,000	1,000,000				2,000,000
5	3 refrigerated vehicles	700,000	1,400,000				2,100,000
6	Other equipment and consumables	100,000	100,000				200,000
	Sub–Total	*7,900,000*	*8,600,000*	*0*	*0*	*0*	*16,500,000*
A4	*Cold Storage Facilities for Crops*						
1	Extension and renovation of building	400,000					400,000
2	Refrigeration equipment	2,000,000	500,000				2,500,000

Table 9: Indicative Costs for Strengthening the Agro–processing Capacity of Rodrigues							
Project Components		Year 1	Year 2	Year 3	Year 4	Year 5	Total
3	Other equipment (waxing, grading, etc.)	100,000	500,000				600,000
4	Other equipment and consumables	100,000	100,000	100,000			300,000
	Sub–Total	*2,600,000*	*1,100,000*	*100,000*	*0*	*0*	*3,800,000*
A5	*Water Harvesting Structures & Irrigation Equipment*						
1	5 units of 1,000 cubic meters each	1,000,000	2,000,000	1,000,000	1,000,000		5,000,000
2	Drip irrigation equipment for 25 ha (over 5 years)	1,000,000	1,000,000	1,000,000	500,000	500,000	4,000,000
3	Rehabilitation works to terraces (50 km) and drains (50 km)	2,000,000	2,000,000	2,000,000	2,000,000		8,000,000
4	Other rehabilitation and maintenance works	500,000	500,000	500,000	500,000	500,000	2,500,000
	Sub–Total	*4,500,000*	*5,500,000*	*4,500,000*	*4,000,000*	*1,000,000*	*19,500,000*
B	Institutional Development (Capital Expenditure)						
B1	*Setting–up of the Rodrigues Trade & Marketing Agency*						
1	Renovation and refurbishment costs to main office and sub–offices	1,000,000	2,000,000				3,000,000
2	Equipment (office administration, logistics, etc)	500,000	1,000,000				1,500,000
3	2 trucks	1,000,000	1,000,000				2,000,000
4	2 light good vehicles	500,000	500,000				1,000,000
5	Other expenditures	200,000	200,000				400,000
	Sub–Total	*3,200,000*	*4,700,000*	*0*	*0*	*0*	*7,900,000*
B2	*Strengthening the Agricultural Services Division*						
1	Equipment (seed breeding, etc)	500,000	1,000,000	500,000			2,000,000
2	Development of others agricultural inputs	500,000	500,000				1,000,000
3	Construction of 20 km of access tracks over 4 years	1,000,000	2,000,000	2,000,000	1,000,000		6,000,000
4	2 additional tractors for primary land ploughing		1,000,000	1,000,000			2,000,000
5	10 power tillers for land preparation on terraces		6,000,000		6,000,000		
6	1 additional vehicle		800,000				800,000
7	Other equipment	300,000	300,000	300,000	300,000	300,000	1,500,000
	Sub–Total	*2,300,000*	*11,600,000*	*3,800,000*	*7,300,000*	*300,000*	*25,300,000*
Total Capital Expenditures		24,900,000	33,550,000	8,400,000	11,400,000	1,300,000	79,550,000
C	Training & Capacity Building						
1	Training: Farmers across Rodrigues (average per year)	300,000	300,000	300,000	300,000	300,000	1,500,000
2	Training: Staff of Agricultural Services (average per year)	200,000	200,000	200,000	200,000	200,000	1,000,000
3	Training: Staff of RTMA	200,000	200,000	100,000			500,000
4	Training in Agro–processing (average per year)	300,000	300,000	300,000	300,000	300,000	1,500,000
5	Visits of experts to Rodrigues (average per year)	500,000	500,000	500,000	500,000	500,000	2,500,000
6	Study tours abroad for staff and selected farmers		500,000	500,000	500,000		1,500,000
Total Capacity Building		1,500,000	2,000,000	1,900,000	1,800,000	1,300,000	8,500,000
Total Expenditures (Capital & Cap. Building)		26,400,000	35,550,000	10,300,000	13,200,000	2,600,000	88,050,000

VII. PROPOSED SOURCES OF FINANCING

VII.1. The project comprises several components that can be classified as follows:

- ***Major infrastructure development:***
  - Slaughterhouse, boning room and chilling cabinet;
  - *Pilot Food Laboratory* and *Certifying Agency*;
  - Cold storage facilities for crops;
  - Water harvesting structures;
  - Irrigation equipment;
  - Refrigerated vehicles;
  - Plant and equipment for food processing.
- ***Capacity building:***
  - Training of farmers at all levels;
  - Study tours;
  - Training of household and individuals in food processing.
- ***Modernising the DoA's Agricultural Services:***
  - Development of new seeds and inputs for the three filières;
  - Recruitment of additional Scientific Officers;
  - Training of staff who will, in turn, disseminate the new techniques of production to farmers.
- ***Institutional development:***
  - Setting up of a *Rodrigues Trade and Marketing Agency*;
  - Setting up a *Record–Keeping and Statistics Office*.

VII.2. ***Financial Backers.*** The project presents a valid and comprehensive case for enhancing the possibility for Rodrigues to attract international financial backers like commercial and development banks, international organizations and financing institutions, etc. These will be the main expected financiers for the big project components including the slaughterhouse, food laboratory, cold storage facilities and irrigation equipment.

VII.3. ***International Organizations.*** For capacity–building, it is proposed to seek technical assistance from organizations such as the FAO.

VII.4. ***Institutions Based in Rodrigues.*** The needs identified in the project can serve as a means to target the different schemes provided by international organizations including the IFAD and the EU. Individuals, households and small entrepreneurs may avail themselves of the facilities offered by the following institutions to develop their activities:

VII.5. ***International Fund for Agricultural Development.*** Under the terms of the *Strategic Framework for IFAD 2002–2006*, IFAD will continue to work towards enabling the rural poor to overcome poverty — as perceived by the poor themselves — by fostering social development, gender equity, income generation, increased food production, improved nutritional status, and environmental sustainability. Agricultural development, livestock and capacity and institution building are among the nine areas being supported.

VII.6. Under the IFAD programme in Mauritius (1999–2006), the *Rural Diversification Programme* has been a major source of foreign aid. The cost of the programme is US$16.6m, of which US$11.12m is a loan from IFAD and the rest is financed by the Government of Mauritius. The aid targets a new orientation to rural investments by the fishing, agricultural and planting community with the aim of raising rural employment, income generation and food production in line with the government's policy to alleviate poverty in the rural areas. Programme activities concentrate on the relatively deprived and neglected northern and eastern regions of Mauritius and on the island of Rodrigues, where rural poverty is widespread. Beneficiary participation is secured by involving them actively in the design, planning and implementation of all activities.

VII.7. ***European Union.*** The types of financing from the EU can be sought in terms of:

- *European Development Fund*: Finance for specific parts of the project, in particular the demand driven initiatives of the existing and prospective farmers, could be obtained under the decentralized cooperation programme.
- The *Partnership Programme for the Promotion of Investment and Technology* (PROINVEST) provides technical, consultancy and financial support for ACP countries.
- The *Centre for the Development of Enterprise* (CDE) programme provides technical support and grants for ACP countries.

VII.8. ***Small–scale and Individual Needs.*** The project requires, for its complete fulfilment, finance for several (relatively) small–scale components like post–harvesting strategies, crop management, etc. Besides, there is also a need for technical and financial support to individual farmers for their own specific needs. It is understood that there are many local organizations that can help in this field. Some of them are:

Table 10: Agricultural Grants/Financial Schemes Available to Rodriguans

1. Development Bank of Mauritius (DBM)	The DBM provides soft loans for the development of productive activities in Rodrigues. They include subjects like (i) fruits and livestock production schemes, (ii) land preparation, (iii) setting up of chill rooms, (iv) working capital to SMEs involved in export–oriented activities, (v) construction of stores for agricultural products, etc.
2. Trust Fund for the Social Integration of Vulnerable Groups (TFSIVG)	• The TFSIVG finances micro–enterprises in collaboration with the DBM. Thus individuals in vulnerable groups with a monthly family income not exceeding Rs6,000 who is involved in any economic activity may obtain a loan up to an amount or Rs50,000 at 7% interest per annum. Repayment may be scheduled over a period of 4 years with a moratorium of 6 months. • It is noteworthy that out of a first batch of 274 projects submitted from Mauritius and Rodrigues under the micro credit scheme of the TFSIVG, 141 are for pig farming activities. With the expertise and skills developed in pig rearing, the breeders could increase their credit worthiness and secure better loans in the future.
3. The Rodrigues Leasing and Venture Capital Fund	This fund in collaboration with the DBM provides loans up to Rs700,000 with a rate of interest of 3%. Leasing facilities are available on the purchase of equipment up to Rs300,000 at 3% rate of interest. The fund also participates in the share capital of companies and co–operative societies up to the tune of Rs150,000.

VII.9. ***The Rodrigues Regional Assembly.*** The RRA will contribute mostly in kind by providing logistics facilities, land and buildings, support of Scientific Officers, provision of administrative facilities and so forth. It will also play a leading role to amend the laws where necessary in order to implement new rules and regulations, especially with regards to food security and the food supply chain.

VII.10. ***The Government of Mauritius*** will also contribute in kind throughout the duration of the project. The *University of Mauritius* as well as the *Chemical Division* of the MAFTNR will provide technical staff to help implement the *Food Laboratory*. The AMB's contribution to setting up the RTMA will be crucial during the early stages of the project.

VIII. PROJECT BENEFITS

A. Socio–economic Aspirations

VIII.1. ***Rural Development and Poverty Alleviation.*** Other than fostering an environment conducive to better organized, modern and commercially viable agricultural ventures, the project promotes the creation of sustainable income generating activities, especially amongst the poorer segments of the Rodriguan population. The proposed strategies and investments foreseen in this project would give a much–expected lease of life to the agricultural sector which drives the livelihoods of many Rodriguan households. Farm–agribusiness linkages are also expected to strengthen considerably as from the second year of project implementation.

VIII.2. The rural population and women in particular depend heavily on pig farming. The growth of the agro–processing industry coupled with the adoption of modern practices will have positive repercussions on their income streams and on their living standards overall. The less well–off consumers can benefit from the increased supply of livestock or food commodities on the market which is expected to lower their prices and make them affordable to a larger market.

VIII.3. ***Job Creation and Capacity Building.*** Although no official statistics for unemployment are available, unemployment in Rodrigues is relatively high and estimates suggest that 8 percent of the total population were unemployed in 2003. At all levels, jobs can be created for employment in units like slaughterhouse and food laboratory, pig breeders, marketing stores, field workers, liaison officers, etc. For the young people who shun manual labour opportunities in the agricultural sector and cannot find employment elsewhere, new interesting opportunities can be created. Besides, capacity building of planters and officers through training and linkages established between countries and institutions could provide impetus for agricultural development, extend its geographical and social class reach and overall enhance the image of the sector.

B. Creation of a Rodrigues Label

VIII.4. ***Quality and Value Addition.*** Food security is ranked as one of the highest priorities of consumers before spending on food items. The setting up of the *Pilot Food Laboratory* will certify the quality and the fitness of the produce for both the local and the increasingly strict export markets. The establishment of the slaughterhouse will rule out unhygienic slaughter practices at home and guarantee the freshness and quality of the meat slaughtered.

VIII.5. The focus of agricultural activities worldwide is also on the creation of value added in agricultural produce. Through effective post harvesting and marketing practices, the farming

community are looking to add value in the products and to capture new and larger markets. The development of the agro–processing industry in Rodrigues would be the driving force behind value addition, whilst keeping tabs on the quality of the raw materials that they would be needing for their processing.

VIII.6. ***Trade Expansion and Enforcement of an Export–oriented Economy.*** Contriving a successful agro–processing industry capable of producing quality goods that attract many consumers outside the island is bound to lay the foundation for the creation of an economy that is distinctive of that of Mauritius in terms of direction and targets. The creation and promotion of a Rodriguan label of quality and freshness opens up export opportunities for Rodriguan produce. The opportunities to expand market size, both local and abroad, will encourage investments in the sector and promote the conduct of agricultural activities in a more professional and organized manner.

C. Modern, Professionalized and Enhanced Background for Agricultural Activities

VIII.7. Another benefit of the project is the bringing about of a new generation of breeders and farmers making use of modern management practices to make their business cost–effective and revenue–enhancing. The development programme will assist in evaluating the different options concerning how pig farming can be developed in a sustainable way by looking after the environmental aspect.

D. Environmental Benefits

VIII.8. By encouraging the population to take up/go back to farming, fewer agricultural lands would be abandoned or left unexploited, hence reducing their vulnerability to degradation. Land preparation (including the cutting down of terraces), better water management and the cultivation of crops would improve the soil's resistance to erosion and to degradation. The adoption of modern agricultural practices with reduced application of pesticides and chemicals as well as the introduction of effective waste management systems would contribute to the development of a sustainable agriculture for Rodrigues.

IX. IMPLEMENTATION ARRANGEMENTS

IX.1. The exhibit in page 18 illustrates the Institutional Framework and Implementation Arrangements to be made during implementation of the project.

IX.2. ***The PMU.*** The project is designed to run for three years under a ***Programme Management Unit*** (PMU) after which all responsibilities will be transferred to a strengthened DoA. The first two years will be essentially about infrastructure developments and capacity building that are expected to change the whole agricultural landscape of Rodrigues, as well as current attitudes and beliefs towards agriculture (which has led to more than 70 percent decrease in area under cultivation over the past decade). The third year onwards will be about managing and sustaining the long–term viability of the programme in a way to keep the momentum going, providing maximum support to potential and existing farmers, and reaping the benefits of first two years of investments.

IX.3. The PMU will be set up as an umbrella organisation that will oversee the implementation of the project and operation of the three filières during the first three years. It will operate under the supervision and guidance of the CoA. The *Programme Manager* (ideally an expatriate) will be

supported by a local Project Counterpart, who will liaise with all stakeholders on a daily basis. It is expected that, after three years, all responsibilities could be transferred to the DoA. The suggested programme structure has proved to be successful in the recent past, especially during implementation of the EU's *Anti–Erosion Programme*.

IX.4. The ***Programme Manager*** would be someone with the necessary technical expertise and fieldwork experience, mainly in developing countries, and he should have been at the forefront of medium– or long–term agricultural investment/development projects. He would be helped in his task by the Project Counterpart, who should necessarily be a Rodriguan who knows the language farmers talk, who understand the specificities of the island, and who is modern in his approach to production techniques. Also, there would be 3 *Project Managers*, with each in charge of each of the three sectors of activity: lime, pork, and chilli.

IX.5. ***Support from Institutions/Organizations.*** Technical, administrative and on–the–field support for an orderly and simplified implementation of the measures would come from the following stakeholders.

IX.6. *The Commission of Agriculture of the Rodrigues Regional Assembly.* The CoA of the RRA has as main policy to capitalize on the various aspects of the local produce, fresh or transformed. It aims at encouraging the local people and visitors to favour local produce at the expense of imported commodities. The *Agricultural Services* of the DoA that is attached to the CoA is divided into 5 units of which are the Crop Production, Extension and Propagation Unit. Also, the Livestock Production Unit of the *Agricultural Services* provides sows and boars to pig breeders and supply weaners for fattening to the public in general. In the case of chilli, the *Agricultural Services* only provides advice on pest and disease control to growers. The *Anti–erosion Programme* funded by the EDF has financed the reinstatement of agricultural lands in Rivière Bananes, Anse Ally, Grand Baie and Rivière Coco. The programme has also financed the construction of a green house at La Fourche Corail for growing chillies under controlled conditions. The objective of the *Agricultural Services* is to use this facility to produce seeds true to the local variety.

IX.7. *Project Officers.* Operating under the guidance of the project managers, these officers of the DoA will be directly involved in fieldwork, and will be responsible to ensure that operational relationships exist between the PMU and the agriculturists and farmers institutions, while assisting to the common project operational functions.

IX.8. *The Fédération des Planteurs et Fermiers de Rodrigues (FEPER).* The FEPER will be the central agency representing all farmers' associations. Membership will be mandatory. Each filière will have its own Federation (each one to operate under FEPER) and will group smaller associations of farmers scattered around the island. All members will be required to adhere to strict rules and regulations (regarding use of inputs and techniques of production) failing which their products will not receive the Rodrigues Label.

IX.9. *Cooperative Societies.* Rodrigues currently has some 20 farmers associations and a few cooperative societies that are not all registered according to law. Lime producers are not grouped into associations. Farmers who are interested to rear pigs or plant fruits or vegetables can organize themselves into cooperatives so as to benefit from economies of scale and to share common facilities including infrastructure and transport, as well as bulk purchase and marketing. Under the *Cooperative Societies Act*, a well–defined legislative framework can be used as the first step in fostering the creation and growth of cooperative societies in Rodrigues. In Mauritius, there are about 13 cooperative societies in the pig credit and marketing sectors, and 3 societies in the livestock sector. These societies found at Trèfles, Palma and Palmar would welcome the idea of importing pork from Rodrigues.

Rodriguans should be made aware of the benefit and administrative procedures involved in setting up and operation of cooperative societies.

IX.10. In January 2005, an association of breeders and planters was set up. The new all–encompassing association will represent these 23 groupings and will include 5 representatives from each grouping. Rules and objectives of the association will need to be worked out.

IX.11. *Fédération des Associations Cooperatives d'Eleveurs Rodriguais (FACER).* In the Final Report of the *High Powered Committee on Pig Farming Activities in Mauritius and Rodrigues*, the authors advocated different propositions, one of which is a strategic alliance with firms selling feeds in Mauritius or Rodrigues itself that could be explored. FACER groups six livestock breeders Associations representing some 838 members scattered all over the island. Its members include breeders of all species of livestock. It already has an alliance for the supply of feeds. Such strategic alliance could also be extended for the marketing of the products at more stable prices. This can ensure a regular supply of feeds and a guaranteed market at reasonable prices for the sale of the farmers' products.

IX.12. *The Pilot Food Laboratory.* The *Pilot Lab* will be one with very specific assignments. It will ensure that the whole food chain has satisfied minimum requirements in terms of international norms and standards. The building will cover an area of about 2,000 sq.ft. and will have at least six separate Analytical Rooms as follows:

- 2 rooms for microbiological tests;
- 3 rooms for chemical tests; and
- 1 room for carrying out sensorial tests.

X. TECHNICAL ASSISTANCE REQUIREMENTS

X.1. In the ***short term***, technical assistance will be required in the following instances:

- Technical and advisory expertise: Mauritian experience would be helpful in the management of processes like water harvesting, crop management, food laboratory specialized services, etc.
- Foreign expertise from the FAO would help to conduct market surveys and feasibility studies about different programmes. There is the need to determine a reference market price for the products of each filière in order to prevent market failures. Assistance from FAO would be crucial to determine these reference market prices.
- FAO assistance will also be sought in the field of capacity building. Training at all levels are required, from orchard management to post–harvesting. Rodriguan farmers are used to traditional ways of farming and have been slow to adapt to new techniques of production and irrigation.
- Expertise will be required during the first two years of the project to set up and run the *Pilot Laboratory* and the *Certifying Body*. Essential chemical and microbiological tests will need to be designed for the selected products that will apply for the Rodrigues Label.

X.2. The ***long–term inputs*** would relate to the following:

- Maintaining a computerized system at an administrative and record–keeping unit so as to register farmers, keep details of crop production rates, raw materials utilization, exportation trends, etc.
- Coordinating secondary structures to further better off agro–processing capability with assistance for running of a full–fledged local *Trade and Marketing Agency* and for boosting cooperation among planters and farmers, etc.

X.3. *Technical Assistance for the Pig Filière.* The RRA intends to seek assistance in the following:

- Training of staff of the *Agricultural Services* and pig breeders in piglet production and pig fattening;
- Training in monitoring and evaluation of meat quality (above all on the use of back fat tester);
- Techniques of processing, packaging and marketing of pork produce;
- Study tours abroad for officers and farmers;
- On farm demonstrations with regards to the adoption of new techniques;
- Environmental management (formulation of mitigating measures to cater for the negative impact of production on the environment);
- Preparation of the technical specifications and the setting up of a processing plant to process pig meat. The structure of the compound, the different facilities need in term of tools/equipments and the maintenance should be considered. Special attention should be given to train the personnel accordingly to ensure the proper function of the plant. A good mechanism must be established to monitor the quality of the processed products;
- Assistance will also be required to run the abattoir during the first two years after implementation. Simultaneously local persons can be trained in the same slaughter house and abroad for the right taking–over afterwards. The local federation/cooperation of breeders can be asked to participate in the management of the slaughter house in a public/private partnership with the RRA in the first run.

XI. ISSUES AND PROPOSED ACTIONS

XI.1. ***Institutional framework.*** Different institutions will be set up during the project implementation period to provide complementary and support services. It is of cardinal importance that there is a proper synchronization of efforts between the institutions and the CoA. A key issue is how to coordinate all activities on a day–to–day basis and how to make sure farmers make use of all facilities being offered.

XI.2. It is necessary for the PMU to coordinate efforts on the ground so that farmers get the required information at the right time regarding location of the facility centres.

XI.3. ***State–owned but commercially–run enterprises.*** There will also be the need to decide to what extent the different facilities that will be set up will be commercially run. Farmers could be requested to participate in the running costs by paying a token to use the facilities, such as the slaughterhouse. The RRA will need to sort out these issues before investing in the projects.

XI.4. ***Incentives.*** To motivate planters, several incentives can be provided like (i) subsidies on certain inputs and equipment, (ii) guaranteed markets and prices, (iii) availability of water for irrigation, etc. Officers working on the project need to get access to latest technology and effective placement and training. On the other hand, cash incentives could be given to planters according to targeted yields or in terms of rebate on loans.

XI.5. ***Marketability of produce:***

- *Role of the Rodrigues Trade and Marketing Agency (RTMA).* The RTMA will be set up to properly disseminate information on the variety and pricing of Rodriguan products and to look for prospective buyers or groups of buyers for these products. The agency will also be responsible to identify the crop development or meat processing phases that would appeal to different buyers and to see how supply can be functionally shaped to meet demand evolutions.

- *Responsibilities of the RTMA.* Marketing in the Rodriguan agricultural sector has so far been a rather randomly conducted activity, undertaken by producers and prospective local exporters with no documentation and information system on market potential and tendencies for an effective market and product analysis. As a result, it has not been possible to derive maximum benefits from agricultural exports, either because the wrong markets were often targeted, or because the products do not often meet the customers needs and demand for better presentation. The RTMA will help to respond to consumers' needs in terms of quantity, quality (by emphasizing the uniqueness of the produce) and timing with respect to product demand. Another responsibility, subject to unanimous consent, is the possibility for the RTMA to act as the sole body through which all goods will be exported. Very significantly, the RTMA would be the depositary of the *"Rodrigues Label"* and would provide certification to producers who want to manufacture according to standards leading to the use of the mark of quality.

- *Setting appropriate price mechanisms.* Another responsibility of the RTMA could be in terms of pricing mechanism. A minimum price for products is often advocated in Rodrigues so as to correct market failures where excess supplies of commodities often prevail. In contrast to the low prices of some products, imported processed meat is often available at high prices on the market. Competition from Rodriguans in the agro–processing field would help to drive prices down and cater for a larger pool of consumers, make them loyal to the products, and eventually allowing them to raise the production base and quality. Besides, a suitable price mechanism is often advocated because with the present system for pigs, for instance, which is based on the actual price of live animals and of meat on the market, the largest profits go to the butchers. This is discouraging pig farmers to engage in pig rearing and encouraging pig breeders to perform on–farm slaughtering (which is illegal). The new price mechanism would ensure that price of animals purchased live will be in relation to the age quality of the carcass, would consider costs of production and a mark–up profit margin for different products, etc.

XI.6. ***Research and evaluation.*** Funds have to be earmarked for research on different commodities in terms of plantation varieties, use of raw materials, agro–processing, etc. This would help in

evaluating the proper and most optimal operation process in view of maximizing yields and bettering off the value added products created. A more specific monitoring and evaluation framework can be put into place so as to gauge whether the project is working or not according to the set parameters. This framework can also indulge in planning of production by forecasting production and taking all related factors into consideration. On another basis, the services of FAO consultants can be sought for market research.

XI.7. ***Legislative framework.*** To support the aim of transforming the island of Rodrigues into a well–controlled agricultural environment, it is crucial to have up–to–date and island–specific laws and/or regulations that can control the activities. As an example, the *Food Act* of 1998 specifies the conditions under which pickles should be produced and sold. Regulation 223 of the Act relates to the cleanliness, use of preservatives and colouring, etc regarding pickle. But, although the *Food Act* sets the conditions in which pickles are to be produced, it does not make any mention of the quality of the raw material to be used. The enforcement of these regulations becomes difficult because of the absence of facilities for regular testing of the composition of processed foods sold in Rodrigues.

XI.8. In terms of pig rearing, under section 193 of the *Public Health Act*, Pig Rearing Regulations have been promulgated in 2001. However, they do not apply to the island of Rodrigues. But, it is important that they do so because pig farming activity should be adequately controlled in a place where pig farming at home is a continuously popular and cultural activity. Hence, pig farming can flourish in a sustainable manner and environmental problems can be prevented or reduced. It is true that there are legislations that have section which apply to Rodrigues like the *Environment Protection Act* 2002 (Part XII). However, given the status of pig farming in Rodrigues, there should be an appropriate regulatory framework to control this activity.

XI.9. ***Land allocation policy.*** The elaboration of a land allocation and utilization policy for Rodrigues is indispensable in view of rising agricultural developments and other increasing pressures on land use. New housing, social, industrial and agricultural facilities, as well as increased infrastructural services have to be planned for and programmed for implementation to meet future needs. The forest areas should be taken care of on a more regular basis by the authorities to help in monitoring deforestation. This is a critical issue in Rodrigues where soil erosion is an acute problem. The problems related to the sloping nature of land and land development permits should be tackled. Focus should be placed on the revised *National Development Strategy 1994–2010 for Rodrigues* and on how best to manage and adjust the release of land and sites for future growth, whilst recognising that some Rodriguans still like the dispersed lifestyle. It is aimed at identifying key settlement clusters and growth zones in the countryside and on the coast where strategic developments should be guided.

XII. POSSIBLE RISKS

XII.1. ***Environmental threats.*** Adverse weather conditions and insufficient water supply can significantly affect the growth pattern and productive output of some foods. Rodrigues is visited by cyclones several times a year and a bumper crop in one year could be followed by devastation in another year. The island is also prone to droughts;

XII.2. ***Price setting mechanism.*** Unless a well–defined price mechanism is developed, this can hamper the development strategies. The low price of live pigs may discourage people to invest more in pig farming as farmers generally prefer to slaughter the animals on the farm and sell the meat to neighbours. The RTMA will be called upon to guarantee market prices throughout the year and prevent market failures.

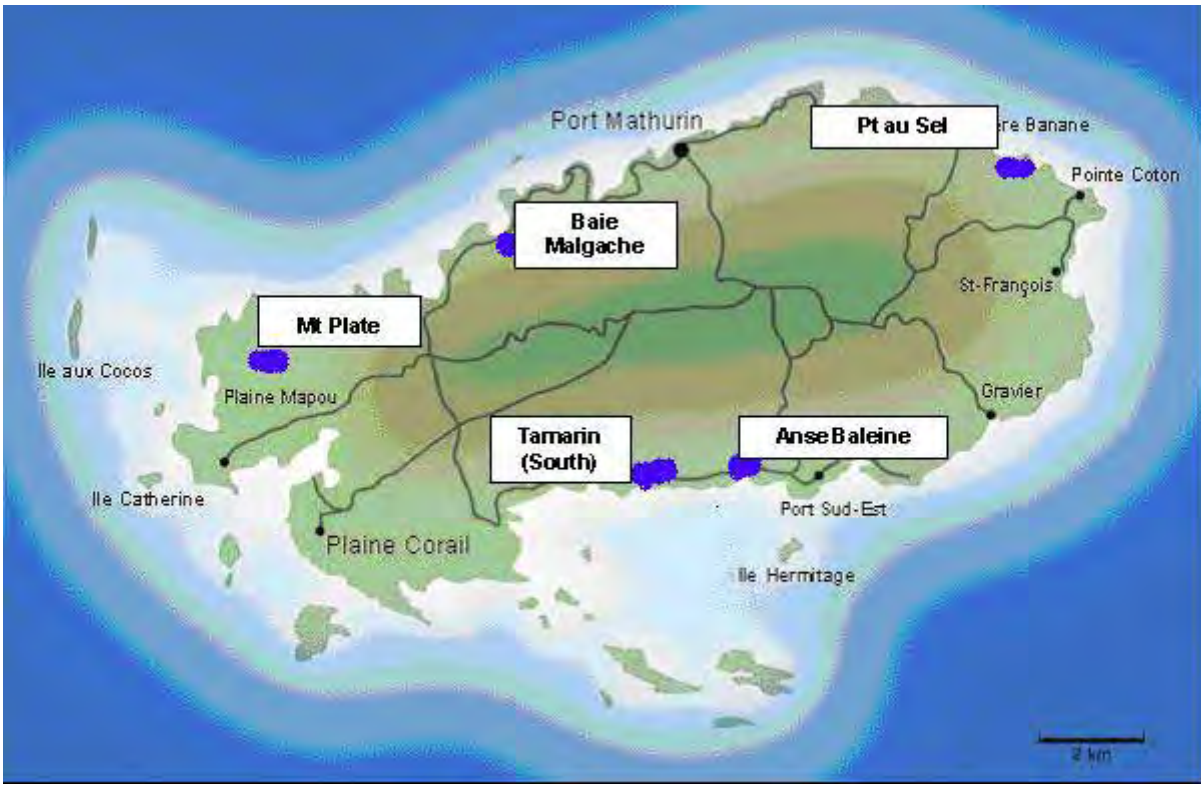
XII.3. ***Participation and skills development.*** Active participation from the farmers' community in Rodrigues is crucial to the success of this project. Because of its overreaching goals and objectives, it is important that most, if not all, of the targeted stakeholders confirm their participation in the project. There is a possibility that training of farmers and other people can take a very long time, and in the meantime, the lack of technically qualified officers and field workers can be an impediment in (i) Understanding the importance and benefits of modern management techniques, (ii) Changing long–established habits and embrace more productive agricultural practices, and (iii) fostering collaboration with other stakeholders.

XII.4. ***Land allocation policy.*** The project aims to increase land under cultivation significantly over the next five years. However, this depends critically on availability of lands at the right time. 90 percent of the lands belong to the State implying that delays in formulating a sound land allocation policy might seriously discourage potential participants from joining the programme.

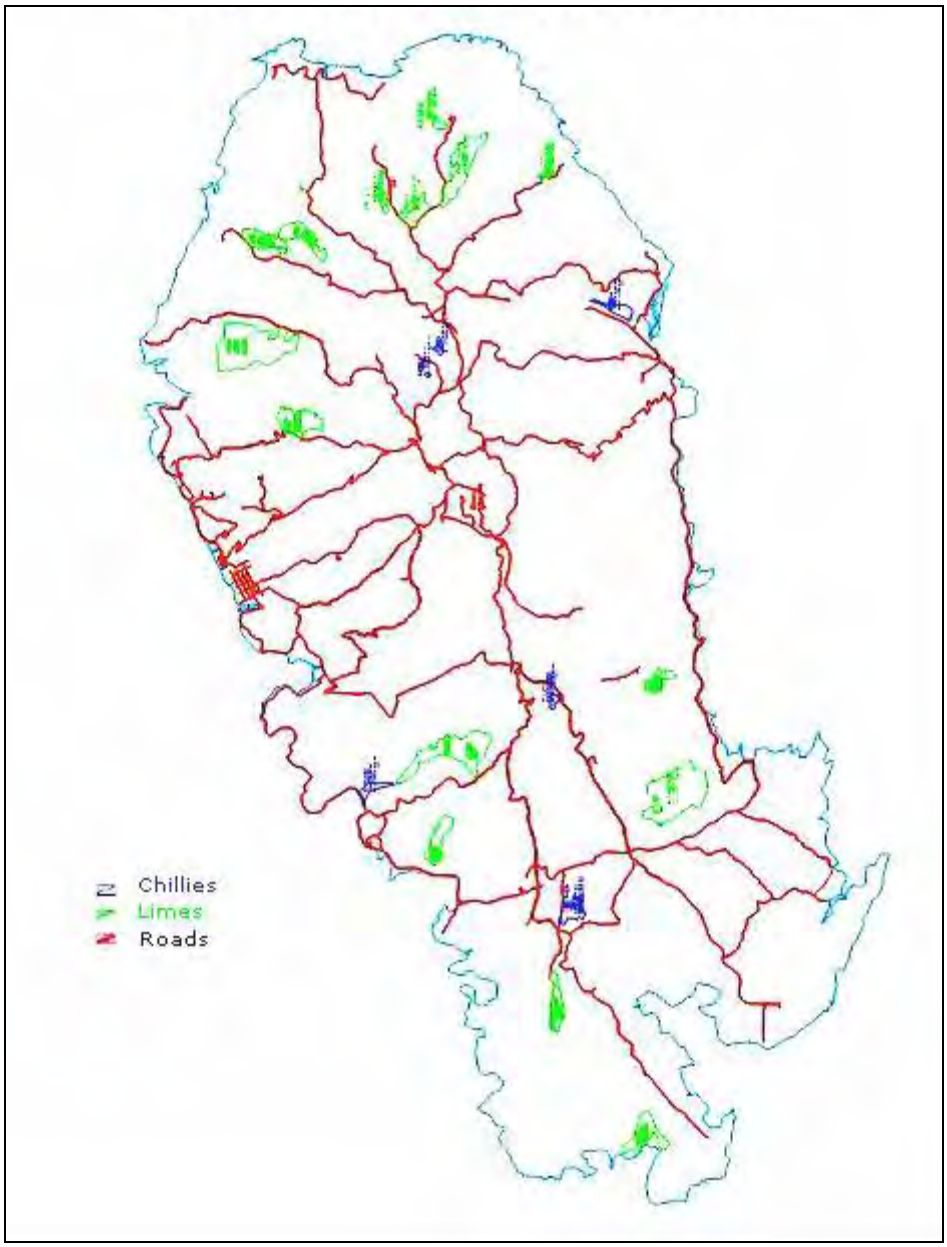
XII.5. ***Intellectual property.*** Those who are already in business may not be willing to share their recipe with others, especially in the case of Rodriguan Ham. The local agro–processing industry produces several products which differ in tastes and quality.

XII.6. ***Decision–making and implementation lags.*** Institutions like the PMU and the FEPER could take considerable time to be fully operational due to the fact that responsibilities and objectives have to be orderly and acceptably set. The synergies that would be developed with all stakeholders would also be a time hindrance in the sense that different units might have different operational structures which could possibly discourage cooperation and collaboration in the initial stages of the project. On the decision side, the PMU might take some time before getting the buy–in of the farmers community and before understanding the complexities of the interlinkages in the Rodrigues agricultural sector.

Appendix 1: Map of Sites Identified for Pig Rearing



Appendix 2: Map of Rodrigues Showing Proposed Sites for Chilli and Lime Production



Appendix 3: Codex Standards

The table explains the Codex Standards that, on the whole, the food laboratory will seek to meet.

Codex Standards for Cured Ham and Fresh Lime and the new Food Act 2000	
Codex Standards	The *Codex Alimentarius* (Food Standards) Commission was created in 1963 by FAO and WHO to develop food standards, guidelines and related texts such as codes of practice under the Joint FAO/WHO Food Standards Programme. The main objectives of this programme are protecting health of the consumers and ensuring fair trade practices in the food trade, and promoting coordination of all food standards work undertaken by international governmental and non–governmental organizations.
Codex Specifications for Cured Ham	• Composition, source, treatment and cure of the meat • Essential composition (essential and optional ingredients, raw material and final product, meat content) • Some applied standards: • The Recommended International Code of Hygienic Practice for processed meat and poultry products • The Recommended International Code of Practice – General Principles of Food Hygiene
Codex Specifications for Fresh Lime and Chilli	• Quality provisions • Physical entity • Free of bruising, pest, abnormal external moisture • Minimum juice content and colouring (applicable to fresh lime) • Sizing provisions • Presentation Provisions (uniformity, packaging), Marking/Labelling
Food Act and Food Regulations in the Republic of Mauritius	• The new Food Act and Food regulations have been prepared and put into force as from 1st January 2000 to cope with the emerging challenges and new changes in the field of food technology, food consumption, etc. • The Food Regulations have been worked out according to international norms and standards such as those recommended by the Codex Alimentarius Commission.

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