



**New Partnership for
Africa's Development (NEPAD)
Comprehensive Africa Agriculture
Development Programme (CAADP)**



**Food and Agriculture Organization
of the United Nations
Investment Centre Division**

GOVERNMENT OF THE REPUBLIC OF THE SEYCHELLES

SUPPORT TO NEPAD–CAADP IMPLEMENTATION

**TCP/SEY/2903 (I)
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Volume II of VI

BANKABLE INVESTMENT PROJECT PROFILE

Sustainable Pork and Poultry Production

January 2005

SEYCHELLES: Support to NEPAD–CAADP Implementation

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

Bankable Investment Project Profiles (BIPPs)

Volume II: Sustainable Pork and Poultry Production

Volume III: Sustainable Vegetable and Fruit Production

Volume IV: Agro–Processing Pilot Project

Volume V: Evaluation and Commercialisation of Underutilized Marine Resources

Volume VI: Support to Wood Exploitation and Utilization

NEPAD–CAADP BANKABLE INVESTMENT PROJECT PROFILE

Country: Seychelles
Sector of Activities: Livestock
Proposed Project Name: Sustainable Pork and Poultry Production
Project Location: National
Duration of Project: 5 years
Estimated Cost: Foreign Exchange..... US\$5.8 million
Local Cost US\$0.8 million
Total.....US\$6.6 million

Suggested Financing:

<i>Source</i>	<i>US\$ million</i>	<i>SR million</i>	<i>% of total</i>
<i>Government</i>	0.8	4.5	12%
<i>Financing institution(s)</i>	5.8	31.9	88%
<i>Beneficiaries</i>			
<i>Private sector</i>			
<i>Total</i>	6.6	36.4	100%

SEYCHELLES:
NEPAD–CAADP Bankable Investment Project Profile
“Sustainable Pork and Poultry Production”

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Abbreviations

BIPP	Bankable Investment Project Profile
CAADP	Comprehensive Africa Agriculture Development Programme
DBS	Development Bank of Seychelles
FAO	Food and Agricultural Organization of the United Nations
MENR	Ministry of Environment and Natural Resources (formerly MAMR)
NAFP	National Agricultural and Fisheries Policy 2003–2013
NEPAD	New Partnership for Africa’s Development
NMTIP	National Medium–Term Investment Programme
SMB	Seychelles Marketing Board

I. PROJECT BACKGROUND

A. Project Origin

I.1. The FAO *Horizon 2010* initiative in 1999 was opportune in that it provided the impetus as well as the context to review the *Seychelles’ Agricultural Policy* of 1993, and it facilitated the formulation, through stakeholder participation, of a new and comprehensive policy framework document for the upcoming decade, encompassing both agriculture and fisheries development with the principal objective of enhancing national food security. Government would have a facilitator’s role in providing an enabling environment to the execution of the policy.

I.2. One of the seven priority domains of focus of the agricultural sub-sector policy of the *National Agricultural and Fisheries Policy 2003–2013* (NAFP) framework document, the endorsement of which by the Cabinet of Ministers is imminent, is to raise local pork and broiler poultry production by the livestock rearing entrepreneurs (private farmers) to achieve 100% self-sufficiency. In its facilitator’s role, government would assist with both the on-farm and off-farm infrastructure and facilities as well as provide the requisite services and qualified personnel to support the livestock rearing and production industry. The livestock rearing entrepreneurs would invest specifically in the on-farm livestock production system which would include the livestock rearing infrastructure; meet the labour, the animal stock and the feed costs along with investment in off-farm marketing depots and facilities. However, it has now been also agreed, with the restructuring of the *Seychelles’ Marketing Board* (SMB), that the livestock rearing entrepreneurs would complement government’s investment in the capital-intensive livestock infrastructure, which would include the feed-mill, the hatchery, the abattoir, the poultry parent stock farm, etc.

B. General Information

I.3. Increasing local livestock production for both pork and poultry broiler meat to achieve 100% self-sufficiency would have immediate positive implications to food security and to foreign exchange savings by significantly reducing import of these food commodities. The current (2003) retail value of local production amounts to approximately US\$11.3m, while imports accounts for approximately US\$8m.

I.4. Livestock farmers of the Seychelles are specialised commercial producers although there are mixed farms that keep animals, however, it is of lesser significance to the crops production activities being concurrently undertaken. There are 35 pig breeders, over 1,500 fatten pigs (ranging from 2 to 500 heads of pigs), 32 rear layers, 13 rear broilers, and a few heads of cattle and goats are kept by some farmers. The larger livestock farms are specialised commercial entities with the principal activity of rearing a particular livestock type using various levels of technology, management and specialised infrastructure. Pork and poultry production in 2003 stood at around 50% and 70% respectively, and the challenge to meet the new production targets hinges on the capacity and the capability of the pork and broiler poultry production industry to adequately address both the specific and common current and upcoming issues of increasing national production through the rearing of larger livestock populations.

I.5. Further increase in broiler poultry production is constrained by a number of deficiencies in the production system that are operational and infrastructure in nature. Hatching eggs for example have to be imported, and all imports compete for limited foreign exchange resources. The hatchery facilities have to be expanded (additional equipment) to meet the new requirements for day old chicks, while the abattoir, blast freezing and cold storage facilities have to be equally well enhanced in order

to meet the additional volume of throughput. Besides, there would be obvious advantages to set up a local poultry parent stock unit for hatching eggs production.

I.6. In the same manner, an increase in pork production would be a function of addressing a number of production issues that are also operational and infrastructure in nature. One of the most pressing operational issues is the current inability of the pork production industry to adequately dispose of the daily large volume of slurry, by virtue of the large volume of water used for cleaning, with a view to meet the local environmental standards. Additionally, the pork industry has to be revitalised through improved sties design (slatted floors), new genetic resources input along with enhanced infrastructure in the feed–mill, abattoir, blast freezing and cold storage facilities, etc., to cater for the larger volume of meat output.

I.7. Livestock rearing activities would be either on private farms or on State land leased to private food producing entrepreneurs. The entrepreneurs on private farms would finance the entire farm–infrastructure although they would be assisted with their development plans by relevant government services and qualified personnel, and would be able to access low cost loans with substantial grace periods through the *Development Bank of Seychelles* (DBS), although commercial banks can provide a similar service but with different conditions. A lessee undertaking livestock rearing activities on State land would pay a monthly rental fee per unit area leased and would also be able to access other services and facilities from government either at a fee or for free. The lessee would finance the requisite on–farm infrastructure, labour, animal stock and other inputs for livestock rearing. Requisite farm–infrastructure would include relevant pens and housing, along with water reservoirs. Government would provide some other basic on–farm infrastructure that would include an access road, irrigation water and electricity supply.

I.8. It is now felt that government along with the livestock rearing entrepreneurs would have to finance the expansion to the hatchery and the abattoir to handle the increased volume of throughput as well as finance the extra storage and blast freezing capacity, the feed–mill, the poultry parent stock farm and the pig breeding centre. Specifically livestock rearing entrepreneurs would invest in marketing depots and butchers shops with a view to enhance the marketing of livestock products.

I.9. Government is also willing to support off–farm infrastructure that entails high investment costs. These would include the setting up of the parent stock farms for the production of hatching eggs for the broiler poultry meat industry, pig breeding centre for the production parent stocks of improved breeds for further.

I.10. This project profile seeks the requisite investment on behalf of government and the private sector in addressing these current and upcoming issues with a view to meet the new livestock production targets for higher national food security, reduce imports and raise farm revenue as set out in the agricultural sub–sector policy framework document.

II. PROJECT AREA

II.1. Current livestock rearing activities are widespread on the three major islands of the Seychelles, being associated with the physically dispersed agricultural undertakings, and are thus not restricted to any particular location. However, such activities have to meet the strict environmental standards of three different government ministries namely those of health, physical planning and environment. The environment standards specify the livestock rearing housing structure, the waste disposal system and the need to be licensed. Evidently, livestock rearing activities would have to be removed from social housing and industrial sites. Nonetheless, with the great significance that social housing has acquired in the last fifteen years, housing construction, to the detriment of the latter, encroached upon many livestock rearing enterprises. In the face of limited land resources, agricultural activities have always been relegated to second position for land allocation. Indeed, agricultural activities, inclusive of livestock rearing, have suffered considerably as a result of scarcity of agricultural land.

II.2. Of the livestock production activities, pig rearing has been the most affected and a number of production units had to be discontinued by virtue of the many environmental constraints associated with pig production. Smell pollution prevents this activity from being undertaken in close proximity to social housing sites. However, more importantly, the pig production industry is unable to adequately dispose of the large volume of slurry produced on a daily basis, through cleaning, so as to meet the strict environmental standards of the Seychelles. This consequently restricts the activity to locations that would be least affected by the activity, and are thus sited away from social housing and industrial sites, surface water bodies etc. On many occasions, entrepreneurs of this activity had to be dislodged with consequent loss of outputs and returns as a result of the termination of an economic activity.

II.3. On the other hand, broiler poultry rearing activities have significantly lower environmental implications although such activities have to also meet with the approval of the three government ministries indicated above. On the basis of its lower polluting potential, it is perceived that this activity has the opportunity to be integrated in the lower forest zones which are environmentally protected areas of the more important islands with a view to optimising and valorising available land resources.

II.4. Notwithstanding the above, the NAFP framework document notes that upcoming livestock rearing activities would be zoned with a view to optimise land resources which are both privately and publicly owned, and that have been legally allocated to the agricultural land bank so as to prevent encroachment by the other development sectors. This would necessarily call for the identification of the national agricultural land resources and the promulgation of the agricultural land bank legislation for the protection of the said resources.

II.5. In the current production system, government provides an enabling environment for the livestock rearing activities while the livestock rearing entrepreneurs are involved in the commercial livestock production activities. Government provides a range of services either for free or for a fee, assist the industry with investment in a range of infrastructure facilities such as the abattoir and the hatchery, as well as support the entrepreneurs with personnel qualified in many aspects of livestock production. Livestock rearing activities take place both on privately and on publicly owned plots, and government facilitates with latter. It is perceived then that these would remain the two most important stakeholders in livestock production industry, although individual entrepreneurs might form themselves into groups for specific advantages inclusive of better marketing abilities. The entrepreneurs would primarily be responsible for investment in on-farm infrastructure and in the rearing activities. Nonetheless, on leased State land, government would, in addition, provide an access road, irrigation and electricity supply. Government would also facilitate the livestock rearing entrepreneurs with low cost loans with long grace periods through the DBS.

II.6. Furthermore, as has been recently agreed, government and the livestock rearing entrepreneurs would jointly invest in the pig breeding centres, poultry parent stock farm for the production of hatching eggs as well as invest in the expansion to the abattoir, blast freezing and cold storage facilities and the enhancement of the capacity of the hatchery. It is unlikely that the farming entrepreneurs alone would be in a position to source the requisite capital to invest in these capital-intensive facilities. On the other hand, government’s investment in these facilities would only be possible if it can access financial resources, inclusive of foreign exchange, at concessionary terms and rates. Although the Seychelles is a middle-income country, it is after-all a small island developing state with limited and insignificant natural resources, a small and vulnerable economy with a low ability to generate internal wealth.

III. PROJECT RATIONALE

III.1. Pork and broiler poultry meat contribute importantly to local protein dietary requirements, and along with fish from the artisanal fishery provide the bulk of the protein requirements of the Seychellois diet. The artisanal fisheries catch has remained constant, averaging slightly inferior to 5,000 tonnes per year over the last four consecutive years. Local pork and broiler poultry meat production has increased from 574 tonnes & 1,279 tonnes in the year 2000 to 601 tonnes & 1,414 tonnes respectively in the year 2003. However, in the year 2003, some 1,216 tonnes of pork and 2,051 tonnes of poultry meat were consumed by a local population of 86,000 inhabitants and 120,000 tourists who averaged a 10 night stay. It is evident then that local consumption of these two meat types has increased over the last four years through both increased local demand and imports rather than through local production. All imports however compete for scarce foreign exchange, which is currently a threat to food security. The NAFFP framework document proposes a target of 100% local production of these two livestock products by the end of the planned period of execution of the project, i.e. by 2010.

III.2. In the year 2010 the local population would be 94,300 on the basis of its actual growth rate of 0% while the projected tourist population for that year would be 193,000 at 65% bed occupancy and averaging 10 nights stay. This would give an effective tourist population of 5,300 for that year. Consequently, the total effective consuming population in the year 2010 would be 99,600. This would imply that on the basis of the actual consumption pattern of livestock products by the present total consuming population of 89,300 (86,000 locals and 120,000 tourists giving an effective consuming tourist population of 3300 tourists averaging 10 nights stay), in the year 2010 the total consuming population of 99,600 (94,300 locals and 193,000 tourists) would consume an additional 142 tonnes of pork and 239 tonnes of broiler poultry meat. This livestock product output translates into an additional 2,000 heads of pigs and 164,500 broiler poultry chicken.

III.3. Local pork and poultry production in the year 2003 stood at 601 tonnes (49.4% of total consumption) and 1,414 tonnes (68.9% of total consumption) respectively, and the challenge to meet the new production targets hinges on the capacity and the capability of the pork and broiler poultry production industry to adequately address both the specific as well as the common current and upcoming issues of increasing livestock production through the rearing of larger livestock populations.

III.4. It is perceived that in keeping with the aspirations of the agricultural sub-sector’s policy framework document, the livestock rearing entrepreneurs would be vested with the responsibility of production while government would ensure an enabling environment to the achievement of these objectives. In this regard, government would have to bear some of the capital investment costs to support the expansion in the livestock industry. These would include the construction of the access

road, provide irrigation water and electricity supply on farms leased on State land. It has recently been agreed that government along with the livestock rearing entrepreneurs would in partnership invest in the necessary expansion to the abattoir, the hatchery, the cold storage and the blast freezing facilities, the setting up of the poultry parent stock farm and the pig breeding centre, etc.

III.5. Government would provide institutional support, qualified personnel and other services to facilitate the execution of the entrepreneurs’ development plans. The entrepreneurs would have the responsibility to invest in the on–farm livestock rearing infrastructure, the feed and the animal stock, marketing depots as well as the labour costs. Through government’s support, technical assistance opportunities would be explored to dispose of the large volume of slurry produced on a daily basis so as to meet the strict environmental standards of the Seychelles; an issue which currently constrains the industry. The DBS would offer the entrepreneurs with the requisite capital at low interest rate for investment, however, government would have to source both foreign and local loans at concessionary rates and terms to meet its contribution in this joint national undertaking.

III.6. This project profile solicits financial resources for investment in the requisite facilities to enhance livestock rearing activities with a view to achieve local self–sufficiency in pork and broiler poultry meat.

IV. PROJECT OBJECTIVES

IV.1. The *overall objective* of the project is to enhance national livestock production so that by the end of the project cycle, i.e. by 2010, 100% of the pork and the broiler poultry meat consumed would be produced locally with a view to raise the national food security status, reduce the cost of living, reduce risks in disease introduction, provide meat free from growth promoters and hormones, substitute imports, save foreign exchange, increase local economic activities, farm income and generate employment opportunities.

IV.2. Embodied in this overall objective are three *specific objectives* as follows:

- Identify and engage sufficient agricultural land to support the targeted livestock output;
- Identify and engage private entrepreneurs with the necessary investment to support the targeted livestock output;
- Commit government’s support and investment in the capital–intensive facilities as well as in the institutional support and services.

IV.3. Evidently, there is an investment objective to allow both the private entrepreneurs and government in supporting investments. Government and livestock rearing entrepreneurs would focus on enhancing the abattoirs, the hatchery, the cold storage, feed mill and blast freezing facilities, the pig breeding and genetic centre and the poultry parent stock facility. The private entrepreneurs’ investments would be primarily in the on–farm livestock rearing infrastructure, purchasing livestock feed, animal stock and the setting up of the marketing depots.

IV.4. Additionally, there is an institutional objective to assist both government and the private entrepreneurs to come up with the necessary agricultural land onto which the proposed livestock rearing activities are to take place.

IV.5. On the basis of the local pork and poultry production statistics for 2003 there is a deficiency of 615 tonnes of pork and 637 tonnes of broiler poultry meat, both made up through imports, in order to satisfy the level of local consumption of these livestock products. If the imported pork in the year 2003 were to be produced locally, it would involve the rearing of 8,700 heads of pigs with an average carcass weight of 70 kg. If it is assumed that a livestock-rearing entrepreneur rears a batch of 1,000 pigs per year on an area of 1 hectare, then 8,700 heads of pigs would require about 9 livestock rearing entrepreneurs on a total of about 9 hectares of land. In the same manner, if the imported broiler poultry meat in the year 2003 was to be produced locally, it would involve the rearing of 438,000 (catering for 6% mortality rate) heads of broiler poultry with an average carcass weight of 1.54 kg. In the same manner, if it is assumed that a livestock rearing entrepreneur rears a batch of 72,000 broiler heads per year (8,000 heads of 5.7 cycles per year) on an area of 1 hectare, then to rear 438,000 broiler poultry heads would require 9 entrepreneurs on a total of 9 ha of land.

IV.6. At the end of the project cycle in 2010, it is estimated that for the targeted pork output, there would be a need to rear an additional 2,000 heads of pigs with an average carcass weight of about 70 kg requiring an additional 2 ha of land. In the same manner, in order to achieve the targeted broiler poultry meat output, there would be a need to rear an additional 164,500 broiler chickens with an average carcass weight of 1.54 kg, which would require an additional 4 hectares of land. Thus a total of 6 hectares of land would be sourced through the identification of new agricultural plots as well as valorising existing ones. This would call for investment by about 2 entrepreneurs in pig rearing and about 4 entrepreneurs in broiler poultry rearing activities.

IV.7. Thus in order to address both the current deficit and the upcoming consumption needs for pork and poultry at the end of the project cycle in the year in 2010, there would be a need to engage a total of 24 entrepreneurs on about 24 ha of land.

V. PROJECT DESCRIPTION

V.1. The project would run for five years and would comprise of the following:

A. Identify Agricultural Land

V.2. The NAFP identifies agricultural land and its use optimisation as one of the seven areas of focus, which would be required to be addressed with a view to contribute to the national efforts towards achieving a higher national food security. It is perceived that in order to achieve this objective, in the face of the many competing ends of a very finite resource, there would be a need firstly for a national exercise to conduct an inventory of land resources with agricultural potential primarily on the main islands of the Seychelles, and this would include both privately and publicly owned land. This would be followed by the incorporation of these plots with agricultural potential into an agricultural land bank, which would subsequently be protected through the promulgation of legislation. Land resources within the agricultural land bank would only be utilised for agricultural purposes and would include both livestock and crop production activities.

V.3. Even though land is a very finite resource in the Seychelles, the proposed project of enhancing livestock rearing activities so as to meet the targeted livestock product output at the end of the planned project period (2010) would make use of agricultural land from two sources namely: from newly identified and surveyed agricultural plots and from valorising old arable agricultural plots which have fallen to gross under-utilisation over the last two decades. Newly identified agricultural plots would come from a combination of land that were previously part of long abandoned coconut,

cinnamon plantations or transformed tea plantations and recently surveyed plots that were never previously used for agricultural purposes. The bulk of this resource would be from public domain with an insignificant contribution from the private sector. Valorising land from the old government agricultural land settlement schemes first initiated in 1958 would be by far the most resourceful exercise to yield land for the proposed undertaking. Well over 45 years later the original settlers (farmers) are physically spent and there is almost no continuity in farming activities by their children. Indeed the reform exercise has already been initiated and the *Agricultural Planning Section* of the Department of Natural Resources of the *Ministry of Environment and Natural Resources* (MENR) is pioneering the process.

V.4. The process would entail the dissection of a house–plot of about 0.1 ha from the original average 2.5–hectare farm, which would be valorised through renewed agricultural activities. In this connection, the old agricultural plots that would be revalorised would yield well over 2 ha each making this the most tangible approach to increase agricultural land supply. However, the immediate proximity of these plots to the housing plots would make agricultural land derived in this fashion less of a contender for livestock rearing activities as opposed to arable agriculture activities. By the fact that the agricultural sub–sector’s policy framework document stipulates that the livestock rearing activities would be zoned, makes the surveying and identification of new agricultural plots the most probable approach to fulfil the targets of livestock production in the planned period when there would be a necessity to engage about 24 ha of land, the bulk of which would be in public domain. Notwithstanding the above, some agricultural plots, which would meet all the environmental requirements for livestock production, would be found on privately owned land and would thus contribute to the national supply of the resource.

B. Identify and Engage Private Entrepreneurs with the Necessary Investment to Support the Targeted Livestock Output

V.5. In order to achieve the targeted livestock products output in the planned period, on the basis of the foregoing, it would be evident that there would be a need to engage additional entrepreneurs in livestock rearing activities. In this connection, it is estimated that to achieve a total output of 755 tonnes of pork, about 10,785 heads of pigs have to be reared (with 500 pigs per cycle of 6 months and carcass weight of 70 kg). Assuming that the average entrepreneur would rear about 1,000 heads of pigs per year implies that in order to attain the targeted pork output about 11 entrepreneurs would have to be engaged in pig rearing activities. In the same manner, in order to achieve the total output of 875 tonnes of broiler poultry meat, it is estimated that 602,500 heads of chicken would have to be reared. If the average entrepreneur would rear about 8,000 heads of chicken in a cycle (with 5.7 cycles per year, 1.54 kg carcass weight and 6% mortality), then in order to achieve the planned output of chicken about 13 entrepreneurs would be engaged in the broiler poultry rearing activity.

V.6. The entrepreneurs would be selected on the basis of the economic feasibility of their development plans along with having the requisite investment capital and the technical know–how to execute the said plans. While the facilitator ministry would vet the economic feasibility of these plans, it would nonetheless provide qualified personnel, institutional support and other services to help the entrepreneurs execute these plans. For example, the facilitator ministry would provide veterinary services for a small fee and livestock extension agents’ advice for free.

V.7. The entrepreneurs would be expected to invest in the requisite housing structure with all the necessary fittings according to the livestock rearing activity that they would be engaged in, and the structural design of the housing structure have to meet with the specifications of the ministry responsible for physical planning if it is to be approved. In this connection, the facilitator ministry

would also provide technical guidance to achieve the best design suited for livestock rearing in the lowland tropical climate. Besides, the entrepreneurs would have to invest in labour, livestock feed, in sourcing the necessary animal stock, which has to be repeated every 9 weeks or so with broiler poultry and every 22 weeks with fatteners, in site preparation, which might involve the use of earth moving equipment, as well as in the other on-farm associated structures such as the water reservoir, to mention the more important ones. Off the farm, depending on their degree of entrepreneurship, investments might be required in marketing depots such as meat shops etc.

V.8. Investments can be secured through personal capital investment and/or a low interest loan secured from primarily the DBS, which provides a maximum of US\$20,000 equivalent or from other commercial banks at a slightly higher interest rate.

C. Commit Government’s Support and Investment in the Capital-Intensive Facilities as well as in the Institutional Support and Services

V.9. It is perceived that government’s support and investment would be both vital and necessary to the livestock rearing industry if it is to meet the targeted livestock product output in the planned period. Government’s support and investment is solicited at two levels. One would be on farms situated on State land and leased to livestock rearing entrepreneurs through a lease agreement. But importantly the more significant government’s investment would be off farms, on corollary livestock production support facilities. However, it is now also being considered that the livestock rearing entrepreneurs jointly with government will invest in enhancing the facilities of the abattoir, hatchery, feed-mill, parent stock, blast freezing and cold storage. This element of investment is large and involves both local and foreign costs. Since the livestock entrepreneurs alone cannot raise this capital locally, it is important that government jointly bears that responsibility as it has the necessary collateral to borrow the foreign costs from foreign or even local financing institutions. Government will nevertheless support entirely the investment related to the operation of the pig genetic centre.

V.10. It is government’s responsibility as reflected in the agricultural sub-sector’s policy framework document for the period 2003–2013 to invest in the construction of access road, to provide irrigation and electricity supply on agricultural plots/farms on State land leased to farming entrepreneurs inclusive of those in livestock rearing. This would be of greater importance on newly surveyed plots where such infrastructure does not exist, rather than on existing agricultural plots that have been revitalised.

V.11. In order to produce a larger population of broiler poultry for rearing with a view to meet the targeted broiler poultry meat output, there would be a need to produce a larger number of day old chicks with due considerations given to the mortality rate. This would necessitate an increase in the hatchery capacity to cater for the higher number of hatching eggs. The broiler poultry meat industry is presently based on the constant import of hatching eggs, which makes the industry precarious to the introduction of diseases, fluctuating costs and insecurity of supplies. It has been found that if investment is made in a local broiler poultry parent stock farm for the production of hatching eggs there would be obvious advantages for the industry.

V.12. In the same manner, in order to meet the targeted pork output, it would be essential to increase the capacity of the pig breeding centre with a view to produce a higher output of breeding animals for the production of fatteners. One specific investment in the pork production industry on the part of government would be in the introduction of new pig blood-lines which would constitute the new pig genetic centre with the objective of reviving the pig breeds available for fattening.

V.13. The actual abattoir facilities need to be enhanced to meet the higher throughput of live animals both in terms of pigs and broiler poultry, in as much as the blast freezing and the cold storage facilities have to be expanded to cater for the increased meat volume.

V.14. Government would also have to support the industry with the requisite services and institutional support either at a fee or for free. In this regard, then government would have to consolidate and expand its livestock extension service with a greater number of qualified personnel to support the entrepreneurs in the execution of their development plans as well as in providing veterinary support. In terms of institutional facilities, government in its facilitating role is perceived as the main investor in providing a livestock diagnostic laboratory, with the standard diagnostic equipment to conduct the more important tests, an essential tool to handle issues relating to rearing even larger national population of livestock in intensive production systems which immensely multiplies the risks to diseases. Essentially there will be a need to develop a plan of action to tackle any outbreak of livestock diseases. This is indeed a very important and necessary investment to support the expansion of the industry to achieve the planned output of livestock products.

VI. INDICATIVE COSTS

Project Cost Summary per Component					
Component	Local (US\$)	Foreign (US\$)	Total (US\$)	% Foreign Exchange	% Total base costs
Feed Mill	900,000	8,100,000	9,000,000	90.0%	28.4%
Hatchery	40,000	360,000	400,000	90.0%	1.3%
Cold-storage and blast freezer, red and white meat abattoir.	1,500,000	13,500,000	15,000,000	90.0%	47.4%
Parent-stock farm	1,450,000	5,800,000	7,250,000	80.0%	22.9%
Total baseline costs	3,890,000	27,760,000	31,650,000	87.7%	100%
Physical contingencies	389,000	2,776,000	3,165,000		10%
Price contingencies	194,500	1,388,000	1,582,500		5%
Total project costs	4,473,500	31,924,000	36,397,500		115%

VII. PROPOSED SOURCES OF FINANCING

VII.1. From the foregoing, it would be evident that there are indeed two main partners in the livestock industry namely the local private sector and the government. Furthermore, there would be two types of costs; a local cost, which requires expenses in local currency and a foreign cost, which requires expenses in foreign currency. While it would be mandatory for the partners to come up with their respective contributions to meet the local cost, in this partnership it is expected that government would borrow in foreign currency from foreign financial institutions on behalf of the partners to meet the foreign cost as well as be able to provide the necessary collaterals and guaranties vis-à-vis these foreign loans.

VIII. PROJECT BENEFITS

VIII.1. The main benefits anticipated from the project would be financial, economic and institutional in nature and would include the following:

- An important local increase in both pork and broiler poultry meat output to meet the entirety of local demand;
- A consequent reduction in the import of these two meat products;
- A reduction in the national foreign exchange outlay to import these meat products;
- An increase in national economic activities by livestock rearing entrepreneurs;
- Enhanced opportunities for job creation and employment;
- Enhanced opportunities for increasing farm income;
- Higher national food security;
- Limit the risk of the introduction of exotic animal diseases.

VIII.2. In view of the strong significance of the environment in the Seychelles, the implementation of the project would also bring important environmental benefits along with social benefits. In meeting the planned livestock products output there would be greater opportunities for job creation and employment, as well as enhanced opportunities for increasing farm income. In the context of environmental benefits, the fact that livestock production activities would be zoned would minimise smell pollution on social housing sites. In the same manner, adequate disposal of the large volume of slurry produced on a daily basis would minimise the impact of slurry disposal on various ecosystems. Evidently, the fact that the locally established poultry parent stock farm would produce all the hatching eggs necessary, there would not be a need to continuously import these inputs and thus limit the chances of the introduction of exotic lethal poultry diseases.

IX. IMPLEMENTATION ARRANGEMENTS

IX.1. The MENR would be the principal body for the execution of the project on behalf of government while the private livestock rearing entrepreneurs would be responsible for the bulk of the on-farm investments. Evidently, government would have to be a stakeholder/partner in order to support many of the capital-intensive developments that are beyond the means of the individual livestock rearing entrepreneurs. Often the MENR would call upon other government ministries e.g. the Ministry of Finance to help it execute that responsibility.

IX.2. For example, in the case where State land is leased to livestock rearing entrepreneurs, the MENR, in collaboration with the *Ministry of Land Use and Habitat*, etc., would be responsible to provide the farm with an access road, an electricity as well as an irrigation and potable water supply. In the same manner, the MENR in collaboration with the Ministry of Finance and possibly with the Ministry of Foreign Affairs would negotiate with foreign financial institutions for the requisite funds to invest in the capital-intensive facilities for livestock production. These facilities would include the enhancement of the hatchery and feed-mill capacity, the setting up of the poultry parent stock farm, the introduction of the new pig genetic bloodline and pig genetic centre, the expansion of the blast

freezing, cold storage and the capacity of the abattoir, along with the setting up of a livestock rearing support diagnostic laboratory.

IX.3. Additionally, the principal government body responsible for the execution of the project would also facilitate the livestock rearing entrepreneurs to access investment funds either from the DBS or from commercial banks by providing various forms of assistance that would include the formulation of project proposal. Government would furthermore provide a livestock extension service to support the entrepreneurs in the execution of their development plans as well as keep them abreast with new developments/technologies in livestock rearing.

IX.4. The individual livestock rearing entrepreneurs would be responsible to do land clearing, establish the relevant housing infrastructure, water reservoir, purchase the stock of animals for rearing, meet the feed and labour costs as well as set up a certain number of marketing depots. Upcoming opportunities will offer livestock rearing entrepreneur potential shares in the capital intensive infrastructure such as the feed–mill, abattoir, parent–stock, hatchery etc. The entrepreneurs could also form themselves into an association that could bring them immediate and tangible benefits.

X. TECHNICAL ASSISTANCE REQUIREMENTS

X.1. Most of the technical assistance required would be short term external support and would include the following:

- A specialist in poultry parent stock;
- A specialist in pig housing design to minimise slurry production;
- A specialist in pig slurry treatment and disposal;
- A pig breeding expert;
- Hardware and associated software/breeding programme to follow the pig breeding schemes;
- A livestock diagnostic laboratory specialist;
- An avian pathologist.

XI. ISSUES AND PROPOSED ACTIONS

XI.1. *Establishing a Broiler Poultry Parent Stock Farm.* The proposed increased in broiler poultry meat output is dependent, among other inputs, on the extra supply of broiler poultry hatching eggs, which are currently being imported on a continuous basis. This poses two issues. Firstly, in the present context, foreign exchange is a limited resource that faces many competing ends. The scarcity of foreign exchange would surely prevail in the short to medium term and would thus impinge on imports. Consequently, the continuous supply of hatching eggs is a function of the foreign exchange availability. Secondly, the widespread prevalence of poultry diseases in the exporting countries threatens the local industry through imported eggs. However, those threats would not be eliminated immediately as the project implementation by virtue of its nature, would span a minimum of four years. This time frame could be long enough as to provide an opportunity to introduce the lethal

poultry diseases. In this regard, it would be imperative that the national veterinary services maintains strict control on the origin of the imported hatching eggs and monitors on a continuous basis the sanitary situation of the country of origin.

XI.2. **Treatment and Disposal of Pig Slurry.** The proposed increase in pork output is highly dependent on the ability of the pork production industry to adequately treat and dispose of the large volume of slurry produced on a daily basis, by virtue of the cleaning methods utilised, so as to meet the strict environmental standards of the Seychelles. This would suggest that if the industry is unable to dispose of the slurry adequately it would not be able to achieve the planned pork output. In the event that this is the case, pork production would strongly be restricted to the pig production zones and hence there would be limited opportunities for production outside of these zones. It is in this connection that technical assistance is being solicited in this domain with a view to address this pertinent issue. On the other hand, depending on the number of heads of pigs kept various livestock rearing entrepreneurs could be faced with varying degrees of slurry disposal problems.

XI.3. It is a fact that the larger is the animal population the greater is the issue at hand. It would follow then that the larger the farms the greater are the need to adopt an adequate treatment and disposal system. This would suggest that smaller farm sizes would be favoured. However, local experiences have shown that the larger the farm the greater is the merit to establish a slurry treatment and disposal system. Consequently, establishing those large farms in a pig production zone would provide the critical mass of farms that can be linked in a pilot slurry treatment and disposal system, and would make this exercise economical. The pilot exercise could provide indications of best practices for the fewer individually dispersed production units.

XI.4. **Establishment of a Livestock Disease Diagnostic Laboratory.** The planned increase in output of livestock products has to be supported by an adequately equipped and manned diagnostic laboratory that is an essential tool in this undertaking. In the current context this facility represents a major deficiency and hence the industry is not adequately supported to thrash out some of the more important issues in livestock rearing. For example livestock officers are presently unable to accurately diagnose the poultry disease that is causing mortality on various farms, although symptoms would suggest Gumboro (Infectious Bursal Disease), a viral disease completely unknown to the local industry prior to the beginning of the 90s. There are increasing threats as a result of globalisation and while the establishment of a local poultry parent stock farm would limit the risk of importing poultry diseases through hatching eggs, more frequent contacts with the external world through travel and imports could possibly open up new avenues for poultry disease introduction.

XI.5. Above all, as has already been established, government would be a stakeholder in this project and its facilitating role would be to provide jointly with the livestock rearing entrepreneurs the necessary investment in enhancing the capacity of the major capital-intensive livestock production infrastructure. Furthermore, it would provide institutional support, maintain livestock production support services using qualified personnel of the MENR; many a time in association with other government ministries, and as well as facilitating the access of financial resources from financing institutions. The private livestock rearing entrepreneurs would be responsible for investment in all the on-farm livestock rearing infrastructure, livestock feed, labour, animal stocks, etc.

XII. POSSIBLE RISKS

XII.1. The following are some of the more important risks associated with project implementation:

- ***Delay in implementing the land reform programme and being unable to secure sufficient land*** to undertake the proposed livestock rearing activities with a view to meet the livestock production targets. There are indications that the land reform programme initiated by the former *Ministry of Agriculture and Marine Resources* (MAMR) a few years ago faces some important setbacks that are social and political in nature. For example, once an entrepreneur has defaulted on his lease agreement, by not implementing his development plan after due warning was sounded, he is liable to be evicted. However, eviction is made difficult in view of the national shortage of social housing facilities, as the State does not evict if the individual is unable to identify an abode. On the other hand, political pressure is such at times that defaulters are spared. Both situations bind unnecessarily a valuable and scarce resource preventing it from achieving its full economic potential. Above all, and probably of even greater significance, is the risk that if government fails to promulgate a legislation that would protect land identified with agricultural potential into an agricultural land bank, there is unlikely to be a reversal of the current situation where agricultural land is being continuously lost to other more competitive and lucrative sectors of the economy. This situation, in conjunction with those cited above, would not yield sufficient land to undertake this project.
- ***Inability of government as a shareholder to secure the necessary investment fund to upgrade the capital intensive livestock production infrastructure.*** The expansion of the capacity of such facilities as the feed–mill, the hatchery, the abattoir, the cold storage and blast freezing rooms, the establishment of the poultry parent stock farm, the acquisition of new pig blood–line and the revamping of the pig breeding centre as well as the setting up of the livestock production diagnostic laboratory are all essential ingredients in the project without which the project would not be able to go ahead. It is however true that each of these investment components would affect the project to varying degrees. In this regard then, it can be argued that if government as a shareholder fails to invest in a few of these components, there is a high probability that the project would not be executed. It is nonetheless difficult at this point in time to establish the level of risk associated with this project as far government’s investment is concerned.
- ***Inability of the industry to adequately treat and dispose the pig slurry to meet the local environmental standards.*** The agricultural sub–sector policy of the NAFFP framework document proposes that the planned livestock production would take place in dedicated livestock production zones identified as part of the agricultural land reform programme. Nonetheless, there are opportunities to operate some livestock rearing activities outside of those production zones as long as the development plans of the livestock rearing entrepreneurs meet with the approval of the government ministries that vet those plans. Evidently, because of the high concentration of pig production units, there are opportunities in these livestock production zones to link the slurry discharges of the individual units into a pilot treatment and disposal system that is one of the proposed activities in this project. The smaller individual farms would benefit from such experiences. In the event that an insufficiently adequate slurry treatment and disposal system is arrived at, the risk that the planned production would not be achieved is relatively low, as the activity would continue on the basis of current practices. There would nonetheless be greater vigilance on the part of the government ministries responsible for environment monitoring.