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### Republic of Seychelles

### Department of Natural Resources

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### THE AGRICULTURAL

### DEVELOPMENT STRATEGY

### 2007-2011

A Compilation of the Agricultural Sub-Sector Papers

Victoria

December 2007

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**ABBREVIATIONS/ACRONYMNS**

% Percentage

ADB African Development Bank

AESS Agricultural Extension Services Section

AVRDC Asian Vegetable Research Development Centre

BSc Bachelor of Science

COMESA Common Market for Eastern & Southern Africa

DBS Development Bank of Seychelles

DNR Department of Natural Resources

DP Development Plans

DVM Doctor in Veterinary Medicine

€ Euro

EMPS Environnent Management Plan of Seychelles 2000 – 2010

etc. Etcetera

EU European Union

F1 First Filial Generation

FAO Food & Agriculture Organization of the United Nation

FDI Foreign Direct Investment

FQA Food Quality Assistance

GDP Gross Domestic Product

GIS Geographical Information System

GMO Genetically Modified Organism

GNR Goods Receipt Note

GTZ German Technical Cooperation Programme

ha Hectare

HACCP Hazard Analysis Critical Control Point

HND Higher National Diploma

IADP Integrated Agricultural Development Project

ICM Integrated Crop Management

IDC Islands Development Company

IITA International Institute for Tropical Agriculture

INIBAP International Network for the Improvement of Banana & Plantain

IPM Integrated Pest Management

IPPC International Plant Protection Convention

KG Kilogramme

LCCS Land Cover Classification System

M Meter

M2 Meter Square

MCB Mauritius Commercial Bank

MENRT Ministry of Environment,, Natural Resources & Transport

MSc Master of Science

NGOs Non-Governmental Organizations

O Level Ordinary Level

ODA Overseas Development Assistance

OIE Office International des Epizooties

OND Ordinary National Diploma

PCS Piece (s)

POPS Persistent Organic Pollutants

PRPV Projet Régional du Protection des Végétaux

SADC Southern African Development Committee

SAHTC Seychelles Agricultural & Horticultural Training Centre

SEnPA Small Enterprise Promotion Agency

SEYCOM Seychelles Commodities (Company)

SMB Seychelles Marketing Board

SOP Standard Operation Procedures

SR Seychelles Rupees

USD United State Dollar

uv Ultra Violet (resistant plastic)

VERS Vegetable Evaluation Research Section

WTO World Trade Organization

**FORWARD**

The close of the 90s bestowed us into the third millennium. The major preoccupation of the world then was on the impending implications of the millennium bug. It was thus far from the mundane concern of achieving the Millennium Development Goal 1 of reducing poverty and hunger through concrete actions for higher national food security. This was albeit the call of the Food and Agriculture Organisation of the United Nations four years earlier which had alerted the world’s attention to the imminent crises in food supply and availability, of grave consequence to the world’s poor and hungry, with some 850 million in chronic hunger.

###### The call for greater food security in the late 90s was met universally by mixed responses depending on specific country capacities and capabilities. The food secure countries mostly in the northern hemisphere were comfortable with their ability to meet their food requirements and to export the surplus. That was possible through their highly subsidised agricultural sector. The countries of the south, mostly the food deficit countries and the net food importing countries made up for deficits through local production, but above all through imports.

###### Some 12 years later the world is presented with a very different scenario on the status of food and agriculture. There are bleak prospects and concerns of shortages of not only basic foods supply and availability but also of soaring prices of the basic foods. These add to the woes of food deficit and net food importing countries, particularly of small island developing states which already face much vulnerability. These are compounded further by the greater frequencies of extreme weather events of climate change, soaring oil prices, low capacity to import through limited foreign exchange, and finite natural resources. However, as a small island developing state, Seychelles has had many opportunities since the late 90s under various obligations to conduct profound analyses of her agricultural sector. The latest which was conducted in 2006 provided the basic framework for this document.

###### This volume is a collection of agricultural sub-sector papers which provide very clear insights into the various land based food production sub-sectors being examined, with the principal aim of achieving a higher national food security. It aims to achieve that through environment sustainability and mainstreaming climate change considerations especially for adaptation measures. It analyses the food production efforts to date, investigates resource utilisation in the land based food production activities and identifies the shortfall. It proposes new targets for national food production in a concrete plan for the next five years and guides the focus of food production on the principle of exploiting areas in which there are national comparative advantages. It identifies the main partners in national agricultural production and allocates distinct roles to them. The State takes on the role of facilitator mandated to provide an enabling environment for agricultural production. The private sector interests or the food producing entrepreneurs have the responsibility to cultivate and produce food. This document elaborates on seven areas/domains which need to be addressed if the food production targets set in this document are to be achieved. These are agricultural land and its use optimisation, agricultural inputs and supplies, agricultural information and marketing, crop production, livestock production, human resources development and training, and the enforcement of legislation.

###### The food production plan contained therein is a concrete national example of public private partnership in the important national task of food production with the consequence of achieving higher national food security status. This document nonetheless recognises that while national efforts are prerequisites, international collaboration is vital to the successful outcomes of the proposals made. Evidently, the inputs of each and every Seychellois will contribute to the achievement of the targets which have been set.

###### In another separate volume the reflections and analyses made in this document are translated into the Government’s policy position on the sector along with the strategies envisioned for the achievement of the objectives.

**Mission Statement of the Agricultural Development Strategy 2007-2011**

To engage local and international partners to sustainably combine scarce economic resources, by exploiting all areas in which Seychelles has comparative advantages with a view to produce a wide range of affordable basic foods to meet as far as possible year round national requirements, thus higher national food security, with all inputs for proper nutrition.

**Vision Statement of the Agricultural Development Strategy 2007-2011**

By the end of the planned period Seychelles attains the desired food security through the agricultural production targets which have been set in the strategy thus producing year round a wide range of basic foods which are afforded by all Seychellois, through sustainable means and allowing proper nutrition.

1. **ARABLE AGRICULTURE DEVELOPMENT**

**1.1 The major achievements and issues**

###### The major achievements were increases in the national arable agricultural outputs through the application of a combination of new technologies, private entrepreneurship, international collaboration, and institutional support provided through the ministry with portfolio responsibility for agriculture.

###### An effective agricultural extension service managed by well trained and experienced agents, resulted in greater agricultural land use optimisation, inputs utilisation, private entrepreneurship and technology inputs along with good farming practices for maximum output. Research ventures were well supported by qualified and experienced agronomists who implemented rigorous and regimented field activities.

**1.2 Arable agricultural production**

###### The national agricultural production for vegetables and fruits ranged between 50% and 60%, using 2002/2003 as a base year. While the agricultural sector’s importance to contribute to GDP remained small (2.8%), the agricultural sector employed an estimated 3800 people. By the end of 2005 the national agricultural production statistics had not changed much. The retail value for crop products was estimated at SR 65 million for the year 2006.

**1.3 Registered farmers**

###### The 520 farmers registered with the Ministry of Environment and Natural Resources (MENR) in 2006 were farming on both private and State land. The registered farmers benefited from a range of services and concessions offered by government. Some 6,714 households were involved in some form of small-scale agricultural practices such as backyard farming. In 2006, it was estimated that potential agricultural land amounted to 6000 hectares. However, only 600 hectares were under arable agriculture with about 200 hectares under intensive cultivation. Farm size was between 0.5-2 hectares.

**1.4 Greenhouse technology and fertigation system**

###### One of the most significant achievements of the sector for the period 1990-2005 was the evaluation and the promulgation, in conjunction with the Food and Agriculture Organisation of the United Nations, FAO, of the tropical greenhouse technology for vegetable crop production. This technology was introduced to counter the effects of heavy rainfall during the months of November to April with a view to continue with the cultivation of food crops during those months. It consisted of a wooden frame roof lattice upon which a clear ultra-violet resistant plastic sheath was stretched and supported either by galvanised or wooden posts. There are structures for flat land and for terraces on slopes.

###### The technology may incorporate an irrigation system to apply water or a fertigation system which incorporates fertilisers while irrigating. The greenhouse technology now accounts for about 10 hectares of the total area under intensive cultivation.

**1.5 Role of government as facilitator**

###### In its role as facilitator, Government established an enabling environment for national agricultural production. It provided a wide range of technical and administrative support services, some basic communal agricultural infrastructure such as reservoirs, irrigation systems along with farm access roads. It provided farm credit at reasonable terms as well as ensured adequate formal and informal training of its technical and support personnel along with the food producing entrepreneurs/private sector interests. The Government was also responsible for the maintenance of the livestock and the crop genetic resources as well as the evaluation farms. In 2005, it promulgated the Agricultural and Fisheries Act 2005. Some USD 2 million worth of loans from the African Development Bank’s Integrated Agricultural Development Project were made available to farmers.

**1.6 Improved crop technologies**

###### The use of improved crop technologies such as improved root crop varieties and the use of hybrid seeds from Japanese seed firms like Sakata and Taiwanese firms like Known-You provided the basis for the good performance of the arable agriculture sub-sector.

**1.7 Bilateral and multilateral assisted projects**

###### The implementation of a large number of bilateral and multilateral assisted projects addressed various issues related to agricultural infrastructure as well as specific technological gaps that limited national arable agricultural production. About US$ 22.22 million were spent between 1990-2005 to address such issues as well as to enhance facilities such as farm access roads, the construction of reservoirs, the laying of pipes for the distribution of irrigation water, the provision of infrastructure for agricultural inputs storage and distribution, infrastructure on agricultural research centres, training of personnel and human capacity development as well as the provision of low interest agricultural credit.

###### By far the largest and the most significant of these projects was the African Development Bank’s Integrated Agricultural Development Project (IADP), executed between 1996-2005, at a total cost of SR 41 million, which accounted for 40% of the total investment in agriculture for that decade, with 17% of the total cost financed by the Seychelles’ Government. The European Union (EU) sponsored a total of € 1.1 million for the melon fly eradication project and € 189,000 for the “Programme Regional de Protection des Vegeteaux” (PRPV). There were other foreign funded projects through the Common Market for Eastern and Southern Africa (COMESA), the Southern African Development Community (SADC) and the Food and Agriculture Organisation of the United Nations (FAO).

###### Bilateral cooperation agreements provided opportunities for the training of technical and support personnel along with food producing entrepreneurs/private sector interests in specific domains of agricultural production. Israel, Kenya, Egypt, China, Cuba and Mauritius were the leading partners which made training offers in various aspects of arable agricultural production. Leading international agricultural centres of excellence such as the International Institute for Tropical Agriculture (IITA), the International Network for the Improvement of Banana and Plantain (INIBAP), and the Asian Vegetable Research and Development Centre (AVRDC) provided much solicited new tropical root crop, vegetable and fruit genetic resources.

In 2005, training workshops and field exercises were carried out under the European Union’s sponsored “Programme Regional de Protection des Vegeteaux” (PRPV). The programme also facilitated the formulation of Standard Operating Procedures (SOP) for field trials which were relevant to the execution of the said programme.

Regional intergovernmental organisations and regional economic groupings such as the Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC) supported national efforts in addressing very specific capacity building issues.

The Food and Agriculture Organisation of the United Nations (FAO) implemented about 18 projects at a cost of about USD 2.22 million over the period 1990-2000 and these addressed specific institutional and technological gaps.

Overall, the investment in the sector between 1990- 2005 facilitated a new generation of food producing entrepreneurs/private sector interests to launch into the sector, and along with those that were already established helped to achieve the indicated national arable agricultural production.

**1.8 The major issues and challenges**

The major issues and challenges to arable agricultural development were in a general manner attributed to five main issues:

* The sub-optimal supply of agricultural inputs and supplies did not permit the realisation of the full potential of the arable crop production sub-sector. This was as a result of foreign exchange shortages which did not allow the State as a major stockist of such items, as well as the few private suppliers to stock adequately, impacting negatively on arable agricultural development;
* The decade also saw the first signs of the effects of climate change through extreme weather events as manifested particularly in the rainstorms of 1997 but also through various periods of intense droughts that were detrimental to agricultural production. There was an estimated loss of SR 1.4 million to crops and infrastructure of the agricultural sector due to the tsunami 2004;
* There was an unprecedented loss of agricultural land to other sectors of the economy such as tourism and social housing along with concurrent gradual reduction in the utilisation of agricultural land as many long standing food producing entrepreneurs/private sector interests passed their economically productive age and were not replaced.
* The arrival and subsequent impact of the Melon Fly and the White Fly on vegetable crops specifically and on biodiversity in general. The melon fly (*Bactrocera cucurbitae*) caused important losses to cucurbit crops which were evaluated at SR 12 -15 million (USD 2.18 – 2.72 million) in 1999.
* There was a shortage of skilled and qualified human resources in the arable crop production sub-sector.

**1.9 Ban imposed by the Pakistani Government and sanctions imposed by the African Development Bank (AfDB)**

The Pakistani Government imposed ban on the importation of Seychelles’ copra from 1994 to late 2001 crippled the local coconut industry. The cinnamon industry was revitalised in the latter half of the 90s through cinnamon bark export which for example stood at 298.5 tonnes in 1999. In the same year, 43 tonnes of black tea were produced; however, local demand for tea had to be made up through import. In 1999 only 1 tonne of organic tea was exported while there was insignificant export of other plantation crops like vanilla etc.

Sanctions imposed by the African Development Bank (AfDB) on the Seychelles’ Government in 1998 in the context of non-settlement of loan arrears of the *Integrated Agricultural Development Project* meant that many of the project components comprising of irrigation equipment, inputs and machinery were not finalised.

**1.10 Proposed arable crop development plan for the period 2007-2011**

For the next five years (2007-2011) Government will remain a facilitator to the agricultural sector. In this regard, it would maintain a number of operational service sections and evaluation farms within the ministry with portfolio responsibilities for agriculture with a view to provide the necessary services and to generate technological information for use by the food producing entrepreneurs. This will provide an enabling environment to enhance national crop production with a view to enhance the national food security.

**1.11 National requirements of fruit and vegetables**

Statistics available on land engaged in national agricultural production would suggest that only about 200 hectares of land are under intensive arable cropping although a total of 600 hectares are under some form of cultivation. To achieve a target of at least 70% of the national requirements of fruit and vegetables (in which there are comparative advantages) by the year 2011, a total of 350 hectares i.e. an additional 150 hectares of land would have to be intensively cultivated. This is based on a projected increase in food demand through consumption of the indigenous population which is expected to grow at 1.6% per year; a forecast of the Management and Information Systems Division (MISD). The ***Seychelles Population Projections 1996-2019,*** a 1997 publication projects a local population of 94,500 at the end of 2013. Furthermore, the Ministry of Tourism and Transport in 1997 projected a tourism growth rate of 7.1% at a decreasing rate of growth of 0.3% per year for the next decade.

**1.12 Intensive and sustainable crop production**

Sustainable agricultural production would form the corner stone of all agricultural undertakings. In broad terms, agricultural production would exploit proven technology packages for intensive production with due regard for the human health and the environment.

To ensure sustainability in crop production, new improved technology such as the use of controlled environment technology packages which incorporate efficient water and fertilizer application techniques and selected improved crop varieties will be exploited. To concurrently conserve the local biodiversity and the crop genetic resources, there will be further promotion of environmentally friendly cultural practices such as Integrated Pest Management, (IPM), (Integrated Crop Management, (ICM), and edible landscape, ensuring that there is minimal land degradation through the use of the limited land resources.

**1.13 Proposed crop development plan for the next five years**

* Identify small research projects, on-farm research activities, to encourage the participation of farmers;
* Identify projects to support and promote research activities in the domain of environmental friendly practices such as Integrated Pest Management (IPM), Integrated Crop Management (ICM) and organic farming;
* Facilitate the working environment of the personnel and equip the functional sections with tools and equipment to upgrade performance;
* Promote improved crop varieties and support sound and friendly cultural practices;
* Conduct and promote field investigation and disseminate results in organic farming to the farmers;
* Highlight through mass media the health attributes of organic crops so as to encourage their local consumption;
* Identify potential candidates and provide opportunities and incentives for tertiary training in agriculture related fields;
* Upgrade the soil and plant pathology laboratory to support initiatives and to respond to the needs of the farming community;
* Improve water management and irrigation systems so as to limit the negative effect of the more frequent droughts as a result of climate change;
* Prepare an efficient and effective programme of fertiliser use in order to prevent deficiency in plants hence leading to optimal yield. This will also help in controlling environmental pollution caused by the excessive use of fertiliser;
* Establish an *Ex-situ* field gene bank at Barbarons for the conservation of Plant Genetic Resources for Food and Agriculture;
* Encourage the production of organic crops and floriculture products along with the exploitation of spices, essential oils and traditional plantation crops through the production of value- added products for export to niche markets;
* Identify agricultural plots along with suitable private sector interests to undertake arable crop production;
* Promote the conservation and utilisation of threatened and neglected Plant Genetic Resources for Food and Agriculture;
* Organise workshops and seminars for the farming community and support staff in the collection of farm data, pesticides and fertiliser application and environmental impact;

**1.14 The current situation and resource requirements**

1.14.1 Land

Out of the 455, 000 hectares of total land area of the Seychelles, 6000 hectares have been estimated as potential agricultural land. However, only 600 hectares are under arable agriculture with about 200 hectares under intensive cultivation. Farm size is between 0.5-2 hectares.

It has been estimated that of the total 6000 hectares of potential agricultural land, 3000 hectares are of the Seychelles’ red earth which is an acidic, feralitic soil. 1300 hectares are of the alkaline, coralline sandy soil. Both types of soils are deficient in both macro and micro elements which are essential for optimum plant growth and development.

As far back as 1909, the soils in Seychelles were described as having very low organic matter content, low water retention capacity and generally infertile. It was clearly stated that the nature of the soil is such that they could not sustain crop cultivation on a long term without the addition of fertilisers.

Land is a limited resource in the face of many competing ends. Probably two thirds of the available land resources are mountainous and are unsuitable for agricultural activities. 75% of the total cultivated land is found on the coast averaging about 2 m above mean sea level. The remaining 25% consist of cultivated land with slopes in excess of 15%.

The topography coupled with heavy rainfall and high ambient temperature throughout the year is the main reasons why the soils of Seychelles have a low fertility status. Most of the nutrients are washed down the slope or leached down the soil profile during heavy rainfall.

To achieve the desired level of crop production (70% of the total national consumption of fruits and vegetables), an additional 150 hectares would have to be engaged and cultivated intensively. However land is a limited resource. The area would come from a combination of currently under-valorised agricultural land resources and newly identified land.

A national inventory of agricultural land and land with agricultural potential would be conducted with a view that it would eventually be bound into an agricultural land bank to be protected by legislation to avoid encroachment form other development sectors.

State land would be leased out to potential food producing entrepreneurs who would be bound by a lease agreement while the food producing entrepreneurs operating on private land would conform to agreements of the land owners.

Therefore agricultural plots would be identified along with suitable private sector interests to undertake arable crop production.

1.14.2 Labour and human resources

There is a shortage of skilled and qualified human resources in crop production and over the recent years qualified human resources moved to more lucrative jobs. There are an estimated 3800 people employed in the agricultural sector.

There are six full time extension officers in all the major agricultural regions and 2 stores keepers working on part time basis with the extension officers so as to acquire field knowledge and experience. The extension officer for the inner island region is based on Praslin, with a total of 90 farmers. There are two extension officers for the north/ central region which consist of 150 farmers. For the southern region there is one extension officer who serves 130 farmers and there are two extension officers for the western region consisting of 140 farmers. There is an average of 85 farmers per extension officer.

At the Vegetable Evaluation and Research Section (VERS) there are 34 members of staff of whom five are research officers. The Plant Genetic Resources Development Section is also plagued by the unavailability of qualified human resources.

The Seychelles’ Agricultural and Horticultural Training Centre (SAHTC) is the institution with the mandate to train human resources for the agricultural sector.

The shortage of skilled and qualified human resources remains a major constraint to the achievement of the agricultural production targets as was the case in the 1992/93 – 2006 period. In the context of the upcoming crop development plan, human resources development and training feature as issues to be addressed.

To achieve the crop output proposed in the plan would engage an additional 80-90 farmers cultivating on 150 hectares of land (350 ha in total will be cultivated).

The Seychelles’ Agricultural and Horticultural Training Centre (SAHTC) should include in its curriculum training to meet the needs of the industry. This would provide trained human resources for the agricultural sector. The institution should also ensure that potential farmers are trained in entrepreneurship skills.

The training provided at the Seychelles’ Agricultural and Horticultural Training Centre (SAHTC) should be more practical in the first year and should include work attachments on farms so as to develop the appropriate skills. The second year should be more technical.

People should be encouraged to work in the agricultural sector and incentives should be made available for the farm workers as a form of encouragement. Where necessary foreign farm workers should be employed to increase production in agriculture and encourage the local workers.

Opportunities should be provided to facilitate formal and informal training of food-producing entrepreneurs as well as build capacity in various grades of technical and support personnel with focus on gender balance, with a view to address gaps and enhance knowledge in agricultural resource utilization. These opportunities should be derived through the exploitation of a combination of bilateral and multilateral agreements along with national initiatives.

Potential candidates should be identified (pre-service, in-service) for general and specific tertiary training in all required fields of agricultural science.

Performance indicators shall be established to monitor and measure the performance of the personnel and incentives created for candidates to take a career in agriculture. Government should revise of the scheme of service for staff employed in the agricultural sector.

In order to sustain the intended crop development plan over the period 2007 – 2011, there is the need for the development and enhancement of support services. This would imply the continuous upgrading of skills and knowledge of the human resources through local and international trainings and refresher courses.

Table 1.0: Training requirements to implement the five year crop development plan

**Field of Training Level Number**

**Agronomy**

* Crop experimentation MSC 2

BSC 1

HND 2

* Plant Genetic Resources BSC 1

**Plant Protection**

* Entomologist BSC 1
* Phytopathologist BSC 1

**Agricultural Extension**

* General agriculture with Agricultural BSC 2

Extension Electives HND 2

1.14.3 Capital

It is often necessary for new farmers and also some existing ones to require initial funding to start new projects or carry out farm improvements. With the high cost of infrastructure and labour most farmers seek assistance for loans. The Development Bank of Seychelles (DBS) assists farmers with feasible projects. Over the past ten years over SR 13 million (USS 2.4m) have been disbursed to farmers for agricultural development at an interest rate of 9%. Farmers invest mostly on farm improvements, irrigation systems, and construction of shade house, livestock rearing pens, procurements of equipment and machineries and working capital. On most vegetable farms a farmer, will employ at least one farm worker and may take on one casual worker.

Loans from the commercial banks should be accessible to farmers. Government should ensure that the present credit line with low interest rate for farmers is maintained by the Development Bank of Seychelles.

1.14.4 Institutional support

The Agriculture and Fisheries Incentives Act, 2005 provides incentives to registered farmers, farming entities (companies), agricultural processors and agricultural exporters. In line with the said act, a registered farmer does not have to pay business tax. Farming entities (companies), agricultural processors and agricultural exporters do not pay business tax if earnings are between SR 0 – 250,000.00 but above SR 250,000.00 there is a tax of 15%.

A draft bill on a Crop Insurance Scheme has been proposed. Farmers, through the contribution of a premium, would benefit from insurance schemes in the event of losses through natural disasters. The scheme would provide the farming community with a sense of security and promote stability and development of agriculture.

The ministry with portfolio responsible for agriculture in collaboration with other stakeholder ministries would continue to create favourable business environment for the farming community through similar incentives.

The ministry with portfolio responsibility for agriculture would remain a facilitator to the agricultural sector providing services to the farming community in research, extension etc.

The ministry with portfolio responsibility for agriculture should provide a high standard of services before the service is made payable although this implies that a high standard of services means qualified personnel and the availability of appropriate equipment.

Certain services provide by the ministry with portfolio responsibility for agriculture should be taken up by the private sector. Examples include the after sales services.

The ministry with portfolio responsible for agriculture must ensure that research work is related to the farmers’ needs and it should work in partnership with the farming community in a participatory approach.

The backyard and small farmers are the pillars of Seychelles’ agriculture and they are the ones who will need most the services provided by the Ministry with portfolio responsibility for agriculture.

1.14.5 Promulgation and adoption of technology

The new generation of farmers are implementing the latest agricultural techniques such as cultivating under green houses and practicing the fertigation technique in order to maximise the use of the limited land resources.

There are some cases of both over- use and under -use of fertilisers. Not all farmers use the ministry’s fertiliser recommendations, but most apply at levels suitable for maintaining near-optimal production. It is mainly the farmers using the fertigation technique who are using the rate recommended by the research officers as precision is required in using this technique.

Most farmers are observed to practice crop fertilisation instead of soil fertilisation. Fertilisers are applied only to supply nutrients requirement by the growing crop, with no regards to what happens to the soil after the crop is removed. The Soil Diagnostic Laboratory of the Department of Natural Resources is responsible for nutrient and moisture determination of soils. Currently, there is very few equipment for the different analyses.

Different soil conservation techniques are promoted by the Ministry with portfolio for agriculture. These include the use of farmyard manure, composts and other locally available organic materials. On steep slopes terraces with grassed faces are built while on level ground ridges and beds are common.

Farmers are also encouraged to use integrated pest management (IPM), integrated crop management (ICM) technique as well as exploit the value of other good cultural practices.

There are water conservation techniques such as low volume water applicators e.g. drip or mini-sprinkler systems which can also be used as fertigators in conjunction with tropical green houses. Farmers use mulch and incorporate soil organic matter to enhance soil water retention ability.

Most farmers are using F1 hybrids seeds which can be purchased at the agricultural requisite shops and those farmers on the coastal plains are using small farm machinery such as rotovators.

Farmers have different views with regards to GMOs. No one is formally involved with the use of GMO seeds or planting materials.

Most of the farmers are exposed to good crop husbandry in the sense of having knowledge of the use of pesticides, fertiliser, herbicides, small machineries and different types of small irrigation systems.

The advent of more extreme weather events as a consequence of climate change seriously threatens water supply. Efficient and effective use of irrigation water through the application of modern technology could partly mitigate these upcoming challenges. These would include the promotion, adoption and the use of low volume irrigation water applicators eg. drip and mini-sprinkler systems, along with roof catchment, tapping ground water and utilising large storage. Implementing various cultural practices like mulching, soil conservation and terracing would help during the period of drought in contributing to minimise land degradation.

The ministry with portfolio responsibility for agriculture has been carrying trials on green house and fertigation technology mainly on coastal sandy soils. The next phase of the research should be targeting farmers cultivating on red soil.

There should be changes in the modality of operations of stakeholders, institutions and individuals to support the dissemination and adoption of food productivity enhancing technologies for the smallholder agriculture. Technologies utilized by the smallholder agriculture will continuously change as a function of the pressure applied for agriculture to deliver output. Thus, it follows that adequate training of the potential farmer and the regular training of the practicing farmer in specific domains would have a net positive impact on the dissemination and adoption of food productivity enhancing technologies.

The ministry with portfolio responsible for agriculture and the private sector interests should ensure the availability and appropriate prices of agricultural inputs for the promulgation and adoption of technology. The said ministry must also ensure that farmers are trained and there should also be follow- up with regards to the adoption of the different technologies of especial significance in the face of climate change.

1.14.6 Supply of inputs

Over the last five years, Government’s ability to stock and supply inputs to the farming community has been seriously constrained by its inability to secure long term credits from foreign firms due to local sub-optimal availability of foreign exchange.

The ministry with portfolio responsibility for agriculture should remain as a facilitator and make available a service along side the private sector with regards to the supply of agricultural inputs. The private sector should act in parallel to the ministry with portfolio responsibility for agriculture with regards to the importation, stocking and selling of agricultural inputs.

Mechanisms should be put in place by the Government to ensure sustainability with regards to the supply of agricultural inputs. Government should ensure that agricultural inputs imported are of high quality and standards and are in accordance with the local laws for the benefits of the farming community.

1.14.7 High pests and diseases prevalence

The high pests and diseases prevalence is one of the constraints with regards to crop production. The existing monitoring and surveillance unit of the Plant Protection Services Section should be revitalised to deal with the increasing prevalence of pests and diseases.

The ministry with portfolio responsibility for agriculture should ensure the strengthening of the Plant Protection Act (1996). A full time legal officer should be employed with regards to upholding of the different agricultural acts including the Plant Protection Act (1996).

The ministry with portfolio responsibility for agriculture and the private sector interests should ensure that pesticides are sold only to persons with a valid pesticide handling certificate as stated by law.

Techniques such as Integrated Pests Management (IPM) should be encouraged and the usage of pesticides should be the last option. Requisite Stores sales persons should be trained with regards to pesticides utilisation and customer care.

The private sector interests should be encouraged to take up pesticide spraying businesses. This will reduce the handling of pesticides by the backyard farmers. Back yard farmers should be trained with regards to the usage of pesticides, as it is now the case with registered farmers and SAHTC students.

The ministry with portfolio responsible for agriculture, the private sector interests, NGOs and all other agriculture stakeholders should be involved with issues related to pests and diseases.

**1.15** **Roles and functions of stakeholders of the agricultural sector**

Government ministries, parastatal organisations, the private sector, NGOs and other agriculture stakeholders will have an important role to play in the achievement of the crop development plan. They would be the major clientele of the Department of Natural Resources and hence the more important group of stakeholders in the sector. They will ensure that adequate and appropriate researches are carried out and results disseminated to all stakeholders. They will help create an enabling environment to encourage investment, improve production and trade of agricultural produce.

1.15.1 The ministry with portfolio responsibility for agriculture

The ministry with the portfolio responsibility for agriculture will be the main facilitator to the sector as well as the main service provider for irrigation water, agricultural loans and projects evaluation and a supplier of agricultural technology through evaluation and agricultural genetic resources farms. The ministry with portfolio responsible for agriculture would create a favourable business environment for the different stakeholders especially for the private sector. The ministry with portfolio responsible for agriculture and the stakeholders would respect and enforce any national policy and legislation on genetically modified crops, genetically modified foods, plants and growth regulators.

1.15.2 The farming community

The main contribution from the private sector will be from the farming community as most farmers are operating as sole traders. Nonetheless some NGOs such as the Seychelles Farmers’ Association and the Val D’endore Farmers’ Association are the leading farmers groups working together to safeguard farmers’ interests.

Farmers or food producing entrepreneurs cultivate either State land or privately owned land. In the case of privately owned land if the owner does not farm the land himself, tenureship is worked out formally or informally with the owner and may entail share cropping along with a regular rent fee. In the case of State land, there is formal tenureship agreement through an official lease for a finite period with a standard fee for per unit area leased.

Farmers are encouraged to form or join an association such as the Seychelles Farmers’ Association this way they could all speak in one voice for their betterment. The other advantage is that international donors tend to make funds available directly to the Farmers’ Association instead of government.

To achieve the crop output proposed in the plan would engage an additional 150 hectares of land (350 ha in total will be cultivated) and an additional 80-90 farmers on 0.5 hectare average farms.

1.15.3 Supplier of inputs

Government has been the main supplier of inputs such as F1 vegetable seeds, fertilizers, pesticides, small machines and irrigation supplies for well over 30 years and private sector participation has been insignificant. However, over the last five years Government’s ability to stock and supply inputs has been seriously constrained by its inability to secure long term credits from foreign firms due to local sub-optimal availability of foreign exchange. Government has found it necessary to invite private sector interests to also stock in parallel without losing sight of the Sanitary and Phytosanitary legislation of the Seychelles. There would have to be optimal supply of agricultural inputs to permit the realisation of the full potential of the agricultural sector.

1.15.4 The national households

One of the major stakeholders would be the national households. They are perceived to be cumulatively a major potential contributor to national agricultural production in the next five years. Currently there are 6,714 households involved in some form of small-scale agricultural practices such as backyard farming. If presently each of the 18,000 national households were to cultivate a minimum of 25 m2, an additional 45 hectares of land could be brought under cultivation; and this would be equivalent to 22.5% of the area currently under intensive agriculture. Indeed, the national households are seen as collectively constituting a stakeholder entity that could potentially contribute towards national agricultural production through home gardening.

1.15.5 Other stakeholders

The other stakeholders as far as food safety is concerned would include the Seychelles’ Bureau of Standards and the Environmental Health Unit of the Ministry of Health. The Seychelles’ Bureau of Standard administers the Codex Alimentarius measures while the food safety office within the Environmental Health Unit of the Ministry of Health administers the Food Act (1987) that became legally binding in May 1990.

**1.16** **Technology**

There would be changes in the modality of operations for farmers to support the dissemination and adoption of food productivity enhancing technologies. The use of shade houses would be further promoted. Presently there are 10 hectares of land under this technology. To achieve the crop production target set for 2011, cultivation under shade houses would have to increase at a rate of 5% per year of the total area under intensive cultivation.

The farming community would make use of improved crop technologies such as high yielding F1 hybrids seeds varieties imported from different international seed companies. The use of small farm machinery such as rotovators would also be very important with a view to reduce the farm work load.

Farmers would be using the Integrated Pests Management (IPM) and Integrated Crop Management (ICM) technologies which are good cultural practices.

Farmers would consider the principles of maximum dose and economic dose in fertiliser application. With the increasing cost of fertilisers, every farmer should be able to ascertain the level of fertiliser application to avoid soil toxicity, depletion and land degradation.

**1.17** **Local consumption**

There would be an increase in food demand through consumption of the indigenous population which is expected to grow at 1.6% per year along with the projected tourism growth rate of 7.1% at a decreasing rate of growth of 0.3% per year.

**1.18** **Marketing of Agricultural Produce**

Agricultural producers would to set the prices of their produce at a level that takes into consideration the cost of production and a reasonable mark-up.

The ministry with the portfolio responsibility for agriculture would facilitate the local marketing of agricultural produce by facilitating adequate infrastructure at district level as well as providing for a few marketing depots for efficient wholesale and retail of agricultural produce

**1.19** **Challenges and threats in attempting to achieve the crop development plan**

The major challenges to the achievement of the crop development plan for the five year period would be associated with the availability of agricultural land, the prevalence of pests and diseases, the availability of inputs as well as the availability of foreign exchange amongst others.

1.19.1 Supply of inputs

The sub-optimal supply of agricultural inputs as a result of foreign exchange shortages will put a lot of pressure on the farming community and the achievement of the crop development plan as a whole.

1.19.2 Agricultural land

The loss of agricultural land to other sectors of the economy such as tourism and social housing along with concurrent gradual reduction in the utilisation of agricultural land in one of the most important challenges.

1.19.3 Pests and diseases

The debilitating effects of pests and diseases on vegetable crops specifically and on biodiversity in general would place tremendous pressure on the crop production systems.

1.19.4 Climate and the prediction of more frequent extreme weather events

The effects of climate change through extreme weather events such as torrential downpours and droughts would negatively impact on the crop production plan for the next five years. Thus the said plan would have to incorporate mitigation and adaptation technologies in view of the forecast of the greater frequency of more extreme weather events.

1.19.5 The farming community

There would be a need for an additional 150 hectares of land (350 ha in total will be cultivated) and about 80-90 additional farmers on 0.5 hectare average farms.

1.19.6 The national households

The national households would be one of the major stakeholders in the achievement of the crop development plan. Currently there are 6,714 households involved in some form of small-scale agricultural practices such as backyard farming. This figure is not expected to increase significantly in the years to come due to the style of the house being built as a result of limited land resources. Most of the houses are blocks of flats with no space available for backyard farming. Therefore this will affect the achievement of the five year plan with regards to the contribution of the national households to the crop development plan.

1.19.7 Environmental degradation and the loss of biodiversity

In the domain of crop production a number of activities could lead to environmental degradation and loss of bio-diversity. These would include soil erosion through inappropriate cultural practices such as cultivating un-terraced slopes, land clearing followed by burning of the bio-mass, pesticide application malpractices, no manure or soil organic matter application, use of pesticides with excessively long residual effects, use of inappropriate amounts of fertiliser etc.

1.19.8 Economic reform policy

The major threat will be related to the reform in the economic policy. The country is going through a period of economic difficulties and the supply of foreign exchange and the government budget allocation for the sector might be sub-optimal.

1.19.9 Labour and human resources

There is a shortage of skilled and qualified human resources in crop production and over the last few years qualified human resources moved to more lucrative jobs. Unless potential candidates are selected for tertiary training in all required fields of agricultural science and incentives are created for candidates to take a career in agriculture, labour and human resources will be one of the most important challenges to the achievement of the said plan.

1.19.10 Marketing of agricultural produce

The lack of market infrastructure in certain districts or their inappropriate locations does not facilitate the marketing of agricultural produce. Many of the local hotels are not making use of the locally available agricultural produce. The relatively high price of fruits and vegetables is one of the most important limiting factors for their marketing.

1.19.11 Local production versus imports

One of the most important issues in the importation of agricultural produce when they are locally available limit the income potential of the local farming community with the risk of the introduction of pests and diseases.

1.19.12 National instruments

The crop development plan envisioned for the next five years would have to be compatible with the exigencies of relevant national instruments as well as complement them. The national instruments include development plans such as the **Environment Management Plan of Seychelles** **(EMPS 2000-2010),** whichis the foundation stone of*sustainable* *development* in all aspects of economic and social interventions, inclusive of agricultural production.

Furthermore, the proposed crop development plan would have to pose the minimum risk to human health and have the minimal impact on the environment. In this context, it would have to be in conformity with the exigencies of the existing internationally binding protocols to which Seychelles are signatories, if the proposed crop development plan is to remain within the precinct of sustainable development protocols. Probably the most important of the sustainable development protocols would be the **Agenda 21** that spells out the rationale for sustainable development. Additionally, the crop development plan proposed would have to conform to such international environment conventions as the **Convention on Biological Diversity,** the **Convention on** **Climate Change** and the **Convention on Desertification.**

Besides, the intended crop development plan would have to uphold and follow the existing laws of the Seychelles. It would have to be congruent with the various national acts and legislation such as the **Plant Protection Act, 1996;** the **Pesticide Control Act, 1996;** the **Animals (Diseases and Imports) Act, 1991;** the **Environment Protection Act, 1994** as well as any future upcoming acts and legislation.

The crop development plan desired would have to take note of Seychelles’ affiliations to regional and international trade and economic groupings as well as international norms, measures and standards such as those promoted by the **International Plant Protection Convention (IPPC)** and the **Codex Alimentarius** as well as those of the **Office International des Epizooties (OIE)**.

1.19.13 The significance of bilateral and multilateral cooperation agreements

Foreign assistance, namely Overseas Development Assistance (ODA), through bilateral and multilateral cooperation, as well as Foreign Direct Investment (FDI) would have to complement the domestic initiatives and efforts towards higher food security facilitated by government and undertaken by the private sector interests. To this end, joint venture type projects would have to be actively sought by government and food producing groups to address specific gaps in the agricultural sector and to provide the necessary synergy for the attainment of the set objectives.

In order to achieve the targets which have been set out in the crop development plan the State along with the agricultural sector stakeholders would have to address the issues which have been identified as limiting national agricultural production. Often the State would also call upon its foreign partners through the bilateral and multilateral agreements to provide some assistance in the advancement of these objectives and in making a concerted attempt to provide solutions to the identified limiting factors.

Training would be accomplished both locally and overseas and it would be both short term and long term. The long term training (3-5 years) at the tertiary level would be effected overseas with either partial or total assistance from foreign bi-lateral or multi-lateral partners. The short term training would be effected in- country with again the possibility of partial or total assistance of foreign bi-lateral and multi-lateral partners or even local partners.

The Ministry with portfolio responsibility for agriculture in collaboration with bilateral and multilateral partners would maintain a number of functional sections, along with a number of plant genetic resources farms through which specific information and services on crop production technologies would be evaluated.

Seychelles is a net food-importing country and most of the agricultural inputs are imported. External funding will have to be sought through loans from international banking institutions. Funds could be raised through bilateral and multilateral cooperation.

**1.20 Proposed crop development plan and a timeframe for its achievement**

The programmes proposed in the five year crop development plan would comprise of medium to long term projects, taking into account the financial resources are not readily available. Most of the programmes will be assisted through multilateral and bilateral cooperation (*see attached table).*

1.20.1 The medium term category of programmes (2007- 2009)

* Identify projects to support and promote research activities in the domain of environmental friendly practices such as Integrated Pests Management (IPM), Integrated Crop Management (ICM) and organic farming;
* Provide adequate, sound and proven technical and institutional support to assist the private sector interests in arable crop production;
* Promote improved crop varieties and support sound and friendly cultural practices;
* Highlight through mass media the health attributes of organic crops so as to encourage their local consumption;
* Upgrade the soil and plant pathology laboratory to support initiatives and to respond to the needs of the farming community;
* Improve water management and irrigation systems so as to limit the negative effect of the more frequent droughts as a result of climate change;
* Prepare an efficient and effective programme of fertiliser use in order to prevent deficiency in plants hence leading to optimal yield. This will also help in controlling environmental pollution caused by the excessive use of fertiliser;
* Promote the conservation and utilisation of threatened and neglected Plant Genetic Resources for Food and Agriculture.

1.20.2 The long term category of programmes (2010- 2011)

* Identify small research projects, on-farm research activities, to encourage the participation of farmers;
* Encourage the production of organic crops and floriculture products along with the exploitation of spices, essential oils and traditional plantation crops through the production of value- added products for export to niche markets;
* Conduct and promote field investigation and disseminate results in organic farming to the farmers;
* Identify agricultural plots along with suitable private sector interests to undertake arable crop production;
* Promote improved crop varieties and support sound and friendly cultural practices;
* Facilitate the working environment of the personnel and equip the functional sections with tools and equipment to upgrade performance;
* Identify potential candidates and provide opportunities and incentives for tertiary training in agriculture related fields;
* Establish an *Ex-situ* field gene bank at Barbarons for the conservation of Plant Genetic Resources for Food and Agriculture;
* Organise workshop and seminars for the farming community and support staff in the collection of farm data, pesticides and fertiliser application and environmental impact.

**1.21 The financial outlay to implement the crop development plan**

The Development Bank of Seychelles (DBS) is the major financing institution for support of projects for agricultural development. The bank assists farmers with loans for agricultural development at 9% interest rate. The DBS also assist the Department of Natural Resources with the management of the *Agricultural Development Fund*. This fund established under the *Integrated Agricultural Development Project*, makes available to farmers loans at a lower interest rate of 8%.

An agricultural credit amounting to SR 10 million (USD 2 million) at an interest rate of 8%, originally provided for under the Integrated Agricultural Development Project (IADP) between 1996-2001, and financed by the African Development Bank (ADB), could be used to further finance, through loans, agricultural undertakings for the next five years. In order to further enhance agricultural production, it is recommended that consideration is given to reduce the interest rate of that loan to 5%. The Development Bank of Seychelles should maintain its offer of agricultural credit. The credit financing institutions along with small credit facilities should also be at the disposal of farmers.

Farmers, through the contribution of a premium, would benefit from an insurance scheme in the event of losses through natural disasters. The ***Agricultural and Fisheries Incentives Act 2005*** would provide the agricultural sector operators with various incentives.

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| --- |
| Table 1.2: Proposed crop development plan and a time frame allocated for its achievement |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Programme | Implementation period | | | Implementing agency |
| Short term | Medium Term | Long term |  |
| 2007-2008 | 2009 - 2010 | 2011 |  |
| Identify projects to support and promote research activities in the domain of environmental friendly practices such as Intergrated Pest Management (IPM), Intergrated Crop Management (ICM) and organic farming. | A total of two projects to be identified  Tentative costs | A total of two projects to be identified  € 1.1 million |  | Ministry of Agriculture, bilateral and multilateral cooperation. |
| Identify agricultural plots along with suitable private sector interests to undertake arable crop production. | A total of 50 new plots should be identified | A total of 100 new plots should be identified | A total of 150 new plot s should be identified | Ministry responsible for Agriculture, Ministry responsible for land use, Ministry responsible for Environment, Private Sector. |
| Promote improved crop varieties and support sound and friendly cultural practices. | One on farm trial and visit by farmers | One on farm trial and visit by farmers | One on farm trial and visit by farmers | Ministry of Agriculture, External assistance through bilateral and multilateral cooperation. |
| Conduct and promote field investigation and disseminate results in organic farming to the farmers. | Two field investigation to be carried out | Two field investigation to be carried out  €40,000 | Two field investigation to be carried out | Ministry responsible for Agricultural, Bilateral and Multilateral Cooperation |
| Identify potential candidates and provide opportunities and incentives for tertiary training in agriculture related fields. |  | HND – 2  BSC – 3  SR 1 million | HND – 2  BSC – 3  MSC – 2  SR 1.4 million | Agriculture, Education, Public Administration and Manpower Development |
| Upgrade the soil and plant pathology laboratory to support initiatives and to respond to the need of the farming community. |  | Provision of laboratory equipment costing at € 19,804.40 |  | Ministry responsible for Agricultural, Bilateral and Multilateral Cooperation |
| Improve water management and irrigation systems so as to limit the negative effect of the more frequent droughts as a result of climate change. | One trial or research project  €30,000 | One trial or research project |  | Ministry responsible for Agriculture, Ministry responsible for land use, Ministry responsible for Environment, Private Sector; |
| Prepare an efficient and effective programme of fertiliser use in order to prevent deficiency in plants hence leading to optimal yield. This will also help in controlling environmental pollution caused by the excessive use of fertiliser. | One trial or research project  €20,000 | One trial or research project |  | Ministry responsible for Agricultural, Bilateral and Multilateral Cooperation. |
| Establish an *Ex-situ* field gene bank at Barbarons for the conservation of Plant Genetic Resources for Food and Agriculture. |  |  | Complete setting up of te project costing at SR 5,288,107 | Ministry responsible for Agricultural, environment,  Bilateral and Multilateral Cooperation |
| Promote the conservation and utilisation of threatened and neglected Plant Genetic Resources for Food and Agriculture. | Highlight through mass media, workshops and training | Highlight through mass media, workshops and training |  | Ministry responsible for Agricultural, Bilateral and Multilateral Cooperation. |
| Organised workshop and seminars for the farming community and support staff in the collection of farm data, pesticides and fertiliser application and environmental impact. | Two events to be carried out | Two events to be carried out  SR30,000 | Two events to be carried out | Ministry responsible for Agricultural, Bilateral and Multilateral Cooperation. |
| Identify small research projects, on-farm research activities, to encourage the participation of farmers. | Two research projects | Two research projects | Two research projects  SR60,000 | Ministry of Agriculture, External assistance through bilateral and multilateral cooperation. |
| Encourage the production of organic crops and floriculture products along with the exploitation of spices, essential oils and traditional plantation crops through the production of value- added products for export to niche markets. |  |  |  | Ministry responsible for Agricultural, Bilateral and Multilateral Cooperation |
| Facilitate the working environment of the personnel and equip the functional sections with tools and equipment to upgrade performance. |  | Appropriate office and laboratory equipment | Transport should be available to te different sections so that visit to farmers can be properly effected | Ministry of Agriculture, Ministry of Administration and manpower development. |
| Highlight through mass media the health attributions of organic crops so as to encourage their local consumption. | Two t.v and radio programme and 2 newspaper arcticles | Two t.v and radio programme and 2 newspaper arcticles | Two t.v and radio programme and 2 newspaper arcticles | Ministry responsible for Agriculture, Ministry responsible for Health and Ministry responsible for Industry |

**2.0 MARKETS AND MARKETING OF AGRIUCLTURAL PRODUCE**

**2.1 Agricultural marketing trends during the past decade**

The term “Agricultural Marketing” is somewhat new to most agricultural entrepreneurs in Seychelles. Most stakeholders, across all sectors of the agricultural industry may confuse the two terms: **Marketing** and **Market**. Summers et al. (2003) defined marketing and market as “*the process of planning and executing the conception, pricing, promotion and distribution of ideas, goods and services to create exchanges that satisfy individual and organisational goals*” and “*markets are people or organisations with needs or wants and the ability and willingness to buy*” respectively.

Therefore, agricultural marketing strategies should be formulated to include all factors related to agricultural productions, processes, technology innovation, policies and research effectively.

In the past, attentions were concentrated mostly to improve production techniques (e.g. research on high yield cultivars, introduction and use of shade houses and fertigation and effective use of agricultural chemicals) whilst very little studies have been conducted to analyse the relationships that exist between agricultural producers’ supplies verses consumers’ demands or vice versa. In other words, very little is known (if yet published) on how and by how much producers, retailers/wholesalers, agro-processors, importers affect the flow and value of goods and information within the agricultural supply (distribution) chain.

A lot of effort has lately been given to collect and analyse agricultural statistics (e.g. farm output and input estimates, market prices of local and imported agricultural produce and quantity and quality of agricultural entrepreneurs). The aim of collecting and analysing these statistics was primarily to formulate and implement policies that would benefit all local agricultural stakeholders.

This document shall look at and suggest alternative means to formulate simple mechanisms and policies that will guide or facilitate the study of all elements related to agricultural marketing in the Seychelles (i.e. how goods, services and information flow affect the agricultural supply chain). Diagram 2.1 (below) shows roughly how different elements (stakeholders) relate to one another in the supply chain.

Diagram 2.1: Flow diagram showing how product and information (are believed) to flow between stakeholders in the supply chain in Seychelles



Diagram 2.2: System diagram showing endogenous and exogenous driving variables in the agricultural supply chain in Seychelles (pre-researched)

Consumer behaviour/trend

Pests & Diseases

Competition

Climate

**Inputs**

Seed/propagation, young, materials, Water, Labour, Agro-chemicals & Fertiliser, Capital, Logistics, Transport/Machinery, Field statistics, Communication tools and media, Technology

**Processing / Transformation**

**Management**

Planning / policy making, (Implementation, Evaluation/monitoring, Control)

**Field / cultural practices** (arable / pastoral)

**Marketing practices**

Transporting

Cool storage

Packaging

Shipping

Selling

Marketing research

**Outputs**

**Physical / tangible outputs**

Fresh /processed fruits /vegetables/meat

**Human / economic benefits**

Income (Profit v/s revenue), satisfaction, employment

**Waste**

Capital Investment

(DBS, Commercial banks)

National / International agricultural policies

Social norms & values

Macro-economic variables (e.g. inflation & interest rates, Gov aids, subsidies, etc.)

**2.2 Marketing of agricultural inputs**

Contrary to supply, demands for agricultural inputs appear to have increased considerably over the past decade. This is particularly true for agricultural land and labour. Availability and accessibility to productive agricultural land is increasingly turning difficult not primarily because of the increasing number of investors but also because of the loss of such potential land to other non-agricultural uses such as residential development. Indeed, one does not expect this trend to stop. There are already plans on future non-agricultural development on current, easily accessible agricultural land such as on coastal land at Anse Royale. Whether the ministry with portfolio responsibility for agriculture or outside agricultural lobby groups are prepared to lobby against such moves are matters for further consideration. Time is unfortunately another very critical factor.

Skilful agricultural labour is becoming much scarcer and unreliable each generation. This is particularly evident among the younger generation who generally prefer to be self-employed and/or opt for seasonal and/or casual employment. Numerous advertisements for agricultural vacancies, either on Mahe, Praslin or on other outer islands (such as Denis Island) were and are still open. Is the government ready to alter its Maximum Allowable Foreign Employees (MAFE) policy to cater for such need is a matter for further consideration. The role and objective of the Seychelles’ Agricultural and Horticultural Training Centre, SAHTC may therefore need to be revised too.

Available stocks of agricultural inputs such as imported fertilisers, agro-chemicals (pesticides, herbicides, nematicides, fungicides and growth regulators) are becoming more difficult to satisfy local demands. Graph 1, below, shows a general, slow rise in total value of agricultural inputs imported from 2000 to 2005 (with the exception in 2004). Arguably, foreign exchange shortages may not be the only reason. With the continuous rise in labour cost, it appears that farmers are becoming ever more reliant on cost effective alternatives to cut down on labour cost. The use of herbicides (e.g. Roundup®) has for instance reduced the need to employ labour to control weeds. A wide range of other cultural activities have also been modernised. Consequently, a vicious cycle has developed resulting in greater pressure being added onto the foreign exchange basket. Nonetheless, such weakness is being eased by the issue of import permits to registered farmers.

Figure 1: Cost of agricultural inputs (SR) 2000 - 2005

-

1

2

3

4

2000

2001

2002

2003

2004

2005

**Year**

**Seychelles' Rupees (million)**

Estimated

5 Year

Average

(SR ' 000)

Estimated

total value

of imputs

imported

(SR ' 000)

The Development Bank of Seychelles (DBS) has been the major financier to agricultural development in Seychelles. There are two main agricultural credit schemes, namely the Agricultural Development Fund – ADF (initiated in 1996) and DBS’ own business’ credit services. To date, more than SR10.5 million has been approved to assist farmers. The other well known agricultural financing entities are the Mauritius Commercial Bank (MCB), the Barclays Bank (Sey) Ltd and the Seychelles’ Savings Bank.

**2.3 Marketing of agricultural planning techniques**

To date, most farmers do not appreciate or understand the need to plan their agricultural business, be it in terms of financial budgeting, crop rotation programmes or time and labour management. As in all businesses, effortless agricultural planning leads to unstable/unreliable production capability and capacity.

In recent years, the Agricultural Planning Section has started encouraging farmers to develop positive attitudes towards effective work plans. Development Plans (DP) have been introduced to help farmers to better manage their production level on an annual basis and it is also enabling the Department of Natural Resources to categorise and register farmers accordingly.

It is therefore important for agricultural investors to recognise the importance of planning as a tool. Early familiarisation/promotion and the development of planning techniques through computer programmes such as Microsoft Excel (among many others) should thus be included in SAHTC’s curriculum.

**2.4 Marketing of agricultural market strategies**

In the past there might have had no need to market agricultural markets. That is, previously, farmers may have found it easy and cost worthy to sell their produce by themselves, at times convenient to them, either when their farm outputs reached maturity or when they had to harvest to earn an income. There was sufficient number of buyers to enable farmers sell most, if not all, of their harvests. Intermediary distributors need not to exist in the supply chain.

SEYCOM, which was later named the Seychelles’ Marketing Board (SMB), and in recent years, private business entities such as EL’s Products are examples among the few numbers of wholesalers that have been established to help guarantee constant and reliable markets for farmers’ produce.

In general, these market bodies also managed to guarantee adequate year-round supplies of fresh fruit and vegetables to consumers. In doing so, commodity prices fluctuated within marginal troughs and peaks. That is, the monopoly (or monopolistic) system was in some way acting as a regulatory body in stabilising both farm-gate and market/retail prices.

Nevertheless, with drastic improvements/changes in communication, trade facilities and policies (Multilateral Free Trade Agreement), monetary transactions, changes in consumer awareness/trends and branding of commodities, it has and will become ever more difficult for local farmers to compete both among themselves and/or with international suppliers. This is particularly true since local production and marketing (promotional) scale is nothing compared to that of big agricultural countries alike South Africa, Australia, Mexico and China, which are better-off due to economies of scale and specialisation of skills and use of resources.

There is an urgent need for the government and the community at large to encourage local agricultural entrepreneurs to group together so that flow of information and sharing of skills and resources are achieved at a more effective and efficient level. One way of achieving this is by labelling and educating consumers on benefits of consuming locally made produce. The labelling concept “Made in Seychelles” has already being adopted by local artisans. This concept should be introduced and spread throughout the agricultural community. It is to be expected that grouping of different complementary agricultural businesses would result in specialisation of skills and better use of resources (e.g. setting up regional centralised-nurseries that would supply quality propagations and seedlings to farmers instead of preparing and producing them on site – as currently being done). Groupings will help to promote short term and long term attainment of optimum industry potential.

One among many alternative regulatory agreements that could benefit both producers and retailers is the “Quota System”. The quota system is currently being endorsed and adopted by the Western Australia Potato Board. Such system requires different groups/pools of producers to produce specific varieties, at fairly precise projected quantities during different periods of the year. The system works on a cyclic roster plan. Each group of producers may collude to form and act as a cooperative group (e.g. by region or specialisation in types of production [livestock, crops, mix or processing]). The Quota System limits the likelihood of over market supply of any agricultural produce at any point in time during the year. It thus allows producers, sellers and consumers to bargain within small price margins.

Currently, there are few agricultural retailers who are diversifying or specialising in the type of service they offer. For example, pre-packed, chilled and pre-cooked (1-minute-microwave-warmed) vegetables are not so popular among most Seychellois. There may be a need to perform a marketing research on such type of goods and services.

Distribution of goods and information is one of the most important weaknesses that the agricultural sector needs to improve. At times of surplus production, only specific regions on Mahé (e.g. Market Street - Victoria) and Praslin are known to be flooded with vegetables. On the other hand, these vegetables are usually in scarce supply in the countryside. This is very evident from the fact that retail prices of agricultural produce in the countryside are known to remain relatively high (and constant) even during periods of oversupply. Some agricultural sellers/importers are capitalising on their effective distribution networks (as a competitive advantage) to compete against other sellers. This is why, for instance, that while some relatively big local producers on Mahé and some on Praslin are claiming market saturation (and thus need to dump their produce), other agricultural sellers are in contrast able to sell their produce relatively well.

**2.5 Marketing of agricultural produce and post-harvest technology**

Despite of the tremendous agro-economic success contributed by the SMB, not much investments, on a national scale, have however been made to reduce the volume of losses and wastage of marketable agricultural produce, especially local ones. Consequently, the country is still facing difficulties at minimizing the gap between the period of relative abundance (during South East monsoon months of May to September and the period of relative scarce supply during the North West monsoon months of October to April.

The role of the SMB and that of private agricultural entities could be extended to act as a Central Marketing Depot (i.e. to sell produce in bulk at below market prices when they are in abundance). However, before this is allowed to take place, licence agreements need to be reviewed and amended to avoid unnecessary competition that may arise between year-round sellers and seasonal sellers. Also, a study may need to be performed to evaluate the feasibility of setting up the Central Marketing Depot away from Victoria.

Through careful planning and implementation of modern, low running cost cool storage technologies (such as Controlled/Regulated Atmosphere and/or Modified Atmosphere technologies) could help to reduce agricultural loss and wastage. In fact, because Seychelles is focusing strongly on Five-Star tourism, it would indeed be beneficial to both the agricultural and tourism sectors to formulate studies on the need and economic advantage of implementing modern, but effective and cost-efficient cool-storage technologies. By this, one would then expect that quality assurance standards in national food production and distribution cycle would become easier to establish and regulated (alike Food Quality Assurance (FQA) and Hazard Analysis Critical Control Point (HACCP) adopted in most developed countries). A new market for local agricultural producers would thus expect to open and grow and hence reduce the need to import Grade A1 fruits and vegetables that could otherwise be produced locally.

**2.6 Marketing of agricultural policies**

The role of government has and shall remain strictly for planning and drafting policies. These policies should facilitate, support and guide local agricultural producers while protecting them from aggressive competitors (including hotels). Even so, hotels and other local food processors will find no need and excuses to import fresh agricultural produce as much as they are presently being permitted to do so in the face of year round local availability. Concurrently, it will be easier to segregate, monitor and support motivated/serious farmers (but without prejudice from farmers who are not).

However, the government should not compromise competition between businesses with authority protection (abuse of governing power). In fact, as Seychelles has ratified many bilateral free trade agreements with other countries, government might in some way be contradicting its engagement and objective towards a free market economy if policies are not drafted properly. Keeping in mind the benefits associated with the concept of “*survival of the fittest*”, it is to be expected that over-protection of one side of the agricultural system will retard, if not impede completely, the drive to innovate operational and marketing techniques/strategies.

Government should not obscure the consequences that may result if Seychelles joins the WTO with regards to the three main policy pillars (namely the green, blue and brown box policies).

**2.7 Conclusions**

Conclusively, as producers know what, how and when to produce, better management of food at national level could be attained. On the other hand, one should not confuse these ideologies with National Food Security. This is principally because Seychelles has not, is not and will never be able to sustain its total local need for food on its own. The principal focus is to improve net flow of information, inputs and outputs between corresponding participants in the national food supply chain.

**2.8 Recommendations**

The following Agricultural Marketing Policy Statements and Agricultural Marketing Strategies are being proposed as central focal points to be set-up during the next five years.

**2.9 Agricultural marketing policy statements**

1. All agricultural stakeholders shall be made aware of the common agricultural vision set by both the Government and all stakeholders involved in the Agricultural Industry;
2. The ministry with portfolio responsibility for agriculture shall encourage and facilitate the development and growth of business relationships between existing and intended agricultural investors and other interested private sectors interests (such as tourism) with the aim of better management and development/innovation of agricultural resources, commodities and technologies;
3. The ministry with portfolio responsibility for agriculture shall initiate and coordinate detailed analytical (both quantitative and qualitative) research on each sector (namely input suppliers, producers/ agro-processors, retailers/wholesalers/exporters/importers and ultimate consumers) that are affected or affect the agricultural supply/distribution chain;
4. The ministry with portfolio responsibility for agriculture shall formulate mechanism to diversify local agricultural markets and/or innovate existing ones to optimise competition between local and imported agricultural goods;

1. The ministry with portfolio responsibility for agriculture in collaboration with private sector interests shall seek from international agricultural bodies (such as FAO, ADB, SADC and Universities) to sponsor or to provide technical advice with regards to points 2, 3 and 4 above;
2. The ministry with portfolio responsibility for agriculture shall review its agricultural human resource policies to reflect actual and future trends.

**2.10 Agricultural marketing strategies**

1. The ministry with portfolio responsibility for agriculture shall invite all agricultural stakeholders to draw a common vision for the agricultural industry within the next five years;
2. The ministry with portfolio responsibility for agriculture shall facilitate and empower private agricultural groups and/or businesses to organise routine seminars, conferences, debates at regional and national level (at convenient venues, on television, radio and newspapers) to make other stakeholders and the general public aware of the actual status and proposed development plan of the agricultural industry;
3. The ministry with portfolio responsibility for agriculture shall continue to collect and process field statistics through site visits, public questionnaires, focus groups, consultations/debates/seminars with international experts and other appropriate means of marketing research to better plan and implement the best course of action; where and as necessary;
4. The ministry with portfolio responsibility for agriculture shall tender opportunities to private sector interests to sell agricultural produce in modern/innovated manner (such as local pre-packed fresh/frozen vegetables/fruits and meat products) along with the setting up a Centralised Market Depot;
5. The ministry with portfolio responsibility for agriculture in collaboration with agricultural entrepreneurs shall formulate and implement quality standards (alike the “Food Quality Assurance” – FQA) to guarantee safe and fair trading between sellers and buyers;
6. The ministry with portfolio responsibility for agriculture shall consult with interested partners (tourism investors/stakeholders and Department of Environment) to formulate policies at encouraging the introduction and development of agro-tourism and agro-forestry respectively.
7. The ministry with portfolio responsibility for agriculture and relevant government departments and ministries shall revise the SAHTC’s curriculum to innovate agricultural education programme and to involve SAHTC students in activities organised by the ministry with portfolio responsibility for agriculture (e.g. enforcing agricultural-business and agricultural - mechanic as compulsory courses and to participate in data collection during agricultural census).

**3.0 HUMAN RESOURCE DEVELOPMENT**

**3.1 Preamble**

Human beings are a very critical resource and although a very difficult asset to handle still remain the greatest asset of a nation and consequently of any organization or enterprise.

Human Resource Development is closely linked with population size, population growth as well as the education policy and education system.

Countries that cannot manage to develop their human resources in line with population growth and subsequent increased production output eventually face a situation where the population becomes a burden.

A country’s state of development is reflected in its level of Human Resource Development. It is a fact that the developed countries of Northern Europe have a highly skilled and professional population (more than 80%) whereas most developing countries possess a professional and skilled population of less than 20%. As a result, less developed countries are forced to depend upon the professional and skilled Human Resource as well as technology of the developed world in order to exploit their vast reserves of natural resources.

Seychelles is a nation with a small population base. The unemployment rate stands at approximately 5%. The employed population is distributed roughly as follows:

* public and parastatal - approximately 60%
* Private – 40%

The population growth rate is approximately 1.2% with a decreasing trend over the past 2 decades.

The agricultural sector is characterized by:

* A large proportion of unskilled and casual labour;
* A few young entrepreneurs and a large proportion of *older* farmers with low entrepreneurial skills;
* A relatively low level of facilitation and service – both physical and human especially at the more technological/ professional level;
* Production constraints beyond the control of the sector.

What strategy should the Agricultural Sector adopt?

What aspect(s) of Human Resource Development should the Agricultural Sector look at?

Some of the major considerations would include:

* The available labour force;
* The distribution of employment and the relevant stakeholders;
* The Education policy/ system.

**3.2 Labour force**

There is need for a study to determine the availability of labour at all levels. The Seychelles’ Agricultural and Horticultural Training Centre (SAHTC) turns out an annual batch of graduates who are trained in production with a high degree of hands-on experiences to meet the national demand for farm hands. The Seychelles’ Government offers scholarships annually for graduate degree programmes in many fields of study.

**3.3 Distribution of employment and relevant stakeholders**

The following sub-sectors must be considered as potential employment opportunities and each with specific criteria:

* The farm production level;
* The farm management level (public as well as private);
* Technicians (for research, extension or information technology and communication);
* Managers/ supervisors of programmes and projects;
* Professionals (at least tertiary level of education);
* Specialists including lawyers, legal specialists;
* Policy makers;
* Decision makers;
* Special skills requirements such as agro-processing, agri-economics, agri-business, agri-engineering, ornamental horticulture, (forestry?);
* As agricultural trainers and educators.

It is worth noting that the private sector being the productive arm of the agricultural sector merits a larger percentage of the workforce. In the case of casual and unskilled labour this is so, however skilled workers are to a large extent employed by Government Agencies.

Agriculture is seen to overlap with many other sectors. Stakeholders may include:

3.3.1Education

* The Seychelles’ Agricultural and Horticultural Training Centre;
* The National Institute Education.

3.3.2 Community Development

* Home Beautification;
* Home gardening.

3.3.3 Tourism

Landscaping of:

* Hotel grounds;
* Golf courses;
* Development of native trails (planting of endemic, neglected or interesting crop species).

3.3.4 Foreign Affairs

* International Conventions and Treaties (legal specialization);
* Submission of projects for international funding (agro-economists).

3.3.5 Seychelles Marketing Board

* Tea production
* Orchid production
* Hydroponics

3.3.6 Islands Development Company

3.3.7 SEnPA

* Agro processing

3.3.8 Farmers’ Associations

3.3.9 Registered Farmers

3.3.10 Home Growers/Non-registered Growers

**3.4 The education policy/ education system**

Education policies are designed to meet skills shortages. Human Resource Development Plan needs to develop a level of competence that could allow for further development at the professional level. This could be facilitated by having an affiliation with a foreign university or institute.

Any Human Resources Development must allow for a complete system of education to include:

* Education: The continuous and never ending process of *learning for life*

including life skills and moral values;

* Training: Aims to achieve effective performance in an activity or range of

activities, that is, to develop the skills required by the job;

* Development: These programmes aim to develop a person’s ability through *learning by experience*. These programmes have an element of *planned study* and *planned experience* and usually supported by coaching and counselling.

**3.5 Manpower planning**

In forecasting requirements for the Agricultural Sector, the Agricultural Development Strategy proposes that by the year 2011, Seychelles aims to be 100% self sufficient in table eggs, in pork and in broiler poultry meat and 70% in fruits and vegetables. For this, the sector would require an additional staff of:

* MSC – 6 persons
* BSC – 16 persons
* HND – 10 persons
* DVM – 1 person

The Agricultural Development Strategy 2007-2011differs slightly in the overall production and sales forecast and would thus influence the Human Resources requirements. The levels of technology being proposed also differs from previous plans and will therefore affect the type of training and level of training required to meet proposed production levels.

Table 3.1: Results of a Preliminary Human Resource Needs Assessment of Natural Resources Department.

**Division:** Animal Health Development

**Section Name:** Veterinary Services

**Present Director:** Jimmy Melanie

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Unit Name** | **Head of Unit** | **No. of Technical staff** | **New staff required** | **Training requirements for existing staff** |
| **Small Animal Clinic** | Dr.Ramanantoanina – Vet. Officer (VO) | 1. Vet. Nurse (VN)  1. Vet.Tech. (VT)  1. Vet. Officer  (VO) | ***1. Vet Nurse (VN)*** | Certificate in Vet. Nurse |
| **Field Unit** | Dr. P. Boudane – Specialist Vet. Officer (SVO) | 1. Anim Husb.  Officer (AHO)  1. Field Assist.  (FA) | 1.Epidemiologist  1 Vet. Techn. (VT)  ***1. Vet. Officer (VO)***  ***1. lab. Techn. (LT)*** | Upgrading VT  Upgrading FA to VT- HND in Anim  Science  New graduate |
| **Stray Animal Control Unit** | Dr. J. Malulu - Vet. Public Health Officer (VPHO) | 1. Field Officer  1. Field Assist. | ***1.Anim. Welfare***  ***Officer (AWO)***  ***1. Field Assist (FA)*** | Upgrading of FA to AWO |
| **Fish Inspection & Quality Control Unit** | Christopher Hoareau – Chief Fish Inspector (CFI) | 1. Principal Fish  Inspector (PFI)  (vacant)  4.Fish Inspectors  (FI)  1. Lab Techn. | ***2. Fish Inspectors*** | Upgrade Fish Inspectors in Food tech.  Food Science & QMS |
| **Small Animal Clinic** | Dr.Ramanantoanina – Vet. Officer (VO) | 1. Vet. Nurse (VN)  1. Vet.Tech. (VT)  1. Vet. Officer  (VO) | ***1. Vet Nurse (VN)*** | Certificate in Vet. Nurse |
| **Field Unit** | Dr. P. Boudane – Specialist Vet. Officer (SVO) | 1. Anim Husb.  Officer (AHO)  1. Field Assist.  (FA) | 1.Epidemiologist  1 Vet. Techn. (VT)  ***1. Vet. Officer (VO)***  ***1. lab. Techn. (LT)*** | Upgrading VT  Upgrading FA to VT- HND in Anim  Science  New graduate |

**Division:** Animal Health Development

**Section Name:** Livestock

**Present Director:** Vacant

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Unit Name** | **Head of Unit** | **No. of Technical staff** | **New staff required** | **Training requirements for existing staff** |
| **Pig and Cattle Unit (Pig Genetic Center and Cattle multiplication Center** | Vacant | 1 | *HND or BSC in animal production (1)* | HND or BSC in animal production |
| **Poultry Unit** | Sandra Moumou | 1 | *BSC Animal Production (1)* | OND Animal Production |
| **Monitoring Unit** | Lewis Molta | 1 | *Certificate (2)* | BSC graduate with knowledge in environment pollution, legislation, construction and design of Livestock infrastructure |

**Division:** Crop Development and Promotion

**Section Name:** Extension Services (Praslin)

**Present Director:** Vacant

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Unit Name** | **Head of Unit** | **No. of Technical staff** | **New staff required** | **Training requirements for existing staff** |
| **Extension (Crops)** | Supervisor  Margretha Rosalie (Extension Officer)  Extension officer  FTC qualified | *1*  *1* | *1*  *1*  *1* |  |
| **Irrigation** |  | 5 Labourers/ workers | *1 supervisor* |  |
| **Requisite Store** | Julien Louise (Assistnat) |  | *1 light duty*  *1 senior store clerk* |  |
| **Extension Livestock** |  | 1 officer on field 3 days per week |  |  |
| **Vet Clinic** |  | 1 Vet officer 2 days per week  1 Assistant |  |  |

**Division:** Planning and Land Management

**Section:** Lands Management

**Head of Section/ Director: Linetta Joubert**

|  |  |  |  |
| --- | --- | --- | --- |
| **Section name** | **No. of Staff** | **New staff required** | **Training for existing staff** |
| Lands Physical Unit | 1  1 | 0  1 | * Upgrade from Diploma to BSc either in the field of Land use planning and or land use management   - Recruitment of Surveyor (university graduate) |
| Lands Administrative unit | 1 | 1 | - Recruitment of a Data clerk entry for data keeping |
| Data Management Unit | 0  0 | 1  2 | Data Manager  Data entry clerk |

Note, there is a need to have a Legal Officer (University graduate)

Note: To be shared with Agricultural Planning

**Division:** Crop Development and Promotion

**Section Name:** Vegetable Evaluation Research

**Present Director:** Keven Nancy

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Unit Name** | **Head of Unit** | **No. of Technical staff** | **New staff required** | **Training requirements for existing staff** |
| **Irrigation / Drainage** | John Rose (Mahe)  Ted Lesperance (Praslin) |  | *3 workers(Mahe)* | 1 FTC graduate – upgrading |
| **Controlled Environment and Fertigation** | Could be transferred to Extension Section |  |  |  |
| **Vegetable Evaluation and Research Programmes** | Nil |  |  | 1 MSC graduate |
| **Soil Fertility** | Holi |  | BSC & OND/ HND |  |
| **Irrigation Crop Water** | Yuna Madeleine |  | BSC & 3 OND/ HND Irrigation/ Drainage 1 Maintenance person |  |
| **Screening of Varieties** | Sandra Sinon |  | BSC & 3 OND/ HND |  |
| **Pest & Disease Pesticide testing** | Andre Volcy |  | BSC & 3 OND/ HND |  |
| **Marketing & Economics** | Holi |  | BSC 7 3 OND/ HND |  |
| **General Maintenance** | Serge Larue |  |  | 12 Casual Labour |

**Division:** Crop Development and Promotion

**Section Name:** Extension Services (Mahe)

**Present Director:** Gilbert Port-Louis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Unit Name** | **Head of Unit** | **No. of Technical staff** | **New staff required** | **Training requirements for existing staff** |
| **Field Unit** | Terry  Georgie  Gilbert |  | *BSC graduate*  *2 HND* | Diploma  Diploma  Diploma Management |
| **Stores** | Daniel  Jemma/ Sherla |  |  | Dilploma Management Training in database management  For computerization the whole training package |
| **CIDU** | BSC (Radio Media)  Manager  Maryse  Emie |  | BSC (IT) | Diploma Management Refresher/ desktop publishing  Refresher doc. Library studies |

**Division:** Crop Development and Promotion

**Section:** Plant Genetic Resources Development

**Head of Section/ Director:** Vacant

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Name** | **No. of Staff** | **New staff required** | **Training for existing staff** |
| **Soil Diagnostic Laboratory** | 1 | * One technician * One general helper | * Upgrade from HND to Bsc in Soil Sicence |
| **Plant Genetic Resources Unit** | 1 | * One Bsc Graduate in Genetic Resources * Two trained PGR technicians * Data clerk for PGR inventory programme | * Upgrade from Advance Certificate to HND in Plant Genetic Resources |
| **Nursery** | 1 Supervisor +  10 staff | Nil | Technicians need costumer service + management skills |
| **Orchard Maintenance** | 1 | Agronomist  2 Technicians |  |
| **Root Crop Research** | 1 Supervisor | 1 Agronomist  2 Technicians |  |

**3.6 Human resources**

There are limited personnel with tertiary level of training in agricultural science, land management and related fields. At present the staff of the Land Management Section comprises of 4 individuals. One of the staff members is a Diploma holder in the field of Construction, 2 staff members are holders of O’ level in General Agriculture and the other staff member is a secretary.

**3.7 Training needs**

* The staff of the Land Management Section needs comprehensive training on the principles of Land Cover Classification System (LCCS) in order to complete a national agricultural land layer and a land cover;
* Short term and medium term (local and/or overseas) training of technical staff, are necessary in the field of land planning and land management;
* In depth knowledge in the use of GIS, GeoVIS application (Short to medium term training);
* 2 university graduates in Land Use Planning and/or Land Use Management/ surveying;
* Legal specialist (university degree).

**3.8 Planning**

* Project Unit – Julien and Rudy
* Statistics Unit – Terry, Velma and Sandra
* Economist – Wallace

**3.9 Land management section**

* Admin Unit – Data Management Unit - Data entry clerk
* Field Unit

**3.10 TORs for human resource development**

* Training needs for the sector –academic and technical levels. To define strategies and to promote the needs for high-level training;
* A training unit to be considered within the institutional review in order to identify all requirements and promote these requirements.

**4.0 AGICULTURAL INPUTS AND SUPPLIES**

#### ****4.1 Introduction****

The Agricultural Extension Services Section (AESS) of the Department of Natural Resources (DNR) of the Ministry of Environment and Natural Resources (MENR) provides advisory services, training and farming inputs to approximately 600 registered farmers, as well as other backyard gardeners/growers. The MENR is the principal government institution to facilitate the agricultural sector**.**

The Stores Unit is one of the three units of the AESS. It is the principal agricultural input supplier in Seychelles and has a long history of service to the Seychelles’ agricultural sector. With the continued support of the Seychelles Government, the unit tries to meet the challenges ahead.

**4.2 Actual situation**

4.2.1 The Stores Unit

The stores unit is currently providing imported inputs supplies to all registered farmers.

There is one main store, at Grand Anse, Mahe, where items are bulked before controlled distribution to the 5 requisite stores, namely at Anse Boileau, Grand Anse, Val D’Endore, Union Vale and Amitie Praslin, where farmers can buy their requiremnts at a reasonable price.

The Grand Anse requisite store also houses the mechanization store, where farmers can buy irrigation equipment, small machinery and spare parts.

The requisite stores offer agricultural inputs such as pesticides, fertilizers, seeds, shade cloth, ultra violet resistant plastic, nursery equipment and tools, amongst others.

These inputs are imported by DNR and stocked at the main store.

4.2.2 Infrastructure

Three of the Requisite Stores, at Grand Anse Mahe, Val D’Endore and at Anse Boileau, plus the Main Stores’ offices are quite old and run down and need repairs/complete renovation.

4.2.3 Workforce

The main store employs 11 staff members, which includes the store manager, 2 stores supervisors, 2 stores clerks, 2 handymen and 1 driver.

Each requisite store is manned by a store clerk, except at the Union Vale store, where there are 2 clerks. Three requisite stores have a handyman each. Thus the store unit employs a total of 21 staff members.

All store staff members have been trained in proper use of personal protective equipment and proper handling of pesticides, but need further training so as to offer a better service to the customers such as in customer care and storekeeping.

4.2.4 Procurement of Inputs

The list of items needed are drawn up by the store’s manager and then taken up to the Extension Heads of Unit Meeting to be discussed with the Director and the Head of Agricultural Field Unit, so as to determine the exact needs of the farmers.

The list is then later processed to the Principal Secretary and the Director General, Crop Development and Promotion Division for approval. The purchasing officer then takes up after that for the sourcing and necessary quotes, before forwarding to Ministry of Finance.

When new technologies are to be introduced, these are screened and tested by the Vegetable Evaluation and Research Section at Anse Boileau, and the best varieties proposed to farmers.

4.2.5 Distribution of Inputs

The store keepers, in collaboration with the Agricultural Extension Officer of the respective region, try to ensure that inputs are well distributed, especially amongst the active farmers. Certain inputs are also sold to backyard growers, such as snail pellets and rat bait.

4.2.6 Funding

4.2.6.1 GTZ Revolving Fund

In September 1988, further to the signing of a cooperation agreement between the Republic of Seychelles and the Federal Republic of Germany, within the context of a project entitled “Supply of Agricultural Equipment, the Deutsche Gesellschaft fur Technische Zuzamenarbeit (GTZ) (German Technical Cooperation Programme), sent agricultural machines and equipment to Seychelles. These were sold to farmers and the funds formed the basis of the current GTZ Revolving Fund, which is used for the purchase of other inputs, such as agricultural equipment, pesticides, fertilizers, etc, which are important for the development of agriculture in the Seychelles.

The GTZ fund is not adequate and does not provide the flexibility to purchase all the agricultural inputs required.

4.2.6.2 Requisite Store’s Revolving Fund

Government first authorized the creation of a requisite store’s revolving fund to finance the purchase/importation of agricultural inputs and supplies in 1995.

As indicated in Table 1 below, from years 2000 to 2005, an average of SR1, 660,243.00 was spent per year, to procure agricultural inputs.

Table 4.1: Estimated amount (SR) spent on the procurement of agricultural inputs between the year 2000 and 2005

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** | *Average/year* |
| **Seeds** | 80036.08 | 196541 | 156268.9 | 51788.41 | 125969 | 459826.5 | *SR178405.00* |
| **Fertilizers** | 212737 | 247158 | 197640 | 10786.75 | 861421.9 | 332414 | *SR310360.00* |
| **Pesticides** | 295778 | 261599 | 316580 | 625634.13 | 1471884 | 721617.3 | *SR615515.00* |
| **Snail Pellet** | 46485 | 56020 | 57698.5 | 132431.12 | 75513 | 140646.6 | *SR84799.00* |
| **Rat Block** | 50808.55 | 124157 | 0 | 61999.74 | 0 | 234707 | *SR78612.00* |
| **UV Plastic** | 356808.67 | 0 | 139860 | 0 | 820858.8 | 0 | *SR219588.00* |
| **Shade cloth** | 0 | 39000 | 0 | 109073.61 | 0 | 0 | *SR24679.00* |
| **Nursery Inputs** | 60286 | 63982 | 0 | 14978.77 | 0 | 171509.4 | *SR51793.00* |
| **Spare part** | 156611.01 | 0 | 18296 | 141516.51 | 35625 | 0 | *SR58675.00* |
| **Water pump** | 75241 | 0 | 37660 | 56716.1 | 0 | 0 | *SR28270.00* |
| **Pig drinker** | 0 | 0 | 26000 | 0 | 0 | 0 | *SR4333.00* |
| **Poultry feeder** | 0 | 0 | 0 | 31286.9 | 0 | 0 | *SR5214.00* |
|  |  |  |  |  |  |  |  |
| **TOTAL** | **1334791.31** | **988457** | **950003.4** | **1236212** | **3391272** | **2060721** | ***SR1660243.00*** |

*Source: Requisite Store GRNs (2000-2005)*

Figures from Table 4.1, show that an average of 146 kg of seeds per year has been procured between 2000 to 2005, whereas the procurements of pesticides averaged 2175 kg and 3137 litres respectively over the said period.

Table 4.2: Quantities of agricultural inputs procured between the year 2000 and 2005

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **AGRIC. INPUTS** |  | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** | *Avearge/year* |
| **Seeds (kg)** |  | 118.84 | 156 | 58.13 | 70 | 95 | 375.7 | *146 kg* |
| **Pesticides (kg)** |  | 870 | 170.5 | 798 | 148 | 6274 | 4792 | *2175 kg* |
| **Pesticides (litres)** | | 737 | 1176.25 | 870.25 | 6337 | 7100 | 2600 | *3137 litres* |
| **Fertilizers (Kg)** |  | 104075 | 80150 | 75000 | 250 | 199000 | 72000 | *88413 kg* |
| **Snail Pellet (kg)** |  | 5000 | 5000 | 4400 | 7100 | 5000 | 9000 | *5917 kg* |
| **Rat Block (kg)** |  | 1000 | 1773 | 0 | 1000 | 0 | 2500 | *1046 kg* |
| **UV Plastic (metres)** | | 11200 | 0 | 2590 | 0 | 16575 | 0 | *5061 metres* |
| **Shadecloth (metres)** | | 0 | 3000 | 0 | 4600 | 0 | 0 | *1267 metres* |
| **Nursery Inputs (pcs)** | | 100000 | 63720 | 0 | 25000 | 0 | 253510 | *73705 pcs* |
| **Spare parts (pcs)** | | 112860 | 0 | 1745 | 244482 | 3618 | 0 | *60451 pcs* |
| **Water pumps (pcs)** | | 125 | 0 | 40 | 75 | 0 | 0 | *40* |
| **Pig drinkers (pcs)** | | 0 | 0 | 400 | 0 | 0 | 0 | *67* |
| **Poultry feeders** | | 0 | 0 | 0 | 500 | 0 | 0 | *83* |

*Source: Requisite Store GRNs (2000-2005)*

Table 4.3 below shows the amount spent in the procurement of vet drugs, from the year 2000 to 2005. It is estimated that an average of SR300, 000.00 was spent annually on vet drugs.

Table 4.3: Veterinary drugs imported during the period 2000 and 2005

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Supplier** | **Amount** | **Total Amount/year** |
| 2000 | Genusxpress  IPS | £ 11 042.65  SR 1 987.00 | **£11 042.65**  **SR 1 987.00** |
| 2001 | Genusxpress  IPS | £ 8 845.26  SR 5 637.38 | **£8 845.26**  **SR 5 637.38** |
| 2002 | Abbeyvet  IPS  Ministry of Health  Genusxpress | £ 36 529.81  SR 30 896.34  SR 528.40  £ 2 186.33 | **£38 716.14**  **SR31 424.74** |
| 2003 | VDM  SMB  IPS  Ministry of Health  Abbeyvet | € 19 898.22  SR 7 592.87  SR 22 376.18  SR 3 100.00  £ 472.35 | **€ 19 898.22**  **£ 472.35**  **SR33 069.05** |
| 2004 | Vet on-line  Ministry of Health  IPS  SMB  Abbeyvet  VMD | ZAR 1 600.00  SR 627.68  SR 971.67  SR242 225.00  £ 18 646.50  € 19 898.24 | **ZAR 1 600.00**  **£ 18 646.50**  **€ 19 898.24**  **SR243 824.35** |
| 2005 | Abbeyvet  VMD | £ 8 230.01  € 2 158.50 | **€ 8 230.01**  **£ 2 158.50** |

*Source: Veterinary Services Section*

**4.3 Major issues**

4.3.1 Input stocks

* Producers are demanding more tolerant seed varieties;
* Shortage of agricultural inputs on requisite stores;
* Certain basic agricultural inputs are not sold on requisite stores, examples are personal protective equipment and gardening tools.

4.3.2 Capital

* Access to foreign exchange (hard currency) for importation of agricultural inputs is difficult.

4.3.3 Manure

* Price of manure is going up gradually.

4.3.4 Timber

* Shortage of treated timber for agricultural infrastructure;
* High cost of timber.

4.3.5 Distribution of inputs

* Transportation facilities are old and cost of maintenance is also high.
* Requisite Store’s infrastructures are old and rundown.
* Requirements of backyard growers are not satisfied.

4.3.6 Communication

* Some agricultural inputs are imported without proper instructions manuals;
* There exists sometimes communication breakdown between producers and the sections of the ministry with portfolio responsibility for agriculture.

4.3.7 Human resources

* Store personnel are not knowledgeable on certain agricultural issues.

4.3.8 Livestock section

* Requirements for livestock inputs are too low to satisfy new national target.

**4.4 Recommendations**

|  |  |
| --- | --- |
| Government should make available an annual estimated total of SR 6 million in foreign exchange for the importation of agricultural inputs in order to ensure optimal supply. | |
| Table 4.1 indicates that an average of **SR1.6 million Seychelles Rupees (**approximately **240,000.00 Euros)** was spent annually in procurement of agricultural inputs. |
| The reality of it is that this amount does not meet all the requirements as to ensure optimal supply of the inputs. |
|  |
| 4.4.1 Importation of adapted/resistant and tolerant varieties. |
| DNR must ensure that inputs procured are of the required standards to produce good quality harvests under local conditions and that they are from reputable firms. |
|  |
| 4.4.2 Proper packaging and labelling of inputs. |
|  |
| Care should be taken that imported inputs, e.g. seeds and chemicals, are packaged in accordance with farmers needs. |
| Suppliers should be informed of exact needs for certain inputs, especially pesticides, since repackaging should be avoided at all costs as it involves certain risks. |
| Inputs must be properly labelled, and the supplier must also include proper instruction manual, expressed in any of the three official languages understandable by stores personnel. |
|  |
| 4.4.3 Testing/screening of imported seeds by relevant bodies before releasing to producers |
| Participation of farmers in these processes should be encouraged, so samples could be tested on farms to ensure that the technology is effectively demonstrated and better accepted by customers. |
| At the same time, farmers should be persuaded to make use of the Research Station to screen any varieties they want to introduce. |
| The relevant body/bodies will submit summaries of performance of each product after testing/screening. |
|  |
| Procurement of agricultural input must be more organized. |
| Procedures must be streamlined to ensure timely delivery of quality goods and services. |
| The final list of items to be procured must be approved by Inputs Committee. |
| Records show an estimated average of 9 batches of imports per year. A schedule of importation could be planned so as to ensure timely approval of inputs lists. |
|  |
| Appropriate transportation facilities must be used to transport agricultural inputs to distribution points. |
| New vehicles are needed in fleet. |
| A forklift will facilitate lifting of bags of fertilizer and other bulky inputs. |
| Relevant legislations/regulations concerning pesticides importation at ports of entry must be reinforced. |
| Importation of POPS must be avoided. |

The ministry with portfolio responsibility for agriculture should remain as the facilitator to the agricultural sector and make available a service alongside the private sector with regards to the supply of agricultural inputs**.**

The private sector interests will act parallel to ministry with agriculture portfolio, in the importation, stocking and selling of agricultural inputs.

The private sector interests venturing into such business should benefit under the Agricultural and Fisheries Incentives Act (2005).

Government through the ministry with portfolio responsibility for agriculture must put in place mechanisms to ensure sustainability in supply of agricultural inputs.

Government through the ministry with portfolio responsibility for agriculture should ensure that imported agricultural inputs are of high quality and standards for the benefits of the producers, and that they are in accordance with local laws and regulations.

The requisite store sales persons should be trained in pesticides utilization and in customer care.

There should be the creation of an Inputs Committee made up of personnel of the ministry with portfolio responsibility for agriculture along with producer representatives)

**4.5 Proposed strategies**

4.5.1 Review means of facilitating the purchase/imports of agricultural supplies and their distribution**.**

4.5.2 Encourage the private sector to be directly involved in the imports and marketing of agricultural supplies

|  |
| --- |
| There is a need to encourage private investments in the supply of agricultural inputs. The private sector can cater for needs of backyard growers, especially for certain inputs, such as snail pellets and rat block. |
| The possibility of setting up incentives to encourage private suppliers to venture into inputs supply would include easier access to foreign exchange for importation of agricultural inputs. |
| Encourage and facilitate the grouping of farmers to form a marketing cooperative where they can sell their products as well as import agricultural inputs for their members and also supply to non-members when possible. |

4.5.3 Improvement, upgrading and modernization of the government supplies depot.

This will entail the following:

|  |
| --- |
| The computerization of the centres/depots; |
| Creation of a production database of producers so that there is follow-up on sales and supplies; |
|  |
| Complete renovation, upgrading and proper refurbishment of agricultural stores’ infrastructure; |
| Provision of First Aid Box and fire fighting equipment must also be included in the refurbishment. |
|  |
| Investment in local training for all stores’ personnel are solicited in the following areas: |
| Pesticides handling competency; |
| Fire fighting; |
| First Aid; |
| Stores keeping; |
| Customer care. |
|  |
| Insurance coverage for the stocks |

Table 4.4: Annual investment plan

|  |  |  |
| --- | --- | --- |
| **Input** | **Amount in SR** | **Comments** |
| Seeds | 700,000.00 |  |
| Pesticides | 1.6 million | With increase in procurement of herbicides, snail pellet and rat block |
| Fertilizer | 800,000.00 |  |
| Irrigation Equipment & Accessories | 500,000.00 |  |
| Nursery equipment/tools | 200,000.00 | For Grand Anse nursery |
| Livestock equipment | 100,000.00 |  |
| Veterinary drugs | 300,000.00 |  |
| **Total** | **4.2 million** |  |

Figure 4.1: Costs (SR) of selected inputs for the years 2000-2005

0

200000

400000

600000

800000

1000000

1200000

1400000

1600000

2000

2001

2002

2003

2004

2005

**Year**

**Cost in SR**

Seeds

Fertilizers

Pesticides

Snail Pellet

Rat Block

UV Plastic

Figure 4.2: Costs (SR) of selected inputs for the years 2000-2005

0

20000

40000

60000

80000

100000

120000

140000

160000

180000

200000

1

**Year**

**Cost in SR**

Shadecloth

Nursery Inputs

Spare part

Water pump

Pig drinker

Poultry feeder

Figure 4.3: Amount (kg) of seeds and pesticides purchased in the years 2000-2005

0

1000

2000

3000

4000

5000

6000

7000

8000

2000

2001

2002

2003

2004

2005

**Year**

**Amount in kg**

Seeds (Kg)

Pesticides (kg)

Pesticides (litres)

Figure 4.4: Amount (m) of uv plastic and shade cloth procured in the years 2000-2005

0

2000

4000

6000

8000

10000

12000

14000

16000

18000

2000

2001

2002

2003

2004

2005

**Year**

**Amount in metres**

UV Plastic (metres)

Shadecloth (metres)

Figure 4.5: Number (units) of water pumps, drinkers and feeders procured in the years 2000-2005

0

100

200

300

400

500

600

2000

2001

2002

2003

2004

2005

**Year**

**Pieces**

Water pumps (pcs)

Pig drinkers (pcs)

Poultry feeders (pcs)

Figure 4.6: Number (units) of nursery inputs and spare parts procured in the years 2000-2005

0

50000

100000

150000

200000

250000

300000

2000

2001

2002

2003

2004

2005

**Year**

**Pieces**

Nursery Inputs (pcs)

Spare parts (pcs)

Figure 4.7: Amount (kg) of fertilizer, snail pellet and rat block procured in the years 2000-2005

0

50000

100000

150000

200000

250000

2000

2001

2002

2003

2004

2005

**Year**

**Amount in kg**

Fertilizers (Kg)

Snail Pellet (kg)

Rat Block (kg)

Table 4.5: Present list of inputs supply firms

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Supplier Name** | **Address** | **Country** | **Telephone** | **Fax** | **Email** | **Web page** | **Inputs supplied** |
| Asian Vegetable Research Development Centre | P.O.Box 42, Shanhua, Tainan | Taiwan 741 | 886-6-583-7801 Ext. 370 (0)’814 (11) | 886-6-583-0009 | hansp@netra.avrdc.org.tw |  | Tomato seeds |
| Betop Green Agri-Tech | Box A-08 Yung Fatha Yuan, Jian She Bei Lu,Hua Du City, Guang Dong Province, | China | 86-20-8696-3309 | 86-20-8696-3310 |  |  | Seed, |
| Daehnfeldt A/S | Farbororgreij PB185 | Denmark | +45 6317 5506 | +45 6317 5505 |  |  | Seed, |
| Dedine (Imports/ Exports Agent) | 801 The Gabbles, 175 Victoria Embankments, Durban | South Africa | (27) 313016760  Mobile: (27) 7271974105 | (27) 313016760 | dedineex@  yahoo.com |  | Pesticide, fertilizer, rat block, snail pellet, seed, pig nipple drinker |
| Elysee Irrigation LtD | P.O Box 27014, Nicosia CY1641 | Cyprus | +357-2-763381 | +357-2-760934 | elysee@  elysee. com.cy | http//www.  elysee.com.cy | Irrigation equipment & spares |
| Emergent Genetics Vegatables A/S | Faaborgreij 248B, DK-5250, Odense SV | Denmark | +456317 5506 | +45 6317 5505 |  |  | Seed, |
| Evergrow Seed Co. (LtD) | 21, Hsim Chung Road, Tainan, | Taiwan 70252 | 886-6-2630463  886-6-2638587 | 886-6-2642088 | int@evergrowseed.com | http//www.evergrowseed.com | Seed, |
| FARM AG International | Box 1291, Verulam | South Africa |  | 10321 945 3305 |  |  | Pesticide, |
| GRUBE KG Forstgeratestelle | D-29646 Hutzel | Germany | 051941 – 900-0 | 051941 – 900-270 | grubeg@ grube.de |  | Fertilizers, spareparts, water pump, nursery equipment, UV Plastic |
| Known-You- Seed Co Ltd | 26 Chung Cheng 2nd Road, Kaoksiung | Taiwan R.O.C | 886-7-224-1106 | 886-7-222-7299 |  |  | Seed, |
| Launch Exports | P.O. Box 76920, Marbleray 4035 | South Africa | 5770931 | 5770931 |  |  | Snail pellet, UV Plastic,, nursery equipment, rat block, |
| MCFI (Freeport) LtD | Fort George, Port-Louis | Mauritius | 242 5077178179 – (240) 9966 | (230) 2409969 |  |  | Fertilizer, |
| Strand International Trading Pty LtD | 22 Burnside Drive, Old Mill Industrial Park, Mount Edgecombe 4300  Box 1523, Durban 400 | South Africa | (031) 5023209 | (031) 5024196 |  |  | Pesticides, |
| Tokita Seed | 1069, Nakagawa, Minuma-Ku, Saitama-Shi, Saitama-Ken | Japan 337-8532 | 048-686-7235 | 048-888-1167 |  |  | Seeds Fi Hybrid cabbage Xiamen |
| Technisen | 7 Avenue DU Garigliano, 91601 Savignysurorge | Cedex France | (33) 699602421 | (33) 169968601 | technisen@ technisen. com | www. technisen. com | Lettuce Minetto |
| Taiwan Agricultural Development Co. LtD. | No. 86, SEC ITIHWA STR, TAIPEI | Taiwan | (02) 2556-4253 | (02) 2556-2357 |  |  | seed |

**5.0 AGRICULTURAL LAND DEVELOPMENT AND UTILISATION**

**5.1 Introduction**

In economic terms, land is considered as an economic factor of production. In Seychelles, land is one of the limiting factors for the development of agriculture. Following the agricultural policy reform in the early 1990s, which revised the role of the ministry responsible for agriculture from that of production to facilitator, the State farms and the cooperatives were closed down to allow more private intervention in agricultural production. Government offered old, non productive farmers the possibility to purchase the existing house plots for their private dwellings. As a result, farm land were subdivided and redistributed to potential developers. However, the various land subdivisions and the sales of the house plots brought about some other difficulties.

Deficiencies have been identified in the survey works conducted, which gave rise to shortcomings in the redistribution of plots and encroachment by other sectors. Many farmers are presently farming on State land that is not surveyed. Agricultural land from unproductive farmers is yet to be repossessed and be reallocated to other agricultural promoters. Demarcation of agricultural plots and road access in certain areas are yet to be effected by the survey section.

Agricultural land use and farming systems in Seychelles is characterised by small family farms of 0.25-0.5 acres with mixed farming.About 10% of the potential agricultural land is currently being used for agriculture. This is because of the limited fertile soils and the steep topography of the granitic islands.

Both the physical and the chemical properties of the soil are poor. The soils are nutrient poor. There is high rate of leaching especially on the coastal soils and the upland soils are rapidly degraded by erosion after land clearing. Application of fertiliser and manure is essential to sustain crop production.

The Agricultural Development Strategy (ADS) 2007-2011 has adopted a series of strategies to ensure that land designated for agricultural development is protected and is exploited to its optimal capacity. The ADS 2007-2011 states that the use of agricultural land would be optimized through various mechanisms, as it is a major scarce resource in national agricultural production. Agricultural production is yet another economic activity that utilizes limited land resources.

**5.2 Brief analysis of the major achievements as well as the major issues over the past ten years in the context of agricultural land development.**

5.2.1 Major achievements

Over the past decade or so due to under utilization of a significant percentage of the allocated agricultural plots, Government carried out a review of the agricultural land situation. The aim of the review was to see how best land designated for agricultural development could be allocated to new potential farmers so as to preserve those plots under agricultural use. In that line, the ministry with portfolio responsibility for agriculture conducted two main studies in the 1990s to implement a major Land Reform Programme. One of the studies was the *Agrarian Policies and Sustained Agricultural Productivity* in the Seychelles and the other one was *Progress on Agrarian Reform and Rural Development*.

The studies gave base to the exercise for the re-demarcation and redistribution of agricultural land. The idea of the re-organisation of the Land Settlement Schemes was to make maximum use of the non-exploited cultivable land by reallocating to potential young farmers. During the past decade this has been successfully achieved. The ministry with portfolio responsibility for agriculture is presently in the same situation as it was a decade ago with the need for more agricultural land due to increasing number of applications received yearly. Presently, some 88 applicants qualify for the allocation of agricultural land and their names appear on a waiting list.

5.2.2 Allocation of State land for agricultural purposes

Government has allocated 381 farmers with a plot of State land for agricultural development. The farm size allowed for having viable economic return is 1000 m2 or more. Subsequent to the land redistribution programme carried out in the 1990s, the average farm size has declined from more than 5 acres to between 2-5 acres.

5.2.3 Lease agreement for agricultural land

Since the 1990s, Government has adopted a new policy of lease concerning State agricultural land, with the primary intention of reserving such land solely for agricultural development. The Lease Agreement Act is a legally binding document between Government and the lessee. The purpose of the lease agreement is to enable the farmer to secure his/her investment and simultaneously enable Government to collect revenue from the renting of the land.

In 2004, the lease management of State agricultural land was transferred from the Ministry of Land Use and Habitat to the Ministry of Environment and Natural Resources. The aim was to enable the ministry with portfolio responsibility for agriculture to better manage the agricultural land lease. To date, out of the 381 farmers with allocated plots, 18 farmers hold a valid lease agreement, 90 farmers have expired leases, and 16 new leases are being processed. Some 181 farmers qualified to have a lease agreement as their agricultural plots were surveyed. Indeed, 76 farmers did not qualify to have a lease agreement on the allocated plots as the plots were not surveyed.

5.2.4 Protection of agricultural land

Following one of the Cabinet Meetings dated the 25th September 2002, No. C02/M16, point 5.1.2.7 stated that C*abinet agreed that all land designated as agricultural land should be used or reserved for that purpose and that such land already leased but not being properly used should be repossessed for allocation to serious farmers*. Concurrently, the agro-biodiversity collection of Grand Anse Mahe has been safeguarded through the same decision.

5.2.5 Creation of a new section for the management of agricultural land

In order to successfully manage the lease agreement and manage the State agricultural land, the Lands Management Section was created in 2005 with the Department of Natural Resources.

5.2.6 Establishment of the Agricultural and Fisheries (Incentives) Act, 2005

In 2005, Government established the Agricultural and Fisheries (Incentives) Act, 2005. As of 03/10/2006, 82 farmers have been benefited under this act. The aim of the act is to provide for the grant of certain incentives to persons engaged in agriculture and fisheries related industries.

5.2.7 Major achievements

According to the Plan D’Amenagement du Territoire of 1992 the demarcated land for agriculture had been reduced to around 2,060 hectares for Mahe, Praslin and La Digue. That represented only 10.3% of the total landmass of these three islands whereas over 60% or 12,000 hectares of the area constituted of protected zones. Over the past 30 years, the total land area devoted to agricultural production has diminished considerably and this is highlighted in the following reports in Table 1 below.

Table 5.1***:*** Reports showing decline in the area of agricultural land over time

|  |  |  |
| --- | --- | --- |
| **Report** | **Year of publication** | **Area in hectares** |
| Agricultural Census | 1960 | 25,335 |
| Agricultural Survey | 1978 | 10,500 |
| Seychelles Agricultural Sector Strategy | 1989 | 6,660 |

Source (Plan D’Aménagement du Territoire, 1992).

As can be seen by the table above, in 18 years the total area lost is 14,835 acres while from 1978 to 1989 that is in 11 years the total area lost is 3,840 acres (Plan D’Amenagement du Territoire, 1992).

Table 5.2: The area of agricultural land lost in various districts.

|  |  |
| --- | --- |
| **District or subdistrict** | **Area in m2** |
| Val D’Endore | 722,402 |
| Praslin (inclusive of Amitie, Cap Samy, Jalousie, La Pointe, Cote D’Or). | 720,373.1 |
| Anse Boileau (Montagne Posée & Hermitage) | 704,713.8 |
| Au Cap | 200,942 |
| Port Glaud | 199,940.5 |
| Anse Royale | 172,800 |
| Grand Anse Mahe | 149,145 |
| Barbarons | 91,780 |
| La Gogue | 71,677 |
| Mare Anglaise | 44,562 |
| Ma Constance | 28,835 |
| La Digue | ? |
| **Grand Total** | **3,107,170** |

**5.3 Policy statement on agricultural land development**

The Agricultural Development Strategy 2007-2011 spells out the need to safeguard, through legislation, all national land resources designated for agricultural undertakings, to avoid encroachment by social and economic sectors with a view to ensure the achievement of the targeted level of food security during the planned period and beyond. Government would formulate a national legislation to protect all national land resources designated for agricultural undertakings, depicted by a land use plan and incorporated in a national agricultural land bank.Simultaneously, Government along with other stakeholders would strive for optimal utilization of agricultural land resources through diverse mechanisms such as shade houses and terraces.

**5.4 Proposed agricultural land planning objectives for the next five years**

To optimise the use of agricultural land (available statistics on national agricultural production would suggest that only about 200 hectares of land are under intensive arable cropping although a total of 600 hectares may be cultivated);

To survey the 76 plots of land allocated previously to the farmers that need to be partitioned;

To lease the surveyed agricultural plot to the 200 farmers;

To identify more land to attain the objective of the Agricultural Development Strategy 2007-2011which aims to attain at least 70% of the national requirements of fruits and vegetables by the year 2011, a total of 350 hectares, i.e.150 additional hectares would have to be cultivated;

To initiate the procedure to safeguard the agricultural land through legislation;

To have a policy on the type of construction permissible on agricultural land;

To map all the agricultural lands;

To develop an agricultural land use plan.

**5.5 Strategies**

Government would identify all national land resources to be designated as agricultural land through a national exercise using a set of established criteria;

Government would incorporate the designated agricultural land resources in an agricultural land bank and identified by a land-use plan which would be regularly updated;

Government would formulate a national legislation to protect all designated agricultural land resources in collaboration with all stakeholders;

Government in collaboration with PUC, along with multilateral cooperation would provide some basic infrastructure that is road, water and electricity to all State land leased for agricultural undertakings by private sector interests;

Government would provide the specifications for the farm dwelling house on all State land leased for agricultural undertakings by private sector interests;

Government would endeavour for land use optimization by setting up a committee of relevant stakeholders that would decide on the criteria for the selection of lessee (aptitude, at least one year certificate level training in agriculture at SAHTC, farm capital investment, ability to recruit farm hands, farm development plan, use of trained manpower) as well as make recommendation based on adopted criteria to evict lessee.

**5.6 Resources requires (land, labour, capital, management skills and technology) and the current state of these resources**

5.6.1 Human resources

There are limited personnel with tertiary level of training in agricultural science, land management and related field. At present the staff of the Land Management Section comprises of 4 individuals. One staff member is a diploma holder in the field of construction, 2 staff members are holders of O’ level in General Agriculture and the other staff member is a secretary.

Table 5.3: Training needs

|  |  |  |  |
| --- | --- | --- | --- |
| **Entity** | **No. of staff** | **New staff required** | **Training for existing staff** |
| * Lands Physical Unit | 1  1 | 0  1 | * Upgrade from Diploma to BSc either in the field of land use planning and or land use management   - Recruitment of Surveyor (university graduate) |
| * Lands Administrative Unit | 1 | 1 | - Recruit a data entry clerk for data keeping |

Apart from the long term training and the need to recruit, the section needs the short to medium term training with the aim of upgrading the staff’s present knowledge in:

* + the principles of Land Cover Classification System (LCCS) in order to complete a national agricultural land layer and a land cover;
  + the field of land planning and land management (short to medium term training);
  + the use of GIS, GeoVIS application (short to medium term training).

5.6.2 Technology

The Land Management Section is equipped with 5 computers. Out of the 5 computers only 2 are capable of running most software such as GIS, AutoCAD etc. Currently, the section has no GIS license software and is using the software license from the Centre of GIS at MLUH. There is also no Local Area Network (LAN) and no server machine. Internet connections are available on only 1 computer via a 52 kbps modem. There is also no GPS or digital camera for field work and no plotter for cartographic output.

In order to achieve the targets and to fulfil the objectives of the Agricultural Development Strategy 2007-2011, it is imperative that the Lands Management Section is equipped with the necessary tools, equipment and system mentioned above that are lacking. The Lands Management Section needs to have access to updated GIS information and software such as Land Cover Classification System, GeoVis.

5.6.3 Capital

The Land Management Section needs to be given a 10%-20% increase in the present annual budget to meet all expenses and provide for an efficient and quality service to its clients. In order to deliver the services with efficiency and effectiveness, mobility through timely availability of transport is a prerequisite.

5.6.4 Land resources

Presently 3,107,170 m2 or 310 ha of land are allocated to 381 farmers for agricultural development (crop, livestock fruits, root crops and floriculture). Firstly though, there is a need to optimize the present use of agricultural land. Secondly, an addition of 150 hectares of land will be needed to meet the demand of the 5 year strategy. During a workshop session of 28th September 2006, workshop participants proposed that Government explore the agricultural potential of the outer islands as well as the newly reclaimed areas for the agricultural development for both crops and livestock farming. The participants suggested that Government liaises with the Islands Development Company (IDC) for the exploration of this opportunity. The participants were in favour for the development of livestock activity on the reclaimed land. They suggested that Government should set up a proper sewerage treatment plant to treat the effluent from the livestock rearing activity in order to minimize the environmental impact. However, it was noted that the exploratory mission should take into account the following:

* environmental impacts;
* Feasibility studies in relation to access, transportation cost and economic viability of the agricultural activity.

The workshop participants requested that a complete survey/reconnaissance of existing land being used for agricultural development is done. The survey should address the quantity of agricultural land that has been abandoned and the current availability of such resources.

The participants suggested that a map depicting all agricultural land should be produced and further proposed that the map should be ready by the end the year 2006.

The participants proposed that all farmers on allocated State agricultural plots should be monitored closely and those farmers who have abandoned the property or are not farming to the agreed minimum level should be evicted.

The participants also suggested that before allocation is made, it is imperative to know the kind and type of promoter. The participants suggested that there should be a way to deter people from illegally encroaching on State agricultural land whether for agricultural purpose or for other motives.

The workshop participants proposed that a regulation is enacted to control allocation and that it should be implemented and enforced.

In terms of acquisition of abandoned State agricultural land, the participants agreed that Government should use the eviction procedure that was used in the past.

The participants believed that agricultural land are availability, but there is a need to valorise these such as through the provision of water, electricity, partitioning of special type parcel and providing descent access.

A policy should be developed to guide the management of agricultural land. The policy should consider small, medium and big entrepreneurs.

A Committee discussed theses issues on 26th October 2006 and it was made known that a land use plan depicting agricultural zones or land designated for agricultural purposes was never gazetted. Therefore the Committee decided that:

* the first step was to prepare and develop a land use plan for agricultural land or zones inclusive of State and private lands;
* the second step was to gazette the land use plan with the appropriate legislation in order to safeguard/protect the existing and future agricultural zones of the country.

5.6.5 Revalorization of existing agricultural land

The committee agreed that before identification of additional land is done, there is a need to revalorise the existing agricultural land.

5.6.6 Request for additional land for agricultural purposes

The request for additional land for agricultural purposes should be made to Government from the ministry with portfolio responsibility for agriculture. Land could come from the State property and could include forest reserves. Once the land has been identified and set aside for agricultural development purpose, then, there would be a need to zone it on a land use plan and to legislate it. Besides, land granted should have the basic infrastructure and utilities such as access road, water, electricity etc.

5.6.7 Outer islands as a source of additional land

The Committee agreed that there is a need to assess the outer islands in terms of their potentiality, economic feasibility (labour, transport, capital injection etc...), and environmental impact in relation to agricultural development. Assessment should also include the scale and types of agricultural activities (both crops and livestock).

5.6.8 Reclaimed land

Government has no intention at this point in time to set aside the reclaimed land for the purpose of agricultural development.

**5.7 Reason for loss of agricultural land earmarked for agricultural development**

5.7.1 Sale of agricultural land as house plot

Since 1993, with the reform in the distribution of land for agricultural use within the Land Settlement Schemes, mostly 200 old farmers were entitled to purchase a house plot of 1000 m2 for a sum of SR 5000.00. Today, 214 tenants have benefited from a house plot. While in reality only 200,000 m2 or 20 ha of agricultural land should have been lost under this scheme, the actual total area lost was281,115 m2or28 ha.

5.7.2 Encroachment of agricultural land

Indeed, some 406, 423 m2 or 40 ha of land designated for agricultural development or that was being developed agriculturally were lost through Land Bank housing projects and other socio-economic development (such as tourism development, leisure and sport) in many regions of the three main granitic islands.

5.7.3 Major constraints for the allocation of agricultural land

The major constraints for the allocation of agricultural land are related to inadequate infrastructure (access road) and a lack of basic utilities (electricity and water). Potential land for agricultural development is constrained and land earmarked for agricultural development is being lost due to expansion of the residential zones. Land for crop development is faced with numerous difficulties ranging from poor soil to difficult terrain on sloppy hillsides, with poor infrastructure such as access road along with a lack of irrigation water.

5.7.4 Sub-optimisation and under utilization of existing agricultural land

There are about 50% of the farmers who have been allocated with agricultural plots and who are not making full use of the land for agricultural production. The reasons are as follows:

* Some of these farmers are ageing or nearing retirement age and hence do not have the potential to cultivate any more;
* They are unwilling or are reluctant to adopt new technologies but still would not return the land to the parent ministry for reallocation to another potential agricultural developer;
* A category of unproductive farmers who have abandoned their farms and gone into employment for various reasons; alternatively they utilize only a small portion of the allocated land.

These farmers occupy roughly some 460,000 m2 or 46 hectares of potential agricultural land.

5.7.5 Compensation and eviction

Government has no readily available schemes to compensate farmers who do not wish to renew the lease agreement on agricultural land and who have not breached the lease clauses, or even to settle with the heirs of a deceased farmer for improvement done on the agricultural plot. As a result of that, much of the eviction process which Government would have liked to carry out was not possible due to lack of funds to repay the lessee/farmer for improvements made on the plot, on the farm infrastructure and on planted long term crops.

5.7.6 Resources and infrastructure

The ministry with portfolio responsibility for agriculture is currently faced with numerous constraints both technical and financial in nature as to limit the process of land allocation.

5.7.7 Access problem

Some potential agricultural plots are vacant and cannot be allocated because there is no demarcated access road to reach the plots. This has arisen as a consequence of the process of excising the house plot from the main agricultural plot. In so doing, no provision was made to access the remaining agricultural plot. If allocation is made, the prospective developer has to access his/her agricultural plot by crossing over private property of the old occupant.

5.7.8 Missing beacons

Most of the agricultural plots surveyed in the past, have had their beacons misplaced or tampered with by their previous occupants. As a consequence of that, allocating to a potential farmer is difficult at times, as the Ministry of Land Use and Habitat is constrained by heavy workloads and is unable to quickly assist in relocating the beacons. The new prospective farmer is unclear of boundary demarcations and at times this may lead to dispute within the farming community due to encroachment on each other’s agricultural plots or even house plots.

5.7.9 Irrigation water, access road and other amenities

As new agricultural land was made available, the ministry with portfolio responsibility for agriculture found it difficult to allocate such land due to the constraints mentioned above. Absence of irrigation water and motorable access are the main problems. New agricultural plots are being opened up in the upper areas of Mahe. Consequently, low water pressure on the farm is a problem and so is the construction of a motorable access. The ministry with portfolio responsibility for agriculture does not have the necessary funds to make available the basic infrastructure before allocation can be made.

5.7.10 Sugar cane cultivation

There are many cases where prime potential agricultural land is being used for sugar cane cultivation. While sugar cane has value to livestock feeding and soil conservation through the use of mulch, should Government allow for prime land to be used for the cultivation of sugar cane at the expense of the national food security objectives and the food production targets laid out in the strategy?

During the workshop of 28th September 2006, although workshop participants saw sugar cane as having some economic benefits eg as a livestock fodder, they agreed that the cultivation of sugar cane especially on State land should not be encouraged. They acknowledged that priority should be accorded to primary crops such as fruits, vegetables, root crops, and livestock. However, participants felt that sugar cane be grown as a secondary crop in marginal areas where the primary crops cannot be grown.

During the Committee meeting held on the 26th October 2006, committee members agreed:

* that there is a need also to assess and compare the nutrition content of the elephant grass and that of sugar cane as a feed for livestock;
* that the condition for the cultivation of sugar cane will be assessed on a case by case basis.

**5.8 The stakeholders, their roles and functions**

5.8.1 Land allocation procedures and lease of agricultural plots

One of the stakeholders is the District Administrator who has 21 days to provide views vis-à-vis the allocation and lease of an agricultural plot to an applicant within his/her electoral district. This procedure is lengthy and can take about 2 months before a plot of agricultural land can be allocated subsequent to approval by MENR. Note also that responses are not given within the specified time frame and more delays are encountered.

5.8.2 Performance assessment on agricultural land

The performance assessment on agricultural land, particularly important on State leased agricultural land is done by the Agricultural Planning Section, the Agricultural Extension Services Section and the Livestock Development Section.

5.8.3 Agricultural projects considerations

Projects are assessed by the Livestock Development Section, if it is related to livestock development. The Economist and the Project Unit of the Agricultural Planning Section assess project viability and economic feasibility while the Agricultural Extension Services Section assesses the agricultural projects in relation to crop production.

5.8.4 The relationship between investment level and lease agreement (period and role)

This assessment is performed by the Livestock Development Section if the plot to be leased is for livestock development. In relation to crop and orchard activity, the Agricultural Extension Services Section decides on the lease period and advises the Land Management Section accordingly. The length of the lease agreement is related to investment level on the farm and the type of farming activities. Investors of greater than SR 200,000 are given a minimum of 10 years lease while investors with an amount lower than that are given 5 year lease which can be renewable or not depending on performance of the lessee or the decision of the lessee of whether he/she wishes to renew the lease agreement.

The Committee meeting held on 26th October 2006 voiced its concerns on the following issues and the decisions taken are listed below.

The Committee agreed that any proposal to buy the allocated or leased agricultural land should not be considered because of the shortage of agricultural land for development. State agricultural land should remain the property of the State for the sustenance and continuity of agricultural development.

The Committee agreed on long term lease but the length of lease should be tied to the level of investment and the type of activity. The Committee agreed that the relationship between the level of investment, the type of activity and the lease periodicity should be proportional.

In terms of average size of land permissible to be allocated to one particular agricultural promoter/investor, the Committee agreed that no limit should be put on the size of land allocated to a promoter provided that there are well set and defined conditions/criteria for allocation.

The Committee agreed that the age of a promoter should not be considered on its own as a factor for not granting allocation or lease of agricultural land to a prospective developer. The Committee agreed that age should be treated in conjunction with other factors in the selection process for allocation and lease.

There is presently a draft policy document addressing these aspects. The document has been sent to the Office of the Attorney General for comments. In relation to dwelling house, there is a guideline which allows for the construction of demountable dwelling house along with reservoir, access road and pig sties and poultry pens.

During the workshop of 28th September 2006, participants decided that there is a need to review the conditions of permanent buildings on State agricultural land. Participants believed that permanent house should be considered. They argued that the construction of the house should be tied to the level of investment and lease duration. They proposed that the conditions for the construction of the permanent house/permanent structure should be clearly stipulated in the lease or appended as an addendum to the lease agreement. The participants suggested that upon expiration of the lease agreement, if the lessee does not want to renew the lease agreement again, the asset found on the property should be reverted to Government without payment of compensation to the lessee/tenant.

During the post workshop deliberation held on the 26th October 2006, Committee members after much deliberation agreed on the following:

* that the present policy of demountable house on State agricultural land should be maintained and be the permissible type of house construction;
* that the Committee also clearly spells out that agricultural land should not be sold;
* that the Committee spells out the need to have clearly laid down conditions for the use of the State agricultural land. The Committee said that before allocation and lease is made to prospective agricultural developer, all the conditions of what are permissible and what are not should be brought to the attention of the new promoter. The promoter should then decide if he/she agrees and accept the terms and conditions before taking on the agricultural land.

5.8.5 Lease agreement and its renewal

Stakeholders for the lease allocation of State land for agricultural development include the District Administration office, the President’s Office, the Attorney General’s Office and the Land Registry’s Office. However, for lease renewal, there is an added step in which the file has to be sent through MLUH to AG’s office for lease cancellation. In relation to lease surrender, the lessee has to personally sign for the surrender of the lease. If he/she does not sign, the lease cannot be cancelled until it reaches the expiry date or it has to go through the cancellation procedure. Presently, the lease agreement is being administered by MENR, but one of the signatories of the lease is the Principal Secretary of Land Use of MLUH as the latter ministry is mandated under the Lands and River Reserves Act of 1903 to do so.

There are several constraints being encountered in relation to the leasing of agricultural land such as the lessee breaching the clauses of the agricultural lease. Once a lessee is in breach of the lease agreement, eviction should be processed. At present, it is difficult to evict the lessee because the lease’s agreement falls under the Lands and River Reserves Act of 1903 which is being administered by MLUH, while the Ministry for Environment and Natural Resources is the ministry responsible for the management of the lease. Note also the eviction is processed by court order issued by the Office of the Attorney General. Another constraint relates to the payment of compensation to the farmer who does not want to lease the agricultural plot again and who has not breached the lease agreement. In so doing, Government has to pay compensation to the farmer for the long term crops, infrastructure (related to livestock development), and work done on the land as stipulated by the lease agreement. At present, Government is taking a long time to pay compensation and therefore potential agricultural land is left idle. Again, neither MLUH nor MENR have the mandate to ensure that defaulters settle their dues and respect the conditions of the lease agreement. Defaulters can only be brought to court by the Office of the Attorney General.

5.8.6 Duration of the lease agreement in relation to the type of activity and /or investment level

In the workshop of 28th September 2006, participants felt that Government should review the conditions/clauses of the lease agreement. Workshop participants resolved that the lease should have sufficient clauses to cover the issue of land utilization. Participants strongly felt that the lease duration should be proportional to the level of investment. They proposed a minimum of 15 years for any tenureship. They felt that Government should honour the clauses in the lease agreement. They felt that it was imperative that a clause was inserted for insurance cover to safeguard the farmer in the event of natural calamities. They spelt out the need to enforce the lease agreement conditions.

5.8.7 Survey of agricultural land

All activities inclusive of survey, subdivision, demarcation of access road and relocation of beacons are done by the Survey Section of the Ministry of Land Use and Habitat.

5.8.8 Partitioning of special type parcel

The committee’s discussions held on the 28th September 2006, addressed surveyed parcels that need partitioning. The committee members felt that Government should come up with a project proposal to partition the surveyed land and to seek funding to partition the agricultural land. The end result will ensure that the farmer can get a lease and secure his/her investment on the land and at the same time Government can collect revenue through lease rent.

5.8.9 Geographic information system GIS) for State agricultural land

This information is provided by the Geo-informatics Section of MLUH.

**5.9 Some of the challenges and threats in attempting to achieve the above development plan**

5.9.1 The challenges

Even though, some of the old farmers are replaced by ne, young, potential ones, the land availability will still be an issue to cater for the actual and future demands. Identification of new areas with potential for agricultural development will need to be done and this should be one of the priorities for the ministry with portfolio responsibility for agriculture. There may be the necessity to concentrate all livestock activities in one or two livestock production zones. Livestock rearing activities have been one of the agricultural activities that have been impacted tremendously over the past years, due to encroachment of other socio-economic developments close to livestock producing areas.

To date the execution of Government’s socio-economic development plans are at the expense of agricultural land. From the estimated figure of 6,660 hectares in 1989 and without a strong policy or legislation to safeguard the existing agricultural land for its intended purpose, it will continue to dwindle through expansion of the other socio-economic development sectors such as the Housing Land Bank Project, and to a minor extent other developments such as airport extension and the construction of leisure activity infrastructure.

Parallel to that, there has been the concurrent gradual reduction in the utilization of agricultural land as food producing entrepreneurs passed their economically productive age and they have not been replaced.

Development of new technologies such as shade house needs to be promoted further with a view to optimize available land. Consequently, in view of the limited amount of available land for agriculture, provisions should be made to popularise food production technologies in order to increase the productivity of land subjects to conservation measures for sustainable development.

Putting in place the basic infrastructure (irrigation water, access road and electricity) and making available the agricultural inputs can render the under-undeveloped farmland more productive.

Farmers who lease State agricultural land should be in possession of a valid lease agreement which legally binds and requires the lessee to cultivate at least 80% of the potentially cultivable areas.

Eviction procedure for farmers unwilling to meet the required production level as mentioned in the lease agreement and in the registration criteria should be enforced.

National agricultural production would entail a combination of arable agriculture and livestock farming, making use of both privately and State owned agricultural land and managed by food producing entrepreneurs using various levels of technology and investment.

5.9.2 The opportunities

Households are perceived to be cumulatively a major potential contributor in national agricultural production in the next decade. If presently each of the 18,000 household were to cultivate a minimum of 25m2, an additional 45 hectares of land could be brought under cultivation; equivalent to 22.5% of the area currently under intensive agriculture.

If the existing sub-optimisation and under utilisation of the agricultural land, on the one hand, and the severe encroachment of land by urbanisation and tourism activities, on the other hand, are addressed by a sound Government land policy, there may be potential for significant agricultural development, particularly linked to tourism sector.

Table 5.4: Project proposals for the next five years

|  |  |  |  |
| --- | --- | --- | --- |
| **Projects** | **Time Frame** | **Collaboration** | **Financial outlay for implementation** |
| Establishment of an Agricultural GIS system | 2007-2008 | MLUH, MENR, FAO | FAO and GoS  U$ 235,000 |
| Development of a legislation to protect agricultural land | 2007-2010 | Ag’s Office, DNR | Recurrent budget |
| Completion of all the outstanding survey work on the agricultural land | 2007-2011 | MLUH, Private Surveyor, DNR | To be determined by MLUH |
| Support for a comprehensive agricultural census using layers obtained and derived from the TCP project SEY/3101 (A). | 2007-2010 | Bilateral | Cost to be determined |
| Development of an agricultural land use plan | 2007-2008 | MLUH, DNR | Recurrent budget |
| Support for a comprehensive national land cover mapping exercise using the pilot area land cover and the agriculture layer. | 2008-2011 | MLUH, DNR, Bilateral | Cost to be determined |

**6.0 LIVESTOCK PRODUCTION AND DEVELOPMENT**

**6.1 Policy statement for livestock development**

Government will endeavour to facilitate sustainable local livestock production to meet the entirety of demand for pork, poultry and table eggs for both the fresh and processed market by the end of 2011, without compromising human health and the environment. Attempts will be made to significantly increase the efficiency of livestock production through adequate technical and institutional support with a view to minimize production costs and the consequent benefits of which will be passed on to the consumers and translated into reduced prices of the livestock products.

Current local production of broiler poultry meat is 80% of the national demand, and it is planned that the production will attain the entirety of demand (100% local production) by the end of the planned period.

Table eggs production is well established with a production of around 19 million units annually, The ministry with portfolio responsibility for agriculture will endeavour to encourage larger layer operations with a view to making these ventures much more economically viable and to continue to meet the rising demand in table eggs which will be expected to reach 22 million units per annum by the end of the planned period.

Pork production catered for 60% of national demand (668 tonnes) for the year 2005. It is envisaged that pork production meets the entire national demand by the end of 2011. The proposed national output will be 1,500 tonnes.

Cattle production contributes to only about 3 % of national demand. By virtue of local constraints in cattle production, it is foreseen that no substantial growth is expected in this sub-sector and the current production will at least be maintained.

Goat production is sparking renewed interests and Government will encourage production in this sub-sector.

Government will also encourage the production of other meat types such as duck, rabbit and turkey.

Consequently, livestock production would focus primarily in areas where there are comparative advantages.

**6.2 The major achievements and issues (1992 – 2006)**

National livestock production has grown significantly over the period 1992/93 to 2006 with the most successful being the poultry sub-sector. Poultry meat production has grown from 830 tonnes in 1992 to 1544 tonnes in 2005.

Self sufficiency has been attained in egg production since 1983 and the estimated output for 2006 was 19 million eggs. However, there have been some inconsistencies in production in relation to market supply and demand which need to be regulated to assure a stable production all year round to meet 100% of national demand. Small operations are very transient as they are not financially stable by virtue of small volumes of production.

Pork production in 1992 was 366 tonnes reaching a high of 668 tonnes in 2005. Ruminant production (cattle, goat, and sheep) has not been a viable commercial undertaking but has been encouraged amongst small livestock farmers and home-owners.

Although livestock production in the country has grown significantly in the last 13 years, the country has continued to import fresh and frozen livestock products, in particular beef (97% of demand), pork (40% of demand) and poultry (20 % of demand). Past policies stipulated that national consumption of pork and poultry meat is met through a combination of local production and imports. This policy has impeded further expansion in local production. Likewise, the enforcement of Environment and Public Health regulations, stringent environmental standards in combination with limited land availability has made it more difficult to facilitate growth, particularly in pork production. The difficulty in provision of adequate pig genetic stock, in terms of numbers and quality, has had a suppressive effect on the industry. Likewise, the lack of a poultry parent stock unit has been an obstacle to the attainment of self-sufficiency in broiler poultry meat.

Livestock rearing has faced many environmental difficulties and this has been particularly evident with pork and poultry production. Besides, the high investment cost of the requisite infrastructure to meet planning requirements has deterred many potential entrants, hence possibly limiting investment in the sector.

No major animal diseases outbreak has occurred in the livestock industry and there has been some improvement in general farming husbandry practices.

The existing national hatchery (for commercial broiler and layer chicks production) facilities which were built in the late 1980s had the capacity to cater for demand at the time and also for future growth, however it has now reached its maximum output capacity of 25,000 day old chicks per week. Provision was made in the building design to incorporate additional hatchers and setters to allow for doubling of its current maximum output.

The national abattoir facilities to cater for the handling of red and white meat (cattle, pigs and poultry) have been established at Le Rocher over 20 years ago. These facilities are now very old and pose a serious threat to the environment as well as to public health. Their cold storage and blast freezing capacities are either inadequate to cater for present production output or need major renovation at a very high cost. Government has recognized the need for the total relocation of the abattoirs as well as the construction of new and modern facilities that will cater for present day production output and growth for the next 20 years.

An animal feed factory was built in the 1980s to provide a readily available fresh and good quality feed for the different sub-sectors of the livestock industry. This decision was implemented as past importation of feed concentrates was not always up to standard, given the abnormal long storage periods leading to feed with very poor nutritive values. The present facility is meeting the entirety of demand for livestock feed which adds up to approximately 15,000 tonnes per annum. It also has the potential to increase production to meet demand for the extra feed necessary given the projected development of livestock for the planned period. There will however be the need to upgrade some of the facilities in terms of computerization and increase the storage volume of raw materials.

Hard currency in the form of foreign exchange is needed on a regular basis for the importation of hatching eggs, raw material for animal feed production, repairs, maintenance and replacement of equipment at the hatchery, abattoirs and animal feed factory. This is a critical factor as any disruption in the essential support services has a direct effect on the producers and consequently on the targeted production of livestock products.

**6.3 Plans and targets for the national livestock development**

Government would facilitate national livestock development to the extent that local production of pork, poultry meat, and table eggs are met entirely through local production.

In 1992 the national consumption of pork was 531 tonnes of which 366 was produced locally and 165 tonnes were imported. In 2005, consumption had reached 981 tonnes of which 668 tonnes were locally produced and 313 tonnes were imported. It is envisaged that 1,500 tonnes will be needed by the end of the planned period. This will necessitate the production of around 21,000 pigs per annum with an average carcass weight of 70kg. All pork imports in the previous years were utilised exclusively for processing and the pork production target set for the planned period would eliminate the necessity for any imports.

Similarly, poultry meat consumption in 1992 was 1,092 tonnes of which local production was 830 tonnes. The 2005 consumption had reached a total of 1,880 tonnes of which local production was 1,544 tonnes. It is envisaged that total consumption will reach around 2,500 tonnes by the end of the planned period.

Table eggs production is well established with a production of around 19 millions units annually. This livestock enterprise has proved its success due to the fact that the country has never had to import table eggs. Government will ensure that growth in demand will be met by increased production through the establishment of new farms or the expansion of existing ones.

Cattle production is not economically viable due to its high cost of production and limited land availability for fodder production, however, there is still considerable interest by some farmers to rear a few heads of cattle. The primary purpose of production is for manure, and milk production is a secondary activity for which a market exists. There is no beef fattening operation and local beef production results from the sale of either steers, spent bulls or culled cows. There is legislation controlling the slaughter of productive females; the purpose for which is to prevent depletion of the limited national stock. The genetic stock of the adapted breeds will be maintained and production will be encouraged to safeguard the national stock which is estimated at about a thousand heads. There will be the need to import some new bloodlines (bulls) of selected breeds for crossing onto the local stock.

A minimal level of small scale goat production has always existed however there has been a marked increase in interest to expand this industry. An average of 25 tonnes of goat meat is imported annually and this equates to 1,250 heads if it is to be produced locally. This is an area open for exploitation and Government will need to not only preserve the existing genetic material but also introduce new adaptable blood lines through importation to upgrade local stock.

There is some demand for other meats such as duck, rabbit etc. by the public and hotels. Production will be encouraged. For the last five years averages of 18 tonnes per annum of duck meat were imported. There are at present no commercial operations in existence. Hotels have shown interest in the imports of exotic meats; rabbit production is a possible area for exploitation. Turkey production can also be considered but the market for this type of meat is limited and restricted to the end of year festive season only.

Government has approved and gave support to the setting up of a poultry parent stock farm, the establishment of a new and modern red and white meat abattoir, the expansion of the hatchery’s capacity and ensuring good and constant supply of quality animal feed produced locally. Expanding and upgrading of the country’s animal genetic centres will be pursued.

There will be the introduction of adequate blood lines of pigs, cattle, goats and possibly rabbits to expand the actual breeding capacity of the existing stock or cross breeding with the local stock. This will ensure genetically improved quality of breeding stock which would enhance productivity in terms of quality and quantity. It should also suffice to meet farmers’ needs.

Existing medium to large sized farms (inclusive of new operations) will be encouraged to adopt modern systems of production. This will necessitate the adoption of improved housing systems with the incorporation of simple but effective mechanization. This will serve to improve production efficiency, output, reduce problems of effluent management and pollution to the environment as well as allow for more productive use of farm labour.

The country is relatively free from infectious and contagious animal diseases. With the intensification of production systems and the increase of the livestock population, the potential deleterious effects of animal diseases must be taken into consideration at all times. The present veterinary laboratory facilities are deficient in capacity to carry out rapid screening or diagnosis of viral diseases. This is a very important factor especially in the poultry sub-sector. In this livestock enterprise rapid disease diagnosis is very important as whole flocks are at risks and the entire stock may be destroyed in a very short period of time. Disease spread to other farms within the country is also a very serious point for concern. To protect the industry and individual poultry producers, proper and adequate disease diagnosis facilities will have to be put in place. There will also be the necessity for the introduction and the implementation of on-farm bio-security measures that will have to be undertaken by the farmers themselves.

The veterinary and livestock services have an invaluable supportive role to the national livestock producers. Timely diagnosis and treatment of animal diseases is very important to the producer in order to curtail loss of production and ensure the maintenance of a good animal health status. Animal diseases are also of public health significance. The strengthening and upgrading of these essential services in terms of adequate resources and efficient personnel is of high priority. The Livestock Development Service plays a major role in the planning, monitoring, evaluating and providing advisory services to the entire livestock industry. Its role therefore must be strengthened by the provision of adequate resources for mobility, data collection and production of genetic materials.

The retail of fresh red meat is done primarily by private butchers and meat processors who purchase animals live from the livestock producers. The majority of the butchers’ shops are located in Victoria with a very limited number established in the districts. The ministry with portfolio responsibilities for agriculture will actively encourage the setting up of small butcher’s shops, and meat processors in all the districts. This will have the effect of making these products more readily available to the consumer and hence encourage sales of livestock products with a consequential increase in outlets for the producers. This would also serve to increase possible competition in this business and reduce prices to the consumer.

**6.4 Current availability and need of resources**

Labour, land, capital, technology and human resource inputs have been and will continue to be important resources in livestock production in the context of the national endeavour to attain greater food security and the targets of livestock product output as laid out in the Agricultural Development Strategy 2007-20011.

6.4.1 Land

Land availability for livestock production is presently very limited in terms of appropriate location, suitability, size and environmental sustainability. No livestock production zones have yet been officially delineated and present site allocations are being authorized on a case by case basis. There are at least 110 commercial livestock farms of significant size in existence covering the production of layers, broilers, pig breeding and fattening. There are also over 500 small scale pig fattening operations which contribute to national production. The total land area under livestock production is not exactly known but currently it is estimated that the total land area sustaining the present livestock output amounts to approximately 160 hectares. Due to the intense nature of production for pigs and poultry, land is an issue that has to be tackled in order to allow for expansion of the industry. Nonetheless, on the basis of current allocation modality, it is envisaged that another 35 hectares of State land should be secured for livestock production in order to meet the proposed targets of the Agricultural Development Strategy (2007-2011). Land should be earmarked only for serious entrepreneurs who should, in the case of pork production, be able to breed and have a fattening capacity for a minimum of 500 animals.

Land will have to be sourced from the State and could include forest reserves and possibly the outer islands. Reclaimed land is out of the question however, private land could be considered for acquisition. Pig production zones should be established and protected and once identified the Department of Natural Resources must initiate and make the necessary request to the Ministry of Land Use and Habitat (MLUH) to incorporate it in the agricultural land bank. Private land owners should be able to contribute to the national effort in pig production provided there is formal authorization by the relevant regulatory authorities. The allotted land must have ready access and essential resources such as water, electricity and ability to handle significant volumes of effluent.

Numerous constraints exist in the production of livestock, in particular pigs. Issues of smell pollution associated with pig production which is brought about not only by slurry disposal methods but also the odour associated with the animal itself. Specifically, slurry handling and disposal on large farms continue to be one of the greatest handicaps which limit the development of this sector. The identification of new areas suitable for pig keeping is proving to be more and more difficult as other developments such as those for residential purposes compete fiercely for land. Designated pig production zones have to be secured and proper sewage disposal systems implemented to avoid pollution to the environment. For disease prevention and control purposes poultry farms should not be in close proximity to pig production entities and buffer zones are needed.

With the intensified systems of production now being adopted by the commercially oriented producers, skilled farm labour is being needed. With the adoption of technologically improved production systems there will be demand and need for skilled farm hands who will be able to adapt and cope with the work required. This will imply that at least three additional farm hands will be required per well established (commercial) farm. This translates into a total requirement of 75 skilled farm hands for the next five years. Furthermore, there will be a need for an additional four trained livestock officers at the minimum level of a higher national diploma (HND), or preferably at the BSc level in animal science. The availability of skilled labour is being addressed by the Seychelles’ Agricultural and Horticultural training Centre and the yearly output should take care of the livestock enterprises requirements. In the case of HND and tertiary training requirements, these will have to be catered for by Government either through its own resources or/and through bilateral or multilateral agreements.

6.4.2 Capital

In the Seychelles’ context, the livestock production systems have to be intensified to meet the targeted output in view of limited (finite) land resources. To meet all the physical planning, environmental, livestock production and public health standards, calls for a costly infrastructure requirement. In the case of broiler and layers for example each square metre of housing infrastructure costs SR 1,400. In the case of pig production, the housing cost is SR 1,200 to SR 1,500 per square metre depending on the degree/system of technology introduced.

6.4.3 Technology

Livestock production in the planned period will continue to be influenced by varying levels of technology and management inputs which are factors influenced by the affordability and practice of the investors. However, the ministry with portfolio responsibility for agriculture will continue to explore, evaluate and promote new technologies in order to increase the production efficiency, minimize environmental pollution and reduce production costs with a view to lower the cost of the product to the consumer. One important technology input will be the introduction of and subsequent valuation of new blood lines in pig production and appropriate poultry breeds.

There will be a need for a diagnostic laboratory for quick tests in livestock diseases, particularly poultry.

**6.5 Roles and functions of stakeholders**

6.5.1 Government

Government will remain a facilitator to the livestock production sub-sector, providing an enabling environment for efficient and stable production undertakings, of a high standard, with a view to meet consumer demands. It will do this through the sustenance of a number of livestock genetic farms/centres, the provision of adequate breeding stock, technical support personnel such as veterinary officers and veterinary supplies and livestock advisory services, in order to curtail livestock disease, monitor production, and encourage sustained production efforts. Government will enforce relevant legislation to ensure orderly production and minimize illegal activity which poses a threat to the environment as well as to the licensed producers. Government will also explore ways and means to provide the livestock producers with adequate local and foreign training to improve their efficiency in livestock production. Government will ensure that the key facilities i.e. the abattoirs, the hatchery and the feed factory are at their optimal production status. Government will make available the requisite land (35 hectares) for the proposed expansion of the industry with a view to meet the planned production target. It will also facilitate through the Development Bank of Seychelles or through other commercial institutions low interest loans in order to facilitate investment in the sub-sector. It will also explore the opportunity to promulgate further concessions which will translate into incentives to incite investment in the sub-sector.

6.5.2 The private sector

The main contributor in the private sector will be the livestock farmers either operating on State or on private land, individually or under the umbrella of non-governmental organisations such as the Farmers’ Associations. The livestock farmers will be responsible for the efficient production of the various types of livestock to meet national demand. All livestock enterprises have to be licensed and production targets have to be achieved, in accordance with set codes of practice. Licenses may be revoked following the failure to achieve set targets or standards. It is envisaged that all farm produce will be sold on the free market.

There will be the need for new investors in the farming business. It is estimated that at least 13 new farms in the pig production sub-sector and 11 in the broiler sub-sector will have to be established in order to cater for the expected growth in the livestock industry within the planned period. The number of new investors will however depend on the size or output capacity of the new farms that need to be set up. On the other hand, instead of investing into the new farm, consideration could also be given to existing broiler poultry producers to expand their existing operations when gearing up to the targeted growth in this industry as proposed by the targets of the Agricultural Development Strategy 2007-2011. This however will be dependent on the hatchery output capacity and the all in all out production system being enforced by the Department of Natural Resources.

Government will have to take a decision regarding the purchase of all mature broilers from the farmers. This has been the practice over the last two decades. It is foreseen that in the future broilers will be slaughtered at a fee by the abattoir and producers will have to source their own markets.

A farm certification scheme is envisaged for livestock farms in order to ensure bio-security within the industry, improve production management and hygiene. It would also enhance quality of farm produce and subsequently give better credibility to the farmers in the marketing of their produce, especially to non-traditional clients.

6.5.3 Other stakeholders

Other stakeholders include the Development Bank of Seychelles and the commercial banks which will be stimulated to provide low interest rates on loans. The Seychelles’ Bureau of Standards also has a role to play where food safety is concerned. It will administer against Codex Alimentarius Standards with respect to the quality of livestock feeds produced locally as well as screen for the abnormal use of antibiotics and prohibitive growth promoters in both feeds and meat products.

**6.6 Assumptions**

Government ministries, parastatals, the private sector, non-governmental organisations and other stakeholders will all have an important role to play in the future development of the livestock industry. The ministry with portfolio responsibility for agriculture has the major role of providing support services. These include veterinary medical services, livestock advisory and monitoring services, provision of pig, cattle and small ruminant genetically improved breeding stocks and research data pertaining to feeding trials, costs of production and performance results of potential new breeds. Other ministries namely those with portfolio responsibilities for environment, health, land use, finance and economic planning will play their role to enable the identification, approval and allocation of appropriate sites for livestock development, financial resources and project promotion, trade and commerce of livestock products. All relevant legislation pertaining to livestock production will be enforced by the ministries concerned to ensure orderly production, minimize pollution to the environment and avoid a public health nuisance, provide a legally inspected and safe product for the consumers and eliminate illegal activities.

All commercial livestock production will be carried out by the private sector and all livestock farmers will be responsible for the efficient production of the various types of livestock to meet national demand.

The Development Bank of Seychelles, commercial banks, the Seychelles Bureau of Standards and other NGOs will have to assume their respective roles in order to achieve the projected targets being set for the planned period.

**6.7 Challenges and threats**

6.7.1 Land

There is a need for an additional 35 hectares of land to meet the proposed livestock production targets. One of the biggest difficulties in obtaining agricultural land for livestock production is the continuous encroachment by housing, tourism and social development. A number of well established registered farms have had to be closed and relocated at high costs and with great difficulty. Many small pig fattening operations in various districts have had to be closed permanently. There is an urgent need to identify new land situated in appropriate areas for livestock production and possibly revalorize existing land resources where additional quota of production can be engaged. The use of private land for livestock production is now very limited due to size, location and opportunity cost. New production sites will undoubtedly have to be derived from State land if the production targets are to be met. There is the issue of topography, accessibility, availability of water and essential services that must be taken into account when considering the suitability of a particular plot for livestock production. There will therefore be the need to tap into national parks (reserves) that could be used for pig and poultry production which, if done properly, would not pose any threat to the environment.

All new and existing land that is or will be approved for livestock production will have to be protected, through legislation, in order to ensure the sustainability of the industry.

6.7.2 Livestock production

The targeted output of livestock for the planned period would entail the engagement of an additional 35 hectares while the current area under production is 160 hectares. This will bring the total land area under livestock production to 195 hectares. This significantly increases the area of livestock production which can potentially be polluted particularly through effluent discharge from pig sties. By virtue of the nature of present methods of pig sty cleaning which is done on a daily basis, a large volume of slurry is produced posing strong environmental concerns. This seriously aggrieves local environmental standards which need to be adhered to. This has negatively influenced decisions for the recent requests further expansion of the pig production industry. Further expansion in the industry as called for in the proposed plan will necessitate the identification of new sites which are suitable and located in areas which are protected for livestock activities.

6.7.3 Site allocation

At the present moment sites for livestock production are proposed by potential investors and they are then assessed by the stakeholder ministries on a case by case basis. Very often these sites are not accepted due to environmental or public health concerns such as proximity to rivers or dwelling houses or unsuitable topography of the land. With limited land available, it is envisaged that future land allocated for livestock farming has to be utilized to its full potential by investors, henceforth producing the maximum number of heads of livestock that the land can cater for. This is known as the carrying capacity of the land. The allocation of many small plots of land for small scale pig production for example is not practical and limits expansion. More prospects exist in allocating bigger parcels of land for large scale production as investment costs predispose to a more conducive scope for expansion.

Motorable access continues to be an issue for livestock production zones as livestock farms are being pushed as far away from residential areas as possible, thus ending up in areas not yet fitted with motorable access, electricity or holding sufficient water resources for cleaning and drinking purposes. Livestock farmers are facing serious water hardships and this limits production or even discourages farms to expand. The cost of providing these resources is a disincentive for the investor.

6.7.4 Essential services

The provision of sufficient and good quality breeding stock is crucial to the further development of and needed expansion within the livestock industry. Government has the mandate to provide genetic materials (breeding stock) to livestock farmers, the demand for which is mainly in pig and poultry. The main constraint for poultry is the availability of foreign exchange for the purchase of adequate supplies of hatching eggs for the production of day old chicks. This can be resolved by the establishment of a poultry parent stock farm. For pig production the government-run pig genetic centre cannot guarantee the adequate supply of top quality breeding sows and boars for the expected growth in this sector. There is therefore the need to expand the present facilities both structurally and in stocking capacity. This necessitates the provision of adequate financial resources for the expansion and upgrading of the existing pig genetic centre as well as the acquisition of regular supplies of new blood lines. The existing government run facilities are inadequate. However, with the provision of adequate financial, technical and physical resources, the facilities will be able to cater for the national demand in breeding stocks. The provision of genetic materials for the farmers is decreed by law and is the responsibility of government. With the present situation, the shortfall in supply of breeding stock is a major concern. Serious farmers would like to import their own breeding stocks. The short fall in breeding stock is a critical issue to livestock development and has to be seriously addressed. Provision will also have to be made to provide breeding stock for cattle but in particular for goats which has a very good potential for production expansion. The cost of imports of genetic materials by individual farmers is prohibitive due to the size of operations that can be undertaken.

The existing veterinary and livestock services sections provide an essential service to the livestock producers. The services provided are severely strained due to the lack of human, financial and material resources. Livestock production has increased significantly (calculated retail value of all livestock products stands at approximately SR 120 million per annum). With the expected growth in the industry the demand for these services will be increased and adequate resources will therefore need to be made available in order to enhance the efficiency and effectiveness of the services. Farmers are prepared to pay the necessary fees but likewise expect efficient services. Farmers will make use of private veterinary services once they become available.

6.7.5 Effluent disposal

One major drawback to livestock production is the generation of large amounts of effluent which pose a risk to the environment and cause smell pollution. Effluent management is difficult and costly but it is a critical issue that must be taken seriously by all livestock farmers. Mismanagement of this product will inadvertently lead to closure of a farm with consequential heavy financial loss to the farmer. Livestock producers will be encouraged, advised and expected to take all necessary precautions to implement the necessary measures to adequately manage and handle slurry and effluent produced on their farms.

6.7.6 Legislation

Legislation is a necessary and mandatory tool that is enacted by government to safeguard the environment, human and animal health. It is a domain that all livestock producers have to be aware of and abide to. No compromise can be made or given on this issue. Legislation exists in the domain of environment, public health, land use, animal disease and imports, animal welfare and animal production. The stakeholder ministries will need to pay particular attention to the implementation of laws. Legislation pertaining to livestock production will have to be reviewed and updated to keep in line with the new developments in the industry.

6.7.7 Human resources

A good majority of the existing livestock producers operate at a small to medium scale and the management of their farms is at a very basic level. There is a need for them to be more commercially orientated with the focus being on maximizing production output with improved quality of stock. Pig and poultry production necessitates the utilization of intensive systems of production that can yield the maximum level of output per specified area of land being utilized. A lot of emphasis will need to be placed on this issue if the targets of the planned period are to be achieved.

The lack of trained farm hands in the livestock sector is a point for concern. Intensive systems of production require a labour force that works with comprehension and understanding of the mechanisms involved. Any form of mismanagement can lead to a major drop in animal growth rates and contribute to disease occurrence or susceptibility due to stress and eventual financial loss to the farmer. The production output targeted for the planned period will necessitate improved management, implementation of well defined husbandry practices, improved bio-security and strict disease prevention procedures. The availability and use of skilled and trained farm hands is an essential component for future growth in the livestock industry.

Adequate support services to the farming community are also an integral and essential component which will contribute to the success of the livestock industry. Presently there is a lack of trained personnel, particularly in the livestock development services that interact, advise and monitor the national livestock production. Livestock farmers will always need expert technical guidance and this can only be done by technical support personnel who have been trained at tertiary level.

Government will use the agriculture human resource capacity building plan of the **Environment Management Plan of the Seychelles (2000 – 2010)** as well as any plan developed subsequently as guides to human resource training and development in agricultural science.

6.7.8 Marketing and distribution

Livestock production is a very dynamic operation and continuous upgrading and maintenance of tools, equipment, buildings and mechanical resources used has to be undertaken. There is also the need for provision of suitable transport for feed and the distribution of products. All the areas mentioned need the timely availability of foreign exchange which is not the case at the present moment and this is a major obstacle to the further development of the industry. This issue will have to be addressed if the targets of the planned period are to be met.

The availability of medical requisites is another essential component that contributes significantly to the success of the livestock industry. Husbandry practices incorporate the use of drugs and chemicals in order to ensure a good animal health status. This is necessary for optimal production and protection of the consumer through provision of a safe and disease free product. With the significant increase in the targeted production, government will have to ensure that all the required medical requisites are made available. In the recent years, an annual amount of about SR 300,000 was made available for the purchase of veterinary medicines to include antibiotics, anthelminthics, vitamins and other supportive drugs. These requisites were used to support the livestock industry which presently has a retail market value of approximately SR 120 million. With the targeted growth in industry, veterinary medical requisites to the value of SR 800,000 will be needed, supplies of which must be available at any one point in time.

The sale of locally produced beef, pork, broiler poultry and poultry eggs is subject to free market forces and retail prices are still relatively high. This is due to demand surpassing supply. Furthermore, the livestock producers are subject to farm gate prices dictated by the butchers and processors. This consequently leads to minimal profits to the producers while butchers and processors maximise profits. Free market forces will rule effectively once demand can be met through adequate supply and, likewise, farmers will have a ready market for their produce.

The supply of locally produced beef, pork and poultry meat does not meet total national demand and there is therefore the need for some imports of these products. Government, in an attempt to bring down prices to the tourism sector allows all tourist related establishments to import their required meat products. For now, licensed private businesses (catering for the local market) are also allowed to import meat products except pork and poultry, the production of which is feasible and can be done locally. There is the need to go to 100% local production especially in poultry and pork in order to avoid trade related issues vis-à-vis the prospects for cheaper imports of these products. All categories of meats can be imported very cheaply and therefore pose a serious competitive threat to local production.

The retail prices of beef, pork and poultry on the local market is very high and this is due to factors such as the inability of local production to meet demand, high cost of livestock feed, high labour and other production costs, and exploitation by the butchers, meat processors and retailers. This justifies the attainment of the livestock production targets set for the planned period. Self sufficiency, through local production in livestock products will allow for the free market forces to work with consequent benefits to the consumers through reduced prices, promote consumption and market demand as well as allow a ready market for the producers. Presently, all livestock producers, except for those of poultry meat, are at the mercy of the butchers and processors who dictate the farm gate prices for pigs and cattle.

When the national targets are reached in a specific product, this should benefit the local as well as tourist markets. Government will then have to review the imports by the tourist market and impose a ban if necessary for that particular livestock product. In this regard there might be a need to revisit the liberalized policy for imports of livestock products.

The cost of livestock production is influenced by many factors which include management, level of investment but particularly livestock feed. There will be the need to bring down the cost of production and this should be achieved by improving husbandry practices and increased output of farms and possibly reduce livestock feed cost. It is imperative that lower production cost is translated into benefits to the consumers.

There is a deficiency in the procurement of farm production and management information from the farmers despite this being stipulated by legislation. This issue will be pursued and the responsibility of data production should rest on the farmers.

**6.8 Institutional support**

6.8.1 The role of the Department of Natural Resources

The pig genetic centre as well as the cattle and goat multiplication unit, managed by the Ministry of Environment and Natural Resources (MENR) will provide all the breeding stocks to all the approved livestock farms. This will be done through the importation of new blood lines or new breeds (pig, cattle and goat) for trial purposes. Some 80 pigs, 50 heads of cattle and 50 heads of goats of select breeds will be imported during the five year period. After evaluation of their performance and adaptation, their progenies will be made available to livestock farms.

The veterinary and livestock section of MENR will provide services in animal health disease prevention, control and treatment through the setting up of a disease diagnostic laboratory and provide advisory and extension services to all livestock farmers. The services will also monitor livestock production levels to see how the industry progresses and make recommendations for the needed expansion of this industry when necessary, to guarantee that demand for local livestock product is met. Advice and assistance will be given to all farmers in the implementation of their projects and the services will need to ensure that livestock production does not pose a threat to the environment.

6.8.2 Abattoirs

The present poultry abattoir (which is presently managed by the Seychelles Marketing Board) can handle an average of 4,500 broilers daily and this caters for present day production but will not be able to cope with any expansion in the industry. The facility is not in accordance with sanitary standards and poses a serious public health hazard. Some temporary renovation works are due to be undertaken. Government has already given its approval for the construction of a new and modern abattoir, with adequate handling and storage facilities, at the Providence Industrial Estate. The construction of the new abattoir is expected to be completed by the end of 2008 and the costs are as reflected in the Table 1. This project also entails the construction of abattoirs in the same vicinity. The existing red and white meat abattoirs will be phased out on completion of the new ones. There is interest for the private participation in joint ownership and management of the abattoirs.

6.8.3 Hatchery

The existing national hatchery which is run by the Seychelles Marketing Board (SMB) has reached its maximum output which covers the production of 980,000 broiler day old chicks and 90,000 layer day old chicks per annum. The facilities need to be upgraded in terms of equipment and air-conditioning/water cooling systems. The building has provision to house additional hatchers and setters, and with the acquisition of new equipment its total output capacity can be doubled. This will provide a production output that will cater for the country’s total requirements of day old chicks to provide for self-sufficiency in poultry products for the planned period i.e. 2007-2011. This will translate into a total of 1.3 million broiler day old chicks and 90,000layer day old chicks per annum. Indeed, the new equipment will allow expansion of capacity to cater for a maximum of 2 million broiler and 100,000 layer day old chicks per annum.

6.8.4 Livestock feed factory

The existing livestock feed factory, managed by SMB, has to maintain the production of good quality feed needed by all the national livestock farmers. There have been some cases of limited feed supplies due to limited stock of raw materials caused by delay in shipments or financial constraints. Existing facilities at the feed factory provide it with the capacity to cater for the increase in demand for livestock feed which will be needed to meet the forecast expansion of the national livestock industry (22,000 tonnes per annum by the end of the planned period). However, modernisation and upgrading of the factory will be needed. There is the necessity to maintain a considerable level of buffer stock of raw materials (2,000 tonnes) all of which have to be imported. It will also be necessary to have at least a two week buffer stock of the various types of finished feeds. This will prevent any shortage of feeds occurring.

6.8.5 Poultry parent stock farm

At present, some 32,000 hatching eggs of both broilers and layers are being imported on a weekly basis. With each importation, there is always the potential risk of introducing a disease, and hatching egg quality cannot be guaranteed. The dependence on air freighting the eggs and payment in foreign exchange are also causes for concern.

Government has already approved the setting up of a poultry parent stock farm and a location has been identified. The project is expected to commence in 2007 and will be completed by 2008. Once fully operational, the parent stock farm will cater for the total national demand for layer and broiler hatching eggs, the production of which will amount to an estimated 60,000 eggs per week by the end of the planned period.

6.8.6 Enforcement of legislation

Government would continue to enforce existing legislation such as the **Animals (Diseases and Imports) Act 1991,** the **Environment Protection Act 1994,** the **Pig Production and Control act 1985,** the **Licenses (Poultry keeper) Regulations 1987** and the **Prevention of Cruelty to Animals Act (revised) 1991** as well as upcoming acts, legislation and regulations (e.g.) the **Biodiversity Act)** with implications to livestock production, human health and the environment. Some of the existing legislation are now outdated and will be amended accordingly. The issue of legislating agricultural or livestock production areas will also be addressed.

Government will update where necessary existing legislation and review policies which have a bearing on national agricultural production, and where and when required would seek for assistance from bilateral and multilateral partners.

Government would respect any policy and enforce the eventual legislation on genetically modified foods, and the use of plant and animal growth regulators.

6.8.7 Insurance coverage

With any form of livestock production there is always the threat of loss of production due to incidence of either outbreak of animal diseases, natural calamities (force majeure) or other factors linked to human interventions or errors. There is currently no insurance for livestock farmers due to the extreme technical complexities in developing the mechanisms for addressing this issue. There is the need to try to categorise the different types of production and establish a meaningful package.

6.8.8 Bilateral and multilateral cooperation

Government along with the assistance of bilateral and multilateral partners would facilitate the training of potential and existing food producing entrepreneurs. Farm hands will be trained locally at the Seychelles Agricultural and Horticultural Training Centre. Potential candidates (pre-service and in-service) will need to be identified for general and specific tertiary training in all required fields of animal science. This will necessitate foreign multilateral and bilateral assistance for scholarships.

Inter ministerial collaboration is called for in order to achieve the targets of livestock production. This is particularly relevant for the ministries with portfolio responsibilities for health, land use and habitat and environment and natural resources which are jointly responsible for inspecting, evaluating and providing final approval for livestock projects, production systems and production sites.

Bilateral collaboration is also needed for specialized consultancies in cases of animal disease outbreak, e.g. Avian Influenza and the management and handling of pig slurry in the tropics.

Table 6.1:Proposed livestock development plan and time frame

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| --- | --- | --- | --- | --- | --- | --- |
|  | 2007 | 2008 | | 2009 | 2010 | 2011 |
| Importation of new blood lines to meet demand for pig breeding centres |  | USD22,000 | |  |  | USD22,000 |
| Expansion of pig genetic centre’s capacity |  | SR250,000 | |  |  |  |
| Achieve 100% pork production |  |  | |  |  |  |
| Upgrading of national hatchery | USD73,000 |  | |  |  |  |
| Upgrading feed mill | SR250,000 | SR250,000 | |  |  |  |
| Upgrading national poultry & pig abattoir  Blast freezers and cold storage | USD305,000 + SR700,000 | | |  |  |  |
| Construction of new poultry & pig abattoir | USD2.6 million | | |  |  |  |
| Construction of poultry parent stock farm | USD1,2 million + SR 9 million | | |  |  |  |
| Training for livestock farmers and farm hands | SR30,000 | SR30,000 | | SR30,000 | SR30,000 | SR30,000 |
| Relocation of the cattle multiplication unit |  |  | |  | SR3 million |  |
| Import of cattle and goats blood lines | USD50,000 |  | |  | USD50,000 |  |
| Training for technical support personnel | SR30,000 | SR30,000 | | SR30,000 | SR30,000 | SR30,000 |
| Transport facilities | USD 60,000  SR450,000 |  | |  | USD 40,000  SR300,000 |  |
| Laboratory for disease diagnosis | USD 25,000 | | |  |  |  |
| Needed amendments to existing legislation |  | |  |  |  |  |

The total cost of the foreign exchange component of the plan will amount to USD 4.45 million plus SR 5.5 million in local costs.