The Republic of Seychelles

Final Draft National Biosafety Framework

Forward

Seychelles is endowed with an exceptional natural environment and a rich history in conservation. These have contributed to the nation's high quality of life and socio-economic wellbeing. Despite the problems of human development such as land use pressure, pollution and climate change, our strong conservation policies have resulted in two world heritage sites, the protection of 45% of our land territory and the establishment of more than 12 marine protected areas.

In 1997 Seychelles developed a comprehensive National Biodiversity Strategy and Action Plan (NBSAP) to address biodiversity conservation. This was followed in 2000 by the Environment Management Plan of Seychelles (EMPS) 2000-2010 which laid the foundation for integrating development issues within our fragile but important natural resource base. Both these plans were developed through nation-wide stakeholder consultation.

One of the major challenges we face is the impact of invasive species and other foreign organisms on our unique biodiveristy. Reports on the effects of invasive species which have reached disastrous proportions on many small islands highlight the wisdom of the precautionary approach adopted by Seychelles.

It is important that biosafety issues and concerns are understood by the entire population, starting at the highest political levels. Understanding that the development of the islands should be consistent with the preservation of their environmental and cultural heritage, for example, the Government is accordingly concerned about the potentially unsafe use of genetically modified organisms (GMOs) in such fragile island ecosystems.

The need to ensure adequate safeguards to address any reasonable doubts concerning the proliferation of such organisms therefore led Seychelles to sign the Convention on Biological Diversity in 1992 and ratify the Cartagena Protocol on Biosafety in 2004.
The consequent development of this National Biosafety Framework is an expression of Seychelles' policy and approach to GMOs.

While we recognize the importance of such organisms to many areas of human development such as health and agriculture, we are also concerned about their inherent risks and potential to impact on our unique biodiveristy in ways similar to invasive species. We have therefore specified institutional re-arrangements, modified existing legal frameworks and proposed a framework to minimise risks.

However this is not sufficient in itself, as we need the resources, technical and financial, to implement these changes and undertake sufficient risk analyses. Seychelles being part of the global village, the future of our biodiversity is a joint responsibility of the people of our islands and the international community if we are to preserve such a unique corner of the world.
It is our wish that our position based upon the precautionary principle will be supported and further adopted by many other countries as we embrace progress towards the bio-age.

Ronnie Jumeau
Minister of Environment & Natural Resources

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1.0 General Introduction

The National Biosafety Framework of Seychelles is a combination of policy, legal, administrative and technical instruments that have been developed to ensure a high level of protection in the field of transfer, handling and Genetically Modified Organisms resulting from modern Biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking into account risks to human health..

The UNEP-GEF Project on the Development of the National Biosafety Framework of Seychelles started in January 2003 and ended in May 2005. As supporting structures in the implementation of the projects were: a National Executive Agency; a National Project Coordinator; a National Coordinating Committee, a National Biosafety Framework Drafting Committee, and a Public Awareness & Public Participation Committee.

1.1 The National Executing Agency (NEA)

The NEA for the UNEP/GEF Project, which was appointed by the Government of Seychelles after consultation with the UNEP/GEF and ICCP, was:

Director of Conservation Section
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1.1.1 The Role and Responibilities of the National Executive Agency

The NEA was the Ministry responsible for the portfolio of Environment and represented by the Director of Conservation Section. The NEA was the legal entity responsible for executing the National project.

1.2 The National Project Coordinator (NPC)

The **NPC** for the UNEP/GEF Project which was appointed by the NEA after consultation with UNEP was:

Mr. Joseph Francois
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1.2.1 Role and Responsibility of the National Project Coordinator
The NPC was responsible for the overall co-ordination, management and supervision of all aspects of the National Project. He reported to the National Coordinating Committee (NCC) and UNEP, and liaised closely with the members of the NCC the NEA in order to coordinate the work plan for the National project. He provided the overall supervision for the staff in the NBF team as well as guiding and supervising all other staff appointed for the execution of various National Project components (eg. NBFDC and PAPPC staff).

1.3 The National Coordinating Committee (NCC)

1.3.1 Role of NCC
One of the Project requirements was to nominate a National Coordinating Committee made up of representative of various stakeholders with mandates relevant to the implementation of the Cartagena Protocol for Biosafety. The Role of the National Coordinating Committee was to advise and guide the preparation of the National Biosafety Framework ensuring that its components are the results of the national requirements of the country.

1.3.2 Composition of NCC
The NCC was made up of 17 members representing government agencies, private sector and public interest groups and represented by the following members:

1. <u>Agriculture Sector</u>

-	Dr. Jimmy Melanie	-	Veterinary Division
-	Mrs. Helda Antoine	-	Plant Genetic Section/Agricultural Planning
-	Mr. Wills Dogley	-	Crop Protection & Promotion/Technical Advisor

2. <u>Environment Sector</u>

•	Mr. Selby Remie	-	Conservation Section (Chairperson).
•	Mr. Denis Matatiken	-	Botanical Gardens Section
•	Mrs. Bergeon Nageon	-	Environment Management Plan for Seychelles 2000-2010
•	Mrs. Lynn Bastienne	-	Education, Information & Communication Section

3. <u>Health Sector</u>

•	Mr. Daniel Bresson	-	Food Control Section
•	Mr. Philip Palmye	-	Public Health Laboratories

4. <u>Trade and Finance Sector</u>

•	Mrs. Raymond Course	-	Import and Export Division

5. Parastatal Organisation

- Mr. Riaz Aumeerudy - Seychelles Fishing Authority
- Mr. Jude Shroff - Seychelles Bureau of Standard

6. NGOs, Private Sectors

- National Consumers Organisation
- Lungos (Unity for Non-Government organisation)

Mrs.Rachel Marie

- Mr. Marlon Montano - Roman Catholic Church
- Mr. Kantilal Shah - Seychelles Chambers of Commerce

7. Legal Affairs

- Mrs. Laura Valabjee/Iris Carolus Caroline Hoareau/Joel Camille - Attorney General Office/Private Lawyers

Others

8. Joseph Francois - National Project Coordinator (Secretary to NCC)

1.3.3 Responsibility of NCC

The National Coordinating Committee worked together as a team for the management of the project. The members met at least on a monthly basis performing the following duties:

1. Develop a common understanding of what was needed to expedite the preparation of the National Biosafety Framework;

2. Oversee the preparation of the National Biosafety Framework;

3. Provide advise on the detailed work plan produced by the National Project Coordinator;

4. Mobilise necessary expertise, when needed for the proper execution of the project outputs;

5. Provide overall policy advice on the implementation of the project;

6. Review and advise on the main outputs of the project;

7. Ensure that information on the implementation of the project as well as the project outputs are brought to the attention of the public, local and national authorities in an organised and coordinated manner for follow up;

8. Assist in gathering of available data and information and ensure a constant information flow between all parties concerned;

9. Assist the project coordinator in communicating with relevant partners and actors particularly in their field of work and using established contact mechanisms;

10. Ensure that Government's policy is fully reflected in the project output;

11. Review and approve the Biosafety Assessment, projects outputs and frameworks documents.

1.4 The National Biosafety Framework Drafting Committee (NBFDC)

1.4.1 Role of NBFDC

The NBFDC is a sub-committee of the NCC having the task to draft the National Biosafety Framework document. Some extra members opted for providing assistance with the drafting and reviewing of the document as and when the need arose. To ensure that the document is in compliance with the Cartagena Protocol on Biosafety, the Focal Point to the Cartagena Protocol on Biosafety who is also - the National Project Coordinator was given the mandate to chair the drafting process.

1.4.2 Composition of NBFDC

The NBFDC consisted of 9 members mostly derived from or the National Coordinating Committee. - When required, assistance were obtained from Ms. Iris Carollus (a private lawyer), Ms. Li Lim Ling (Biosafety Lawyer for Thirld World Network) and Mr. Alex Owusu-Biney, (National Projector Coordinator for Ghana). The committee was comprised as follows:

Mr. Joseph Francois	- Chairperson (National Project Coordinator)
Mr. Selby Remie	- Director of Conservation Section, Dept. of Environment
Mrs. Rachel Marie	- Executive Director of National Consumer Forum (NATCOF)
Mrs. Raymonde Course	- Director of Public Affairs, President Office
Mr. Daniel Bresson	- Head of Food Control Unit, Dept. of Health
Mr. Philip Palmyre	- Director of Public Health Laboratories, Dept. of Health
Mr. Denis Matatiken	- Acting Director of Botanical Gardens, Dept. of Environment
Mrs. Helda Antoine	- Asst. Director of Agricultural Planning, Dept. of Natural Resources
Mr. Joel Camille	- State Lawyer, Attorney General's Office

Local Reviewer:	Ms. Iris Carolus (Lawyer, Private/Freelance)
International Reviewers:	Ms. Li Lim Ling (Biosafety Lawyer for Third World Network) Mr. Alex Owusu-Biney (National Project Coordinator for Ghana)

1.4.3 Responsibilities of NBFDC

The duties of the NBFDC were as follows:

1. To collect and analyse all information and data relevant to the drafting of the National Biosafety Framework;

2. To identify and fill gaps that has arisen in the result of the national surveys;

2. To actively participate in the drafting of the National Biosafety Framework;

3. To mobilise the necessary expertise required for the proper execution of the framework components;

4. Ensure that Government's policies are fully reflected in the National Biosafety Framework;

5. Ensure that information required in the National Biosafety Framework are obtained from the public, local, and national authorities;

6. Communicate pertinent issues with the relevant partners and actors influencing the development of the National Biosafety Framework;

7. Complete the drafting of the National Biosafety Framework

1.5 Public Awareness and Public Participation Committee (PAPPC)

1.5.1 Role of PAPPC

PAPPC consists of three members from the National Coordinating Committee and a journalist. The main roles of the PAPPC were to facilitate the dissemination of information and to ensure public awareness and participation for the duration of the project. As Seychelles is more likely to be impacted from Modern Biotechnology through commodity import, a committee was set up under the chairmanship of National Consumer Forum (NATCOF) to design ways to communicate Biosafety issues, techniques, practices and the application of modern biotechnology to the public.

1.5.2 Composition of PAPPC

The PAPPC consists of the following three members:

Mrs. Rachel Maire	- National Consumer Forum (Chairperson)
Mrs. Lynn Bastienne	- Education, Information and Communication, Department of Environment
Mr. Nick Watson	- Journalist (Seychelles Nation)

1.5.3 Responsibilities of PAPPC

As responsibilities the PAPPC was mandated to;

1. Advise the NCC of the best possible public awareness systems to disseminate information related to biosafety;

2. Devise awareness information for the public during the development of the National Biosafety Framework Project;

3. Advise the NBFDC on the most workable public participation and methods for raising public awareness and tools to ensure compliance to the Cartagena Protocol for Biosafety.

4. To facilitate mobilisation of the public in public awareness workshops

2.0 Background Information on Seychelles

The Republic of Seychelles is an archipelago of 115 islands scattered over one million square kilometers in the Western Indian Ocean. It is situated 5 degrees south of the equator and between 630 to 1300 miles off the east coast of Africa.

The Archipelago covers a total land area of 458 sq. km of islands of two geological types (Coralline and Granitic Islands). The Granitic islands physical features are characterized by high, rugged mountains of granite boulders interspersed by human settlements on the main islands, while the barely inhabited coralline islands are characterized by extensive coastlines of clear, sky blue water and often pristine lagoons of rich coral reefs and marine biological diversity. The components of the biotic features are as diverse as its geophysical elements; broadened further by the consequent climatic attributes of the equatorial region. The special group of oceanic islands, especially the central granitic islands have undergone unique biological and geological evolution through isolation for millions of years. There are numerous species whose ancestors on mainland areas have long gone extinct. Many of the coral islands themselves contain unique biota and some are regarded as living laboratories (e.g. Aldabra, Cosmoledo). Through this natural endowment, the country has acquired a special significance at the global level.

The Seychelles economy is predominantly based on tourism and fisheries both contributing to ***42 % and 46%*** of its Gross National Products respectively (2004 figures from MISD).

The Seychelles is endowed with a rich natural environment. The islands are known to be repositories for over one thousand living species of animals and plants found nowhere else in the world. With stable and farsighted political leadership, low population size, traditional reverence for nature, cautious modernization, environmentally sensitive development policies the country has succeeded in keeping the environment as one of the most pristine in the world. The importance of the islands to global biological diversity conservation is therefore preeminent.

3.0 Seychelles and The Catagena Protocol for Biosafety

The Government of Seychelles has always ensured that the development process of the islands are consistent with the maintenance of its environmental cultural integrity and the commitment to protecting the many rare, endangered and endemic species in Seychelles. This decision to uphold the national and global responsibility was demonstrated when the Seychelles was the second country to sign the Convention for Biological Diversity (CBD) in 1993. The CBD is the main international instrument for addressing biodiversity issues. It provides a comprehensive and holistic approach to the conservation of biological diversity, the sustainable use of natural resources and the fair and equitable sharing of benefits deriving from the use of genetic resources. In **article 19(3)** of the **CBD convention text** states *" The Parties shall consider the need for modalities of a protocol setting out appropriate procedures, including, in particular, advance informed agreement, in the field of the safe transfer, handling and use of any living modified organism resulting from biotechnology that may have adverse effect on the conservation and sustainable use of biological diversity"*. In line with its commitment, Seychelles participated very actively in the development of the protocol called the Cartagena Protocol on Biosafety. Upon its adoption and coming into force in September 2003, the Biosafety Protocol hails an important step forward in providing an international regulatory framework to reconcile the respective needs of trade and environmental protection with respect to a rapidly growing global industry, the biotechnology industry. By ratifying the Biosafety Protocol in August 2004, The Seychelles showed the world

that it fully supports the creation of an enabling environment for the environmentally sound application of biotechnology, making it possible to derive maximum benefit from the potential that biotechnology has to offer, while minimizing the possible risks to the Seychelles fragile environment and to the health of its population of 82,000 individuals.

4.0 Environment Plans and Strategies in Seychelles

4.1 The National Biodiversity Strategy and Action Plan (NBSAP)

The dependence of the Seychelles' population on very limited natural resource base makes conservation of biodiversity a real challenge. Realising this, Seychelles with the technical coorperation of UNEP and the World Conservation Union (IUCN), funded by GEF developed a comprehensive National Biodiversity Strategy and Action Plan (NBSAP) in 1997 to address a holistic approach to biodiversity conservation and sustainable development programmes. The NBSAP comprises of a summary of Seychelles Biodiversity Assessment. The document addresses the opportunities and challenges of protecting and mobilizing the country's biological diversity. It also describes the gaps and constraints currently hindering Seychelles's efforts in biodiversity conservation and sustainable use, including gaps in capacity, partnerships, coordination, and management of species and ecosystems. The document also provides a timetable for action over a Plan period of 5 years, the funding requirements and the list of partner organizations involved in its implementation.

4.2 The Environment Management Plan of Seychelles

With the extensive interrelationship of environment issues in the economic, social and political sectors, their direct and indirect implications on the fragile natural ecosystems of the Small Island Development State, a comprehensive multi-disciplinary strategic document with the participation and involvement of all local agencies though a process of active consultations and participations was required for Seychelles. With assistance from the World Bank, the result process gave rise to a document that would promote, coordinate and integrate sustainable development programmes that cut across all sectors of society in the Seychelles in order to achieve environmental excellence. The document is called The Environment Management Plan of Seychelles (EMPS). The first plan came about in 1990 and was for duration of 10 years (1990 – 2000). This was followed by a second plan of the EMPS for 2000 – 2010. In fact, Seychelles was the first African country to prepare the so-called second generation of environment management plans.

Some of the key common elements of the EMPS 2000 – 2010 and the NBSAP of Seychelles are studies on the relevance of impacts of new organisms and pests on local biodiversity of Seychelles; the sustainable management of marine resources including coral reefs, capacity building for assessing, monitoring and forecasting environmental problems, establishment of appropriate sanitary and phytosanitary standards. All projects and programmes projected from year 2000 to 2010 in Seychelles that have a direct effect on the natural environment are featured in the EMPS document including the development of local Biosafety legislations and policy to address the use of GMOs. In

such a way, the protection of the environment is undertaken in a planned and coherent manner involving all stakeholders.

5.0 The Challenges facing the Seychelles' Natural Environment

The Seychelles being a Small Island Development State (SIDS) with scarce natural resources is especially interested in developing methods for ensuring sustainable use so as to encourage a more dynamic and diverse economy and an equitable sharing of benefits for all citizens. As a SIDS, the country combines land scarcity and a small population with great distance from market sources and consequently high import and export costs (NBSAP, 1997).

With the expansion of tourism, fisheries and agriculture in the country over the last two decades, the demand for the importation of products has greatly increased. The influx of plant materials, fruits and vegetables and other plant products from neighboring countries without effective quarantine measures locally has led to an increase build up of pests and diseases in the country. The Government of Seychelles quickly realizes that the isolated and scattered nature of the islands no longer provides an effective barrier to the importation of alien species into the country. It was clearly recognized that biodiversity loss can lead to wide range of costs in biodiversity-dependent activities.

The recognition that our islands' environment and the inhabitants are vulnerable to the introduction of devastating new pests and diseases led to the setting up of an invasive species committee in July 2004. This committee involves the participation of officers from a wide range of relevant stakeholders. Just months after its set up, the committee made several recommendations on the proper sanitary and phytosanitary measures necessary for conservation of biological diversity, animal and plant life and health. More importantly the committee emphasized strongly on re-enforcing quarantine laws and other regulations to control import of alien species, and to adopt **risk assessment techniques** for identification of potentially harmful species, their entry, establishment and control. Furthermore, the committee has recommended the establishment of suitable quarantine facilities at entry points.

6.0 Biotechnology in Seychelles

In Seychelles, neither the Government nor the private sectors have shown much interest in modern biotechnology or in its commercial application for the country. This is due to both lack of awareness of potential benefits and risk of modern biotechnology, and the little need to produce products on a large scale. As a result, the need to regulate GMOs was considered not a priority until the development of the present framework.- However, there is likely to be an increasing interest in biotechnology in the country with new emerging and controversial issues from international press as well as in our effort to diversify the local economy and involve more private sector participation in the country's economy. This is more likely to occur in the Agriculture sector as projected by the Agricultural Policy 2003 – 2013 (awaits adoption).

However, the society cannot ignore the potential environmental and economical impacts of the proliferation of GMOs or its product. There is an increasing and urgent need for enforcement of biosafety guidelines, rules and regulations in order to manage any risk from the deliberate or accidental release of GMOs into the environment.

Realizing the potential of both the benefits and risks of GMOs not only for Seychelles, but also for the region, Seychelles is proactively identifying strategies and policies that are needed at the national level to take a precautionary approach to the introduction, use and dissemination of GMOs. Being an island nation, Seychelles is particularly threatened by GMOs of marine and coastal origin and in these areas the country stresses the need for regional corporation as well especially in a collaborative effort to address issues of technical capacity building among the SIDS and the use of external assessors for assessing GMO applications. Realizing this Seychelles joined the effort of other Indian Ocean SIDS (Mauritius and the Maldives) and ratified the Cartagena Protocol on Biosafety, in August 2004.

The issue of unintentional imports and/or deliberate imports is a critical issue in Seychelles, since most of its food products are imported mainly from South Africa, USA, Europe and South East Asia which are already handling GMO products commercially. To date in Seychelles, there is neither technical capability nor the required infrastructure to assess them. Thus, there is no certainty that products containing GMO have not already entered the country. This makes it more difficult when there is inadequate public awareness on this issue.

Even though Seychelles lacks the capacity to develop products of modern biotechnology in the foreseeable future; it is possible that it will either be a transit point or destination of GMOs. Hence, the Seychelles decided to take a more proactive approach with the development of its NBF with linkages to priority activities identified in the EMPS 2000 - 2010.

6.1 Biotechnology in Agriculture

The Seychelles does not subsist on any integrated system of agriculture, livestock and forest products use. The country currently meets only 60% of its vegetable needs. The national goal of realizing self-sufficiency in food production faces several constraints: the limited amount of arable land, which hinders intensification; the nature of the terrain, which makes intensification difficult; a low population growth rates which poses labour problem; and the increase in urban and non-farming communities.

Agriculture research in Seychelles is co-coordinated by the Department of Natural Resources in the Ministry of Environment and Natural Resources (MENR). The department has a vegetable evaluation and research section with the mandate to enhance the development of improved crop farming technology for the farming community. This would include production and introduction of new and high yielding crop varieties through adaptive or basic research. The department has a small Pig Genetic Center, which provides new varieties of pigs through importation of pig's semen and allows breeding locally as part of an adaptive research programme. The Farmer's Training Center apart from offering academic and technical training in the field of tropical

agriculture, the institution is also exploring the possibility to breed goats and cattle using imported varieties.

At present, the Research Centres are not involved in the development of new varieties as they are only mandated to do adaptive research. In general, the status of modern biotechnology development in Seychelles is non-existent and thus, there is no question of production of GMOs being developed nor intentional propagated or field tested at present, but with the new proposed Agricultural Policy 2003 – 2013 such possibility may exist and Seychelles will need to improve on its capacity to monitor and assess GMOs in the field of Agriculture.

6.2 Biotechnology in other economic sectors

Tourism and Fisheries, the most important sectors of our economy are both directly dependent on the pristine, natural ecosystems. The Government of Seychelles is conscious that the use and release into the environment of GMOs produced by modern biotechnology could have adverse impacts on the conservation and sustainable use of biological diversity. For this reason, Seychelles supports through international agreements, principles of risk assessment and management to ensure a safe development, application, exchange and transfer of biotechnology products. As a result of these concerns and the realization that our capacity to detect such products are limited in the country, the Government of Seychelles strongly supports Advance Informed Agreement procedures in the field of the safe transfer, handling and use of GMOs resulting from modern biotechnology.

The rapid developments in modern biotechnology create opportunities for improvement in health care, agriculture, food and the environment. Modern Biotechnology can exert a strong influence on developments in society. The Government of Seychelles believes that while these opportunities should be explored and used, this should be accompanied by measures to safeguard and ensure safety, transparency in decision-making, freedom of choice for our citizens and ethical acceptability. It is with this objective that the Government hereby develops this National Biosafety Framework.

Development in modern biotechnology is strongly knowledge-driven, and at present the local expertise is insufficient to effectively deal with issues of modern biotechnology and Biosafety. In order to keep pace with the development in modern biotechnology, the Government of Seychelles needs support to strengthen local capacity to be able to address the needs of modern biotechnology and biosafety.

7.0 EXISTING REGULATORY REGIMES

Existing legislation and policies in areas relating to Biosafety

The biological diversity of the Seychelles, as well as the local population, enjoys a significant amount of protection through various pieces of legislation. This is being administered by a number of governmental organisations.

Different pieces of legislation in the fields that have a bearing in the management of Biotechnology or Biotechnology products in the Seychelles have been identified as follows:

7.1 Agriculture

i. The Plant Protection Act (PPA), 1996

The Plant Protection Act 1996 provides legal measures to control the movement of diseases, insects and other pests of economic importance. Currently, this legislation is being administered by the Department of Natural Resources in the Ministry of Environment and Natural Resources. This Act makes provision for preventing the importation and spread of plant pests and diseases, for better protecting the agricultural, forestry resources and ecological environment of Seychelles. This is attained through the regulation of the importation of organisms, of plants and of plant products. A comprehensive quarantine administration system exists under the Act, but is rather under-practiced due to limited human resources capacity and appropriate technology and technical expertise particularly at the ports of entry. The PPA does not make any reference to products of Modern Biotechnology nor does the proposal which is currently being submitted to review the Act.

ii. The Animal and Diseases Act, 1981

The Act provides for the notification of notifiable diseases and the related powers of inspectors of the Veterinary Section in the Department of Natural Resources to act in such cases. The Act also makes provides for imports and quarantine procedures

iii. The Agriculture and Fisheries Incentives Act, 2005

The Act provides for the grant of certain incentives to persons engaged in Agriculture, Fisheries and related activities.

iv. The National Agricultural Policy

The National Agricultural Policy 2003-2013 is in the process of being submitted for approval. The overall objective of the policy is the achievement of higher food security through sustainable agricultural production. Furthermore, the policy envisages exploiting proven technology packages for intensive production with due regard for human health and the environment. One of the strategies envisaged under the policy is that Government would respect any eventual policy on genetically modified crops, foods and the use of

plant and animal growth growers as well as enforce any legislation subsequently enacted.[1]

7.2 Fisheries

a) The Fisheries Act 1986

The Fisheries Act 1986 addresses the conditions and regulations for fishing in Seychelles. The Seychelles Fishing Authority (SFA) administers the Act. The Act has a practical set of administrative systems that address aquaculture in Seychelles with a clear system of permit and post permit monitoring protocols. The SFA also has a mechanism for close consultation with the Department of Environment before making such a grant under this Act. However, aquaculture practices have so far been very limited and almost exclusively centred around the large-scale commercialisation of prawns on Coetivy Island. The SFA boosts a relatively high level of expertise in the Fisheries Sector with a number of its staff with postgraduate qualifications in marine sciences. However, the small number of staff and low level of technology that exist in the organisation does not make it possible to monitor the entire1.3 million sq km of the Seychelles Exclusive Economic Zone (EEZ).

b) The Agriculture and Fisheries Incentives Act, 2005

See above comments.

c) The National Fisheries Policy 2003 – 2013

Government policy for the fishing industry promotes sustainable and responsible fisheries development and optimising the benefits from this sector for the present and future generations. It focuses principally on the promotion of sustainable management and responsible fishing practices as well as the effective protection of the marine ecosystem. The policy projects more development in aquaculture aimed at exportation. Government will promote responsible research and development in this area and also ensure that this development is ecologically sustainable and that it allows the rational use of resources. Aquaculture will be promoted with the aim of minimising adverse environmental changes and related economic and social consequences. This is an area where Modern Biotechnology is likely to feature.[2]

7.3 Environment

I. The Environment Protection Act (EPA) 1994

The Environment Protection Act 1994 provides for the protection, preservation and improvement of the environment and for the control of hazards to humans and biodiversity. The Act also provides for the coordination, implementation and enforcement of policies pursuant to the national objectives on environment protection. This Act is administered by the Department of Environment in the Ministry of Environment and Natural Resources, which has been designated as the Authority under

[1] The Draft National Agriculture Policy 2003-2013
[2] National Fisheries Policy 2003-2014

the Act. The Act makes provisions for the Authority to co-ordinate the activities of other agencies concerned with the protection of the Environment.
The functions of the Authority under the Act are as follows:

7.4 To evolve standards for quality of the environment in its various aspects, i.e., air, water, soil as well as for emission or discharge of environmental pollutants from various sources, i.e. effluent, emission of air pollutants, noise emissions, odours and pesticides residues.

7.5 To commission research and studies on problems relating to environmental pollution.

7.6 To examine manufacturing processes materials and substances likely to cause environmental pollution.

7.7 To evolve procedures and safeguards for the prevention of accidents which may cause environmental pollution, remedial measures for such accidents as well as coordinating actions required in a state of environmental emergency or any situation which may pose a serious threat to the environment.

7.8 To collect and disseminate information in respect of matters relating to environmental protection.

The Act provides for the management and protection of coastal zones as well as the management and minimisation of wastes and hazardous substances.
The Act also makes provisions for Environmental Impact Assessment (EIA) studies and authorisation for particular projects and activities. A person wishing to undertake any prescribed project or activity in a protected or ecologically sensitive area is required to produce an EIA document to the Ministry of Environment. The primary aim of the EIA is to assess the risk associated with the development and to come up with a risk management protocol before the development is authorised.
The officers under the EPA are empowered to enter premises and to seize and destroy products that are in contravention of the Act.
The penalties ranging from Rs. 5000 to Rs. 250,000 are seen as elevated to discourage potential offenders from spoiling the much dependable natural resources of the country.
Despite the fact that there are no specific provisions under this Act relating to GMOs per se, we have seen that a number of general provisions that tackle any adverse environmental consequences, which introduced organisms, may cause to the natural environment.

II. Draft Access and Benefit Sharing Legislation

Draft legislation is currently being developed on Access and Benefit Sharing pursuant to the Convention on Biological Diversity.

7.4 Health

a) Public Health Act 1960

The Public Health Act 1960 contains a comprehensive set of provisions which cover general sanitation and hygiene in the Seychelles population with the view to controlling formidable epidemic diseases and to preventing or suppressing infectious diseases including venereal diseases. The Act also provides for the protection of water supplies as

well as any *mal practices* that could lead to health problems. The Act is currently under a thorough revision as a number of its provisions are outdated and have failed to evolve with the emerging health issues of a modern society with sufficient provisions for means and ways to prevent or contain them. Furthermore, the penalties under this Act are no longer deterrent. The Act is being administered by the Department of Health. The provisions of this Act make no reference to issues of Modern Biotechnology in the health sector.

b) Food Act 1991

The Food Act 1991 contains a comprehensive set of provisions, which address food safety in relation to human health in Seychelles through a detailed regulatory system. The Division of Community Health in the Department of Health is currently administering the Act. The Act regulates any food which is injurious to human health; the sale of poisonous or unwholesome food; deception of character, nature, composition and quality of food (including clear labelling, packaging or advertisements); sanitation in premises where food is being prepared (including restaurants, slaughter houses), as well as regulating importation of food with strong emphasis on proper and adequate labelling. The administration of the Act is made by the Food Control Board, which is made up of different stakeholders in the field of food safety. Its members are appointed by the Department of Health for a period of 3 years. Officers of the Division of Community Health, who are also involved in the community, enforce the Act. The powers vested in the officers under the Food Act are rather comprehensive and makes provision for preventive approaches to food safety as well as the power to act timely and effectively in the event of emergencies. The Act also makes provision for food samples to be analysed in official laboratories. Such analysis is however, limited due to the lack of appropriate and modern equipment and facilities. The Act does not make any reference to food derived from Modern Biotechnology nor from any form of technology. However, if food derived from Modern Biotechnology is injurious to human health it will automatically be regulated by this set of laws.

c) Pharmacy and Drug use Act 1970

The Pharmacy and Drug Use Act 1970 details the protocol for the safe use of drugs and pharmaceutical products. Specific references are made to products that have been approved and considered safe by relevant international organizations such as WHO, FDA, as well as local procedures for the safe use of the drugs and pharmaceutical products. The Act is being administered by the Pharmacy Section in the Department of Health. The Act is currently under revision to address new emerging issues and to address the rapid changes in the decentralisation of Pharmacies and Chemists through private practices. The Act makes no specific reference to pharmaceutical products that have been resulted from the use of Modern Biotechnology.

d) Food and Nutrition Policy

A national food and nutrition policy is currently being developed.

7.5 Consumer Protection

a) Consumer Protection Act 1997

The Consumer Protection Act 1997 regulates trade practices, ensures consumer rights, and imposes duties on producers and suppliers of goods. The Act makes provision for the appointment of a Director for Consumer Protection and the establishment of a Consumer Protection Board. The Director of Consumer Protection is required to keep under review the carrying of commercial activities in Seychelles, which relate to goods supplied to consumers or produced with a view to being so supplied. Furthermore, the Director is required to collect information to ascertain circumstances relating to practices, which may adversely affect the interests, whether economic, or with respect to health or safety of consumers in Seychelles. The Act also makes provision for clear and appropriate labeling of products. The Act is currently under review.

b) Competition Policy

A national competition policy is also currently under preparation.

CONCLUSION

The pieces of legislation that have a bearing in the management of Biotechnology or Biotechnology products in the Seychelles have been identified and discussed above. A number of provisions in the existing legislations offer to some degree protection and safety to human health, food safety and the protection of the local biological diversity. These, however, are rather inadequate. Seychelles lacks an enabling legislative framework in the area of Biosafety. As the existing framework fails to cover new and emerging issues particularly that of Modern Biotechnology. More importantly it has limited technical capacity and institutional limitations to address a number of concerns in the development in that field. Furthermore, the various pieces of legislation are being administered by a number of organisations and departments and which needs to be harmonised as the current administrative system is rather fragmented and uncoordinated. The National Biosafety Framework is currently developing a draft Biosafety legislation that will propose to facilitate implementation of biosafety with a more coordinated permit. enforcement and monitoring system.

8.0 SEYCHELLES BIOSAFETY POLICY ON IMPORTATION OF GMOS OR GMO PRODUCTS

8.1 Introduction

Over the last 25 years biotechnology has undergone major developments. These developments have taken place rapidly worldwide, and this progress seems sure to continue for a long time to come. In Seychelles even before we were made aware of it, we were utilizing two of the products resulted from Modern Biotechnology in the Health sector: Monotard Insulin, and Hepatitis B vaccine. The two products are being widely used and, according to Department of Health they are much preferred to the past types. It is very possible due to our direct commodity import with GMO producing countries such as South Africa, India, China for vegetables and vegetables products we might have been exposed to other commodity imports that are products of Modern Biotechnology.

8.2 The Mission

- Ensure effective regulation to provide a high level of protection to the environment and human health;
- Provide accurate and updated information to the public in a timely manner;
- Ensure effective decision making through a coherent and transparent system

8.3 Government Goals for Biosafety and the use of Modern Biotechnology:

- To ensure that human health and the environment are safeguarded, in particular through a rigorous, efficient and transparent system of regulation and administrative systems for use and application of Modern Biotechnology and its resulting products;
- To ensure adequate capacity building in the safe use and handling of modern biotechnology and its products;
- To ensure that the general public has access to information about modern biotechnology including, the potential risks and benefits of GMOs;
- To maintain the ethical standards through active public participation in decision making;
- To enhance economic benefit through the development of sustainable agriculture;
- To ensure that public is informed on what they consume and utilize and the right for them to make a choice.
- To ensure public confidence in the way risks are assessed and managed;

8.4 Policy of Modern Biotechnology and Biosafety in the Health Care

The application of modern biotechnology knowledge in the health care sector has already led to new methods of diagnosis, prevention and treatment of diseases such as Diabetes and Hepatitis B in Seychelles. The importance of biotechnology for health care in Seychelles is expected to increase further with the several hundreds health care and

pharmaceutical products currently in clinical testing stages or awaiting approval in the United States, Canada, the EU and other 'modern biotechnology advanced' countries.

However, assessment of impacts on change in health care, risk perception, acceptance of biotechnology, legislation and liability needs to be done as a matter of urgency before widespread use of such products in Seychelles.

Being both a member of WHO and FAO, Seychelles presently uses the CODEX Alimentarius guidelines as well as the WHO guidelines for the harmonization of safety assessments of foods in international trade. Presently, the government is in agreement on the way in which food safety is guaranteed and assessed by international organisations. The government is currently adopting the standards formulated in CODEX when it comes to GMOs in food, and FDA for drugs and other pharmaceutical products. With new research and discoveries taking place in the medical sector, the government will remain on alert to address any potential harm that GMOs or products may have on human health. The government would react appropriately to any proven danger in that field and would not hesitate to review its policy vis a vis GMOs in the Pharmaceutical and medical sector.

8.5 Policy of Modern Biotechnology and Biosafety in Agriculture

In the field of plant improvement and cultivation this development in knowledge means that the genetic origin of valuable qualities can be quickly identified, thus, enabling plants and trees to be improved in shorter times that were previously possible. Two trends of applications have been recognised as potential opportunities to improve the local agricultural sector:

1. The improvement of characteristics important to commercial production, such as the building-in of resistance genes in order to reduce the use of, and dependence on synthetic plant protection such as herbicide and insecticide, or to increase yield

2. The introduction of genes to improve quality, such as a longer storage life, or improvement in nutritional compositions.

The same knowledge can also be used in animal breeding to select the desired genes for breeding animals, build in resistance or to improve livestock's meat, or even improve on products produce in aquaculture.

In any case before the introduction of Modern Biotechnology or its products in the field of Agriculture, all procedures mentioned in the Risk Assessment and Risk Management must be met, as well as compliance with any relevant national laws related to the intended development.

8.6 Policy of Modern Biotechnology and Biosafety in Industry

In the processing industry, the use of biocatalysts enables production in more selective manner. Direct application of Modern Biotechnology in the Environment Sector in the cleaning technology, to locate contamination, to improve waste management are areas of opportunities for Seychelles.

Before the introduction of Modern Biotechnology or its products in the above field, all procedures mentioned in the Risk Assessment and Risk Management must be met as well as fulfilling all the conditions of the Existing Environmental Impact Assessment in the EPA and any other relevant national law and procedures.

8.7 Policy of Modern Biotechnology and Biosafety the Social & Ethical Environment

The apparent endless and more or less rapidly realizable possibilities of genetic modification raise many questions. On the one hand, they promise many developments, such as new medicines and a reduction in the use of plant protection products. While on the other hand, some applications raise the question of whether everything which is technically possible is also desirable, safe and acceptable in social and ethical terms. These questions are becoming increasing pressing in the recent years as more products of Modern Biotechnology are appearingly on the market. The world have passed the stage of the first laboratory experiments in the 1970s and the first field trials in the 1980s;now we are confronted with actual products, such as foods and medicine, that are available to the consumers.

In order to protect the individual consumer choices, the population must at all times be informed of what they are consuming. The population must be sufficiently equipped through vigorous public awareness programmes in order for them to make informed decisions based on choices, and should be at any given time be able to identify such products.

8.8 Advance Informed Agreement (AIA) procedure

The Cartagena Protocol on Biosafety's general scope includes the transboundary movement, transit, handling and use of all LMOs that may have adverse effects on the conservation and sustainable use of biological diversity, taking into account also risks to human health (Article 4). However, some categories of LMOs or transboundary movements are excluded by the protocol. In some cases the exclusions are limited to specific provisions relating to the AIA procedure, while in others they are not covered by protocol's provisions.

For Seychelles, all GMOs (LMOs and products of LMOs) will be subjected to regulations under our national legislation through appropriate AIA procedures. This will remain in application until sufficient scientific evidence proves otherwise. Even when certain GMOs are excluded from the Protocol's provisions, in the context of Seychelles they may still be subjected to national regulations depending on decisions made nationally. Such decisions will be made available to all parties on the BCH.

The AIA procedures will only apply to the first occasion that a GMO is intentionally moved into Seychelles from any exporting countries or exporting parties.

8.9 The Competent Authority

In line with Article 19, The Ministry responsible for Environment in Seychelles which also house the Focal Point for the Convention for Biological Diversity and the Cartagena Protocol for Biosafety will be responsible for performing the administration functions required by the Protocol, and is authorized to act on behalf of Seychelles with regard to those functions (as per Article 19).

8.10 Notification and information

All GMOs subjected to transboundary movement into Seychelles must be notified to the Government of Seychelles. Depending on the nature of the GMO different set of information will be required (to be featured in the Biosafety Act). Such information would be revised from time to time in line with new knowledge in the field.

8.11 Decision for Importation

In line with the Protocol Seychelles within 90 days of receiving the notification, would acknowledge receipt. Within 270 days of receiving the notification, Seychelles will communicate its decision to the Applicant and to the Biosafety Clearing House established under the Protocol. In its decision, Seychelles may either:

- Approve the import of the GMO, with or without conditions;
- Prohibit the import of the GMO;
- Request additional information; or
- Inform the Applicant that the import decision will be taken within a further defined period of time.

8.12 GMOs not subject to Protocol AIA provisions

The protocol's specific AIA procedure does not apply to the transboundary movements of following GMOs in Seychelles:

- GMOs in transit,
- GMOs for contained use,
- Approved GMOs for the pharmaceutical use (see chapters below).

Instead, the national laws make provisions for a simplified AIA procedures to apply for such products (refer to paragraphs below). This exclusion also does not affect the right of Seychelles to review its decision when reliable scientific information becomes available concluding otherwise.

8.13 GMOs in transit

The Protocol does not make provision for a specific AIA procedure for GMOs in transit. Seychelles being a small island development states is highly vulnerable to the introduction of invasive organisms. It has limited human resources to conduct eradication once organisms are established in its natural environment. Thus, the authority has decided to regulate the transportation of GMOs transited in Seychelles territory. The Applicant will just have to produce a simple notification document for the GMO is question (format to be developed). Seychelles will also make available to the Biosafety Clearing-House its decisions regarding the transit of specific GMOs through its territory.

8.14 GMOs destined for contained use

Even if the Protocol's AIA procedure does not apply to the transboundary movement of GMOs destined for contained use, this would be undertaken in accordance with the standards of the Seychelles Bureau of Standard for research purposes (SBS Act). It is noted that contained use is defined in Article 3 (b) of the Protocol to include activities in which GMOs are controlled by specific measures that effectively limit their contact with, and their impact on, the external environment.

8.15 GMOs intended for direct use for food, feed or for processing (GMO-FFPs)

GMOs use for food, feed or for processing covers activities such as genetically modified agricultural commodities, such as GM Maize or GM soybeans for food or feed use. GMO-FFPs in Seychelles are subjected to the same AIA procedure set out in the Article 4 of the protocol. In principle such products were not meant to be planted into the natural environment, but in the context of Seychelles it is without doubt that such products will be planted mostly in back yard farming. Thus, a full AIA would be required for GMO-FFPs with prior consent for import of GMO-FFPs to be included in the national legislation. Such laws and regulation will be made available to the Biosafety Clearing House .

8.16 GMOs for pharmaceutical use that are addressed by other relevant international agreements or organizations

Under Article 5, these GMOs as long are they are addressed by other relevant international agreements or organizations are excluded from the AIA procedure, and from the other provisions of the Protocol related to transboundary movement. The definition for Pharmaceutical products in Seychelles is adopted from The 1970 Pharmaceutical Inspection Convention which defines "pharmaceutical products" as any medicine intended for human use or veterinary product administered to food-producing animals, presented in its finished dosage form or as an active ingredient for the use of such dosage form, that is subject to control by pharmaceutical legislation in both the exporting State and the importing State.

Due to our high dependence of medical, health care and pharmaceutical products from external, and with our limited capacity to conduct tests on medical products, the government is in agreement to follow the World Health Organisation (WHO) guidelines on the Certification Scheme on Pharmaceutical Products Moving in International Commerce.

The following certification is required for those pharmaceutical Products:

1. "the specific product is authorized to be placed on the market within the exporting country jurisdiction or, if it is not thus authorized, the reason why that authorization has not been accorded";
2. "the plant in which the pharmaceutical product is produced is subject to inspections at suitable intervals to establish that the manufacturer conforms to Good Practices in the Manufacture and quality control of drugs as recommended by WHO";
3. "all submitted product information, including labelling, is currently authorized in the certifying country".

The WHO Certification Scheme is consistent with the provisions of The 1970 Pharmaceutical Inspection Convention which Seychelles is a party to.

GMOs for pharmaceutical use not approved by a recognised, reputed by relevant international agreements or organisations will be subjected to the full AIA procedure (Article 4 of the Protocol).

8.17 GMOs identified by the meeting of the Parties to the Protocol as being not likely to have adverse effects.

Based on Article 7(4) of the Protocol, Seychelles may decide to exclude specific GMOs or categories of GMOs from the application of the AIA Procedure, as and when decided by the Meeting of Parties. This would take into account of developments in the future if and when certain GMOs have been shown to be sufficiently safe to exempt their transboundary movement from the AIA procedure.

8.18 Biosafety Clearing-House (BCH)

Under Article 18 (3) The protocol establishes a Biosafety Clearing-House to facilitates the exchange of scientific, technical, environmental and legal information on, and the experience with GMOs to assist parties to implement the protocol Seychelles as a party to the protocol will have to identified a Focal Point for the BCH and make available the following information amongst other:

- To declare that Seychelles' requires notification and risk assessment prior to the first import of a GMO-FPP;
- National decisions taken with regards to GMOs in transit, contained use and for pharmaceutical use;
- Laws, regulations and guidelines for implementation of the protocol;
- Any Bilateral, regional and multilateral arrangements Seychelles may have in relation to GMOs and Biosafety;
- Seychelles decisions on import or release of GMOs;
- Summaries of risk assessments or environmental reviews of GMOs generated by the Seychelles regulatory process;
- Any cases illegal transboudary movement of GMOs to Seychelles;
- Any other relevant information that may be useful to share with other parties with regards to GMOs and Biosafety

8.19 Illegal Cases, Liability and Redress

Seychelles will adopt in our national legislation measures to prevent and penalize transboundary movements of GMOs that occur in contravention of its domestic measures in implementing the protocol.

In the case of such illegal movements, the Seychelles will request the Party of origin to dispose of the GMOs by repatriation or destruction.

Seychelles awaits the decision of the Meeting of Parties to adopt a process with respect to the appropriate elaboration of international rules and procedures for liability and redress for damage arising out of the transboundary movements of GMOs.

9.0 The Administrative System to address GMOs in Seychelles

9.1 The National Biosafety Structures

The National Biosafety structures under the present National Biosafety Framework are the structures required and relevant to the effective implementation of requests and applications involving Modern Biotechnology and its resulting products. Due to resources constraints (mainly financial, infrastructural and human resources) most of the structures proposed in this chapter are already in existence, but will be modified to also include the roles and responsibilities associated with Biosafety. These structures and their supporting procedures are all in compliance with The Cartagena Protocol on Biosafety, but tailored specifically for practical and local implementation based on national competences.

9.2 The National Competent Authority

The National Competent Authority for implementing the Cartagena Protocol for Biosafety in Seychelles is the Ministry responsible for the portfolio of Environment. This ministry also administers the Convention of Biological Diversity (CBD). It is the same ministry that has been identified to administer the implementation of the present National Biosafety Framework and the Biosafety Act (under development). At present the ministry in question is referred to as the Ministry of Environment and Natural Resources (MENR). As functions this ministry is responsible for exercising the administrative functions required by the Cartegena Protocol, and is mandated to act on behalf of the Seychelles' Government to the following functions:

- Receive notification of transboundary movement of GMOs and products of GMOs that fall within the scope of the Biosafety Act (under development);
- Acknowledge receipt of notifications;
- Request further information from Applicant(s), when and if necessary;
- Communicate the country's decisions to Applicant(s) and the Biosafety Clearing House Mechanism(BCH) with reason(s) where required;
- Respond to request by the Parties of export or Applicant (s) to review decisions;
- Consult with the Applicant (s), where necessary, on treatment of confidential information;

The MENR is responsible for carrying out administrative functions under the Cartegena Protocol and is also responsible for liaising with other parties. The decision-making process in the National Biosafety Framework will constitute of a wide range of representatives from national authorities, departments and other stakeholders. They will be represented on a **National Biosafety Board.** The National Biosafety Board will receive inputs and advices from the **Advisory Bodies, Public groups** and **Inspectorate Committees**. The Biosafety and the Biosafety Administration office will be located in the office of the Division of Nature and Conservation within the Ministry of Environment & Natural Resources. This office will be responsible for conducting the above mentioned administration duties.

9.3 The Biosafety Administration Office

Due to financial implication on setting up a new registrar for receiving notifications, Seychelles has decided to use the Office of the Focal Point to the Cartagena Protocol as the Biosafety Administration office and the location of this office is mentioned in section 10.1.1 above. Such decision is to facilitate reporting, posting information to the BCH and receiving updates on new development with regards to the protocol. The roles and responsibilities of this office will be as follows;

- Receive official notification (s) and be the entry point for all GMO applications. The officer responsible shall ensure that legal requirement regarding accuracy of information is provided and respected by all Applicants;
- Ensure that safety and socio-economic reviews are undertaken and that the public are consulted in the decision making process on all applications.

- Coordinate meetings of the National Biosafety Board and the Biosafety Advisory Committees and issues permits and rejection letters on applications at the request of the Board;
- Respond to national, regional and international queries and keep record on all GMO issues and activities, and simultaneously keep and maintain a database on all products containing GMOs produced or imported into Seychelles;
- Verify the content of the notification to ensure that the information specified by the regulations is contained at a minimum, in any of the Seychelles official languages (English, French and Creole).
- Provide official acknowledgement of receipts of the notification and communicate the decision taken on the notification the Applicant(s) and BCH.

In line with the Protocol the Biosafety Administration Office shall issue acknowledgement letter stating:

a) The date of receipt of the notification;
b) Whether the notification, *prima facie,* contains the information referred to in the Biosafety Act;
c) Whether to proceed according to the Seychelles regulations.

The acknowledgement will identify the next steps in the process, and will confirm the date upon which the 270-day period begins within which Seychelles should reach a decision on the proposed import or local development of the GMO in question.

9.4 The National Biosafety Board

The decision making body for the implementation of the National Biosafety Framework will be the National Biosafety Board. It will comprise of highly technical personnel coming from relevant sectors and stakeholders as requested by the Cartagena Protocol for Biosafety. The Board which will be composed on not more than 11 members from a wide range of national authorities including representatives from the Health Sector, Environment, Agriculture, Economic Planning, Commerce, the Private sector, the National Consumer Forum, Import and Export regulators as well as representatives from the General Public. The Board will elect a chairperson, a vice chairperson and a secretary during its first official meeting. The members of the Board will be nominated by their respective ministers or head of organization, while the Minister responsible for the implementation of the Cartagena Protocol will nominate the non-governmental organizations and individuals from the private sector.

The National Biosafety Board will set up the procedure for consultations with other advisory bodies whenever required before any decision on a proposed import, research, field trial, release or place on the market of a GMO or a GMO product will be taken. The decision taken by the Board will then be endorsed by the Minister responsible for administering the Cartagena Protocol for Biosafety.

The National Biosafety Board will make all decisions regarding GMOs in Seychelles. The specific terms of reference will be established in the Biosafety Act. Key stakeholders shall be represented on this decision making body as Board Members. Members of the Board must be persons of credibility and free from any conflicts of

interests. The decisions of the body shall be based on recommendations of the Advisory Committees and public input. The Board shall operate independently of any manipulation. The source of funding for its functioning shall be drawn from the service fees and government funding.

9.5 The Biosafety Advisory Bodies

The setting up of several smaller committees of scientific, socio-economic, ethic and public interest experts are preferred over a big committee due to the wide range of GMOs and GMO products. The roles and responsibilities of the Advisory Committees are listed below:

- Conduct the biosafety reviews of applications and make recommendations on the various concerns in relation to the risks and risk management conditions for each permit to the National Biosafety Board;
- Provide technical support to the Administration Office and assist with the reviewing of guidelines, regulations and legislation;
- Assist with training on relevant issues to build local capacity;

The Biosafety Advisory Bodies will have access to a wide pool of reviewers (both locally and international) to cover specialist sections of any application on both safety and non-safety issues during the (socio-economic) reviewing processes. Comprehensive reviews shall include safety and non-safety issues and will be undertaken on applications when necessary. Recommendations made will be conveyed to the National Biosafety Board. This process would ensure that all concerns are taken onboard during decision making on applications.

9.6 Appeal System

An appeal process will provide a mechanism to appeal any decision(s) by the National Biosafety Board. All appeals should be made to the Minister responsible to implement the Biosafety Framework and legislations. This process will be embedded in the Biosafety Act and will be opened and accessible to all stakeholders. Provision for a second review, totally independent of the first review may be allowed within the appeal process. The appeal process will be stringent so as not to be subjected to manipulation, but yet accessible and user friendly so as not to discourage appeals, particularly from the public.

9.7 Inspection Services

Approvals for granting GMO activities and/or products containing GMOs in Seychelles will contain conditions, including risk management that need to be applied and will be restricted to a duration not exceeding 5 years. Approval may be renewable subjected to compliance with the conditions. Inspection services will check to ensure that the activities are carried out in accordance with the permit requirements and the Biosafety Act. Senior members of the Inspectorate teams will sit on an advisory committee for reviewing application(s) and should be conversant with both the local requirements as that of the protocol. They should also be competent in assessing the level of compliance and any unintended socio-economic effects.

9.8 The Notification Process

Procedure for Launching a Notification

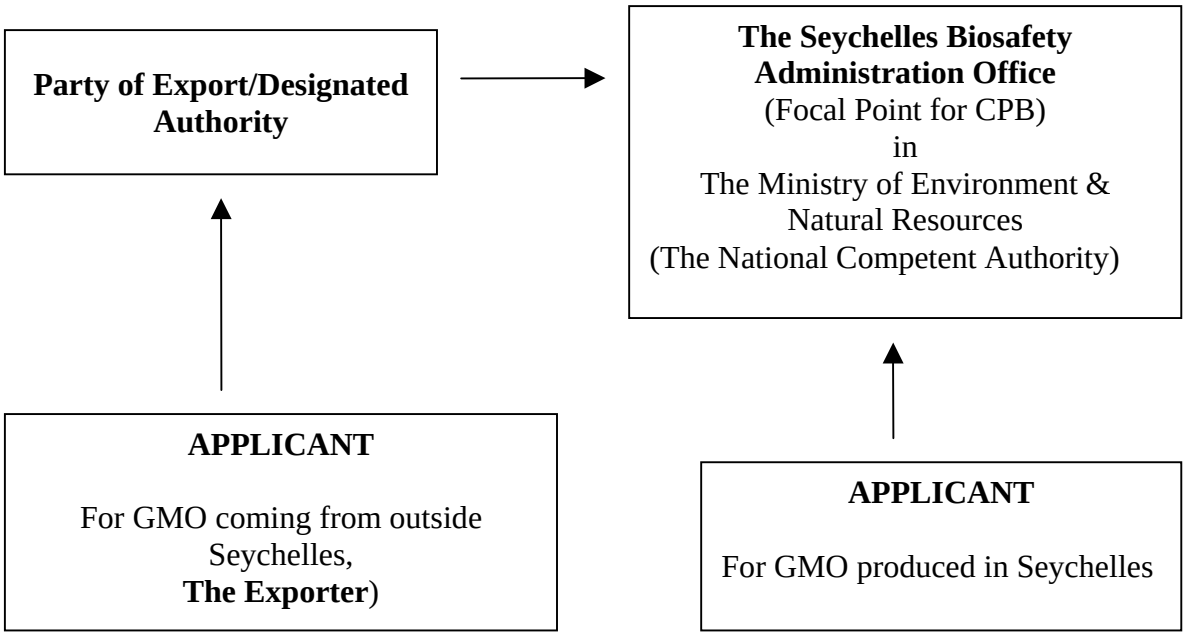
Before the first transboundary movement of a GMO or a GMO product regulated by the Biosafety Act is destined to arrive in Seychelles, or a local development of GMO is initiated a notification must take place.

The Party of Export/designated authority or the party developing the GMO locally (Applicant) will have the legal obligation under the Biosafety Act to ensure that the National Competent Authority of Seychelles (through the Biosafety Administration Office) receives notification of the proposed transboundary movement or the proposed local development. For request from outside Seychelles the Notification must come from the party of export (mandated under the Cartagena Protocol) or designated authority (for countries not a party to the protocol).

All Notifications must be made to the Biosafety Administration Office (The office of the Focal Point for Biosafety, Division of Nature & Conservation), and shall be accompanied by the appropriate processing fee to be specified by the Biosafety Act.

A Notification must contain, at a minimum, the information specified in the Biosafety Act. In the case of transboundary movement, the Notification should be launched through The Party of Export. The Party of Export must ensure that legal requirement is imposed for the accuracy of information provided by the exporter. The language of the Notification can be in any of the Seychelles official languages (English, French and Creole).

The FIRST points of communications for importation/local production of GMOs & GMO products in Seychelles



9.8 Acknowledgement of Receipt of Notification

1. The Biosafety Administration Office will acknowledge receipt of the notification, in writing, to the Applicant to the Party of Export or the Applicant (if local) within ninety (90) days of its receipt.

2. The acknowledgement shall state:

(a) The date of receipt of the notification;
(b) Whether the notification, *prima facie*, contains the information referred to in the Biosafety Act;
(c) Whether to proceed according to the procedure described in the Biosafety Act (AIA procedure);
(d) Confirms the date upon which the 270-day period begins within which Seychelles should reach a decision on the proposed application;

3. A failure by the Biosafety Administration Office to acknowledge receipt of a notification shall not imply its consent to the notification.

9.9 Decision Procedure

The Biosafety Administration Office within 270 days will inform the Party of Export or the Applicant (if request is made locally) and the BCH, in writing whether the intentional boundary movement or the local development of the GMO or GMO products may proceed.

The number of days the Biosafety Administration Officer has to wait for additional relevant information will not be included in the 270 days.

This writing response will include the following:

(a) Approving the import or local development, with or without conditions, including how the decision will apply to subsequent imports or local development of the same GMO or GMO products;

(b) Prohibiting the import or local development;

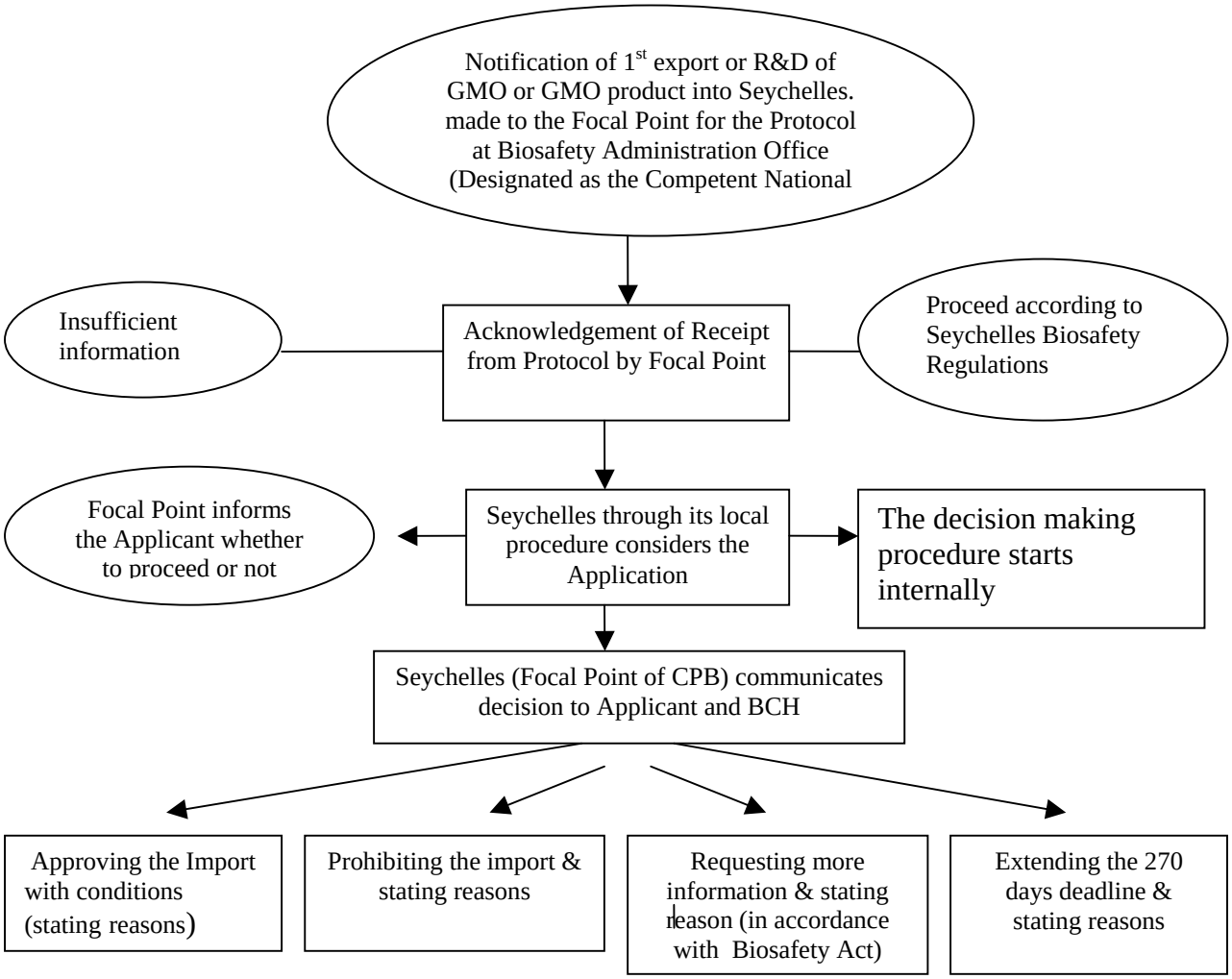
(c) Informing the Party of Export/designated authority or the Applicant that the period specified is extended by a defined period of time.

Except in a case in which consent is unconditional, a decision will set out the reasons on which it is based;

A failure by the Biosafety Administration Office to communicate the decision within 270 days of the date of the receipt of the notification will not imply its consent to go ahead with the transboundary movement or the local development of the GMO or GMO products;

Lack of scientific certainty due to insufficient relevant scientific information and knowledge regarding the extent of the potential adverse effects of a GMO (or GMO product) will not prevent the National Biosafety Board from taking a decision, as appropriate, with regards to the import or the local development of a GMO or GMO product in question, in order to avoid or minimize such potential adverse effects.

The Administrative Steps involve in the NOTIFICATION process of a new GMO in Seychelles

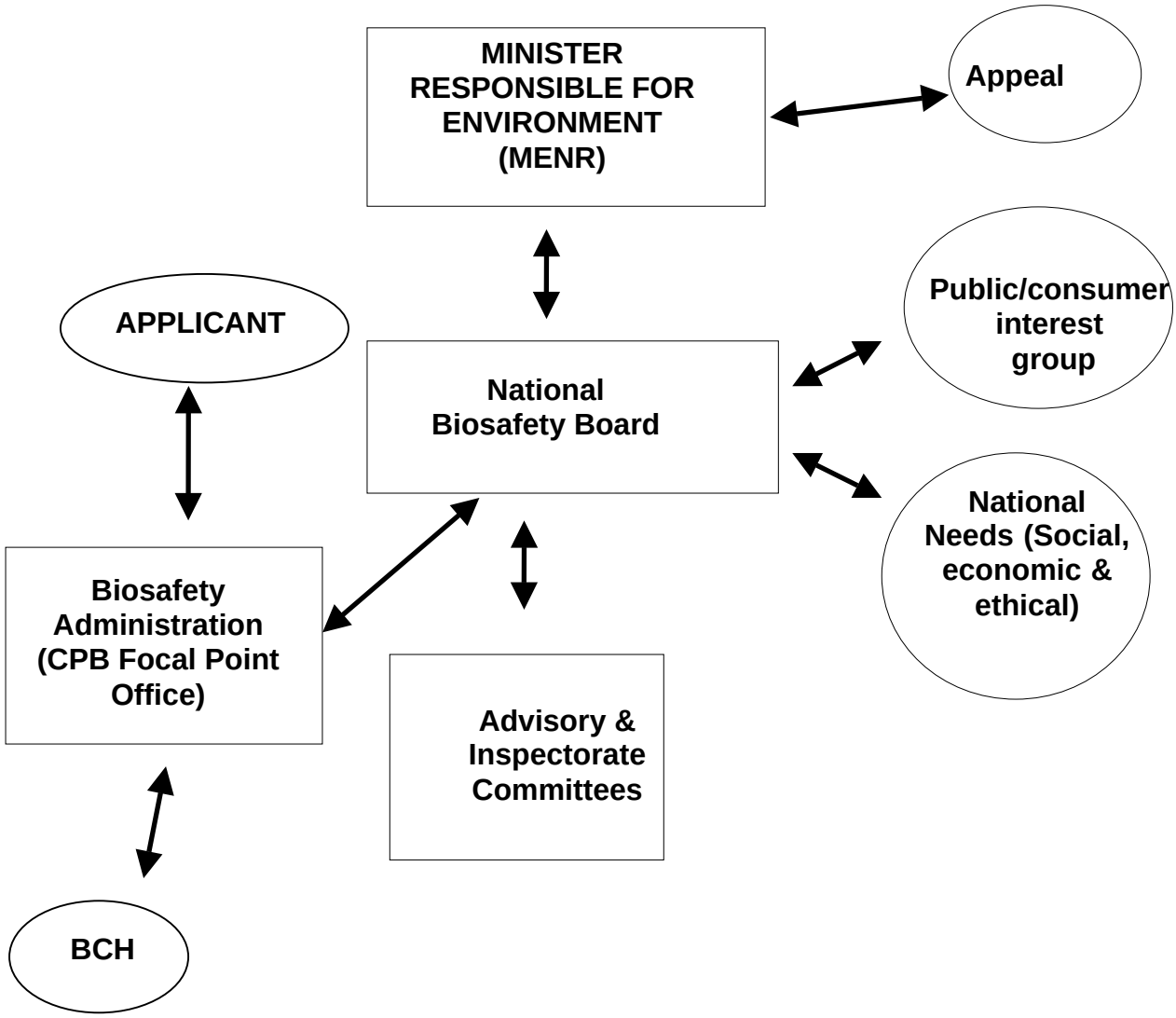


9.10 Summary of the Administrative Process

After acknowledging the Notification by the Biosafety Administration Office to the Applicant, the document will be sent to the National Biosafety Board (NBB) within a week from the acknowledgement date. After reviewing the Application the NBB will appoint experts to review the risk assessment of the Application produce by the Applicant. In the case where expertise is not available in Seychelles the rooster of experts on the BCH will be consulted for possible international assistance to review the risk assessment document. The NBB will also send the document to the consumer and public group for them to give their views and comments, as well as to the relevant authorities for assessment of the socio-economic and ethical impacts.

The results of the various risk assessment reviews should be sent back to the NBB. After thorough analysis of the comments received the NBB will make a decision on the application. The decision will then be communicated to the Minister responsible for Environment (MENR) for endorsement. Following its endorsement by the Minister, the decision will then be communicated to the Biosafety Administration Office. The Office will then inform the Applicant of the decision. All appeal shall be made to the Minister responsible for Environment (MENR) within two months of the receipt of the decision.

In the case that approval is granted the relevant body (ies) of inspectorate shall be involved in control, enforcement and monitoring of the conditions and progress. Periodic reports and findings shall be communicated to the National Biosafety Board.



10.0 Risk Assessment and Risk Management

10.1 Knowledge of risks base on Science

Before Seychelles decides to import ANY GMO and/or promote the application of modern biotechnology locally, the people of Seychelles have to be aware *as far as possible* of the following:

- The effects of both intentional and unintentional release and;
- The possible harmful effects of the GMO or the technology that may impact on human health and on the natural environment of the country.

This applies to GMOs as commodity imports, research, field and laboratory tests, as well as in any other forms of introduction into Seychelles.

The knowledge on all the effects of modern biotechnology and its applications is necessary for the Government and the people of Seychelles to have in order to allow them to make proper founded scientific decision of the risks, the chances that something untoward may happen and the nature and intensity of the consequences.

Each decision will be made based primarily on the scientific knowledge available at the time of the application. As a result, all available knowledge in various disciplines should be increased through capacity building programmes. The government realizes that it is impossible to achieve zero risks. Therefore, the continuous flow and exchange of the information will result in knowledge increase. This knowledge will allow maximum transparency in research and policy formulation. It will allow responsible decision making on applications and close monitoring and enforcement which would serve to keep these risks at a minimum.

10.2 Risk assessment – Who does it?

The National Biosafety Board of Seychelles will have the mandate to make decisions on GMO applications. In order to assist the board to come up with well-informed decisions, pools of expertise on specific requests of the Applications will be brought together on committees called Advisory Committees. One of the main roles of the Advisory Committee is to review the applications and to come up with recommendations and advice. The Applicant should produce a Risk Assessment document based on the requirement of the Biosafety Act. The NBB and Advisory Committees will only review the Risk Assessment document and come up with recommendations or decisions whenever appropriate. In the case that more information is required, the onus lies with the Applicant to provide the required information. Shall there be a need to make specific tests or independent reviews, all costs shall be borne by the Applicant.

Although, not always required, expert committees offer an invaluable adjunct to members of the National Biosafety Board. They not only expand the pool of expertise brought on specific issues, but also provide stimulating debate around the limitations of scientific data to arrive at conclusions and the uncertainties that must be considered. There is limited supply of national experts in Seychelles and it is particularly challenging to find reviewers/assessors without conflict of interest. At present, Seychelles seeks support of other SIDS countries for

regional cooperation and the use of experts from larger international communities. With the issues of the Biosafety Act and Biotechnology this will be no exception and Seychelles will continue to seek international support to effectively ensure that unbiased risk assessments are made. Capacity building in the field of risk assessment is of overriding importance to Seychelles. It is noted that at the moment, Seychelles, cannot afford the cost of assembling such experts as well as the cost to conduct assessments. In such instances Seychelles will have to seek support from the international community to meet such costs.

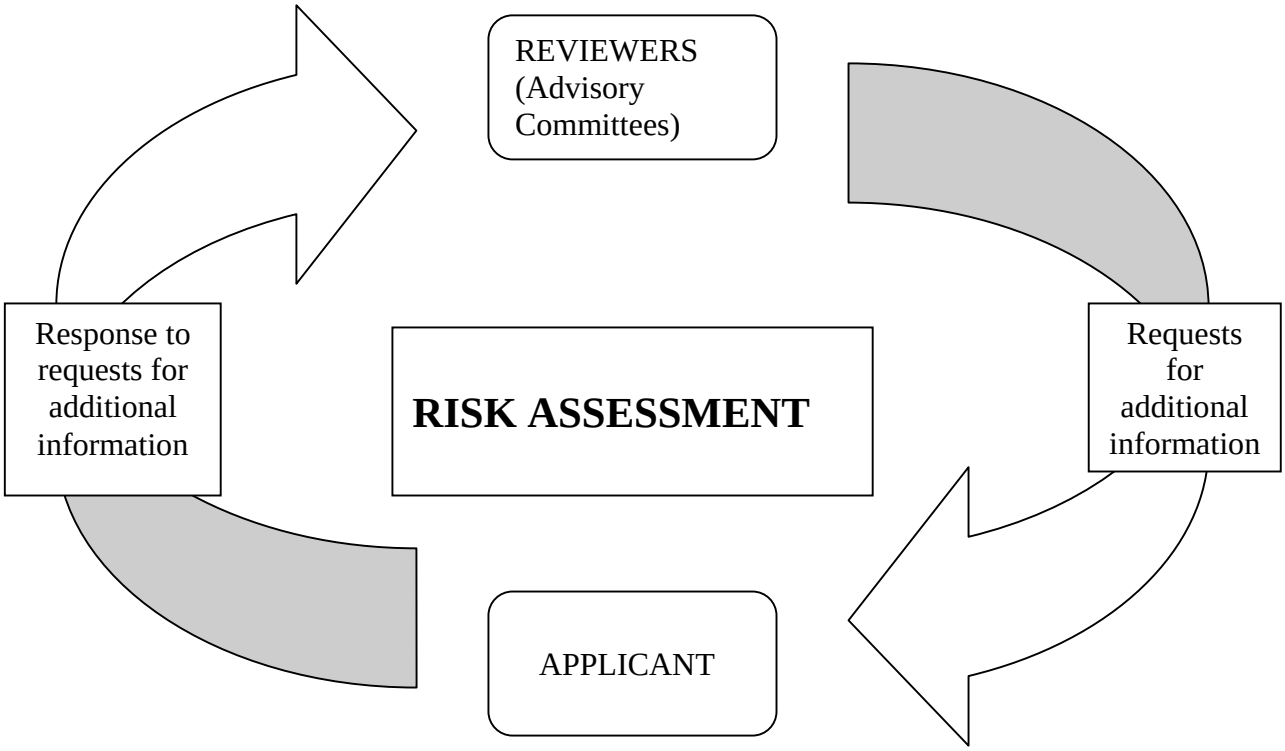


Figure 4: Risk Assessment: an interactive process between reviewers and applicant

10.3 The need to weigh the Risks against the Benefits

As Seychelles is a Small Island Development State (SIDS), it is absolutely necessary for a proper assessment of the possible risk of any introduction of GMO against its intended benefit to the society. The areas in Seychelles that warrant risk assessment to be carried out are health and GMO release into the environment where the potential risks are often considered irreversible. When these benefits outweigh the potential risks, the products may be considered acceptable. Seychelles, being a SIDS, with a fragile economy base on its limited local natural resources, it is very important for the country to take extra precaution with regard to risks especially when alternatives are already available.

10.4 Risk Assessment - "case by case' and "step by step" approval

The Government of Seychelles firmly believes that Risk Assessment of GMOs either for consumption, field trials or commercial release should take place using a "case by case" and "step by step" assessment techniques method. This means that each use of GMOs in a permit application will be judged separately and that the risk assessment is geared to the specific situation of the GMO application. It also means that a permit application must be accompanied by a detailed profile of the GMO and a detailed description of the proposed procedures with the GMO as will be listed in Annex I of the Biosafety Act.

10.5 Procedures for Risk Assessment

The risk assessment will begin with an identification of potential harmful effects on human and the environment resulting from the introduced genetic properties, the organism used the specific application and the circumstances under which the application will be used in Seychelles. The possibility of unintended uses will also be taken into consideration. Any harmful consequences for human and the environment will be regarded as including the effects on both natural and agro ecosystems and safety to animal feed. The identification of harmful effects will be followed by an estimate of probability that such an effect will occur. The ultimate risk will be decided on a combination of the gravity of the effects and the probability that they will occur. Therefore, the heavier the gravity of the effects or greater the probability that the risk will occur and the higher are the risks, then the higher are the chances that the GMO or GMO products will be refused to be intentionally introduced in Seychelles.

Uncertainties are likely to be encountered when estimating the possibility of a certain effect occurring; such as the possibility of a gene (such as an antibiotic – resistance gene) being transferred from a genetically modified plant to another type of plant or to bacteria. If no adequate data is available to estimate the change of such a cross-breeding or transfer, then it will be assumed that cross-breeding or transfer will take place, and thus, it would be essential to know the effects of it. In such cases, therefore, the Seychelles will adopt a worst case approach.

10.6 Assessing Risk to Seychelles Ecological Environment

The possible effects of GMOs and GMO products on the local ecosystems will be considered when assessing the risks to humans and the environment. The knowledge and experience acquired by local farmers and/or Environmentalists through the cultivation of certain food crops or propagation of invasive alien species for instance will be considered useful in making a responsible estimate of the ecological effects of a proposed genetically modified crop.

By combining practical knowledge and experience with available information given or obtained during the "step by step" method and the development process of the GM crop, The National Biosafety Board will be able to make an estimate of the possible risks that the introduction or market approval could bring to the ecosystem.

However, on the other hand, it is widely recognized that the current knowledge of ecology in Seychelles is very limited to safely allow any large-scale field trials or market

approval. It is believed that more research is required on the possible effects of GMOs on the tropical ecosystems, especially into the country which the GMOs are to be introduced. Furthermore, Seychelles believes that extreme precaution should be taken to prevent irreversible situations. In general fundamental knowledge of tropical ecosystems and possible ecological effects of GMOs are limited. Extension of the knowledge on the possible effects of GMOs on the tropical and ecological systems is expected to continue and expand in Seychelles. At this juncture, it is noted with regard to the manageability of any ecological risks that there are important differences between various organisms, besides actual genetic modification. Such differences will be taken into consideration in the assessment of ecological risks.

10.7 Assessing risk in the Medical Sector

Due to our high dependence of medical, health care and pharmaceutical products from external, and with our limited capacity to conduct tests on medical products, the government is in agreement to follow the World Health Organisation (WHO) guidelines on the Certification Scheme on Pharmaceutical Products Moving in International Commerce.

The following certification is required for those pharmaceutical Products:

4. "the specific product is authorized to be placed on the market within the exporting country jurisdiction or, if it is not thus authorized, the reason why that authorization has not been accorded";
5. "the plant in which the pharmaceutical product is produced is subject to inspections at suitable intervals to establish that the manufacturer conforms to Good Practices in the Manufacture and quality control of drugs as recommended by WHO";
6. "all submitted product information, including labeling, is currently authorized in the certifying country".

The WHO Certification Scheme is consistent with the provisions of The 1970 Pharmaceutical Inspection Convention which Seychelles is a party to.

10.8 The use of Precautionary Principle

For a small country like Seychelles, a central role in the consideration of risks will be allocated to the Precautionary Principle, as currently being defined in the Cartagena Protocol on Biosafety. This is very important for a small country of only 455 square km and with a high dependence on the local biodiversity for its economic growth and prosperity. Genetic changes are irreversible and by their nature self-reproducing. This is the most important reason why the people of Seychelles should be cautious with the application of Modern Biotechnology products within the jurisdiction of their country.

In Seychelles the risks will be assessed on the basis of available information, or if this is not available, on the basis of a worst case scenario. In the case of an application for the release of a GMO in the environment, then if the risks are regarded as acceptable, permission will be granted for field trials of that GMO first. The introduction will always take place in line with the Precautionary Principle. If sufficient data is lacking then an

acceptable risk level may also be obtained through the imposition of a series of additional regulations, such as confinement of working area, conducting the field trial only at certain period of the year, etc.., and such regulations and conditions can be adjusted in the course of time and as knowledge increases.

10.9 Assessing the risk in socio-economics and ethics

In addition to the scientific issues, for a country with a population of 82,000 people, ethical and social considerations also demand considerable attention. Especially as most of the products that will enter the jurisdiction of Seychelles will be commodity import and would thus, directly influence the consumer market. When addressing the risk assessments in Seychelles, divergent values and interests and issues will be weighed up against each other. The Government is fully aware that some people will judge that for reasons of faith or respect for life. E.g. genetic modification of any organism, whatsoever is not acceptable under any circumstances, while others will, due to the advantages of genetic modification in medical, environmental, industry and agricultural areas, will regard the application of this technology as highly desirable. The Government is aware that such considerations and the resulting choices are far from simple, especially as this technology is quite recent. Such matters will be carefully treated in the Biosafety Act in order to provide the consumers with informed choices.

10.10 Safety and Acceptability

In general, Seychelles recognizes the opportunities that Modern Biotechnology provides for sustainable farming, cleaner production methods, better health care and a better environment. There is no doubt that such opportunities should not be explored. However, these opportunities should be accompanied by optimum safeguards to ensure safety; transparency in decision-making; freedom of choice for the individual; and ethical acceptability. Thus, it is not surprising that Seychelles opted for optimum safety and acceptability to come with every new GMO or GMO product entering the country.

10.11 Approval

(i) Field trials or market introductions into the country will only be permitted if it has been sufficiently shown in a scientific manner that it does not pose any social, economic and ethical threats to the country and its population; and that these trials or introductions constitute an acceptable risk to human and the environment.

(ii) Only when application of the “step by step” method and an exhaustive risk analysis (either by local experts or with the assistance of foreign experts) has reasonably indicated that a GMO or GMO product constitutes an acceptable risk to human and the environment will it be authorized to be placed on the local market.

(iii) If uncertainties in the assessment indicate that the risk may be too great because the effect may be serious and the chance of them occurring are too high, then in accordance with the Precautionary Principle the introduction will not be authorized in Seychelles.

(iv) Since field trials are to be permitted only if the risks are acceptably low this means that a field trial is more likely to be approved if the organism:

a) shows that there is a high degree of certainty about the possible effects on human, and the environment;
b) does not cross-breed with wild relatives of local economic importance;
c) cannot survive unassisted in the environment.

(v) If the reverse situation applies to an organism, approval will not be made. This means that in the case, for instance of a field trial, more data would be needed on the behaviour of the GMO plant in order to judge whether the risks can be reduced to an acceptable level.

(vi) The method of risk assessment will be evaluated and adjusted if necessary. The risk assessment will devote a lot of attention to the possible ecological effects of introducing GMOs into the environment and of market approval of GMOs, while on health products international guidelines and the minimum requirement of the protocol will be used where applicable as much as possible.

11.0 Public Awareness, Education and Participation

In Seychelles every citizen has access to environment, agriculture, health and consumer related information. Such information is even incorporated in the school curricula. Systematic modes of transferring information to the general public through the national media are shown below:

Type of Media	**Name of Programme**	**Length of programme**	**Frequency**	**Sector involved**
The Seychelles Nation (national newspaper)	Environment articles	One full page	Weekly	Environment sector
	Agriculture and fisheries articles	One full page	Fortnightly	Agriculture and Fisheries sectors
	Consumer articles	Half a page	Weekly	Consumers
National Radio (SBC)	Nou Lanvironman	30 minutes	Bi-weekly	Environment sector
	Depans	30 minutes	Fortnightly	Consumers
	Radio clinic	30 minutes	Weekly	Health
	Resours	30 minutes	Weekly	Agriculture and Fisheries sector
National Television (SBC)	Seychelles Que J'aime	35 minutes	Fortnightly	Environment sector
	Resours	35 minutes	Fortnightly	Agriculture and Fisheries sector
	Ou Lavi	35 minutes	Monthly	Health
Newsletters	Enviro	Entire newsletter	Yearly	Environment sector
	Konsomater	Entire newsletter	Twice a year	Consumers

Regular workshops and meetings are held for the four main sector stakeholders to the Biosafety Protocols (Environment, Health, and Agriculture and Social) to encourage public awareness and participation in national policies. Formal structures such as the Youth National Assembly, Senior Citizens Committee, Women's Leagues, Youth Leagues, the Farmer's Association, the Fishermen Association and Young Citizens are among some of the various groups found in the country representing the population structure of Seychelles.

These groups hold regular workshops and meetings where national policies, local developments and other national and community issues are discussed.

Public information on Biosafety and biotechnology in Seychelles is being viewed as information provided to the public about modern biotechnology and the safe use of biotechnology; including the benefits, risks, and systems set in place to promote safety for the environment and human health in Seychelles. Such information is useful

to inform, raise awareness and educate the public, whilst promoting transparency. In Seychelles, good public information leads to public participation, trust and confidence. The four most relevant sector organisation to the Cartagena Protocol on Biosafety in Seychelles enjoy credibility among the public. Thus, for the implementation of the National Biosafety Framework the mentioned organizations will conduct public information and participation programmes. However, these organizations need to enroll on a capacity building programme to be well equipped to provide the public with the right information on the activities of Biosafety and Biotechnology, to the consumers on the scientific, environmental, educational and ecological issues. These organisations should also be well trained to be able to provide such information to the media.

The national media will be used as the principal means to disseminate Biosafety and Biotechnology information to the Seychellois Public. The different political papers will also be used to reach politicians and political activists. The various groups representing the Seychelles' population structures will be used as means for raising public awareness and public participation. Formal educational programme on Biosafety and biotechnology is currently being integrated into the school curricula at secondary and post secondary institutions such as the Farmer's Training Center, National Institutes of Education etc..,

In Seychelles, for the purpose of Biosafety and Modern Biotechnology the public is defined as all the person, groups and institutions who are, and will be affected by the activities of Biosafety and biotechnology within the country. The persons, organizations and institutions can be categorized into the following groups:

- *Users:* Persons, organizations, which will be directly involved in the introduction and use of biotechnology;

- *Consumers*: The end users or consumers of GMOs;

- *Regulators*: Persons and institutions involved in developing rules, regulations and framework to govern the safe handling and use of biotechnology;

- *Implementers*: Persons and institutions with a particular knowledge and training related to the safe introduction, handling and use of biotechnology;

- *Interest groups*: Organizations and institutions in the public and private sectors who have an interest in the development, safe use and handling of biotechnology;

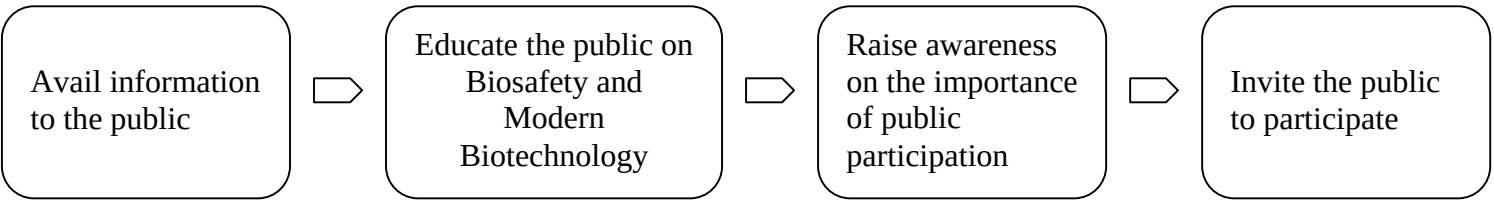
In Seychelles, information is better understood when it is tailored to address the specific needs of the public sector e.g., the consumers' group may have questions and concerns completely different from those of scientists or policy makers. Thus, in the implementation of the present National Biosafety Framework different public awareness information strategies will be developed for the various distinct groups mentioned above. This would allow the public to make inform decisions on issues that concern them and keep them updated on the fast evolving issues of biotechnology in their respective lines of interest. It will enable those who will be involved to learn, create and take ownership of Biosafety and of Biotechnology projects before their
implementation.

The Biosafety Act makes provision for the public to be allowed to participate in the decision making process for GMO application in the following manner:

1. It is mandatory to have a member representative the general public interest on the National Biosafety Board to make decisions on GMO applications in Seychelles.
2. The various public interest groups will participate on Biosafety Advisory committees.

3. General public to be encouraged to provide their comments on GMO applications which be advertised in the media. The document (excluding confidential business information stipulated by the Biosafety Act) will be made available for public inspection for 4 weeks at a designated area as will be advertised.

The authorities should ensure that all provisions of the law ensuring public safety are enforced, special reference is being made to Labeling, Advanced Inform Agreement, and the Precautionary Principle provisions. Below is a diagrammatic representation of
the intended participation process of the public to ensure effective implementation of the National Biosafety Framework



The Table below shows the ways and means of which the basic information of Biosafety and biotechnology is expected to be disseminated to the population by targeting the different public groupings in Seychelles mentioned above.

12.0 Monitoring and Enforcement

According to the proposed Biosafety Act, the Ministry responsible for the portfolio of Environment shall be responsible for the administrative functions required to implement the Biosafety law and consequently, the focal point to the Cartagena Protocol on Biosafety is housed within the Ministry responsible for Environment. The administrative functions include timely notification to other states, the BCH and relevant international organizations of any event in Seychelles involving GMOs.

The effective implementation of the National Biosafety Framework will include monitoring and enforcement of decisions taken by the National Biosafety Board. The Biosafety Act empowers the bodies of inspectorate mentioned below to inspect and monitor the use of GMOs and GMO products in Seychelles:

1. **Department of Finance (Customs Division)** – monitoring of commodity imports and exports, verifying permits and certificates at the ports of entry/exit.
2. **Department of Environment** – monitoring GMOs in the field as field trials, research and commercial propagation.
3. **Department of Health (Division of Community Health)** – monitoring food safety standards, labeling requirements, use of GMOs and laboratory testing.
4. **Department of Natural Resources (Plant Protection Section)** – monitoring GMOs in the field of Agriculture as field trials, research or commercial release, verifying permits and certificates at the ports of entry for plants and plant products.
5. **Department of Natural Resources (Veterinary Section) –** monitoring GMOs in the livestock segment of Agriculture, verifying permits and certificate at the port of entry and conduct fish inspection.
6. **Seychelles Bureau of Standard –** monitoring food standards, research documents as well as verifying laboratory standards (Reference laboratory).
7. **Department of Finance (Consumer Protection Section)** – monitor GMOs and GMO products in the country with the aim of ensuring consumer protection, inspecting goods to ensure compliance with labelling requirements as per the Biosafety Act. Monitoring public awareness and public participation systems and programmes to ensure compliance with the Biosafety Act, the National Consumer Act, the National Biosafety Framework and the Catagena Protocol for Biosafety.

Apart from the present duties of the inspectorate officers mentioned above, these inspectors will be empowered to seize and destroy GMOs or products of GMOs that contravene the law. These powers to be vested into the inspectors will complement and will not affect existing powers to search and seize under the Plant Protection Act, Animal Disease (Import control) Act, Import and Export (customs) regulations, Food Act and Environment Protection Act. The implementation of the Biosafety Act would not require a specialize group of officers to be stationed at the ports of entry to check for GMOs import or inspect field trials or commodities on the market. Instead, the custom officers and officers of Environmental Health and Natural Resources would play an important role in checking certificates and permits for GMO imports. Each department will monitor and enforce the Biosafety Act in its line of duties.

Collaboration and coordination are have been identified as very paramount among the various departments and organisations for GMO identification, risk assessment, and risk

management (DoE, DNR, DoH, DoF, MoEP, NATCOF and, SBS). Such joint efforts are therefore essential for the effective implementation of the Biosafety legislations.

As there were neither Biosafety policies nor legislation in Seychelles before the execution of the National Biosafety Framework project, the above bodies of inspectorate have not yet been trained in GMO detection, field trial, or market release inspection. Intensive training will be required for the mentioned bodies for inspectorate activities. As per the administrative systems, a senior inspectorate officer from each of the mentioned departments and organisations involved in the monitoring and enforcement will sit on the Biosafety Advisory Committees and will also be able to provide practical situation reports on any particular GMO application in relation to monitoring and enforcement. This would ensure effective implementation of the Biosafety Act through an update and informed monitoring and enforcement system. The National Biosafety Board will monitor the enforcement, monitoring systems and mechanisms to ensure its efficiency.

So far no applications for GMO have been received in the country and as a result no permits have been issued yet.

From the Survey results of the Institution capacity it was found out that there are no laboratories equipped enough to conduct or carry out GMO analysis in Seychelles (See Institution Survey result). The closest laboratories that can be enhanced to allow some basic tests to be carried out are the Clinical and Public Health Laboratory in the Department of Health and the Laboratories to monitor standards at the Seychelles Bureau of Standard (would benefit with the use of a PCR , Polymerase Chain Reaction). Seychelles have no University yet to conduct such test.

However, as soon as our Laboratories are equipped even with a PCR, the Ministry of Environment & Natural Resources together with the Ministry of Health and Social Services and the National Consumer Forum will introduce a program for monitoring the presence of genetically modified products in food in Seychelles (especially agricultural products).

Compliance with the Biosafety legislations as well as other related legislations such as the Veterinary, Quarantine procedures, EPA, Food Act, Public Health Act and SBS Act should be permanently and effectively controlled. All the relevant bodies of inspectorate mentioned above should monitor the shipment, propagation, content and use of GMO in Seychelles within their particular mandates. The detailed roles of each body and approaches in monitoring and inspections will be worked out by the individual government institutions (see survey results).

Further monitoring and enforcement strategies will be developed during the implementation of the National Biosafety Framework. These issues will also be considered during the annual reviews of the Seychelles Biosafety Policy.

Any illegal release of GMOs in the environment or on the market will be subjected to a penalty as will be stipulated in the Biosafety Act.

12.1 Monitoring

With regards to monitoring, the Department of Environment will monitor and take measures in order to ensure the project owner abides by the environmental management plan during the project construction, operation, and closure as per the EIA regulations under the Environment Protection Act, 1996. In practice, monitoring and reporting system on any effects to the environment and/or effects to human health and the nature of the GMOs will have to be addressed by the appropriate line ministries and simultaneously with the coordination of a concerted inter-ministerial effort. This would require committed cooperation from relevant line ministries, parastatal organizations, NGOs, media and the private sector.

The monitoring of impact on the environment and human are conducted by the Environmental Impact Assessment Section within the Department of Environment. This section is responsible for carrying impact assessment on any proposed development of projects in the country. This includes GMO field trials projects intended for planting and commercial use in Seychelles.

The Custom Officers, Environmental Health Officers and Natural Resources officers will be responsible to verify certificates, permits of import or export of goods and commodities. If any of these prove to contravene the Biosafety law or any other national legislation, these goods and commodities will be confiscated and will be sent to the relevant departments for further inspection and legal case development.

In the event that there is an unintentional release, the Department of Environment would be the leading organization to ensure risks are immediately contained as soon as the unintended release is known. During normal inspection, the relevant ministries and groups should immediately report to the Biosafety Administration Office who in turn will notify the National Biosafety Board for urgent action, such as risk management and operation of an emergency response plan.

Monitoring areas of priorities shall be:

1. Field trials of GMOs if they have been allowed into the Environment (DoE and NR);
2. GMO in contained use (if they have been allowed e.g. Laboratories) (DoH, DoE and NR);
3. Illegal transboundary movement (Custom, DoE, NR and DoH);
4. GMOs for direct use for food and feed (DoH, SBS, NATCOF and VET);
5. Impact of GMO on Biological Diversity (DoE);
6. GMO in transit (Custom and DoE).

12.2 Enforcement

Enforcement varies according to the nature and intended use of the GMO. The GMO will be subjected to different laws other than the Biosafety laws as the nature of imports and uses of the GMOs could come and be in various forms. Therefore, the different laws that exist in the country will be used. With regard to the Biosafety laws, the following agencies will have the responsibilities in this law to uphold and ensure effective enforcement.

- Ensuring labelling compliance (DoH, NATCOF, DoF and SBS);

- Verification of permits, certificates or letters of approval (Custom and DoE, NR, DoH);

- Ensure safe transfer, handling and use of GMO in Seychelles (All department, NGOs, and parastatals concerned);

- Enforce Advance Informed Agreement procedure with parties and non-parties to the Cartagena Protocol on Biosafety (DoE);

- Enforce fine or penalty for offenders related to the Biosafety Act (DoE and Police Department).

13.0 Seychelles Biosafety Action Plan 2005 - 2010

The Seychelles Action Plan 2005 – 2010 is a set of guidelines for the country to adopt and achieve throughout the coming five years in order for Seychelles to fully comply with the provision of the current framework and the Cartagena Protocol on Biosafety. It was not possible to confirm fundings from International agencies to any of the mentioned actions during the time of the development of the current Biosafety Framework Project. However, being a Party to the Protocol Seychelles is expected to enrol on the Biosafety Clearing House project and the Implementation of National Biosafety Framework Project. In principle the two proposed projects should at least cover the majority of the required International short term funding for Seychelles to put in place the basic requirements of Biosafety.

1.0 Setting up of Biosafety Structures

Objective:
Support the implementation of the National Biosafety Framework through the setting up of the Biosafety Administration systems

Actions

Activities	Funding Agency	Responsible Agency	Verifiable Indicator	Time Frame
To set up and equip a Biosafety Administration Office	Local (Gov.) and International (not yet identified)	National Competent Authority (NCA)	Office up and running	By Dec. 06
To establish a high level Biosafety Board to handling GMO Applications and to advise the Government on Modern Biotechnology issues (including capacity building, research possibilities and priorities, international links, public interest issues and ethical issues),	Local (Gov.)	NCA	Biosafety Board up and running	By Dec. 06
To establish a rooster for experts available in the country that could be consulted to review GMO applications as and when required (to form the Biosafety Advisory Committees).	Local (Gov.) and International (not yet identified)	NCA	Committees set up with experts identified	By June. 06
To facilitate information sharing and access to international pool of experts through the Biosafety Clearing House.	International (GEF)	NCA	BCH being actively used	By Dec. 06

2.0 Establishment of a Public Awareness, Education and Awareness system for Biosafety

Objective:

Increase public awareness of Biosafety in the application of Modern Biotechnology, the potential benefits and risks associated with the technology, and of the regulations, procedures that safeguard the people of Seychelles and the natural environment in order to facilitate informed participation and choices among the public.

Actions

Activities	**Funding Agency**	**Responsible Agency**	**Verifiable Indicator**	**Time Frame**
To set up of a Committee to sensitise the public on the regulations set up for their protection, the content of the National Biosafety Framework, the provisions of the Cartagena Protocol for Biosafety, the way risks are assessed and managed.	Local (Gov.)	NCA	Committee up and running	By June. 06
To set up effective mechanism(s) for public participation in the risk assessment of GMO applications.	Local (Gov.) and International (yet to be identified)	Public Sensitisation Committee	Committee up & running, feedback obtained from public	By June 06
To facilitate public discussions through existing media of public awareness and participations	Local (Gov.) and International (yet to be identified)	Public Sensitisation Committee	Programmes produced, feed back obtained from Public.	Ongoing
To Provide a clear mechanism for public participation in the decision making process	Local (Gov.)	NCA	Mechanism established under the law	By June 06.
To Encourage public contribution to policy decisions through various target groups	Local (Gov.)	Public Sensitisation Committee	Inputs and Feedbacks from public	Ongoing
To ensure that the rights of consumers are reflected in the national decisions	Local (Gov.)	Public sensitisation Committee/NCA	Consumer concerns are reflected in the GMO Decisions	For each notifications as per NBF

3.0 Building of local capacity to handle Biosafety

Objective:

Build human resource capacity and technical competence in all areas of Biosafety (including risk assessment and management, monitoring and enforcement, and Biosafety politics, policies and regulations).

Actions

Activities	**Funding Agency**	**Responsible Agency**	**Verifiable Indicator**	**Time Frame**
To source funding from international organizations and institutions in order to strengthen local human resources capacity in the field of Biosafety.	Yet to be identified	NCA	Funding made available	From Sept. 2005 to Dec. 2010
To encourage and facilitate trainings of Seychellois professionals to conduct risk assessment and risk management in the field of Biosafety.	Local (Gov.) and International (yet to be identified)	NCA/NBB	Trained Seychellois in the mentioned field	Ongoing up to 2010
To provide local and facilitate international trainings for Inspectors who will be involved in field and post market release monitoring.	International (yet to be identified)	NCA/NBB	Trained Inspectors in the mentioned field	Ongoing up to 2010
To provide legal trainings for lawyers and legal officers in the field of Biosafety to better understand the international politics of Modern Biotechnology and Biosafety.	International (yet to be identified)	NCA/NBB	Trained lawyers and legal officers	Ongoing up to 2010
To build partnership with regional and international institutions in order to facilitate short courses, graduate and post-graduate trainings in the field of Biosafety	Regional and International (Yet to be identified)	NCA/NBB	Qualified Graduates and post graduates in the mentioned field	Ongoing up to 2010
To explore the possibility for a Small Island Developing States regional approach to address capacity building where possible.	Regional, Meeting of Parties, International (yet to be identified)	NCA/NBB	Regional agreements signed and exchange programmes running	2006 - 2010

4.0 Strengthening existing local institutional to address Biosafety

Activities	Funding Agency	Responsible Agency	Verifiable Indicator	Time Frame
Government and the local private sector to facilitate the enhancement of technological and institutional capacities in Biosafety.	N/A	NCA/NBB	Institution capacities strengthened	By 2007
Government to ensure that the local requirement in institutional strengthening in Biosafety is brought to the attention of international funding agencies, organisations and institutions and such is discussed in Meeting of Parties (MoPs).	N/A	NCA/NBB	Seychelles needs placed on the agenda of MoPs and project proposals sent to funding agencies	By 2007

Objective:
Strengthen existing local institutions through technology transfer and enhance capacities and know-how to address Biosafety issues nationally.

Actions:

5.0 Study the impacts of Modern Biotechnology on local agricultural (including livestock productions and aquaculture practices)

Objectives:
Sensitise local farmers and policy makers about Modern Biotechnology applications in agriculture, including potential socio-economic effects of modern biotechnology on local farming, food security, and any possible potential, adverse impacts that may result from the use of the technology. (In Seychelles small farmers face some most difficult agricultural challenges: significant portions of their harvests are lost to pests, diseases, poor soil, poor quality seeds, flooding and lack of agricultural technologies).

Actions:

Activities	Funding Agency	Responsible Agency	Verifiable Indicator	Time Frame
To identify, monitor and assess opportunities and challenges of Modern Biotechnology-related changes in the agriculture and food industries in Seychelles.	Local (Gov.) and international (yet to be identified)	NCA/NBB	Assessment reports, workshop reports, field monitoring reports	Ongoing
To identify and address relevant Biosafety and Modern Biotechnology issues for Seychellois farmers through continued monitoring, education	Local (Gov.) and international (yet to be identified)	NCA/NBB	Awareness programmes made, educational materials produced	Ongoing

and awareness activities.				
To advise decision makers of 'proven safe' Modern Biotechnology applications that can be used to enhance food security in Seychelles.	Local (Gov.) and international (yet to be identified)	NCA/NBB/Advisory committees	Scientific docs reproduced, case studies analysed, BCH docs and notifications from MoPs.	Ongoing
To ensure that the views of farmers are reflected in local policies (especially where importation of GMOs for agricultural purposes is concerned)	Local (Gov.) and international (yet to be identified)	NCA/NBB	Concerns taken into consideration in GMO application procedures	2005 onwards

6.0 Maintaining Food and Pharmaceutical use safety in Seychelles: a public health priority.

Objective:

Pursue the economic and public benefits of improved health care through products of Modern Biotechnology, but at all times ensuring that the products have been considered safe for human health (by reputed, recognised organisations/institution).

Actions:

Activities	Funding Agency	Responsible Agency	Verifiable Indicator	Time Frame
To advocate and support the development of objective, rigorous risk-based, sustainable, integrated food safety systems.	International (yet to be identified)	DoH	Food safety system protocol fully in place	By Dec. 2006
To improve on existing systems of assessment and management of food borne risks, risks from pharmaceuticals and other drugs products, and communicating information, in cooperation with other sectors and partners	International (yet to be identified)	DoH	Systems improved and tested	By Dec. 2006
To conduct a survey on impacts on change in health care, risk perception, acceptance of MB, legislation and liability in Seychelles.	International (yet to be identified)	DoH	Survey results	By Dec. 2006
To ensure effective management of potential hazards of GMO foods and Pharmaceutical products through the use of preventive approaches	National (Gov.)	DoH/NBB/NCA	No of Applications denied for the mentioned reasons	Ongoing
To promote a holistic approach to the safe use of food and medical products derived from modern biotechnology.	National (Gov.)	DoH/Public Sensitisation Committee	Programmes and materials made	Ongoing
To keep abreast with internationally agreed methodologies and guidelines for evaluation of safety in the use of food, food ingredients and medical products resulting from Modern Biotechnology based on WHO and CODEX standards and guidelines.	National (Gov.)	DoH/NCA	Regular revision of health policies on GMOs and GMO products	Ongoing

7.0 Ensuring effective sets regulations and policies that are in line with constant changes

Objective:
Adopt appropriate legislation and policies to ensure that the local biological diversity of Seychelles is given adequate protection taking into account safety to human health.

Actions:

Activities	Funding Agency	Responsible Agency	Verifiable Indicator	Time Frame
Finalise the Biosafety Act	International (under the GEF/UNEP NBF Project)	AG's Office/NCA	Biosafety Act approved by National Assembly	June. 2006
To ensure that the existing bodies of inspections and control systems that safeguards the Seychelles public and the environment against possible risks are enforcing the regulations, procedures and policies in place.	National (Gov.)	All Inspections and Monitoring bodies with appropriate mandates mentioned in the NBF	A workable, enforceable and a system based on good cooperation and collaboration	Continuous
To revise and update the regulations and policies periodically to take into consideration the evolving issues that occurs in that field.	National (Gov.)	NBB/NCA/AG 's Office	Revised regulations	Continuous

Below are the details of the basic activities that require urgent regional and international attention and financial support in order for Seychelles to fully comply with the National Biosafety Framework and the Cartagena Protocol for Biosafety.

Field	Activities
Institution Building for Biosafety Regime Development	• Finalise the Biosafety Act; • Develop/strengthen administrative structures and processes to support the Biosafety Act;
General Risk Assessment Capacities	• Develop/strengthen administrative processes to conduct Risk Assessment and to manage Risk; • Develop local risk assessment capacity to coordinate multi-disciplinary analyses; • Enhancement of technological and institution capacities for risk assessment; • To identify outside experts for Reviewing GMO Applications; • Understanding of relevant biotechnological processes and applications;
Science and socio-economic capacities	• Analyse risks to conservation and sustainable use of diversity; • Evaluation of genetic modifications; • Analyse risks to human health of the effects on biodiversity; • Analyse ecosystem effects of GMO introduction; • Assess food security issues arising from risks to biodiversity; • Enhancement of existing related scientific, technical capacities

General risk management capacities	• Understanding of application of risk management tools to different Modern Biotechnology sectors;
Decision-making capacities	• Identification and quantification of risks, including through sound application of the precautionary approach; • Capacity to assess relative effectiveness of management options for import, handling and use of Modern Biotechnology and its products, where appropriate; • Capacity to assess relative trade impacts of management options, where appropriate;
Monitoring and Enforcement	• Identification and handling of GMOs at point of import; • Monitoring of environmental impacts against expected impacts; • Capacity to monitor, enforce and report on compliance • Enforcement capacity at Port of Entries; • Emergency notification and planning and response capacity; • Capacity to monitor longer term environmental impacts, if any (base on current baselines); • Establishment of reporting systems.
Data management and information-sharing	• Exchange of scientific, technical, environmental and legal information; • Collection, storage and analysis of scientific, regulatory and administrative data; • Communication to the Biosafety Clearing-House.
Human Resources Strengthening and development	• All aspect of the regulatory regime development, evaluation and maintains for risks assessment and risk management. • Raise awareness of modern biotechnology and Biosafety among scientists, government officials; • Training and longer term education; • Procedures for safe handling, use and transfer of GMOs
Public awareness and participation	• Administer and disseminate information on legal and administrative framework; • Public awareness of participation in scientific assessment process; • Risks associated with handling, use and development of GMOs
Involvement of stakeholders, e.g. non-governmental organisations, local communities, private sector	• Processes for community, NGO consultation in development of risk assessment and management regimes; • Processes for community, NGO consultation prior to decisions.
Financial assistance for Biosafety	• Actively search for funding to support Biosafety in Seychelles

ANNEX I

PUBLIC AWARENESS AND PARTICIPATION IN BIO-SAFETY
(Rachel Marie)

It is a well known fact that information dissemination is never enough. From environmental and developmental viewpoints there has been a conscientious effort by the various ministries, organizations and institutions to put in place mechanisms for promoting and facilitating public awareness, education and participation.

Such initiatives have been very well appreciated by the general public as its gives them an opportunity to air views provide suggestion and feel a sense of ownership about the projects, activities, programmers placed at their disposal by either the government or other stakeholders.

The Seychelles have tried as per the country's constitution to make sure that the public are informed and educated on various issues and bio-safety is no exception. As per its international obligations such as the Cartage Protocol, the country has tried to assess the effectiveness of the existing mechanisms for public participation that are already in place.

Within the Ministry of Health, there exist a unit for health education and promotion as well as a public relations unit. These two units have been set up with the aim of giving the public the necessary and appropriate information on health matters. There is no specific system for public participation although at several clinics there are complaints and suggestion, boxes, whereby the public can place their complaints and suggestions. How the complaints and suggestions are then used this is not clear.

At regular intervals the ministry has also tried to organize decentralized meetings, where the public are invited to participate and air their views and give their suggestions.

The ministry has always reserved the right not to disclose information to the public if they wish not to do so.
The public for example might not be informed if such a drug is genetically modified if the ministry thinks this should be the case and so far their has not been any such obligation from the ministry, although a patient always reserves his or her right to such information.

The Ministry of Environment and Natural Resources on the other hand has in place a system for public can participate and give their views on any environment development through the Environment Impact Assessment procedure (EIA) which has an avenue for public participation. The EIA process makes provision for public notification through the mass media. This is done through the daily paper, over a certain period of time. The public is able to view the project plan at the Ministry of Environment or the National Library and comments.

The comments and suggestions put forward by the public are then taken into consideration. If found to be valid a project might not start due to the public involvement and viewpoint. Another avenue for public participation is through the Education Information & Communication section which is responsible for the creation of public awareness and

education on environmental issues; living modified organisms and GMO's included. The public can express their opinion through the various media programmes that are aired, especially vox pop, which is one avenue for public participation.

Food security and biotechnology is of concern to various governments the world over, the Department of Agriculture and Marine Resources within the ministry of environment and natural resources has to ensure that sufficient food is produce to feed the population at all times. The Ministry does not at present have in place a mechanism for public participation per se, though various tools for information dissemination are used to be able to transmit awareness programmes to the public. Written information via the print media has been an effective medium used to reach the public, open days, agricultural shows and agricultural fairs are organized orientated towards information dissemination and propagation. The public are able to participate actively at these activities and at the same time ask relevant questions, clarifications or comments. The various programmes over the visual media have also been a plus in information dissemination but the public does not really get much opportunity to get involved in these televised programmes.

The Import and Export Division within the Ministry of Finance and the customs division are also key players in bio-safety as the Seychelles is major importer of food, agriculture products and pharmaceutical products, therefore they are also a player that should create an avenue for public participation within their respective area of work, which at present is none existent. The public are vary rarely informed of activities within these divisions and are rarely if at all consulted on any matters in relations to import, export and customs services. These two sections are more into policing rather than creating an avenue for the public to participate.

Various other stakeholders are either directly or indirectly involved in sensitization information dissemination or are the public's avenue for representation or participation, such organization such as consumer organizations which are champions of consumer rights, such as their rights to be heard ensure through regular meetings and through representation on various boards and committees that the public's opinions, comments and concern are taken on board. Through these bodies the public are able to lobby or advocate for public participation either directly or indirectly on various issues that are of concern to them, notably bio-safety, food security, food safety etc….

Other agencies such as the Seychelles Bureau of Standards, Seychelles Marketing Board, Farmers Association, and the Seychelles Fisheries Authority who are also partners in promoting, facilitating and creating public awareness through education visa vis bio-safety and the implementation of the Cartegena Protocol does not have on board any direct avenues for public participation, although indirectly through their various activities the public may be able to get involved.

The proposed plan that the country is working on does ensure public participation at various stages, if and when the country does decide to either import, produce or handle genetically or living modified organisms in the near future. The proposed document makes provision for representative of the public or civil society organizations to sit on committees to represent the public. It also ensures an avenue for direct public comments and opinion within a define period of time.

ANNEX II

Inventory of existing infrastructures and equipment to address Biosafety in Seychelles (Helda Antoine)

1.0 Introduction

In Seychelles there are three reference laboratories, which carry out scientific tests and there are no accredited or independent laboratories. The operating reference laboratories in Seychelles are namely the Seychelles Public Health Laboratory (SPHL), Seychelles Bureau of Standards (SBS), and the Public Utilities Corporation (PUC). There are other small organizational and departmental laboratories operating in the country and they carry out specific tests which are specifically related to their scope of work and mandates and have also been included in this inventory exercise such as the Soil and Diagnostic Laboratory, Plant Clinic Laboratory, the Pollution and Control Laboratory, the Fish Inspection Laboratory, the National Institute of Education Laboratory and the Seychelles Polytechnic Laboratory. The mandates as well as the types of tests performed by the reference laboratories are outlined below.

2.0 The Seychelles Public Health Laboratory (SPHL),

The Seychelles Public Health Laboratory (SPHL), which is based at the Victoria Hospital within the Ministry of Health and Social Affairs has the mandate under the Food Act of Seychelles to support the importation and consumption of safe and wholesome foods consume or be consumed by the population. It is divided into four units, which are the Food microbiology, Water microbiology, Sexually Transmitted Disease and Disease Surveillance. The Seychelles Public Health Laboratory is the focal point for lab-based disease surveillance and is the government's designated reference laboratory. The list of main analytical equipment in operation at the Seychelles Public Health Laboratory is appended at **Annex 1A** while the list of tests per unit and their respective Maximum Turnover time is appended as **Annex 1B**.

2.1.1 The main responsibilities of the Seychelles Public Health Laboratory are:

(i) Monitor the quality of food and water.
(ii) Being the national laboratory focal point the SPHL laboratory is involved in the integration and creation of more efficient disease surveillance activities.

2.1.2 Present case at the SPHL

At the moment the analysis being performed by the SPHL in many cases are presumptive as confirmatory tests are unavailable. Over the past decade the SPHL has been called upon to confirm the epidemiology of certain sporadic and recurring outbreaks of diseases such as Influenza, Hand foot and Mouth, Measles, Mumps, Diphtheria, Anthrax, SARS and viral hemorrhagic amongst others. The SPHL has also assisted in the containment (through laboratory confirmation) of community-acquired infections such as Tuberculosis and Sexually Transmitted Infections.

2.1.3 Handicap

However, in past situations of epidemic outbreak in the country samples for diagnosis for example measles and dengue have been sent to reference laboratories overseas. This has meant that delays in sending samples and receiving diagnostic results for particular epidemic/outbreak situations have also led to decreased response time in preventing its spread.

2.1.4 Future plans

With the recent advent of the deadly outbreaks of SARS and Bird Flu there has been hopeful plans for the construction of an Isolation Unit to include a Bio-Safety Level 3 (BSL3) laboratory facility, which will fall under the responsibility of SPHL.

2.1.5 Testing for GMOs

With the increasing demand for quality test and demand for accurate result in minimum delay, there is an urgent need for institutional strengthening. The acquisition of Polymerase Chain Reaction (PCR) facilities will be of benefits for lab-based surveillance done locally as well as testing for confirmation of Genetically Modified Organism food or products of GMOs.

Therefore testing of Genetically Modified Organism (GMOs) would be a logical technological progression of the testing facilities already being done in the Food Microbiology, Water Microbiology, the Disease Surveillance and Sexually Transmitted Infections laboratory units of SPHL.

2.1.5 Strategic plans

The SPHL would like to acquire a Polymerase Chain Reaction (PCR) system. This will be of significant benefit to the country as a whole and not only for the testing of GMOs. Acquiring a real PCR would be of benefit as it enables rapid, cost-effective routine testing of GMOs, diagnostic and epidemiological purposes. The details of costing of some of the equipments that the SPHL would envisage to have in order to fully meet the objectives of its mandate is attached as **Annex 1C.**

3.0 The Seychelles Bureau of Standards (SBS)

This organization is based at Pointe Larue on Mahe. The postal address is P.O.Box 953, Victoria Mahe, Seychelles, home page www.seychelles.net/sbsorg. **E-mail:** sbsorg@seychelles.net. Phone number (0248) 380400) and Fax Number: (0248) 375151.

The Seychelles Bureau of Standard Laboratory is divided into several units, which perform different tests from the Environmental Pollution Laboratory, Chemical Analysis Laboratory, Microbiology Laboratory and Food Chemistry Laboratory. Note also that the SBS carries out other tests such as Physical Test, which are not covered, as the scope of this inventory is to cover tests and equipment, which cover the scope of Biotechnology and Biosafety. The list of equipment found at SBS are attached at Annex 2

3.1 The most important tests carried out at the SBS Laboratory are:

(i) Environmental Pollution Laboratory

- Water analysis (potable, bottled, boiler, swimming pool, industrial waste and domestic waste) for compliance to Public Health Regulations, Environment and Protection Act etc.,
- Soil test for trace elements and physico-chemical properties,
- Fish and fishery products and oils for trace elements and,
- Ambient air monitoring and noise emission tests,
- Testing of paint for quality factors.

(ii) Chemical Analysis Laboratory

- Quality of soaps, detergents and javals,
- Quality of toilet paper, candles and corrugated iron sheets,
- Quality of petroleum products,
- Testing of plant materials (including medicinal) plants for active ingredients and other quality factors and,

(iii) Microbiology Laboratory

- Isolation, purification, enumeration and identification of microbes in all sorts of food, animal feed and water,
- Air and surface contamination monitoring.

(iv) Food chemistry Laboratory

- Quality of food products such as fish and fishery products, milk and diary products, fruit and fruit products, cereals and cereal products, spices and condiment and meat and meat products,
- Monitoring of fruits and vegetables for organochloride pesticides,
- Quality and nutritional parameters of animal feed,
- Quality of alcoholic beverages.

4.0. The Public Utilities Cooperation Laboratory

The Seychelles Public Utilities Cooperation is the body responsible for the treatment of potable water and its distribution to its clientele. PUC is also responsible for the treatment of sewage. The list of equipment and tests performed by the PUC laboratory is attached as **Annex 3**

The list of equipment and the tests performed by other departmental and sectional laboratories are appended in the annex listed below:

Soil and Diagnostic Laboratory as **Annex 4,** the Plant Clinic Laboratory as **Annex 5** the Fish Inspection Laboratory as **Annex 6**, the Pollution and Control Laboratory **Annex 7,** the National Institute of Education Laboratory as **Annex 8** and the Seychelles Polytechnic Laboratory as **Annex 9.**

ANNEX 1A

MINISTRY OF HEALTH AND SOCIAL AFFAIRS

LIST OF MAIN ANALYTICAL EQUIPMENTS IN OPERATION AT THE SEYCHELLES PUBLIC HEALTH LABORATORY

ITEM	QUANTITY IN UNITS	PURPOSE
Water Distiller	01	Distilled water for analytical work
Centrifuge	05	Water & Environment microbiology Food Micro & Enteric Pathogens Testing Chemical Analysis
Centrifuge 16A	01	Food Micro & Enteric Pathogens Testing
Rota Mixer	01	Water & Environment microbiology
Water bath Waterbath-Haake /BN2 Waterbath (with set of 12 holes)	05 02 01	Water & Environment microbiology Food Micro & Enteric Pathogens Testing Chemicals Analysis Chemicals Analysis
(GS) Microscope	01	Water & Environment microbiology
Vacuum Pump	01	Water & Environment microbiology
3-Brch Manfold-500ml	02	Water & Environment microbiology
Vacuum Pump	01	Water & Environment microbiology
Air Sampler	01	Water & Environment microbiology
Electrical Balance	01	Culture Media Preparation
Incubator	03	Culture Media Preparation
Lamina Flow Cabinet	01	Culture Media Preparation
Heating Block	01	Special Analysis-Disease Surveillance Work
Chiller	01	Special Analysis-Disease Surveillance Work
Fluorescence Microscope	01	Special Analysis-Disease Surveillance Work
Mina Vidas Analyser	01	Special Analysis-Disease Surveillance Work
Slide Drying Bench	01	Special Analysis-Disease Surveillance Work
Microscope (OLYMPUS-CH2)	02	Communicable Disease & STI lab work Food Microbiology & Enteric Pathogens Testing
LTE scientific incubator	01	Communicable Disease & STI lab work
Deep Freezer	02	Food Mirob.sample storage after analysis
Hot Air Oven (Model D15)	02	Sterilising of Glass wares
Autoclave	03	Sterilising of Cultures media Sterilisation of infections Materials
Autoclave- computerise	01	Sterilising of Cultures media 7 infectious mat.
Colony Counter	01	Food Micro & Enteric Pathogens Testing
Vortex Mixer	02	Food Micro & Enteric Pathogens Testing
Safety Cabinet –CL 1 II Safety Cabinet –CL 1	02	Safe Handling of Infections Materials

Stomacher Hoocirculator	01	Food Micro & Enteric Pathogens Testing
pH Meter	01	Chemicals Analysis
Gas Chromatography GC 14b	01	Chemicals/Pesticides Analysis
Transformer-GC 14B	01	Chemicals/Pesticides Analysis
Hot Plate Stirrer	01	Chemicals Analysis
UV Cabinet	01	Chemicals Analysis
Hammer Mill	01	Chemicals Analysis
Dri Block	02	Chemicals Analysis
Fume cupboard	01	Chemicals Analysis
Hammer Mill	01	Chemical Analysis

COMPUTER EQUIPMENT:

ITEM	QUANTITY IN UNITS	PURPOSE
Monitor (DELL) Monitor (Model E771a) (DELL)	01 01	Food Micro &Enteric Pathogens Testing/DS
CPU (DELL)	02	Food Micro &Enteric Pathogens Testing/DS
Keyboard (DELL)	02	Food Micro &Enteric Pathogens Testing/DS Water and Environment /chemistry/DS

ANNEX 1B.

LIST OF TESTS PER UNIT AND THEIR RESPECTIVE MAXIMUM TURN-OVER TIME (M.T.T)

A. DISEASE SURVEILLANCE & S.T.I UNITS (DSS)

TEST	M.T.T.
Culture for N. Gonorrhoea	3-4 days
Gram Stain for intra Cellular GND	1-2 days
Antigen Test for Chlamydia	2 times per week
Nasal Swabs culture for S.Aureus	6-10 times per week
Fluorescent Microscopy Examination for AFB	1-3 days

B FOOD MICROBIOLOGY AND ENTERIC PATHOGEN UNIT (FEP)

TEST	M.T.T.
*APC	4-9 days
Bacillus cereus	4-5 days
Campylobacter	5-7 days
*Clostridium perfringens	5-7 days
ColiformB	4-7 days
*E.coli	5-7 days
*Enterobacteriaceae	5-7 days
Listeria monocytogenes	6-7 days
*Salmonella analysis	7-10 days
Staph aureus	5-7 days
Vibrio parahaemolyticus	5-7 days
*Yeast and Moulds	5-7 days

*** =HYGIENE CHECK WHICH ARE ALSO CARRIED OUT**

STOOL ANALYSIS

TEST	M.T.T.
Culture (Salmonella and Shigella)	5-7 days
Microscopy	1-2 days

C WATER AND ENVIRONMENT UNIT

TEST	M.T.T.
WATER ANAYSIS	
APC	3-4 days
Intestinal enterococci	4-6 days
Pseudomonas aeroginosa	4-6 days

Salmonella	5-8 days
Staph aureus	5-7 days
Sulphite Reducing Clostridia	3-5 days
Thermotolerant Coliform	3-4 days
Total Coliform	3-4 days

D OTHERS

TEST	**M.T.T.**
Chlorophyll-a	1-3 days
Cholinesterase	Test done I batch of 10 every 2-3 weeks

ANNEX 1C

Desired equipment being requested by SPHL.

The SPHL would like to acquire a **real time PCR compared to other PCR system**

Reasons

- Is more sensitive and results are more reproducible,
- Has a dynamic range of detection,
- Permits rapid target identification and results may be ready in as little as 30-60 minutes,
- Eliminates post PCR processing which may be unsafe,
- Is highly specific hence used for confirmation and in many methods is referred to as the 'gold standard ' for testing,
- Allows multiplexing, i.e testing for the more than one target and specimen at a time.
- Permits quantification of the target under study.
- Has a high throughput.

Due to its versatility PCR testing has many other applications and covers diverse field including bacteriology, virology, immunology, and genetics amongst others. These fields will benefit immensely in confirmation of specific cases where a diagnosis is required and where preliminary tests have failed to confirm or detect significant data to enable a diagnostics.

The Magna Pure LC/LightCycler workstation from Roche Applied Science (RAS) is real-time PCR system, which is widely used and is well establishment in GMO testing worldwide. It can test for genetic modification qualitatively or qualitatively. With the inclusion of the Mag Na Pure LC instrument DNA preparation is automated and there is no need for any other external manipulation which eliminates errors and cross-contamination, as is the case when using traditional PCR systems.

Summary of the Main Benefits of the Light Cycler ™2.0 System.

- 6 colour detection channels,
- Software Version 4.0,suited to Research and Diagnostic applications,
- Closed, single-tube assay for implication and detection,
- No post –PCR manipulation (e.g. gels), which minimizes the risk of amp icon cross contamination,
- Reliable, high speed amplification,
- Has a broad dynamic range from 10 to 10 copies in a single run,
- Has high reproducibility,
- High sensitivity. Single copy gene detection in one genome equipment.
- **No manual human intervention is required –**everything is software driven**.** This makes it ideal in a multi-user facility.
- Uses Windows 2000.User-friendly and easy access controlled.
- Multi –colour multiplex PCR reactions possible **(6 detection channels).**
- Automatic sample report generation.
- Extensive application expertise available from Roche South Africa.

- Service engineers available to service all instrumentation.

Availability of trained personnel locally

A technologist was attached at the National Health Laboratory Service (NHLS) and the National Institute of Communicable Diseases (NICD) in South Africa for two months, and was able to gain experience in latest technologies including PCR testing.

Pricing Information

Below are the pricing information obtained from (RAS) comparing four real- time PCR options to give an idea of the costs. Note that the **preferred one is option 4.**

Description	Cost	Option	Remarks
LightCycler V1.5™Instrument + GMO Screening & Quantification kit + GMO Sample Preparation kits for Nucleic Acid Isolation.	USD 28,858.84 USD 1682.06 USD 931.73	**1**	The cheapest option however does only one sample at a time requires manual preparation, which may incur errors.
Total Cost for option 1	**USD 31,472.63**		
Light cycler VI. %			
LightCyclerV1.5™and Magna Pure LC instrument + GMO Screening & Quantification Kit	USD 98,944.60 USD 1682.06	**2**	Third cheapest option although only one sample can be tested at a time. Sample preparation is automated.
Total Cost for option 1	**USD 100,626.66**		
Light Cycler V2.0™ Instrument + GMO Screening Quantification kit + GMO Sample Preparation kits for Nucleic Acid Isolation.	 USD 1682.06 USD 931.73	**3**	Second cheapest option and can test more than one sample at a time, but manual sample preparation may incur errors.
Total Cost for options 3 Magna pure LC instrument + GMO screening & quantification kit	USD 138,522.42 USD 1682.06	**4**	Best option which tests more than on sample, preparation.
Total cost for option 4	**USD 140,204.48**		

Notes:
These prices were calculated using an exchange rate of ZAR (South African Rand) 6.064 to USD (US Dollar) 1.00. This quote is subject to fluctuations in South African Rand to Euro exchange rate of >3%.

- Running costs are dependent on the type of kit being used for extraction and for detection and Quantification.
- Automated Mag NA Pure Extraction of Nucleic acid: If using the DNA I kit to extract (for certain food types). Cost per sample=USD.24.
- If using the DNA III kit to extract (for difficult food types: Cost pr sample= USD 6.68

Accessories Provided with LightCycler Instrument

- Light Ccycler Sample Carousel
- LightCycler Software Package
- 1 box containing 96 Light Cycler capillaries (20ul)
- Light Cycler Centrifuge Adapters
- LightCycler capping tools
- LightCycler capillary releaser
- Operator's Manual
- One Pentinum PC (desktop or notebook) is also supplied with the lightCycler Instrument.

Accessories Provided with the Mag Na Pure LC Instrument

- Mag Na Pure LC Cooling Block, LC Centrifuge Adapters
- Magna Pure LC Cooling Block, 96-well PCR plate
- Magna Pure LC Disposables Starter Set (for two complete stage set-ups)
- Magna Pure LC Operator Manual
- One Pentium PC with Windows 2000 and MagNa Pure LC software Version 3.0

Accessories required and not provided

- Micropipettes (i.e 20 ul, and 100ul)
- Disposable Tips for micropipettes.

ANNEX 2

SEYCHELLES BUREAU OF STANDARD (SBS)

List of equipment available within the SBS Laboratory

1. Gas – Liquid Chromatography with FID and ECD
2. HPLC
3. UV-VIS Spectrometer
4. Atomic Absorption Spectrometer
5. Fluorescence spectrometer
6. Refractometer
7. Colorimeter
8. Microtiter plate reader
9. Ovens
10. pH meter
11. Conductivity meter
12. Analytical balance
13. Muffle furnace
14. Laminar flow hood
15. Incubator
16. Autoclave
17. Colony counter
18. Water bath
19. Refrigerator
20. Centrifuge
21. Binocular microscope
22. Compound microscope
23. Nephelometer
24. Digital titrators
25. Automatic pipettes
26. Dispensettes
27. Double distillers
28. Steam bath
29. Fume hood
30. Air sampler
31. Microwave oven
32. Freezer
33. Air sampler
34. Rotatory evaporator
35. COD reactor
36. BOD incubator
37. Noise meter
38. Distiller
39. Viscometer
40. Mini gloss meter

41. Hydrometer
42. Heating mantle
43. Testostor (Temp/Humidity recorder)
44. Blender
45. Deionizer

ANNEX 3

PUBLIC UTILITIES COOPERATION (PUC)

3.1 List of equipment/apparatus available within the PUC Laboratory

Equipment/apparatus names	Quantity per unit	Description /make of items
Autoclave	01	Astell Scientific
Automatic pipette	02	Drummond
Balance Electronic	01	Sartorius
Balance Electronic	01	Sauter
Boiling Bath	02	
Colony Counter	01	Gallenkamp
Combination Sampling Outfit	01	
Comparator, Colour Benchtop	01	Lovibond
Comparator, pH Disc	02	Lovibond
Computer	01	Dell-OptiPlex GS+
Cooker	01	Frigidaire
Cooled Incubator	01	B+T
Deioniser	01	Barnstead
Drying Cabinet	01	Corsair Heating & Catering
Finnpipette	01	Labysystems
Hot plate/magnetic stirrer	01	Philip Harris Ltd.
Humidity/Temp. monitor	01	Sper Scientifiv
Incubator	01	Philip Harris
Incubator	01	Leec
Incubator Plus Series	01	Gallenkamp
Loop, Inoculating	03	
Meter, conductivity	01	Hach
Meter, conductivity	02	Toledo
Meter, Dissolved Oxygen	02	Hach
Meter, ISE	01	Hach
Meter pH, Benchtop	01	Toledo
Meter pH, Benchtop	01	Philips
Meter, Spectrophoto	01	Hach
Meter, Turbidity	03	Hach
Microscope, stereo	01	Zeiss
Oven	01	Memmert
Pressure cooker	02	
Printer	01	Deskjet
Probe, BOD	01	YSI

Probe, conductivity Probe, conductivity	01 02	Hach
Probe, DO Probe, DO with 10ft cable Probe, DO with 30ft cable	2	Hach YSI YSI
Probe, pH Probe, pH Probe, pH Probe, pH combination Probe, Temperature	01 02 01 01 03	Mettler Toledo Hach Hach
Pump, vaccum Pump, vacuum	01 02	Vacuubrand Sartorius
Reactor, BOD	01	Hach
Reactor COD	01	Hach
Refrigerator Refrigerator	01 02	Fisher & Paykel Westpoint
Sterilizer	01	Millipore
Test sieve shaker	01	Endercolts
Timer, Two Channels	01	Hanhart
Water bath	02	B+T
Water Still Water Still	01 01	FISONS Scientific Bibby Scientific

3.2 Types of tests perform by the Water and Sewage Division Laboratory Section

- Residual Chlorine
- pH
- Appearance
- Colour hazen
- Odour
- Taste
- Turbidity
- Dissolve Oxygen
- Jar Test
- Total Coliforms
- Faecal Coliforms
- Plate Count (24 hours)
- Alkalinity
- Faecal Streptococci
- Chloride
- Calcium Hardness
- Total Hardness
- Conductivity
- Nitrate
- Phosphate
- Total Dissolve Solids
- Suspended Solids
- Ammonia-Nitrogen

- Nitrate-Nitrogen
- Temperature
- Escherichia Coli
- BOD
- COD

ANNEX 4

MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES

DEPARTMENT OF NATURAL RESOURCES

List of equipment and the tests perform within the Soil Diagnostic Laboratory

SECTION A: SOIL PHYSICAL ANALYSIS

Equipment/apparatus names	**Quantity per unit**	**Purpose**
Refrigerator	01	For keeping cultures specimens and some chemicals
Furnace adjustable to 550°C	01	Determination of Organic matter content ins the soil

SECTION B: SOIL CHEMICAL ANALYSIS

Equipment/apparatus names	**Quantity per unit**	**Purpose**
Titration equipment	01	- Determination of carbon content of soils, - Active calcium carbonate according to Drouineau/Galet, - Determination of Iron, Manganese, Copper and Zinc.
pH meter (*Not operational*)	01	Determination of the soil pH.
Long Steam tunnel	01	Determination of leaching rate in the soil
Flame photometer (*Mechanically damage*)	01	Determination of exchangeable Potassium, Sodium, Calcium and Magnesium.
Block digester adjustable to 350ºC (*Not operational*)	01	Determination of available phosphate according to Olsen.
Atomic absorption spectrophotometer	01	Determination of exchangeable Potassium, Sodium, Calcium and Magnesium
Titration equipment with magnetic stirrer	01	Determination of chloride (by titration with Silver Nitrate Ag $N0_3$).
Distillation unit	01	Determination of exchangeable acidity in 1 Molar Potassium Chloride extracts by

		titration.
Digestion equipment (*Not operational*)	01	Determination of exchangeable acidity in 1 M Potassium Chloride extracts by titration.
Reciprocal shaker	01	Determination of organic phosphorus according to Saunders and Williams. Extraction for the analysis of the following: pH, electrical conductivity, Sodium ion, Potassium ion, Calcium ion, Magnesium ion, Carbonate ion, Chloride ion, Sulphate ion, Hydrogen carbonate ion and nitrate ion.

SECTION C: WATER SAMPLES ANALYSIS

Equipment/apparatus names	**Quantity per unit**	**Purpose**
Titration equipment		Determination of soluble salt in water samples inc: Sodium ion, Potassium ion, Calcium ion, Magnesium ion, Carbonate ion, Chloride ion, Sulphate ion, Hydrogen carbonate ion and nitrate ion
Conductivity meter (*Not operational*)	01	Determination of conductivity
Salinity meter (*Not operational*)	01	Determination of salinity

<u>List of equipment/apparatus that would be desirable</u>

Equipment /apparatus name	**Purpose**
(i) Hydrometer with buoyoucos scale in gm/litre	Mechanical analysis of soil particles size
(ii) Soil dispersing stirrer	
(iii) A high speed electric stirrer with a cup receptacle	Active calcium carbonate according to Drouineau/Galet
(iv) Magnetic stirrer with heater	Determination of Gypsum ($CaS0_4.2H_2O$)
(v) Centrifuge (5,000 r.p.m) conductivity meter	
(vi) Determination of leaching rate in the soil	Leaching tubers with rack, percolation rack

ANNEX 5

MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES

DEPARTMENT OF NATURAL RESOURCES

PLANT DIAGNSOTIC LABORAOTY

List of equipment and their purposes for the Plant Diagnostic Laboratory

Equipment name	**Quantity per unit**	**Purpose**
Refrigerator	01	For keeping culture specimens and some chemicals.
Incubator	01	For culture growth.
Microbiological Safety cabinet	01	For sterile working environment during isolation and culturing to avoid contamination
Autoclave	01	For sterilising media and agar preparation.
Stereoscopic Microscope	01	For examination and insect identification.
Compound microscope	01	For examination and pathogen identification.
Top pan Balance	01	For weighing chemicals and media.
pH meter	01	For checking pH of media.
Oven	01	For preparing media and sterilising glassware.
Water deioniser	01	For supplying pure water.

ANNEX 6

MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES

DEPARTMENT OF NATURAL RESOURCES

FISH INSPECTION UNIT LABORATORY

List of equipment within the Fish Inspection Laboratory

1. Agitateur Magnetique Chauff
2. Agitateur
3. Balance Handy
4. Bain Marie
5. Centrifuge Hemato
6. Centrifuge Spinette
7. Etuve Bacteriologique
8. Jarre Anaerobic
9. Microscope complet standdar

ANNEX 7

MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES

DEPARTMENT OF ENVIRONMENT

POLLUTION CONTROL LABORATORY

Equipment/apparatus names	Quantity /item Description	Operating Status
Noise meter		Ok
Laboratory Oven	20L	Ok
Analytical balance 220g	Model AAA 250L	Ok
Water Jet filter Pump		Ok
Merc-Free 6 place BOD system, comprising of: 6 place inductive stirring system 6 Brown BOD bottles 6 Stirring magnets		Ok
BOD incubators, 180L		Ok
Pipette Controller +Charger +Wall support		Ok
BRUNEL Microscopes Stereomicroscopes	2	Ok
DR 2000 Spectrophotometer		Ok
Euromex ARNHEM microscopes	1	Ok
COD Reactor	2	Ok
Bacterial Incubator	1	Ok
Automatic Sampler	Sigma Model	Missing Power supply and Battery Charger

Dissolved Oxygen Meter Dissolved Oxygen Meter (new)	Hanna	Problem with switch At PUC for Calibration/maintenance
pH Meter pH Meter pH Meter (new)	AGRAR 2000 JENWAY Wagtech	Sent to Praslin Calibration failure At PUC for Calibration/maintenance
Conductivity meter Conductivity meter (new)	Hanna	Calibration failure At PUC for Calibration/maintenance
Spectrophotometer	Cecil 9000	Ok
Mobile Air Conditioning Unit		
Refrigerator Full Automatic	Goldstar	Ok
General Purpose Thermometer	2	Ok
Test strip, multiple parameter, pH range, and total alkalinity.	2	Ok
Dipper	2	Ok
Handle connector Dipper Rod	1	Ok
Handle connector	1	Ok
Glass micro fibre filter	5	Ok
Aspirator	1	Ok

Types of tests perform by the Pollution and Control Laboratory Section within the Department of Environment

- Dissolve Oxygen Demand
- Total Suspended Solid
- Noise measurement
- Conductivity
- pH
- Taxonomy
- Chemical Oxygen Demand
- Turbidity
- Chemical Analysis
- Cell Matching
- Appearance
- pH interference

ANNEX 8

MINISTRY OF EDUCATION AND YOUTH

NATIONAL INSTITUTE OF EDUCATION

List of equipment/apparatus within the National Institute of Education

1. Meter Ammeter
2. Meter Voltmeter
3. Meter Millimeter
4. Meter Galvanometer
5. Madgeburg Hemisphere
6. Oscilloscope
7. Oven
8. Convex Mirrors
9. Incubator
10. Vacuum Pump
11. Printer/Computer
12. Disc Drive/Keyboard Unit
13. Crooker Radiometer

14. Calorimeter
15. Calorimeter - Filter Set
16. Circuit Board 'Worcester' kit
17. Dissecting Set
18. Deflagrating Spoon
19. Dissecting Awl
20. Dynamic Thooley
21. Filter Pump
22. Autoclave
23. Balance Spring
24. Balance Wooden Double Pan
25. Balance Double pan" Bean"
26. Balance Way master 'Bathroom"
27. Balance Lever
28. Balance Digital
29. Balance electrical 'Soutouirs'
30. Barometer Aneroid
31. Centrifuge
32. Caliper Vernier
33. Spirit Machine 1 x RA100
34. Refrigerator
35. Potometer
36. Thermometer 0 - 250ºC
37. Thermometer 0- 350ºC
38. Gas Generator Kipp's
39. Aspirator
40. Bell Jar

ANNEX 9

MINISTRY OF EDUCATION AND YOUTH

SEYCHLLES POLYTECHNIC

List of equipment/apparatus within the Seychelles Polytechnic Laboratory

BIOLOGICAL APPRATUS INVENTORY AS OF 2004

Equipment/apparatus names	Description of items	Quantity
Aspirator	Borosilicate 1m*l*	01
Aspirator	Heavy Duty HDPE 10m*l*	08
Aspirator	Polythene 10 ml	07
Autoclave	Aluminium Alloy Gas	01
Balance	Avery Berkel DC22T	01
Balance	Dial-O-Gram 311	01

Balance Balance Balance	Double Beam 1560 SD Portable 200 x 0.1 Portable 2000 x 1	01 08 08
Bath	Unstirred JB Range	02
Calorimeter	Food	01
Centrifuge		01
Chromatography Chromatography	Paper Grade 1 CHR 40 mm x 100m Tank	2 Reels 08
pH meter	Hanna (Water proof)	01
Microscope Microscope Microscope Microscope Microscope Microscope	Swift M3200 s Philip Harris Olympus Student Illuminated Student Stereo Student inclined	01 12 10 30 02 20
Lens objective Lens objectives Lens objectives	DIN Achromatic x 40 NA 0.65 X 40 X 10	04 15 15
Magnifier Magnifier Magnifier	With Handle 75 mm With Handle 50 mm Plastic	05 20 03
Microtome		09
Potometer		16
Thermometer Thermometer Thermometer Thermometer Thermometer	Red spirit filled -ºC/110ºC 305mm Mercury White backed 10ºC/110ºC 305mm Mercury, Yellow backed -10ºC/110ºC 152mm Mercury, Yellow backed -10ºC/110ºC 305mm Red Spirit filled 10ºC/110ºC 155mm	04 04 19 01 50

List of equipment/apparatus within the Humanities and Sciences Physics Laboratory of the Seychelles Polytechnic as of 2004

Equipment/apparatus names	Description of items	Quantity per unit
Accumulators 2v		30
Ammeters Ammeters	(0-A) (0-1Ma)	07 01

Ammeters	(0-5A) AC	05
Ammeters	(Dual Range (0-1A & 5A)	07
Ammeters	(Micro)	02
Ammeters	(0-100mA)	01
Amplifier	(50mv)	01
Balance	(Chemical)	01
Balance	(Lever patterns)	10
Boyles's Law apparatus		02
Callipers	Gauge Engineers	05
Callipers	Vernier	27
Calorimeter	Aluminium	02
Calorimeter	Copier	02
Calorimeter	Steel	02
Charles Law Apparatus		01
Cloud Chamber		01
DC Amplifier/Electrometer		01
Decade Capacitance		02
Compact light source		01
Cell solar		06
Cell mercury		01
Digicounter		01
Digimeter		01
Discharge lamp Transformer		02
Discharge Tube	Helium	01
Discharge Tube	Hydrogen	02
Discharge Tube	Mercury	02
Discharge Tube	Neon	01
Discharge Tube	Nitrogen	01
Discharge Tube	Oxygen	01
Discharge Tube	Planar Diode	01
Discharge Tube	Cadium	01
Diffractions Graying	80 lines	02
Diffractions Graying	300 lines	03
Diffractions Graying	600 lines	03
Diffractions Graying	Multi	02
Electroscopes	Dual range	07
Four stroke pump		01
Frequency meter		01
Galvanometer	Centre zero	17
Galvanometer	ED/spot	01
Gyroscope		01
Hydrometer	For accumulators	02
I.Redetector		01
Ingenhouzes Apparatus		02
Joulemeter		01
Joules Watt meter	Didital	01
Lenses	Biconcave	01
Lenses	Biconvex	14

Lenses	Planoconvex	05
Linear Expansion apparatus		01
Magdeburg Hemisphere		02
Microphome	probe	01
Newton meter		20
Potentiometers	One metre single wire	15