REPUBLIC OF SURINAME

MINISTRY OF LABOUR, TECHNOLOGICAL DEVELOPMENT AND ENVIRONMENT

NATIONAL BIOSAFETY FRAMEWORK FOR SURINAME

April 2005

VOORWOORD

Suriname, dat deel uitmaakt van het Amazône Gebied en het Guyana Schild is nog één van de weinige landen in de wereld met een bijzondere rijkdom aan biologische diversiteit. Veel van de voorkomende ecosystemen zijn onaangetast en de aanwezige verscheidenheid aan planten- en dierensoorten is voor een groot deel nog geheel onbekend. De ontwikkelingen, die zich mondiaal aan het voltrekken zijn op het gebied van de biotechnologie, maken dat landen als het onze zeer alert dienen te zijn. Het land is namelijk uitgestrekt, wat de contrôle op hetgeen er binnenkomt en er weer uitgaat zeer bemoeilijkt. Bescherming van de jacht- en leefgebieden van de in stamverband levende Inheemsen en Marrons en het blijven waarborgen van de gezondheid van de totale Surinaamse samenleving zijn hierbij van eminent belang. Het is vanwege deze feiten dat de Staat Suriname heeft aangegeven dat zij het Cartagena Protocol on Biosafety wenst te ratificeren. Hiermede aan de internationale gemeenschap haar bereidwilligheid tonend, mee te gaan met de nieuwe ontwikkelingen, waarbij zij haar eigen belangen beschermd en in lijn brengt met hetgeen in het Protocol wordt aangereikt. Met dit Bioveiligheids Raamwerk zal derhalve zeker een aanzet gegeven worden voor het reguleren van de handel, het gebruik en de transfer van Genetisch Gemodificeerde Organismen en zal het bewustzijn van onze samenleving op dit stuk tevens worden vergroot.
Het raamwerk biedt de overheid met name het Ministerie van Arbeid, Technologische Ontwikkeling en Milieu, de volledige ruimte om tezamen met de andere actoren, het reeds ingeslagen pad verder te vervolgen en ervoor zorg te dragen dat bioveiligheid, haar volledig beslag krijgt in de Surinaamse gemeenschap.

Het Ministerie wenst allen die een bijdrage hebben geleverd aan de samenstelling van dit Raamwerk dank te zeggen, in het bijzonder de Project Coördinator, Mw. G. Emanuels-Smith, die uitstekend werk heeft verricht bij het verloop van het project. Het Ministerie zegt tevens dank aan de National Biosafety Coordinating Committee, het Nationaal Instituut voor Milieu en Ontwikkeling in Suriname, de consultants, de Universiteit van Suriname en het Buursink Consultancy Bureau.

De Minister van Arbeid, Technologische
Ontwikkeling en Milieu,

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(5 April 2005)

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SAMENVATTING

Dit rapport beschrijft een raamwerk voor het veilig verhandelen en gebruiken van Genetisch Gemodificeerde Organismen (GMO) in Suriname. Het is het resultaat van een 18-maanden durend ontwikkelingsproces, waarbij er continue consultatie heeft plaatsgevonden met relevante stakeholders. Het presenteert een analyse van de bestaande situatie met betrekking tot biotechnologie en bioveiligheid, waarbij de tekortkomingen en mogelijkheden voor regulatie werden geïdentificeerd. Vervolgens is er een wettelijk, administratief en technisch kader ontwikkeld met een bijbehorend implementatie plan.

Het rapport geeft een analyse van het beleids-, wettelijk- en technisch kader voor handel en gebruik van GMOs. Het blijkt dat de Staat van Suriname geen specifieke melding maakt van biotechnologie in haar beleid- en wetsproducten met betrekking tot handel en gebruik van GMOs. Meer nog blijkt dat er tekortkomingen zijn in de quarantaine en sanitaire procedures bij de handel in levende organismen. Tevens blijkt de kennis en management van Suriname's genetische bronnen beperkt, tezamen met de wetenschappelijke expertise op het gebied van moleculaire biologie en aanverwante vakgebieden. De analyse heeft ook uitgewezen dat er weinig bewustwording is over biotechnologie en dit terwijl er GMOs gebruikt worden in onderzoek en mogelijk ook in de landbouw en de industrie.

Het Nationaal Raamwerk voor de Bioveiligheid (NBF) beschrijft een logische en systematische procedure voor het afhandelen van aanvragen voor het importeren/exporteren en beschrijven van GMOs. De NBF, zoals in dit rapport beschreven, bestaat uit 5 componenten t.w. een beleidskader, een wettelijk kader, een administratief systeem, een technisch evaluatie systeem en een methode voor publieke participatie.

Het wettelijk kader wordt voorgesteld met een interim regeling totdat de uitgebreide bioveiligheidswet binnen 3 jaar is gemaakt. Verantwoordelijk organisaties en hun specifieke taken worden geacht te zijn het Ministerie van Arbeid, Technologische Ontwikkeling en Milieu (LTDE), het Nationaal Instituut voor Milieu en Ontwikkeling in Suriname (NIMOS), het Ministerie van Handel en Industrie (TI), het Ministerie van Landbouw, Veeteelt en Visserij (AAHF) en het Ministerie van Volksgezondheid (HEALTH). Binnen deze instituten bestaat de behoefte aan gekwalificeerd en getraind personeel in de biotechnologie. De opbouw van capaciteit zal derhalve van eminent belang zijn.

Een ander component van het NBF is het systeem voor technische evaluatie van risico's geassocieerd met biotechnologisch voedsel, planten, dieren en micro-organismen. Dit wordt uitgevoerd wanneer deze producten worden geïmporteerd, geëxporteerd en gebruikt binnen Suriname's territorium. Suriname bezit weinig wetenschappelijke expertise in risico analyse en risico management. Daarom is er een systeem ontworpen welke voornamelijk gebruikt maakt van buitenlandse expertise. De NBF heeft verder vier momenten waarop het publiek kan participeren in het nemen van een beslissing tot GMO handel of gebruik.

De implementatie van het NBF geschiedt middels een monitoringsplan. Dit plan biedt een instrument voor gedetailleerde planning- en management van de implementatie plan, waarbij de institutionele verantwoordelijkheden en financiële vereisten worden weergegeven.

EXECUTIVE SUMMARY

The present report provides a framework for the safe movement and use of Genetically Modified Organisms (GMO) in Suriname. It presents the result of an intensive 18-month consultative process with relevant stakeholders. The report provides an analysis of the current status on biotechnology and biosafety, presenting the gaps, deficiencies and opportunities for GMO regulation, after which a regulatory, administrative and technical framework is developed and presented with a supporting implementation plan.

This report describes the analysis of the policy, legal and technical framework regarding trade and use of GMOs. Suriname has no specific policy on biosafety and does not address biosafety in any of the laws that focus on the import, export and use of GMOs. In addition, the analysis identified gaps in the quarantine and sanitary procedures when trading living organisms. It appears that the knowledge and management of Suriname's genetic resources is limited, along with the scientific expertise on molecular biology and related issues. Although Suriname is in the process of using biotechnology in research and possibly in agriculture and industry, it is evident that there is still minimal awareness regarding this subject.

The National Biosafety Framework (NBF) provides a logical and systematic flow of procedures to handle requests for the import, export and use of GMOs. The NBF as envisioned in this report includes 5 components: policy framework, regulatory system, administrative framework, technical evaluation system and system for public participation. For the regulatory framework, an interim measure is presented until a comprehensive biosafety law is comprised after 3 years. The agencies and institutions designated with the responsibility for formulating this law are the Ministry of Labour, Technology and Environment (LTDE), NIMOS, Ministry of Trade and Industry (TI), Ministry of Agriculture, Animal Husbandry and Fisheries (AAHF) and the Ministry of Health. Some of these institutions have need for qualified personnel in biotechnology. The building of capacity is therefore of great importance.

Another component of the NBF is the technical evaluation system of risks associated with biotechnological food, plants, animals and micro-organisms. This is conducted when these products are imported, exported or used within the Surinamese territory. For this, there exists limited scientific expertise in risk assessment and management and therefore a system is developed, making primarily use of technology from abroad. The NBF involves four points of input for the public when taking the decision on GMO trade or use.

The NBF development is followed by a monitoring plan. This plan provides a detailed planning and management tool for the effective implementation plan, outlining the institutional responsibilities and financial requirements.

INTRODUCTION

This document represents the National Biosafety Framework (NBF) for the Republic of Suriname. The National Biosafety Framework is the first step to comply with the administrative, legislative, technical and decision-making standards set under the Cartagena Protocol on Biosafety, which was adopted on 29 January 2000. The National Biosafety Framework serves as an interim step towards the preparation of a more permanent legislative framework to be developed in the coming years.

The National Biosafety Framework is the result of an 18-month consultative process with stakeholders from Government, private sector, academia and NGOs. The NBF development process is funded by the United Nations Environment Program (UNEP) and the Global Environment Facility (GEF) and implemented by the Ministry of LTDE.

Use and Management of Biotechnology

The Government of Suriname is committed to ensure the protection of the environment and specifically the pristine and rich biodiversity that comprises 80%-90% of the country's area. Suriname has about 14% of its land managed into protected areas, one of which is declared a World Heritage Site by UNESCO. Indigenous and rural communities use many of these resources for self-sufficient food production.

In Suriname, the field of biotechnology is still at an early stage of development. There is no mechanism established to ensure protection from (potential) adverse impacts from products of biotechnology. The concentration of the biodiversity in a large and inaccessible area of the interior, the inadequate control on transboundary movements and the poor quarantine measures taken at borders corroborate to the need for safety measures.

The Government of Suriname recognizes that the use of modern biotechnology can significantly contribute to improving agricultural- and industrial production. Adaptive and practical biotechnologies that improve productivity and reduce the pressure on the environment will increase self-sufficiency through import-substitution.

However, the use of modern biotechnology, if not properly managed, can also pose a potential risk to the environment and the conservation of biological diversity. When the Government of Suriname ratified the United Nations Convention on Biological Diversity in 1996, it recognized the need for care when using biotechnology in the conservation of biodiversity and the sustainable use of its components.

The Cartagena Protocol on Biosafety is specifically designed to manage the transboundary movement, transit, handling and use of all living modified organisms that may have an effect on biodiversity and pose a risk to human health. To ensure an adequate level of safety in the use and transfer of products from biotechnology, the Government of Suriname intends to soon ratify the Cartagena Protocol. Such a process implies not only an expression of interest as indicated by the signature, but also the transformation of the treaty's principles and obligations into national law.

To meet the requirements of the Cartagena Protocol, the Government initiated the National Biosafety Framework (NBF). The NBF development is the first activity related to biotechnology and biosafety in Suriname and is coordinated by the Ministry of LTDE.

Objective and scope of the National Biosafety Framework

A National Biosafety Framework is a system of legal, technical and administrative instruments set in place to address safety for the environment, including the safety of humans, in the field of modern biotechnology. The National Biosafety Framework is designed to provide a realistic approach towards addressing the management of genetically modified organisms.

National biosafety frameworks vary from country to country, depending on the specific national priorities, regulatory structures, administrative systems and traditions. Despite this diversity, national biosafety frameworks in general share number of common elements. Most national biosafety frameworks contain:

1) A national biosafety policy,
2) A regulatory regime,
3) A system to handle requests for permits for certain activities, such as releases of GMOs into the environment and transboundary movement of GMOs,
4) A system for the monitoring and enforcement of GMOs, and
5) A system for public awareness and participation.

In general, the NBF provides the basis for countries to benefit from modern biotechnology while minimizing the associated risks.

Specifically, the NBF will assist the Government of Suriname to establish a biotechnology policy and to implement priority aspects of this policy in order to promote:

1) Precaution and the safe use of biotechnology to minimize the negative effects on the environment and human health,
2) The long-run competitiveness of the agricultural- and industrial sector through the development of biotechnology industry, and
3) The management of the existing genetic resources and traditional knowledge.

The NBF development process took place from July 2003 until December 2004. The process required effective coordination between institutions in order to develop comprehensive policies for the Government of Suriname to deal with the cross-cutting issue of biotechnology. The Ministry of LTDE commissioned the preparation of the NBF under the auspices of – a National Coordinating Committee, a multidisciplinary team of national and international experts and stakeholders from Governmental organizations, environmental sector institutions, private sector organizations, indigenous- and maroon communities, NGOs, and academia.

Format of the Report

The National Biosafety Framework report presented here consists of three chapters. Chapter one describes the current status of biotechnology and biosafety in Suriname, explaining its scientific use, handling, and management capacities. Chapter two presents the National Biosafety Framework itself, providing policy guidelines, technical and administrative implications, laws and regulations and public participation components. The last chapter gives recommendations for implementation of the NBF, and proposes specific actions, time frames, and follow-up activities.

CHAPTER 1

CURRENT STATUS OF BIOTECHNOLOGY AND BIOSAFETY

This section presents an overview of the current status in biotechnology and Genetically Modified Organisms (GMOs), and their relevance to biosafety in Suriname. It is based on a national survey that was carried out by a group of eight experts that consulted with Government agencies, private sector, NGOs and professional individuals between December 2003 and February 2004.

Comprehensive analysis of the information gathered led to the identification of gaps and deficiencies and gives a clear view of the opportunities of biotechnology for Suriname. The section regards a wide array of interrelated topics, all relevant to the development of the National Biosafety Framework.

Current status on use of biotechnology and GMOs

Biotechnology is still in the early stages of development in Suriname. Although, a biotechnology industry per se is lacking, interest for biotechnology is mainly from the private sector. Mining companies are interested in the potential use of GM micro-organisms for cleaning up waste.

The University of Suriname had earlier involvement in biotechnology research. This included the microbial screening of extracts with recombinant bacterial strains in a USA-funded project by the International Cooperative Biodiversity Group (ICBG). This project proceeded from 1993 - 2003. In addition, one University researcher (plant virologist) is involved in developing pathogen-derived virus resistance plants in collaboration with a research group at Cornell University in the USA.

The University of Suriname (UVS) has no specific education program in biotechnology or related sciences such as molecular biology or biochemistry. Being the only academic institution in Suriname, UVS faces problems with creating an environment for innovative research due to low level of public investment in research and development.

The UVS is involved through its Department of Agriculture in maintaining a food- and biotechnology website for the SIMBIOSIS network (OAS funded Latin American and Caribbean network for food- and biotechnology). The UVS possesses one tissue culture facility and one laboratory with elementary DNA analysis equipment. These laboratories, similar to most laboratories in Suriname, face problems with safety, waste management, calibration and maintenance of equipment.

Human capacity in biotechnology and related fields is limited. Suriname has few experts that have specific knowledge of molecular biology and biotechnology. Other experts have academic qualifications in biotechnology and related disciplines and have a minimal of 5 years of experience in their field of expertise as follows:

- Agriculture, animal husbandry, forestry and fisheries (7),
- Plant- and animal sanitation (14),
- Biology (7),
- Molecular biology (4),
- Biochemistry and human sciences (9),
- Social sciences (7),
- Food science (4).

A coordinative effort between scientists in general is absent (no professional societies, science boards and even advisory organs to the policy makers). Education and experience in biotechnology is usually gained through activities of individual experts.

Regulatory regime

The Cartagena Protocol on biosafety is the first legally binding set of regulative guidelines for the use and transboundary movement of living modified organisms derived from modern biotechnology. The inclusion of biotechnology and biosafety in international agreements is worldwide at an early stage of development. Trade-related agreements under the WTO do have provisions to regulate the transboundary movements of GMOs but the inter-linkages among international agreements are not well defined due to the wide applicability and cross-cutting nature of biotechnology. The need for improved coordination has been recognized.

The international agreements relevant to biosafety are presented in Figure 1. They are the Cartagena Protocol on Biosafety and the WTO-SPS and TRIPS agreements and the international guidelines under WHO/FAO-Codex Alimentarius.

An overview of national legislation pertinent to biosafety is presented in Figure 2. In several cases new legislation is being drafted. For instance, the Ministry of AAHF is currently modernizing laws and confines supplementary regulations to meet obligations under the WTO and other agreements (figure 2). Many of the proposed national legislation do not have provisions on GMOs.

The draft Environmental Framework Law is also relevant to biotechnology. The Law will provide the legal basis for environmental- and social assessment, informed consent of communities and enforcement policies. These provisions corresponds to the risk analysis, advanced informed agreement and compliance procedures of the Cartagena Protocol on Biosafety.

Figure 1: Overview of international agreements for Suriname relevant to biosafety

International agreement		Date entry into force	Relevance to biosafety	Ongoing activities	Executing entity
UN World Trade Organization					
GATT	General Agreement on Tariffs and Trade *Regulate trade in all products*	1995	Article XX recognizes the objective of protection of the environment including human, animal, plant life and health (GMOs)	Mandatory review in trade policy	Ministry of TI
SPS	Sanitary and Phytosanitary measures *Ensure sanitary measures in trade of plants, animals and food*	1995	Art. 2.1 states the right to take sanitary and phytosanitary measures for protection of human, animal, plant life and health (GMOs) Art. 5.7 gives parties the right to a precautionary approach in risk assessment (GMOs)	1. Establishment of Agricultural Health and Safety Unit (2001) 2. Strengthening system for plant protection and control (2003) 3. Strengthening system for food control (2003)	Ministry of AAHF- FAO IICA
TBT	Technical Barriers to Trade *Ensure technical regulations, standards, testing and certification in trade*	1995	Art. 2.2 states the right to make technical regulations, standards and conformity assessment procedures for protection of human, animal, plant life and health and the environment (GMOs), thereby promoting the use of science and risk assessment	Legislation Bureau of Standards approved	Foundation Bureau of Standards
TRIPS	International Trade-related aspects of Intellectual Property Rights *Protection of intellectual property rights in trade*	1995	Art. 27.2 states that patents can be refused when it might endanger human, animal or plant life and health and the environment, thereby excluding microorganisms, microbial and non- biological processes (GMOs are currently under review).	Draft industrial property act in legislative process	Ministry of Justice & Police - WIPO
United Nations					
WIPO	World Intellectual Property Organization *Protection of intellectual property right*	1976	GMOs are currently under review for patentability or non-patentability	Draft industrial property act in legislative process	Ministry of Justice & Police
CBD	Convention on Biological Diversity *Conservation of biodiversity, sustainable use of its components and equitable sharing of benefits*	1996	Preamble calls for precautionary approach when decision on import of GMOs is made by a serious threat to the environment regardless of its scientific certainty. Art. 8j. ad-hoc working group on traditional knowledge addresses the handling of biotechnological innovations and distribution of benefits. Art. 8g. states that parties should manage, regulate and control risk associated with the use and release of GMOs. Art. 19.4 states provision of information to other parties on their use and safety regulations on GMOs (Clearing house mechanism)	Preparation of National Biodiversity Action Plan (2001)	Ministry of LTDE-NIMOS-UNDP
CP	Cartagena Protocol on biosafety *Ensure safety with the use and transboundary movement of living modified organisms*	2003	All	Establishment of a National Biosafety Framework (2003)	Ministry of LTDE-UNEP
Basel	Basel Convention on the Control of Transboundary Movement of Hazardous wastes and their Disposal. *Environmentally sound transboundary movement and disposal of hazardous waste*		GMOs can be considered hazardous waste and thereby fall under the Basel convention	Proposal and plan of action for ratification (2003)	Ministry of LTDE - NIMOS
TBT	Technical Barriers to Trade *Ensure technical regulations, standards, testing and certification in trade*	1995	Art. 2.2 states the right to make technical regulations, standards and conformity assessment procedures for protection of human, animal, plant life and health and the environment (GMOs), thereby promoting the use of science and risk assessment	Draft legislation Bureau of Standards in legislative process	Foundation Bureau of Standards

Figure 2: Overview of National Legislation in Suriname relevant to Biosafety

	Existing National legislation		Ongoing activities	Relevance to biosafety	Responsible entity
	General	**Specific**			
TRADE	2003 Act on the Import and Export of goods *Trade in goods and services*	2003 Decree negative list *Goods with import and export restriction*		Degree negative list can be easily amended to include GMOs	Ministry of TI
	1936 Act on the export of agriculture, horticulture and forest products *Export of agriculture, horticulture and forest products*	2000 Fish inspection act 1959 Act on import of vaccine/serum for animals 1953 Rice export decree 1964 Citrus export decree			Ministry of AAHF
	1911 Food act *Safe use and trade of food products*	1940 Decree on food establishments 1954 Decree on food inspection 1961 Decree milk and dairy products 1943 Bread decree 1931 Decree cheese 1980 Decree vinegar 1952 Decree coffee and tea 1952 Decree on spices 2001 Decree on labeling of brewery products	Draft food act Decree on import and export of food	Draft food act can be easily amended to include GMOs	Ministry of Health
QUARANTINE	1965 Plant protection act *Prevention and control of plant pests and diseases*		Draft plant protection act Draft seed act Draft breeding act	Draft plant protection act provides the opportunity to prohibit/restrict entry of GMOs when harmful to the local flora. Not clear if draft seed act covers GMOs	Ministry of AAHF
	1954 Act to control animal diseases *Prevention and control of animal pests and diseases*		Draft act to control animal diseases Draft animal husbandry act Decree animal husbandry Decree control animal diseases Decree on pet shops Decree on use of animal medicines Decree on destruction Decree on discharge of veterinary medicine	Act to control animal diseases does not specifically mention GMOs	Ministry of AAHF
	1911 Food act *Safe use and trade of food products*	1961 Meat inspection act 2000 Fish inspection act	Draft Food act Decree on labeling Decree on preparation and handling of food Order on hygiene Decree on packaging Decree on meat inspection Amendment Fish Inspection act	Draft food act can be easily amended to include GMOs. Meat inspection act does not specifically mention GMOs	Ministry of Health
SPECIES INTRO	1954 Act to control animal diseases 1965 Plant protection act			See above	Ministry of Natural Resources
INTELLECT PROPERTY	1912 Trade mark act 1910 Patent act 1913 Copy right act Penal code, articles 390 and 400 Civil code, article 1401j		Draft act on industrial property rights	Draft industrial property act does not contain provisions on GMOs. Civil code provides for measures against the misleading of the public (GMOs)	Ministry of Justice & Police

Systems for handling transboundary movement of living organisms and food products

Living organisms

The trade of living organisms is regulated through a licensing system under the "Act on the Import- and Export of Goods, 2003. Under this licensing system there is no special control on GMOs and little is known of the amounts of GMO transboundary movement. Living organisms are permitted to enter Suriname unless they have undergone a procedure of risk assessment. The procedure for risk assessment does not comply with the WTO-SPS standards, although efforts are underway to do so.

Risk assessment in animals is based on only allowing animals and their products from disease free countries. This is a zero-risk policy that is based on intensive international communication. The Veterinary Department faces similar problems as the Plant Quarantine department and plans to comply with the WTO-SPS standards by introducing obligatory farm registration and animal identification and regulation of import, trade and use of veterinary drugs (residue analysis) through a newly established "Agricultural health and Food safety unit" for plant-animal health and food safety. Export of animal products is granted with a certificate if they are proven to be disease free (sanitation monitoring).

In the case of plants, a pest risk analysis is conducted to judge whether the product to be imported could pose a danger to the agricultural sector in Suriname. Import is permitted when the risk assessment proved safe with the issuance of a health certificate. Risk assessment is usually not adequately carried out because the quarantine facilities are understaffed, have inadequate facilities for housing (screen houses) and corresponding laboratories are not optimally functioning due to limited financial means and one or more of the above mentioned reasons. A few efforts are taken to improve the status of the plant quarantine situation in Suriname through institutional strengthening of the Plant quarantine department by training in modern procedures, establishment of a phytosanitary laboratory and support for the development of the electronic database. Depending on the regulations and requirements of the importing country, the exporter will notify the Department to conduct the inspection prior to export. This inspection includes a visual inspection to assure that the consignment is free of any harmful pest. In some cases, where treatment is a mandatory requirement of the importing country, the department will conduct a treatment which can be either fumigation or a chemical spray treatment.

Food products

Import of food products is only permitted with a health certificate from the Ministry of AAHF (living) or the Ministry of Health (processed). The health certificate from the Ministry of Health-Bureau of Public health (BOG) is not subjected to a structural procedure of risk assessment by testing. The need for a health certificate is evident when a food product is designated "as food" when imported and categorized by the custom code system. Unfortunately, food products that need to be certified seem to pass through this custom code system. Food products for export are tested according to the needs of the importing country.

Efforts are underway to establish a Food Safety Unit and corresponding food safety program at the BOG. Institutional strengthening of the BOG is proceeding with support from FAO and the Ministry of AAHF on strengthening laboratories and the revision of food laws and regulations. In addition, the Ministry of (TI), the Ministry of AAHF, the Ministry of Health and other functional groups formulated draft regulations for the establishment of a National Food Safety Board. This board would have a coordinative function in implementing policy on food safety. This board is not established yet due to differences in opinion on the organizational structure and functioning.

There exists no specific import or export measure for micro-organisms. Living microorganisms that are specifically prohibited for import are those that can be used as biological weapons.

An overview of the trade and sanitation procedures for living organisms in Suriname is given in figure 3.

Figure 3: Overview of trade and sanitation procedures for living organisms and food in Suriname

Action	Animals	Plants	Microorganisms	Food	GMOs
Import	only from disease free countries	with risk assessment for agricultural health	none	subjected to health assessment	none
Export	with certificate after visual inspection	with certificate after visual inspection and testing	none	testing depended on the importer	none
Sanitation	surveillance of veterinarians/farmers Ante- and post mortem visual inspection with slaughtering Fish quality inspection	None	none	inspection of fish for food safety	none
Emergency plans	Confinement, controlled transport and destruction Plans which are being studied	Draft plan for exotic plant pests- and diseases	none	None (curative action)	none

Managing genetic resources

Suriname is internationally significant because of its extensive tropical forest cover (>90% of the country) and richness of wildlife and plants species. A small number of animals (<20) and approximately 200 plant species are endemic to Suriname. Most inventories on genetic resources have taken place in the coastal plain of Suriname, whereas large areas in the terrestrial interior remain completely unknown for their flora, fauna and ecosystems.

The two national institutions responsible for general inventories of the flora and fauna and preservation of the knowledge of biodiversity are the National Herbarium Suriname (NHS) and the National Zoological Collection Suriname (NZCS). Inventories of plants with agronomic importance are made by the Ministry of AAHF (fruits), CELOS (grains) and ADRON (rice).

There is additional knowledge on flora in herbaria outside Suriname. Efforts on listing plant material with medicinal use are from Conservation International (ICBG project) and the FAO. Inventories on microorganisms are limited to agricultural pest- and disease collections of the Ministry of AAHF. On the level of ecosystems few inventories have been carried out, mainly of the Savanna belt and of the freshwater ecosystems. Fish surveys have been carried out in various river systems.

Collections are scarce and their maintenance is constrained by the lack of financial means and human capacity. Collections that are well kept are those of the NHS and NZCS and the strategic (working) collection and gene bank of rice at the ADRON. These collections maintain an electronic database in Biolink (NZCS), Excel (NHS, ADRON). Databases on farms animal genetic resources and fish breeds are not available.

The introduction of new species is not regularly monitored. The extensive free movement of organisms with neighboring countries poses a potential danger to the conservation of biodiversity and its continued use by indigenous communities. Several animal species have been - unintentionally or intentionally - introduced in Suriname such as rodents, tilapia, ornamental fish, iguanid lizards and gekkonid lizards. The impact of these potential alien invasive species on the local biodiversity is not known.

Regular surveillance is performed on animals, because of the transmittal danger to humans. Veterinarians and farmers are obliged to report all suspected or confirmed diseases to the Veterinary Department of the Ministry of AAHF. Animals in slaughterhouses receive ante- and post mortem inspection (visual inspection) for food safety. The veterinary inspection can take emergency action by confinement, controlled transport, and/or destruction of animals and products. A draft emergency plan based on the Jamaican "Animal disease emergency preparedness plan" (IICA) is under consideration.

Plant pests- and diseases are not regularly monitored after entry into the country. The Plant Quarantine department of the Ministry of AAHF uses field reports from the extension service (understaffed and weak) and individual farmers for monitoring. The Department does not have the authority to inspect farms and transportation vehicles. A draft "emergency action plan for exotic plant pests and diseases" is under review of the IICA and could also be applicable to alien invasive species.

Food safety is controlled by the Bureau of Public Health (BOG) through the Departments Food Control & Inspection and Epidemiology, with the exception of fish. Fish inspection is by the Ministry of AAHF. A Foundation to conduct fish inspection and control for consumption is planned but not yet founded, although the law has been in place since 2000. Sanitary control on food products (and food handlers) is done through food inspectors of the Ministry of Health, who have the ability to enforce the laws in case of violations in transport, storage, conservation and sale of the end product. The Fish department of the Ministry of AAHF runs a food safety program that monitors the presence of histamine, ciguatera and toxic metal residues (mercury). There is almost no inspection and control on the food production processes.
There exists no disaster plan for food safety. The Ministry of Health takes curative action after outbreaks of food intoxication are reported through surveillance (Epidemiology department). Curative action is conducted in collaboration with the WHO/PAHO.

Public awareness and participation

Awareness on issues of biotechnology is generally minimal in Suriname. This reflects a limited understanding of its potential impacts on the environment and human health at all levels, from decision makers to the general public. A survey (van der Kooye, 2003) under youngsters between the ages 16-30, showed little awareness on environmental institutions and treaties; more than 90% was unable to name a single international environmental treaty or organization. Even in the academic community there is limited knowledge on biotechnology, as was concluded in the scientific seminar (Ministry of LTDE and University of Suriname, 2004).

The participation of the public and various stakeholder groups in plans and decisions is regularly performed through multi-stakeholder commissions and -consultations. Suriname is currently developing more participatory mechanisms, especially with the proposed Environmental Framework Law that requires public involvement in environmental and social impact studies.

In the case of biosafety, the Cartagena Protocol prescribes effective public participation in making the decisions to import GMO's. Public involvement in biosafety is a challenge, because issues in biotechnology which are very complex.

CHAPTER 2

NATIONAL BIOSAFETY FRAMEWORK

A National Biosafety Framework is a system of legal, technical and administrative instruments set in place to address safety for the environment, including the safety of humans, in the field of modern biotechnology.

National Biosafety Frameworks vary somewhat from country to country, depending on the specific national priorities, regulatory structures, administrative systems and traditions. Suriname is in an early stage of developing and implementing its national biosafety framework. Suriname's National Biosafety Framework is designed to provide a practical system for biotechnology regulation in Suriname. The Suriname NBF consists of a policy and regulative framework, an administrative system to handle requests, a mechanism for risk assessment, monitoring and enforcement, mechanisms for public awareness and participation, and a system to provide information to stakeholders. The NBF applies to the research, development, handling, transport, use, transboundary movement, release and management of Genetically Modified Organisms (GMOs) on the territory of Suriname. Specific focus is on the transboundary movement of GMOs, in light of the high imports of goods and the non-existence of border control in the interior of the country.

The NBF is the result of an intensive consultative process with stakeholders. All Ministries that are directly involved were consulted on their administrative, regulatory and technical capabilities. Stakeholders from Government, academia, private sector and NGOs were asked to develop a conceptual framework for implementing the biosafety system. They determined that the following principles should apply to the NBF:

- a flexible system that can be attuned to the changing developments in biotechnology
- a system with strong coordination to handle the cross-cutting issue of biotechnology
- a system that is transparent, practical and can be added-on to the existing systems
- a system that facilitates decisions to be made at the community level
- a system that can provide for continuous capacity building
- a system that is mutually supportive to the international obligations of Suriname
- a system that is cost-effective

The development and implementation of the NBF is not an easy task in a country that is used to sectoral approaches. Crosscutting issues are not well defined in the Government administrative- and regulative system and increase the need for strong coordination between organizations. Stakeholders specifically identified this aspect as a prerequisite for successful implementation of a biosafety system in Suriname.
The NBF provides Suriname with an interim step towards a permanent legislative framework. This permanent legislative framework is expected to be developed in the coming 3 years.

2.1 POLICY FRAMEWORK

The policy of the Government of Suriname on environmental management is specified in the Government Declaration 2000-2005 and the corresponding Long-Term Development Plan 2000-2005 (MOP). The Long-Term Development Plan identifies six focus areas (figure 4), however, in general, environmental management is in a preliminary stage of development; focused on definition of policies, laws and regulations. The overall objective of national environmental policy, as outlined in the MOP, is the protection and conservation of the environment, and the improvement of environmental quality and sustainable development through the formulation of a national policy, regulations, and the implementation thereof.

Although the MOP does not specifically address biosafety, it is the task of the Ministry of LTDE, to promote the implementation of Multilateral Environmental Agreements signed and ratified by the Government of Suriname. In this particular case the Cartagena Protocol on Biosafety. Furthermore the importance of biosafety is stated in several official statements by the Minister of LTDE. The Government wishes to comply with the international regulations with respect to biotechnology and biosafety and plans to ratify in 2005 the Cartagena Protocol on Biosafety while recognizing the strategic role of the UNEP/GEF project in this process.

Figure 4: Focus areas of Suriname's Long-Term Development Plan 2001-2005

Focus area MOP
Formulate national regulations, set standards and guidelines to comply with international regulations
Use of sustainable agricultural practices and reduce of pesticides
Formulate national regulations regarding climate change
Strengthening waste management system
Sustainable development of natural resources and energy
Strengthening public participation systems for local communities

Guiding Principles

Through its international obligations the Government of Suriname is also committed to several general guiding principles on environmental management and biosafety. These principles, now embedded in both international and national law, are:

1) *The right to a healthful life;* the State shall protect the right to life and thereby create the basic needs of living such as work, food, health care, education, energy, clothing and communication (Constitution of Suriname 1987, Article 14);

2) The right to a healthful ecology; the State shall provide for conditions for the protection of nature and maintaining the ecological balance (Constitution of Suriname 1987, Article 6g);

3) *The right to safe biological products*; the State is responsible for the supervision of the manufacturing, storage and trade of chemical, biological, pharmaceutical and other products used for consumption, medical treatment and diagnosis (Constitution of Suriname 1987, Article 48);

4) *The right to equal protection and the prohibition of discrimination;* the State is responsible to create an environment for non-discrimination including socio-economic and ethical considerations (Constitution of Suriname 1987, Article 8).

5) *The precautionary principle:* In case of serious or irreversible damage to the environment, the lack of scientific uncertainty shall not be used as a reason for Suriname to postpone cost-effective measures to prevent environmental degradation (Rio Declaration on Environment and Development 1992, principle 15)

6) *Transparency and public participation in decision making;* Member States shall provide appropriate access to information concerning the environment that is held by public authorities and the opportunity to participate in the decision making processes. The State shall facilitate and encourage public awareness and participation by making information widely available and effective access to judicial and administrative proceedings shall be provided (Rio Declaration on Environment and Development 1992, principle 10).

7) *Protection of traditional knowledge*; Each contracting party needs to respect, preserve and maintain knowledge and innovations of indigenous and local communities embedding traditional lifestyles (United Nations Convention of Biological Diversity, Article 8j)

Institutional coordination

The mandate to manage biotechnology issues lies with the Ministry of LTDE. This Ministry is responsible for the preparation, coordination and monitoring of environmental policy and its implementation. The Ministry is provided with technical support of trained professionals in environmental management and –legislation within the Environmental Section of the Ministry from the NIMOS.

The Ministry of LTDE as the national coordinating mechanism for environmental issues established the National Coordinating Committee, as to have a more effective coordination amongst stakeholders within the area of biotechnology (see Annex 8).

In addition to the Ministry of LTDE, several other Ministries, their departments and others have a role to play in the regulation of biotechnology. This is outlined in Figure 5.

Currently, the private sector is not yet aware of the aspects regarding biosafety, however efforts are being made to get the sector involved in the process as much as possible.

Figure 5: National institutions with a potential role in biosafety management

	Organization	Relevant Institutions	Relevance to biosafety
	Ministry of Labour, Technological Development and Environment (LTDE)	National Institute for Environment and Development in Suriname (NIMOS)	Develops comprehensive policy on GMOs Assessment and management of risks associated with GMOs (NIMOS)
GOVERNMENT	Ministry of Public Health (VG)	Bureau of Public Health Central laboratory	Regulations set on human health effects Analyzes products of GMO origin
	Ministry of Agriculture, Animal Husbandry and fisheries (AAHF)	Agricultural Health and Safety Department (to be established) Plant Protection & Quality Control Department Animal Quarantine Department Fisheries Department	Coordinates activities related to plant and animal health and food safety Facilitates trade (in GMOs) Facilitates trade (in GMOs) Facilitates trade (in GMOs)
	Ministry of Trade and Industry (TI)	Division of import, Export and Foreign Currency Control Chamber of Commerce and Industry Foundation Bureau of Standards	Issuing licenses on import/export of organisms (GMOs) Registration of companies (using GMOs) Sets standards for GMO products
	Ministry of Finance	Customs Department	Identifies GMOs by entry point
	Ministry of Education	University of Suriname (UVS) CELOS	Assessment of risks of GMOs in environment and human health Education programs in biotechnology Experience with use GMOs for drafting regulations
	Ministry of Natural Resources (NH)	Nature Conservation Division Foundation for Forest management (SBB)	Introduction and management of GMOs in the environment

2. 2 REGULATORY REGIME

The legal basis

The legal framework for a new specific subject such as biosafety must be based upon and integrated into the legal system of the country. The Surinamese legal system may be classified as a civil law system and is fundamentally similar to the Dutch legal system. The core codes – relating to civil law, civil procedures, criminal law, criminal procedure and trade and commercial law are very similar to the Dutch equivalents.

Primary legislation, (laws) are enacted by the Parliament. However, some of the primary legislation in force is in the form of decrees, since they date from the period of Military rule. The Government is entitled to make subsidiary legislation based on the law or the Constitution. Subsidiary legislation could be enacted by one or more Ministers, the Council of Ministers and the President (resoluties, presidentiële besluiten). The Council of Ministers issues State decrees (Staatsbesluiten) to prescribe binding rules of general application and to achieve specific purposes such as the implementation of the provisions of a law or State decree or to lay down policy guidelines for the exercise of discretionary authority. In addition Ministers may issue regulations (Beschikking) in the exercise of powers granted by laws.

The Constitution of the Republic of Suriname states that the State should provide for conditions for the protection of nature and maintaining the ecological balance. More over, the State shall protect the right to life and thereby create the basic needs, including human health. The constitution also assigns to the State the responsibility of the supervision of the manufacturing, storage and trade of chemical, biological, pharmaceutical and other products used for consumption, medical treatment and diagnosis.

In Chapter 1 we have outlined the national legislation relevant to biosafety as well as the international agreements pertinent to biosafety. The National Biosafety Survey (Ministry LTDE, 2004) of the existing regulatory regime has shown that there are a lot of gaps and overlaps with respect to biosafety. Therefore changes are required in our existing regime to enable the country to regulate biosafety.

It will be a huge task to include biotechnology in all of the draft legislation. In order to address issues on biotechnology, a new law should be drafted to cover all issues of biotechnology, including intellectual property and socio-economic aspects. Due to the fact that biosafety concerns aspects of human health, plant and animal protection, trade, intellectual property rights and socio economics, it is recommended to regulate biosafety through a comprehensive legal system addressing all aspects. This system will contain regulations enabling provisions to allow for certain matters to be left for more detailed regulation at a later date. Institutional rearrangements and collaboration between the institutions are indispensable for effectively implementing this system.

Experience with drafting and formalizing laws has learned that it can take years before a law is in place and fully enforced. For the transitional period an interim measure must be taken to allow for urgently needed regulation and management of GMOs in the coming years. In the meanwhile, discussions, research and public awareness will lead to clearer visions on the content and effective implementation of a biosafety law.

Interim measures

The National Biosafety Framework provides a useful interim measure towards a more permanent and comprehensive legislative framework covering all aspects of biosafety. Both the Act on the Import and Export of Goods, 2003 and the State Decree Negative list form the legal basis to introduce the abovementioned interim measures. The act aims to regulate the international trade of goods, while fulfilling Suriname's international trade obligations on international trade. The State Decree Negative list, which is a subsidiary legislation under the Act of Import and Export of Goods, provides a restriction on the trade (prohibition, license required and special treatment) of goods. Due to the fact that a State Decree is easier and quicker to promulgate it is recommended to adapt this decree. This will allow the country to develop a biosafety law in the future based on experiences from the implementation of the State Decree.

It is worthwhile to mention that this state decree is currently under discussion at the Council of Ministers. Amongst others, it is proposed that GMOs are included in the list of goods requiring a license. If the abovementioned proposal is approved, a starting point for implementation of the biosafety framework is established.

Proposed legal framework for Suriname

Because of the crosscutting nature of biosafety, the legal framework should be overarching and not heavily influenced by one sector. Furthermore, the framework should allow for certain matters to be left for more detailed regulation at a later date. The National Biosafety Survey (Ministry of LTDE, 2004) has also showed that many relevant laws (plant protection, animal quarantine, food control, etc.) and institutions exist but are not equipped to address GMO management. The proposed legal framework is expected to fill in the gaps, support the existing relevant laws, and harmonize these with new legislation.

Objective

The overall objective of the proposed legal framework is "Preservation of the genetic diversity and integrity through control of the production, commercialization and use of biotechnological techniques, methods and substances that constitute a risk to life, to the quality of life, and to the environment"

Scope

The legal framework shall apply to: the import, export, transit, deliberate release/ intentional introduction into the environment for experimental or commercial purposes, contained use and placing on the market of GMO plants, GMO crops, GMO animals (including fish), GMO microorganisms, GMO foods, GMOs for animal treatment and GM animal feeds.

Exemption: Certain GMOs or products may be exempted from the regulatory regime, either now or in the future, where they are considered, on the basis of a long history of safe use in the country, to pose no risk (exemption must be consistent with the CP).

Principles

The key principles, which will be taken into consideration, are among those identified in the policy framework (section 2.1).

Definitions

The scope of the regulatory regime will require careful definition of the following terms: use, transboundary movement, handling, dealing, contained use, field trial, deliberate release/ introduction into the environment, placing on the market, unintentional transboundary movement, etc.

Advance Informed Agreement procedure (AIA procedure)

The first intentional transboundary movement of GMOs use of the party of import shall be subject to the AIA procedure, which means that the party of export or the exporter shall notify in writing to the party of import prior to the intentional transboundary movement of the GMO. There can be no export of GMOs or products thereof unless the State is satisfied that the country of import gives its prior informed consent.

The Ministry of LTDE is the National Competent Authority (NCA) responsible for the handling of notifications and applications for the use and transboundary movement of GMOs. Formally it is the Ministry of TI who is the responsible agency for issuing licenses for the import and export of goods. Every exporter shall send his notification/application (standard form) to the Ministry of TI. The Ministry then forwards this application to the NCA (Ministry of LTDE) for handling. Within ninety days the NCA shall acknowledge the receipt of the notification/application.

Within two hundred and seventy days of the date of receipt of notification, the NCA shall communicate its decision, in writing, to the applicant and to the Biosafety Clearing House. If necessary, the NCA can request additional relevant information. The number of days the NCA has to wait for additional information shall not be taken into account.

The application for the use of GMOs is directly send to the National Competent Authority. The application for approval must be accompanied by very comprehensive information supplied by the applicant. This information must be sufficient to allow for an adequate evaluation of any foreseeable risks from allowing the activity in relation to the GMO or product thereof.

The application shall include the information set out in annex I of the CP, in particular:

- General information
- Information related to the GMOs or products thereof;
- Information relating to the conditions of release, contained use or placing on the market and, where appropriate, the receiving environment;
- Information on the interaction between the GMOs or products thereof and the environment;
- Information on monitoring, control, waste treatment and emergency response plans;
- In case of an application for contained use, an impact assessment setting out the consequences of unintentional release of the GMOs or products thereof
- Report on the impact and risk posed by the GMOs or products thereof to human and animal health, biological diversity and the environment;
- Information on results from deliberate releases in the country and other countries of GMOs or products thereof previously or currently carried out by the applicant;
- Information on where and for what purposes the GMOs or products thereof will be marketed, together with detailed instructions for use and the proposed labeling and packaging, fulfilling the requirements specified in Annex II, Part C of the Protocol;
- Other information as may be required by the NCA.

Risk Assessment and management

The applicant shall carry out, or cause to be carried out, an assessment of the impacts and risks posed by the GMOs or products thereof to human and animal health, the environment and biological diversity based upon the guidelines in Annex III of the Protocol. The applicant then submits the report through the Ministry of TI to the NCA.

An expert group is responsible for the coordination of the risk assessment process. This group will be an integral part of the NIMOS. Depending on the GMO product, external experts are assigned to assist the expert group in evaluating the risk assessment report. The expert group advises the National Competent Authority on the risks within 100 days. At the conclusion of the evaluation of

the applicant's report, the NCA may, if it so decides, carry out, or see to it that an assessment of the impacts and risks is carried out.

The risk assessment and the evaluation of the risk assessment report should be regulated through subsidiary legislation. It should take into account, inter alia, the following:

- All relevant scientific evidence and experience;
- General characteristics of both the GMOs or products thereof and the parent organism, the vector used, the GM and the novel traits, including market traits and other sequences even when not expressed
- The native environment or host range of recipient organism and donor organism
- The intend use of the GMO or product thereof and the nature of the receiving environment
- Potential impacts of the GMOs or products thereof on the environment, including long term, direct and indirect ecological impacts;
- Direct, indirect and long term effects on human , plant and animal health
- Socio economic impacts
- Conformity with ethical and cultural values and norms etc.

Other considerations that shall be taken into consideration are whether if the use of the GMO will benefit the country and contribute to sustainable development. Also the expert group shall consider the efficiency of sustainable alternatives as well as safer alternative technologies.

Any approval for release or use shall require the applicant to carry out monitoring and evaluation of risks after the GMOs or products thereof have been imported, released, used in contained conditions or placed on the market. There is a risk management team (monitoring is the responsibility of the sector-Ministries Agriculture and Health) to monitor the activities after the approval. The team may take measures to manage the risks posed by GMOs or products thereof.

Public Participation and consultation

The public is kept informed through daily newspapers and the Internet (National Biosafety website) and by the information office of the Ministry concerned. All relevant information that is supplied by the applicant, including the risk assessment report must be made available to the public. In addition, the NCA may ask for public consultation. Stakeholders will be given 30 days to submit their written comments to the NCA. Comments given by the public must be taken into account into the decision-making.

Decision-making procedure and appeal process

The competent authority must prepare a report of its decision and the grounds of its decision, setting out the matters that it considered in its evaluation. The NCA shall take a decision within 30 days after receiving the risk assessment report. When approval is given it may be with or without any conditions.

The NCA shall, as a condition for approval, require the applicant to take out a policy of insurance against liability to pay compensation for damages. The applicant shall not carry out any activity in relation to GMOs or products thereof until an approval for so doing has been obtained.

No approval may be given unless there is firm evidence that there are no risks posed to the environment, biological diversity and human and animal health. This is a very stringent requirement. Risk is generally defined as the magnitude of the harm measured against the probability of occurrence of the harm. This means that the lack of scientific certainty does not preclude the refusal of the application or the imposition of conditions for approval if there is reason to believe harm may result.

Any approval given shall be revoked if new evidence, or a review of existing information, shows potential risks, based on the precautionary principle. Alternatively, fresh or additional conditions

may be imposed. There is an obligation on the applicant to provide information of any possible risks that become known to the applicant at any time.

The NCA may require the applicant to bear all, or any part of, the costs for evaluating the risk assessment report and/or for carrying out the risk assessment (see section 2.3).

Any person aggrieved by any of the decisions of the competent authority, may appeal at any time within the period of 90 days beginning from the date of receipt of the decision.

Identification and labeling of GMOs

All GMOs must be identified and/or labeled as such that they can be traced. Products thereof must also be identified and/or labeled stating the fact that there is evidence of the presence of GMOs in the product. Identification and/or labeling is also required to indicate that the presence of GMOs in a product cannot be excluded, if this be the case.

Confidential Information

The NCA shall protect information, which it determines as being confidential after the applicant makes a claim of confidentiality on the ground that its competitor may be able to acquire and use the information and harm the applicant's competitive business position.

The NCA determines the claim for confidentiality according to the normal criteria, namely: that the information is not generally known among, or readily accessible to, persons that normally deal with the kind of information in question; that the information has commercial value; and that reasonable steps should be taken to keep information secret. In addition, the applicant must also show that the disclosure of that information will harm the competitive position of the company. In any event, the claim for confidentiality may be overridden in the public interest.

Liability and redress

For liability of any person or entity responsible for harm caused by the introduction of a GMO or product thereof, the articles of the Civil Code regarding product liability are applicable.

Subsidiary legislation

Certain detailed aspects that will be covered by subsidiary legislation are:

- Intentional introduction of GMOs
- General safety and emergency provisions
- Contained use of GMOs
- Illegal transboundary movement
- Procedures for GMO' intended for direct use as food or feed, or for processing
- Packaging, labeling and identification
- Risk assessment

2.3 ADMINISTRATIVE SYSTEM TO HANDLE REQUESTS

This section below presents the administrative framework to handle the requests for permits for transboundary movement and use of GMOs. This includes the system to handle the first import/export of GMOs, subsequent movements in or out of Suriname and the use of GMOs in Suriname. Some components of the system are required under the Cartagena Protocol on Biosafety, whereas others need to be incorporated to make the system more effective for the practical handling of request in Suriname.

Administrative responsibility for regulating Biotechnology

The Ministry of LTDE is the Government of Suriname agency responsible for liaison with the secretariat of the Cartagena Protocol on Biosafety. All contact with regard to new developments within the Protocol and its implementation is handled through this Ministry. Such an arrangement ensures flexibility in handling biotechnology issues.

The Ministry of LTDE is the National Competent Authority (NCA) for biotechnology and is obliged to handle the applications and all administrative requirements under the Cartagena Protocol (notification, coordinating and communicating Risk Assessment (RA), decision-making with public participation). The NCA is also the contact point for unintentional transboundary movement and should be able, through its expert group, to flexibly respond to emergencies and accidents.

Administrative systems for the first import/export of GMOs

Any import/export of GMOs into Suriname's territory will follow the same procedural arrangement. Handling of request will proceed in a 4-step process consisting of

1) Notification,
2) Risk assessment,
3) Decision, and
4) Monitoring.

Step 1: Notification

When an applicant sends an application to Suriname for import/export of GMOs, it is called a notification. The notification is sent to the Ministry of TI with a complete risk assessment in English, and with a summary in Dutch. The Ministry of TI can only grant permission when the Ministry of LTDE (NCA) advises positively on the application. The administrative tasks of the Ministry of TI are:

- Inform applicants on the application needs and fee

- Receive the application with RA (performed by the exporter) through the Office of Import, Export and Foreign Exchange (IUD) and send it to the NCA/Ministry of LTDE within 7 days.

  Subsequently, the application is sent to the Ministry of LTDE. For handling the biosafety requests they need one designated person for (expected 15 hours/week) to conduct the following administrative task:

- Receive the application with RA (performed by the exporter) and the application fee.
  The application should have minimal requirements (see section 2.2) and the RA should be submitted both in English and Dutch, with 2 hard copies and 1 soft copy.

- Notify the applicant in writing if the application is complete or if additional information is needed within 90 days. Therefore, the NCA will consult the expert group about the application.

- Notify the applicant in writing on the further procedure for processing the application, such as times frame, legal obligations, additional information, and confidentiality.

- Inform the public through a newspaper advertisement that there is an application for importing/exporting GMOs. The advertisement should include: the name of applicant, the GMO to be imported/exported, the purpose of the GMO use in Suriname, and one NCA-contact person designated for more detailed information. This information is also placed on the national biosafety website.

Step 2: Risk Assessment

The expert group at NIMOS coordinates the scientific risk assessment process. Their administrative tasks are:

- Hire the experts for the Risk Assessment (RA) review team.
  The expert group will identify the RA experts, negotiate and prepare their contractual agreement.

- If needed, seek additional information and advice in writing from key-Ministries. The AAHF and Health may aid in the RA on import/export of products for respectively agricultural purposes and human health. The assistance will be communicated through the RA team and be used for making a sound scientific evaluation on the (potential) risks to the agricultural sector and human health.

- If needed, the applicant will be asked for additional information during the RA review process. In this case, the applicant is given a certain amount of time (to be decided) to submit the information. This period of time is not included in the time frame.

- Compile the comprehensive RA review report in English within 100 days. The RA review team may wish to select information in the application process to be kept confidential. They will mark this information as such when documents are reviewed. The RA review document follows a specific format (see section 2.4). The RA review team may wish to review the decision when certain criteria are met (see section 2.4).

- Publish a summary of the RA review (both in Dutch and English) for the public made available through the NCA.

- Send the RA report and summary to the NCA

- Maintain an electronic database of RA cases in collaboration with NCA. The elements to include in registering the GMOs are: summary of the RA, registration number, name and qualifications of user and safety supervisor, identity and characteristics of the GMO, purpose of intended use, information on accident prevention and emergency measures.

Step 3: Decision

The NCA is legally responsible for taking the decision on import/export of the GMOs. The NCA need to seek voluntary advice from stakeholders (biosafety stakeholder group) on issues that are not of technical nature such as economic (labour, costs, trade) and social considerations (ethics, religion, traditional knowledge, gender impacts, equity).

- Take a decision based on the RA and consultation with stakeholders through a meeting, if needed. Stakeholders will be given 30 days to submit their written comments to the NCA. The NCA may wish to take into consideration the comments of the public changing their decision.

- Inform the applicant, the Ministry of TI in writing on the decision made. The decision document will include: a summary in English and Dutch, the application, the decision making process including the input from the public, the decision itself including the scientific review process and the monitoring requirements.

- Inform the general public on the decision made by publishing the Dutch summary in the newspaper. The decision will also be placed on the National biosafety website.

- Inform the Biosafety Clearing House on the decision (including RA) made within 15 days.

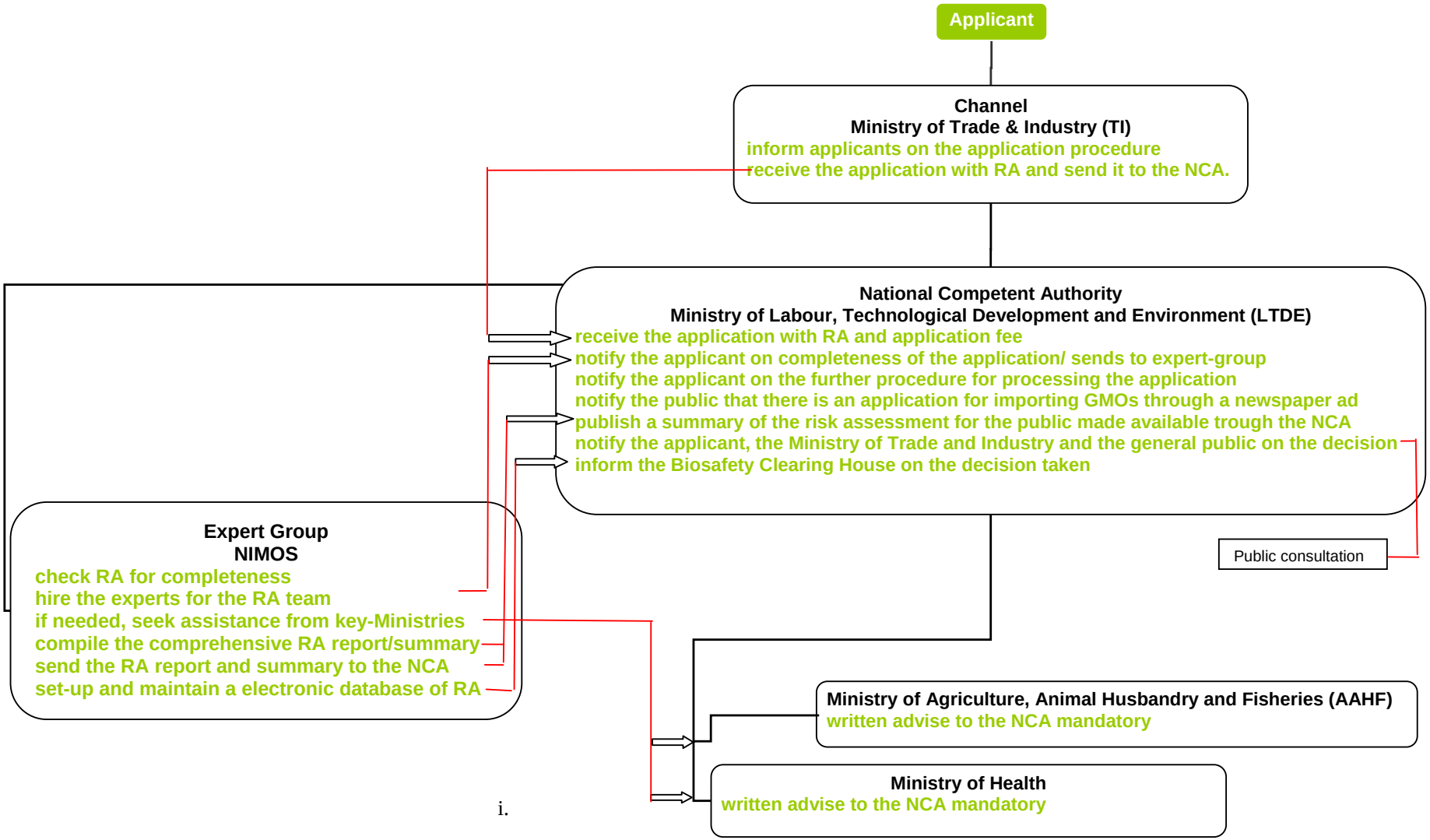
Step 4: Monitoring

Monitoring will be conducted by the Ministry of VG/AAHF. Specific administrative requirements may be:

- Requests for periodic reporting to the NCA (expert group) on how monitoring takes place (strategy, measurements, outcomes) and evaluation of monitoring reports and follow up actions.

An overview of the administrative system for AIA import/export is given in figure 6.

Figure 6: Administrative framework for first import/export of GMOs into Suriname (AIA) showing internal tasks and interrelations between organizations



i.

Administrative systems for subsequent import/use/export of GMOs (Simplified procedure)

Whenever a GMO has undergone risk assessment and is granted permission to be used in Suriname, it is registered with the expert group (NIMOS). This registration makes it possible that subsequent imports/exports may fall under a simplified procedure. Such a simplified procedure shall only apply to GMOs that have gone through the Advanced Informed Agreement (AIA) procedure.

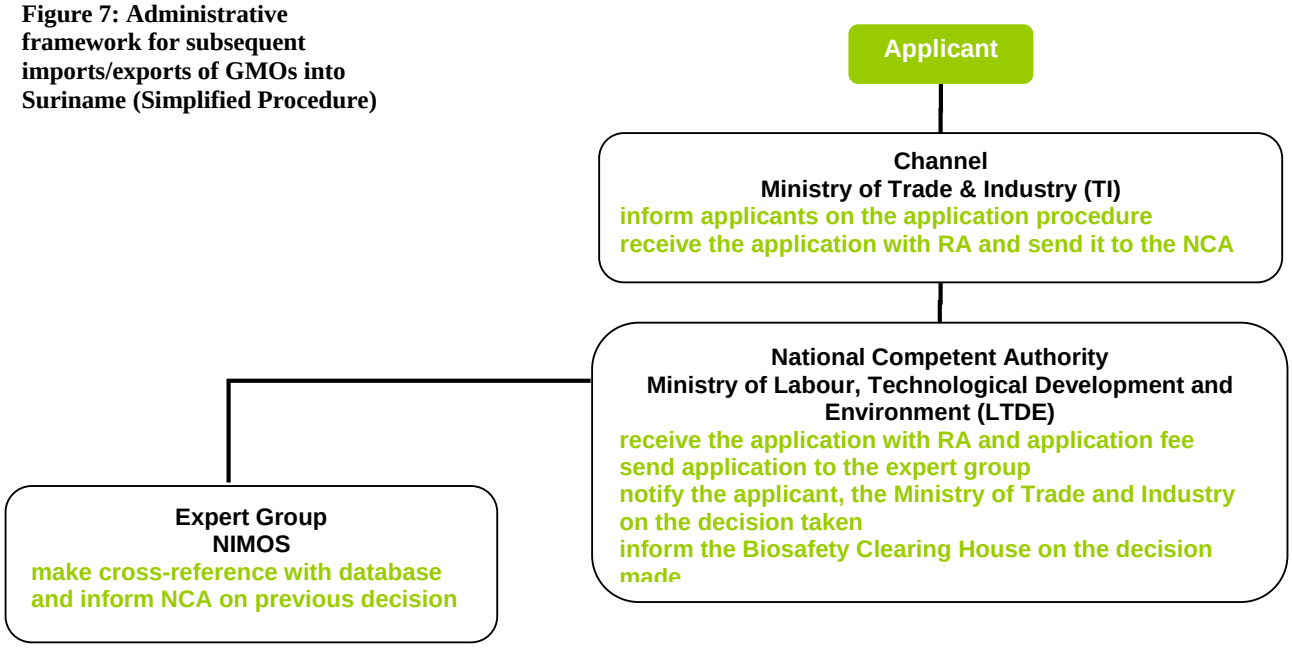
The simplified procedure makes it possible to bypass the RA process. In such a case, the application follows the same route to the NCA. Importers and exporters should indicate on the application form that they are applying for the simplified procedure (see section 2.4 for application contents). The NCA sends the application to the expert group that makes a cross-reference with the database to look for a registration number. When the registration number is found and the previous decision for import/export was positive, the applicant is granted permission. The expert group sends their advice to the NCA who in turn will inform the Ministry of TI, the exporter or importer on the decision. Risk assessment and public announcements are not performed with the simplified procedure (figure 7).

The only way to revert the simplified procedure to the AIA process is when there is evidence of new scientific information (which can be brought to the NCA by anyone living in Suriname) on the GMO that was granted permission before. In this case, the procedure for application restarts and the GMO can only be permitted when the risk has been properly reassessed.

Administrative system to handle use of GMOs in Suriname

The use of GMOs that are present (manufactured or already in use) in Suriname will be handled through the same procedure as proposed with the import/export of GMOs. The only difference is that the request will directly be submitted to the NCA. The NCA will subsequently handle the request as any other, passing it through the RA review and decision making procedure. After the decision is taken, the decision document is compiled and sent to the applicant and the relevant supervising Ministry.

Figure 7: Administrative framework for subsequent imports/exports of GMOs into Suriname (Simplified Procedure)



2.4 MECHANISM FOR RISK ASSESSMENT AND MANAGEMENT

Risk Assessment (RA) and Risk Management (RM) will be mandatory for activities that make use of GMOs (contained, unintentional or intentional release, commercial or experimental) for:

- Research/Teaching purposes (e.g. in laboratories, schools/universities, etc)
- Medical purposes (e.g. in laboratories, hospitals, etc);
- Industrial purposes (the use of ferments, fungi or microbes to produce for example enzymes, chemicals or new materials (e.g. biodegradable plastics, new types of fibers, etc.)
- Agricultural purpose;
- Import or export of GMOs or products containing or made of GMOs such as foods, feeds, seeds, eggs, grains, etc.

Basically, RA and RM will be required when GMOs are utilized for research, production and consumption.

In this section we describe the organization of Risk Assessments (RA) and the three key elements of the RA procedure: (1) import/export of GMOs under AIA procedure, (2) subsequent imports and exports of GMOs, and (3) the use of GMOs in Suriname.

Organizational aspects for RA & RM

Conducting the Risk Assessment is the responsibility of the importer or exporter. All RA reports should be written in English and Dutch and submitted to the NCA with 2 hard copies and 1 soft copy.

The Risk Assessment (RA) Team is responsible for the review of the RA dossier. The RA Team will consist of a core group of maximum 3 experts, called the Expert group. The expert groups consist of experts in biotechnology, molecular biology or related disciplines that are constantly up to date on the developments in risk assessment worldwide; one of the 3 experts will be the Coordinator/Chairperson of the Team. The core group will, depending on the case, be enlarged with (case) specific experts who can be chosen from a list of registered experts (see Annex 7-Roster of experts). To be registered as an expert, one should have the following minimum qualifications:

- A MSc. or PhD. degree in (molecular) biology, biochemistry, toxicology, epidemiology, forestry, veterinary science, environmental science, or related disciplines;
- At least three years experience in related discipline;
- Oral or written capability in Dutch and/or English.

To be able to do the RA, the expert group should make guidelines for the specific uses of GMOs (food, feed and processing, transit, research, release into the environment, contained use etc.). The Expert Group will provide a registration number to all submitted cases (both approved and not approved). Upon completion of the review of the RA report, the Expert Group will submit to the NCA a review report containing their findings as well as possible risk management measures. Importers and/or users of a GMO in Suriname will submit yearly to the Expert Group a report containing the monitoring of the measures taken to manage the risks associated with the import and/or use.

Elements for RA for first import/export under AIA procedure and use of GMOs

Importers and exporters are subjected to AIA and need to submit with their application a RA dossier. Also users of GMOs in Suriname need to comply with these procedures. Elements to be included in Risk Assessment dossier under the Advanced Informed Agreement (AIA) procedure are:

1. The risk assessment should be based on the following:

a. Information relating to the intended use including the name and address of exporting – and importing user;
b. The identification of any potentially harmful effects, in particular those associated with:
    i. the recipient organism, receiving environment & donor organism,
    ii. the genetic material originating from the donor organism,
    iii. the vector,
    iv. the resulting GMO.
c. Origin, name and taxonomic status of recipient organism;
d. The identification of any novel genotypic and phenotypic characteristics associated with the GMO;
e. The severity of the potentially harmful effects;
f. The likelihood of the potentially harmful effects being realized, taking into account the level and kind of exposure of the likely potential receiving environment to the GMO.
g. Information about accident prevention and/or emergency response measures.

2. Consider as potentially harmful effects, the following:
    a. Disease to humans including allergenic or toxic effects;
    b. Disease to fauna or flora;
    c. Detrimental effects due to the impossibility of treating a disease or providing an effective prophylaxis;
    d. Deleterious effects due to establishment or dissemination in the environment;
    h. Deleterious effects due to the natural transfer of inserted genetic material to other organisms.

Elements to be included in RA for subsequent imports/use/exports (Simplified Procedure)

This particular phase in the RA and RM scheme in Suriname will only apply to projects with GMOs that have gone through the AIA process before and are registered with the Expert Group. To apply for the simplified procedure an importer/user/exporter needs to submit an application with the following RA elements:

1. Summary of the previous RA (in Dutch and English) and registration number submitted by the Expert Group;
2. Name of the user(s) including those responsible for supervision and safety and information on their training and qualification(s);
3. Identity and characteristics of the GMO;
4. Purpose of the intended use including information on the recipient organism/receiving environment and expected results;
5. Information about accident prevention and/or emergency response measures.

Depending on the experiences with GMOs in the local environment and experiences of countries with similar natural and socio-economic conditions as Suriname, the Expert Group can establish a classification of GMOs to use under the Simplified Procedure. The classification will be based on GMOs or products containing or made of GMOs that pose: 1) no risk, 2) low risk and 3) high risk. The classification as such will be based on the following concept:

- A potential undesirable event, which brings out a hazard;
- Likelihood of whether the undesirable event will happen;
- Adverse consequence of the undesirable event;
- Uncertainty and perception about the above components

Emergency measures

Emergency measures are drawn up for GMO uses where an accident or failure occurs that could lead to serious danger, whether immediate or delayed, to humans and/or to the environment. In the event of an accident or failure, the user shall be required to inform the NCA immediately and provide the following information:

- The circumstances of the accident or failure;
- The identity and quantities of the GMO concerned;
- Any information necessary to assess the effects of the accident on the health of the general public and the environment;
- If applicable, the measures taken

In case a GMO has been released into the environment due to an accident or failure and can affect (an) other (country)/countries, the NCA will immediately inform the potentially affected country and indicate measures needed to protect its interests, in particular its biodiversity. The information supplied will include the identity, the relevant characteristics and numbers/volumes of organisms involved, information related to risk assessment and risk management, and any available information on the handling of the organism

Review of Decisions (Re-evaluation of RA)

The Expert Group can review a RA decision made for the release of a GMO into the environment considering that:

- A change in circumstances has occurred that may influence the outcome of the risk assessment upon which the decision was based; or
- Additional or new relevant scientific or technical data or information becomes available; or
- An emergency (accident or failure) has occurred that requires a re-evaluation of the risk assessment.

The same procedure is followed as with the RA review procedure.

Scientific requirements and scientific preservation

A risk assessment should be based on sound science that is decision driven and supported by systematic analysis that maintains integrity and protects the risk assessment from political and other pressure. The accuracy of a risk assessment is depending on the quality of available data. When definitive data are lacking, assumptions must be made. These assumptions can be based on the principle of familiarity (knowledge and experience with the organism involved) and acceptability of the risks. Moreover, risk management measures must provide a major contribution to those assumptions. There is a high likelihood that a risk assessment will raise uncertainties that might be addressed through further research/experiment. The risk assessment models used should be flexible, such that they can be easily revised when new data or information become available. Risk management should be determined by the risk assessment, organism involved, method of release, location of release, and control of gene flow.

2.5 PUBLIC AWARENESS AND PARTICIPATION

Capacity building of the stakeholders have been an ongoing process during the development of the NBF. In particular the general public had difficulty understanding the high scientific level of biotechnology. Many efforts were made to foster awareness: among scientists through a scientific awareness seminar, for the public in general (awareness workshop, awareness campaign), for the National Coordinating Committee and staff of Ministries through presentations), and to industry (presentations), consumer groups (newspaper articles, presentations) and importers (open consultation). The process resulted in increased awareness and improved understanding and participation.

With limited experts in biotechnology and related sciences, the approach was to invest in people that have a scientific background and have interest in future work in biosafety. This was practiced during the National Biosafety Survey (Ministry of LTDE, 2004) which involved eight national experts. Some of them participated in consultations with stakeholders and in drafting of the NBF.

In general, we firmly believe that the development of the NBF is based on a strong and functional consultative process that ensures sustainability for future implementation.

Public awareness and participation during NBF implementation

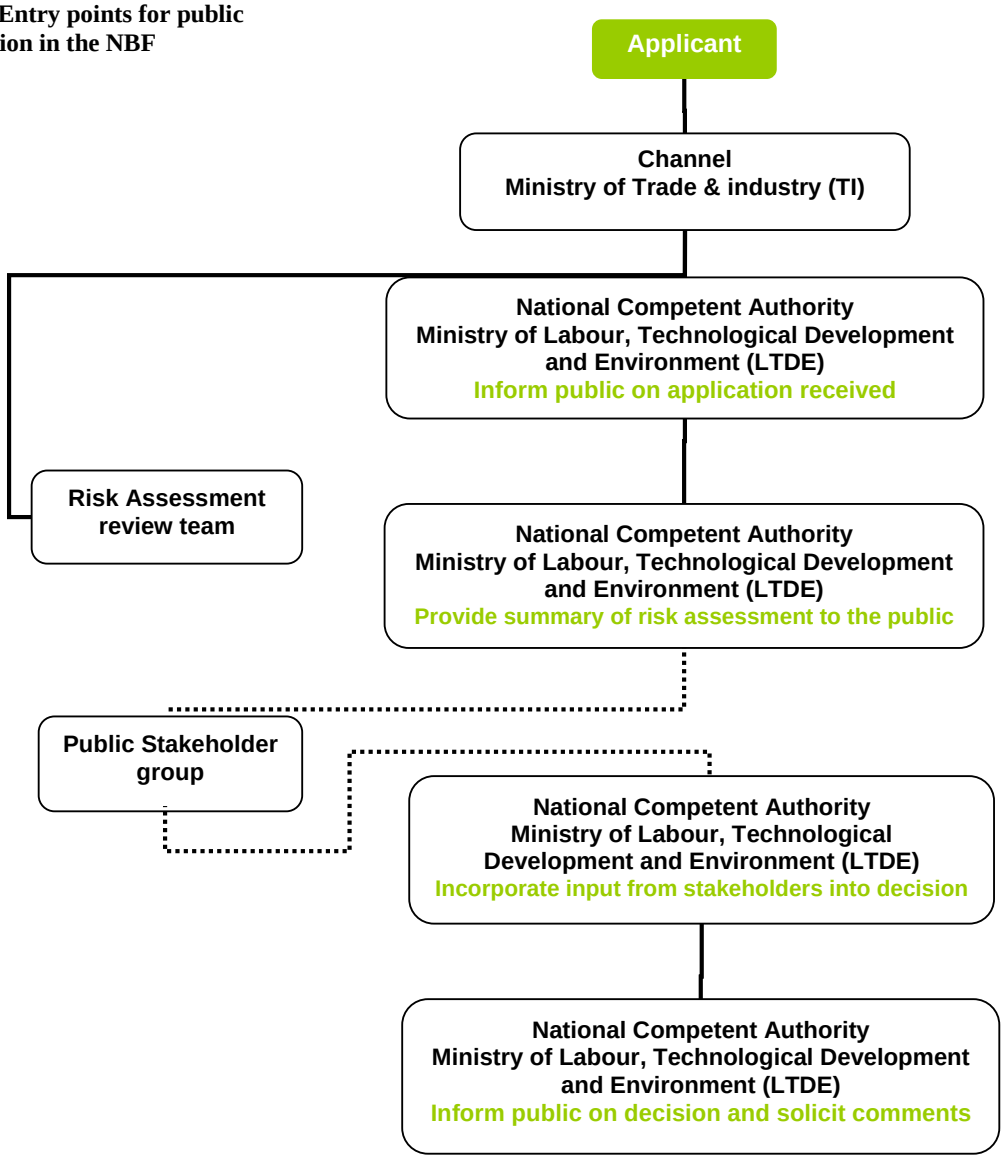
Implementation of the NBF will be accompanied with continuous awareness of the public and major stakeholders. The needs for information for specific target groups will be determined and a strategy for awareness-raising developed including specific audiences, messages, and multimedia. The NCA will require additional funds to execute this multimedia plan. In the meantime, development of biosafety awareness will take place with the available brochure, info CD-rom, children's cartoon, newspaper advertisement, presentations etc.

Because biotechnology has struggled with polarized views over the years, it is absolutely necessary to ensure involvement of the public. Public participation, although poorly practiced in Suriname, will be an integral part of the NBF. The NBF is designed to have four entry points for public involvement (figure 8):

- After the request for GMO import/export/use has been submitted to the NCA, the public is notified by a newspaper article and assigned a contact person for further dissemination of information.
- The public is provided with a summary of the risk assessment, made available through the NCA contact person.
- The public can be consulted in the decision making process through a meeting. This meeting can convene with local community groups, stakeholder representatives, consumer groups etc.
- The public is given the opportunity to give comments to the decision made by the NCA, within 30 days after its publication in the newspaper.

This recommendation for public involvement needs to be evaluated regularly (every 6 months), because views on public participation may change in the future. It may also need adjustment for more effective and functional participation.

Figure 8: Entry points for public participation in the NBF



2.6 INFORMATION SHARING AND THE BIOSAFETY CLEARING HOUSE

This section describes the procedures for disseminating information on biosafety regulation to the public of Suriname, thereby addressing the role of the environmental institutions and the strategic role of the Biosafety Clearing house (BCH).

Role of NCA and supporting institutes in information sharing

The NCA is responsible for promoting awareness-raising for the general public to make the issues related to the biotechnology and biosafety understandable and enabling the public to give valuable input to the safe use of modern biotechnology. In this regard, the Ministry of LTDE has access to a regular (weekly) TV program through its Information department, and has a small amount of funds available for multimedia exposure. The development of a website that will be easily accessible and provides information on new events, ongoing activities, applications for GMOs, CBD and CP activities, background information is ongoing. The website also displays awareness materials and, among others, will provide a useful tool to start discussions regarding biosafety in the future.

NIMOS, being the technical support arm of the Ministry of LTDE, can provide information on biosafety legislation and risk assessment procedures through its Office for Awareness and Education. Such effort should be coordinated with the Expert group.

Biosafety Clearing House

The NCA needs to be up to date on the issue of biotechnology regulation to ensure effective handling of applications and emergency measures. The NCA participates in the ongoing negotiations of the CP and is facilitated with the Biosafety Clearing House (BCH). The BCH is an international online information system that systematically administers the ongoing activities regarding focal point contacts, biosafety regulations, GMO permissions and risk assessments.

BCH accessibility: The NCA manages GMO requests with a database system that is configured to the BCH format. This system facilitates accessibility at four distinctive levels. Level 1 is designed for general users (guests) who can search for data and print data reports. Level 2 is designed for administrators that need to enter data into the database. Level 3 is accessible for the system administrator of the NCA that can modify data and subsequently send data to the BCH and level 4 is only accessible by the system designers (University of Suriname).

Contents and management capabilities: The database system is built to administer steps in the handling of requests. Every request is provided with a registration number and through this number is easily tracked throughout the system. The system is designed to administer all steps in the handling process: decision types (AIA, FFP), decision administrators (TI, NCA, and NIMOS), decision makers (NCA) and decision making mechanism. All of these steps are linked with their national contacts (persons, organizations). The database system also gives the opportunity to enter laws and regulations, make archives and print specific reports (list of decisions, decision management screen, risk assessment by case with experts etc.)

Workability with the BCH: The database program is designed in Microsoft access and has an easy to understand format. Information needs to be selected and sent to the BCH twice a month (every 2nd and 4th week of the month). The NCA should assign one person (5 hours a week) for data entry and managing of the database.

Sustainability and maintenance: The system will be maintained by the University of Suriname, Information Department.

CHAPTER 3

IMPLEMENTING THE NATIONAL BIOSAFETY FRAMEWORK

This chapter presents a draft plan for implementing the NBF. The action plan includes an outline of objectives and activities, a time frame and an indicative monitoring plan.

3.1 OVERVIEW OF THE NBF IMPLEMENTATION PLAN

An overview of the implementation plan and monitoring requirements is given in figure 9. The overview is based on the concept that the management of biosafety projects should have an integrated approach, incorporating trans-sectoral policy implementation. The implementation plan has concrete objectives and goals to be reached in specific time periods. Monitoring of the plan should be ongoing and will be based on specific indicators. The institutional responsibilities for implementation are presented as well as recommended follow-up activities and possible financing arrangements

Figure 10: Implementation plan for National Biosafety Framework in Suriname (2003-2008)

ACTIVITIES	OBJECTIVES & GOALS	ACTIVITIES	PERFORMANCE INDICATORS	INSTITUTIONAL RESPONSIBILITIES	FOLLOW-UP
Establish interim measures	To set in place interim measure until biosafety law is in place	Amendment State Decree Negative list to put import/export GMOs under restriction	Interim measures to be effective within 6 months after start	Ministry of LTDE/TI	None
Establish effective coordination mechanism	To set in place a structure to coordinate biosafety implementation	Legal assignment NCA by Ministerial Decree Legal assignment Expert group by Ministerial Decree	Structures to be set up within 6 months after start	Ministry of LTDE	None
Biosafety framework law	To develop appropriate laws for appropriately regulating biosafety	Gain experience/ Lessons learned from exercising with interim measures Draft biosafety framework law, ensure public input and formalize	time frame for formulating the law under 1.5 years time frame for law to be effective under 2.5 years	LTDE/NIMOS/Min. TI/Min. Health/Min. AAHF) Ministry of JP, stakeholder groups	Yearly review of law for possible amendments
Biosafety subsidiary regulations	To develop appropriate subsidiary guidelines to support the biosafety framework law in its practical implications	Establish working group for establishing guidelines: expert group, NIMOS, Ministry of Justice and Police and roster of experts. Test guidelines on real-life cases, evaluate and amend to appropriate and practical guidelines for 1 year.	# of regulations developed # of imports/exports and uses under regulation	LTDE/NIMOS with support of Ministries of AAHF and Health	Yearly review of regulations for possible amendments
Training human resources	To train human resources such as decision makers, regulatory agents, industry, communities and interest groups	Train public officers: Customs, Min. TI, Min. AAHF, Min. Health, Min. LTDE, and NIMOS on basic biosafety issues. Workshops for political and scientific communities, decision makers, private sector, NGOs. Organize workshops in an effort to harmonize the National Biosafety Framework (with Caribbean & South American region).	# of people trained # of trained people involved in biosafety regulation	LTDE/NIMOS	Reporting and evaluation
Institutional capacity building	To equip institutes with knowledge, infrastructure and mandate to regulate biosafety	Organize study tours to Neighboring Countries advanced in biosafety matters (for decision-makers, scientific community). Establish co-operation between NCA & local Expert Group and those in other neighboring countries. Establish at the UVS Train-the-Trainers programs on RA & RM. Establish at the UVS training programs and refreshment courses in RA & RM or related subjects (for NCA, Expert Group, scientific community, etc.). Establish basic laboratory testing for GMO origin in plants, animals and food (BOG, UVS)	# of staff from institutes involved in bio safety regulation # of working relationships with biosafety institutions worldwide	LTDE/NIMOS UVS Ministry of VG, Ministry of AAHF	Reporting and evaluation
Awareness raising	To raise awareness about biosafety with the general public	Awareness about GMO administrative and legal framework (Importers/Exporters/Users/General Public) Awareness on the implications of the biosafety framework law Awareness about biotechnology and biosafety in general Awareness about risk assessment and management	# of people knowing what biotechnology/ biosafety is	LTDE/NIMOS NGOs, industry and interest groups	Reporting and evaluation
Fund raising	To raise funds for	Initiate and negotiate collaboration with potential donors	% of capacity building	LTDE and potential	Reporting and

	capacity building		activities funded	donors	evaluation

3.2 PROPOSED TIME FRAME FOR NBF IMPLEMENTATION

The implementation of the NBF is expected to take up to 3 years and a time schedule is given in Figure 10. The start-up phase consists of establishing the structures to enable successful project execution. The foremost important task is to prepare the biosafety legislation. A new law will be drafted under the Dutch civil law code during most of the implementation period. Other key tasks are also scheduled, such as capacity building, awareness raising and fund raising.

Figure 9: Time schedule for implementation of the NBF (2005-2008)

Implementation	Year 1				Year 2				Year 3			
Task	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**	**Q10**	**Q11**	**Q12**
Establish interim measures												
Establish effective coordination mechanism												
Develop detailed implementation strategy												
Establish legal structures for NBF												
Develop and approve biosafety framework law												
Develop subsidiary guidelines												
Training human resources												
Institutional capacity building												
Awareness raising												
Fund raising												

3.3 INSTITUTIONAL RESPONSIBILITIES

Coordination in NBF implementation

Effective coordination among different actors will facilitate successful NBF implementation. This will be organized by bringing together the environmental focal points (usually one person per Ministry) of the key-Ministries (AAHF, Health, TI). These focal points were confronted with biosafety before by participating in the NBF development project.

The implementation is also greatly facilitated by a National Coordinating Committee (NCC). This has proven to work very well, facilitating coordination, harmonizing efforts and building capacity within Ministries and other organizations. The NCC can serve as a guide in the implementation process and attune it to the needs of the stakeholders during implementation.

Capacity building requirements

For the NBF to work effectively, it should be supported by strong capacity building, both in terms of human resources and infrastructure. Capacity building assistance is available through a roster of experts registered at the CP and can be requested from the secretariat of the CP. This is an in-kind contribution to countries that are in urgent need to strengthen risk assessment, regulation development etc. It is expected that capacity building activities will proceed for approximately 2.5 years. The capacity building initiatives should accomplish the following:

- *Enhance decision-making capacity within the Government, civil society and stakeholder groups to oversee the benefits and possible risks involved of modern biotechnology.*
  Includes training in the general principles of biotechnology and biosafety. The trainees will be potential members of the National Biosafety Committee, staff of relevant Ministries, decision-makers, regulatory agencies, industry, indigenous communities, NGOs, interest groups, media and other national stakeholders.

- *Enhance technical resource capacity within the national regulatory agencies to carry out and oversee technical and support functions in biosafety operations. Upgrade capability and provide support to national regulatory agencies for dealing with the practical and technical aspects of biosafety.* This includes training and study tours in all matters related to risk assessment, monitoring of GMOs into the environment and GMO detection and analysis. The trainees will be those involved in the regulatory process and members of the roster of biosafety experts in Suriname (see Annex 7).

- Enhance capacity in communication of science-based issues of biotechnology and biosafety among media and others involved in the public communication processes. Upgrade capacity of national organizations involved in communication to evoke participation of the general public. This includes the development of a strategic awareness plan and corresponding multimedia output. Awareness materials will be provided in basic information materials and communication activities. Persons will be trained in effective communication in biotechnology and biosafety. The trainees will be members of the media and those involved in public communication processes.

- *Enhance technical capacity within regulatory agencies to develop biosafety laws and regulations attuned to the Surinamese law system. Upgrade capability and provide support to regulatory agencies for dealing with practical implications of the laws.* This includes guidance in developing the national biosafety framework law, as an

instrument for long-term regulation of biotechnology and biosafety. Persons will be trained to develop subsidiary regulations of the framework law. The trainees will be members of the technical agencies dealing with environmental law development.

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3.4 PROPOSED FINANCIAL ARRANGEMENTS FOR NBF IMPLEMENTATION

The dedication and commitment of the Ministry of LTDE and its technical institute NIMOS, the Ministry of TI, AAHF and Health will eventually define the success of implementation of the NBF. The cost of implementing the NBF is difficult to calculate, because it is dependent on the amount of applications for transboundary movement and use received yearly. An indication of possible finance arrangements is given below

Potential financing by the State, Ministry of LTDE:

- All public participation activities under the biosafety regulation This includes costs for newspaper advertisements, public hearings, and stakeholder meetings.

- Administrative supplies (stationary, use of equipment, use of premises, messenger services, and communication)

- The Ministry of LTDE should assign one full-time person to biosafety, with the following workload:
  5 hours/week database input and management
  15 hours/week for handling the biosafety requests (administrative task)
  20 hours a week for following up in coordination, awareness and biosafety development in CP.

- The expert group (NIMOS) should have at least one person assigned full time to biosafety risk assessment. The other two persons can be half-time acquainted in this group. Costs for the expert group are the responsibility of the State.

Potential financing by the UN Environment Program (UNEP) and/or the Global Environment Facility (GEF):

- Capacity building assistance for RA and RM can be requested from the secretariat of the CP.

- Assistance for drafting the biosafety framework law and subsidiary regulations

- Awareness raising

Potential financing by others:

- Fees for consultants involved in the risk assessment review are to be compensated by the applicant in the application fee. Also laboratory tests should be paid by the applicant.

- Maintenance of the database and website should be entrusted to the University of Suriname, Information Department. The costs to be covered by the application fee.

- Monitoring activities are to be compensated by users or shared with ongoing activities of relevant Ministries and the UVS.

ANNEXES

ANNEX 1: TERMS OF REFERENCE FOR THE NBF

Terms of Reference
Consultant
National Biosafety Framework

Background

The United Nations Convention on Biological Diversity was adopted in 1992 recognizing the need for adequate safety measures when using biotechnology to making a contribution to the conservation of biodiversity and the sustainable use of its components. In 1995 the mandate was given to develop appropriate procedures to address the safe transfer, handling and use of products of biotechnology. This led to the adoption of the Cartagena Protocol on Biosafety in January 2000.

The Cartagena Protocol on Biosafety is objected to ensure an adequate level of safety with the use and transfer of products from biotechnology. The Protocol specifically applies to the transboundary movement, transit, handling and use of all living modified organisms that may have effect on biodiversity, taken also into account the risk to human health.

In the Republic of Suriname, the field of biotechnology is still at an early stage of development. Until now, there are no mechanisms established to ensure protection from (potential) adverse impacts from products of biotechnology. The concentration of the biodiversity in a large- and inaccessible area of the interior, the inadequate control on transboundary movements and the poor quarantine measures taken at borders corroborate to the need of safety measures.

In respond to this the Republic Suriname intents to ratify the Cartagena Protocol no later than December 2004. To meet the requirement of the Protocol, Suriname should set up a National Biosafety Framework (NBF). The NBF will be prepared to set up a framework for the management of living modified organism at the national level. It should consists of legal instruments, administrative systems, decision-making system (including a mechanism for public participation and information) and risk assessment procedures.

The process of developing the NBF consists of four phases:

- Phase 0: setting up the required project management structures
- Phase 1: gathering relevant baseline information
- Phase 2: analyzing the baseline information, consultation with stakeholders and training
- Phase 3: drafting the NBF, the project is currently in the last phase of drafting the NBF.

Consulting assignment

The consultant will compile a final report on the National Biosafety Framework (NBF) for Suriname. The NBF is to address safety in the field of modern biotechnology in Suriname and will support the Government of Suriname to fulfill the obligations under the Cartagena Protocol on Biosafety.

The NBF report is of analytical nature and will comprise, among others, the following contents:

- Executive summary, both in Dutch and English
- The government policy on environment, biodiversity, health related to biosafety
- A regulatory regime comprising of legislation, laws, decrees and or guidelines on GMOs.
  (baseline situation, general provisions, operational provisions and other elements)
- An administrative system that includes the institutional arrangements, systems for handling notifications, systems for risk assessment and systems for decision-making.
- Mechanism for public awareness, education and participation
- Recommended action plan for the implementation of the regulatory regime, administrative system and mechanism for public participation.

The consultant will work in close collaboration with the National Project Coordinator, the consultant on the development of a legal framework and the consultant on the development of a technical framework (risk assessment).

In preparing the work for this consultancy, the consultant should take into account the outcome of the National Biosafety Survey (March 2004), the National Biosafety Workshop: current status and opportunities (May 2004), the sub-regional workshop on "Regulative and administrative framework for SIDS countries' (May 2004), the legal consultations (June 2004), the technical consultations (August 2004) and the open consultations (September 2004).

Duration of the assignment

The assignment will start at November 2004, 30^{t} and will end on December, 30th

The consultant will report in accordance with the following time schedule:

- within 3 weeks after signing of the contract submission of the draft-framework
- within 4 weeks after signing of the contract submission of the final-framework

Deliverables

Results of the assignment should be presented in a format that is understood by non-specialists. Reports will be submitted in 1 (one) hard- and softcopy. Reports are written English in Microsoft Word in the following format: all text should be in Normal style, Times New Roman 11. All references should be included, also the names of persons consulted. All tables should be stored into annexes, with reference in the text.

ANNEX 2: AUTHORS OF THE NBF

The NBF was compiled by both national and international experts as listed below. The list shows the responsibilities for study coordination and technical aspects.

Subject	Name of Specialist
Overall coordination and report editing	John Buursink
Technical coordination	Gwendolyn Emanuels-Smith
Regulatory regime	Nancy Del Prado (national) Inge Jaspers (international)
Risk assessment and management	Cedric Nelom
Trade and quarantine measures	Franklin R. Grauwde (plant) Edmund Rozenblad (animal) Ricky W. Stutgard (food)
Genetic Resources	Joan Muller
Biotechnology and Biosafety	Jerry Ausan

ANNEX 3: ABBREVIATIONS/ACRONYMS

ABBREVIATION	DUTCH NAME	ENGLISH NAME
AIA	Melding vooraf	Advanced informed agreement
ADRON	Anne van Dijk Rijst Onderzoekscentrum	Anne van Dijk Rice Research Centre
LTDE	Ministerie van Arbeid, Technologische Ontwikkeling en Milieu	Ministry of Labour, Technological Development and Environment
BCH	Biosafety Clearing House	Biosafety Clearing House
BOG	Bureau voor Openbare Gezondheidszorg	Bureau of Public Health
CELOS	Centrum voor Landbouwkundig Onderzoek in Suriname	Center for Agricultural Research in Suriname
CP	Cartagena Protocol voor Bioveiligheid	Cartagena Protocol on Biosafety
EIA	Milieueffecten Rapportage	Environmental Impact Assessment
FAO	Voedsel en Landbouw Organisatie	Food and Agriculture Organization
FFP	Voedsel, voeder en verwerking	Food, feed and processing
GB	Gouvernementsblad	Government Gazette
GEF	Wereld Milieu Fonds	Global Environmental Facility
GMO	Genetisch Gemodificeerde Organismen	Genetically Modified Organisms
GOS	Surinaamse Overheid	Government of Suriname
TI	Ministerie van Handel en Industrie	Ministry of Trade and Industry
IICA	Inter-Amerikaans instituut voor landbouw cooperatie	Inter-American Institute for corporation in Agriculture
ILO	Internationale Arbeidsorganisatie	International Labor Organization
JP	Ministerie van Justitie en Politie	Ministry of Justice and Police
AAHF	Ministerie van Landbouw, Veeteelt en Visserij, v/h Ministerie van Landbouw, Veeteelt, Visserij en Bosbouw (AAHF&B)	Ministry of Agriculture, Animal Husbandry and Fisheries
NBF	Nationaal Bioveiligheids Raamwerk	National Biosafety Framework
NCA	Nationale Competente Autoriteit	National Competent Authority
NCC	Nationale Coordinatie Commissie	National Coordinating Committee
NGO	Niet-Gouvernementele Organisatie	Non-Governmental Organization
NH	Ministerie van Natuurlijke Hulpbronnen, v/h Ministerie van Natuurlijke Hulpbronnen en Energie (NHE), v/h Ministerie van Opbouw	Ministry of Natural Resources; formerly Ministry of natural resources and Energy, formerly Ministry of Development
NHS	Nationaal Herbarium Suriname	National Herbarium Suriname
NIMOS	Nationaal Instituut voor Milieu en Ontwikkeling van Suriname	National Institute for Environment and Development of Suriname
NTFP	Bosbijproduct	Non-Timber Forest Product
NZCS	Nationale Zoologische Collectie Suriname	National Zoological Collection Suriname
OW	Ministerie van Openbare Werken, v/h Ministerie van Openbare Werken en Verkeer (OW&V) en Ministerie van Openbare Werken, Telecommunicatie en Bouwnijverheid (OWT&B)	Ministry of Public Works, formerly Ministry of Public Works and Traffic, formerly Ministry of Public Works, Telecommunication and Building
PAHO	Pan-Amerikaanse Gezondheidsorganisatie	Pan American Health Organization
RA	Risico analyse	Risk assessment
SB	Staatsblad	State Gazette
SBW	Surinaams Burgerlijk Wetboek	Surinamese Civil Code
SPS	Sanitaire en Phytosanitaire maatregelen	Sanitary and Phytosanitary Measures
STINASU	Stichting Natuurbehoud Suriname van NH	Foundation for Nature Conservation in Suriname of NH
UN	Verenigde Naties	United Nations
UNCBD	Verenigde Naties Conventie van de Biodiversiteit	UN Convention on Biological Diversity
UNEP	Milieu programma van de VN	UN Environment Programme
UNESCO	Onderwijs en cultuur programma van de VN	UN Education and Cultural programme
UNCED		UN Conference on Environment and Development
UNDP	Ontwikkelingsprogramma van de VN	UN Development Program
UVS	(Anton de Kom) Universiteit van Suriname	(Anton de Kom) University of Suriname
WHO	Wereld Gezondheids Organisatie	World Health Organization
WTO	Wereld Handels Organisatie	World Trade Organization

ANNEX 4: GLOSSARY

Term (English)	Term (Dutch)	Explanation (Dutch)
Biotechnology	Biotechnologie	Biotechnologie is het gebruiken van levende organismen (of delen daarvan zoals celsystemen) om producten te vervaardigen of te verbeteren
Genetic modification	Genetische modificatie	Genetische modificatie is het veranderen van de erfelijke eigenschappen van een organisme op dergelijke manier die op een natuurlijke wijze (doo voortplanting) niet mogelijk is.
Genetically Modified Organism (GMO)	Genetisch Gemodificeerde Organismen	Genetisch gemodificeerde organismen zijn organismen waarvan het genetisch materiaal is veranderd op een wijze die natuurlijk niet mogelijk is. De Genetisch gemodificeerde organismen zijn in staat genetisch materiaal te vermenigvuldigen en of over te dragen.
GMOs for Foods, Feeds and Processing	Genetisch Gemodificeerde Organismen bestemd voor Voeding, Veevoeder en Voedselverwerking	Genetisch gemodificeerde organismen (zie bover welke special bestemd zijn voor voeding, veevoeder en voedselverwerking.
Risk analysis	Risico analyse	De aard en de omvang van de risico's van GMO gebruik worden vastgesteld door middel van een risicoanalyse

ANNEX 5: LIST OF WORKSHOPS AND MEETINGS

Workshop/Meeting	Purpose	Date and Place
Biosafety Stakeholders Meeting	Acquaintance with the topics of biotechnology and biosafety and the official introduction of the National Biosafety Framework project for Suriname.	November 5th, 2003 Paramaribo
Scientific seminar "Biotechnology and Environment"	To get scientist in Suriname coordinated and start a discussion on the issue of risk, its assessment and management related to biotechnology.	February 5th, 2004 Paramaribo
Sub-Regional Workshop for SIDS on risk assessment and management and public awareness and participation	To get acquainted with risk assessment and management and public participation requirements under the CP.	February 18th-21th, 2004 Fiji islands
National Biosafety Workshop: "Current status and Opportunities"	To present the current status on biosafety in Suriname with the findings of the National Biosafety Survey to the stakeholders from Government (officials and decision-makers), private sector/industry and the NGO's.	May 4th, 2004 Paramaribo
Sub-Regional Workshop for SIDS on the development of a regulatory and administrative systems for National Biosafety Frameworks"	To get acquainted with various regulatory regimes and administrative systems for the NBF in SIDS countries.	May 11-14th, 2004 Port of Spain
Legal Consultations on NBF components and implementation	To present a first draft of the NBF to the legal experts and solicit comments and suggestions.	June 7th-8th, 2004 Paramaribo
Technical consultations on Risk assessment/management and its implementation	To present the first thoughts on how to structure risk assessment and management in the NBF to the technical experts and solicit comments and suggestions.	July 7th-9th, 2004 Paramaribo
Administrative consultations on the NBF	To present the first thoughts on how to structure the administrative system of the NBF. The consultation was held with the key- Ministries involved in the regulatory process.	August 27th and September 3rd, 2004. Paramaribo
Open consultations	To present the first thought on the NBF to the general public.	September 16th-17th, 2004 Paramaribo
Training workshop in Risk Assessment and Risk Management in Biotechnology	To train 26 scientists in strategies and methodologies in risk assessment and risk management in biotechnology.	October 5th-8th, 2004 Paramaribo

ANNEX 6: LIST OF CONSULTED STAKEHOLDERS

Organization	Function	Name
Government		
Ministry of Labour, Technological Development and Environment	Environmental officer	T. Chin A Lien
Ministry of Labour, Technological Development and Environment	Representative Public awareness	A. Sidhoe
Ministry of Labour, Technological Development and Environment	Representative Public awareness	M. Timpico
Ministry of Labour, Technological Development and Environment	Chairman NCC	H. Uiterloo
Ministry of Labour, Technological Development and Environment	Environmental Policy Officer	M. Kerkhoffs-Zerp
Ministry of Labour, Technological Development and Environment	Environmental officer	M. Riedewald
Ministry of Labour, Technological Development and Environment	Environmental officer	A. Khoen Khoen
National Council for the Environment	Chairman	C. Julen
Ministry of Health, Bureau of Public Health	Director	L. Resida
Ministry of Health, Bureau Public Health/ Central Laboratory	Head Chemical laboratory	E. Fung A Foek
Ministry of Health, Bureau Public Health/Central laboratory	Head Bacteriology laboratory	H. Tjon Kon Fat
Ministry of Health, Bureau public health	Acting Head food inspection service	N. Bhageloe
Ministry of Health	Legal Department	M. Poepon
Ministry of Health	Legal Department	T. Silent
Ministry of Health	Toxicological Focal Point	J. de Kom
Ministry of Agriculture	Head of the Vetenary Department	E. Rozenblad
Ministry of Agriculture	Entomological Department	A. van Sauers
Ministry of Agriculture, plant health	Entomological Department	G. Ramadin
Ministry of Agriculture	Environment coordinator	A. Kartoredjo
Ministry of Agriculture	Fisheries Department	J. Colli
Ministry of Agriculture	Research Department	E. Doelahasori
Ministry of Agriculture	Legal Department	A. Narain
Ministry of Agriculture	Research Department	Van den Tuva
Ministry of Agriculture	Director Research	P. Milton
Ministry of Agriculture	Coordinator Agricultural Health	T. Nanden
Ministry of Agriculture	Representative	E. Tjon A San
Ministry of Agriculture	Representative	G. Tjon A San
Ministry of Agriculture	Head Plant Quarantine Department	F. Grauwde
Ministry of Finance	Custom inspector	M. Karsoredjo
Ministry of Planning	Representative	A. Boedhoe-Hemai
Ministry of Trade and Industry	Representative	C. Cameron
Ministry of Trade and Industry	Representative	T. Kartoredjo
Ministry of Trade and Industry	Legal Department	S. Rewat
Ministry of Trade and Industry	Representative NCC	J. Dankerlui
Ministry of Justice and Police	Representative NCC	M. Rommy
Ministry of Foreign Affairs	Representative NCC	T. Shameen
Ministry of Foreign Affairs	Head International Affairs	J. van Glaanenweygel
Ministry of Natural Resources	Legal Department	B. Drakenstein
Ministry of Natural Resources	Environmental coordinator	M. Held
Ministry of Natural Resources	Officer	Zorg
Semi-Government		
NIMOS	Lawyer	F. Hausil
NIMOS	Director Monitoring and Enforcement	C. Nelom
NIMOS	Director legal affairs	N. del Prado
CELOS	Forestry coordinator	K. Tjon
CELOS	Agronomist	M. Callebaut
CELOS	Agronomist	A. Soetosonojo
CELOS	Tissue culture coordinator	G. Ramzan-Ragoebier
CELOS	Representative	G. Malone
CELOS	Fish Biologist	J. Mol

▪ Organization	Function	Name
Semi-Government		
University of Suriname, Biology Department	Plant Pathology	H. van de Lande
University of Suriname, Biology Department	Plant virologist	F. Klas
University of Suriname	Information Technology Department	O. Elmont
University of Suriname	Information Technology Department	M. Koendjbiharie
University of Suriname	Student Environment	G. Landbrug
University of Suriname	Student Environment	P. Chatten
University of Suriname, Faculty of Medical Sciences	Biochemist	M. Adhin
University of Suriname, Faculty of Medical sciences	Cell biologist	E. Brunings
University of Suriname	Chemist	G. Wesenhagen
University of Suriname	Food technologist	R. Stutgard
University of Suriname	Coordinator Biology Department	H. Tjon A Joe
University of Suriname	Environmental Department	G. Ramdhiansing
University of Suriname	Legal student specializing in Biodiversity	E. Madngisa
University of Suriname	Environmental Department	S. Carilho
University of Suriname	Agriculture student	S. Sultan
University of Suriname	Agriculture student	A. Raghoebarsing
University of Suriname	Plant breeder	C. Rahan-Chin
University of Suriname	Coordinator Agricultural Department	R. Tjien Fooh
University of Suriname, Agronomy Department	Horticulturist	J. Muller
Foundation for Nature Conservation in Suriname (STINASU)	Representative	M. Djosetro
Foundation for Forest Conservation Suriname (STINASU)	Director	Y. Merton
Council for Development of the Interior	Respresentative	H. Vreedzaam-Joeroeja
Council for Development of the Interior	Representative	M. Held
NATIN (Nature technical school)	Director	M. Kaboord
NATIN (nature technical school)	Representative	D. Sabajo
Advanced Teachers College (IOL)	Representative	E. Blackman-Dulder
ADRON Rice Research Institute	Plant breeder	J. Tjoe A Wie
Advanced Teachers College	Geneticist	G. Balkema
Non Governmental Organizations		
Marroon Womens Network	Representative NCC	P. Bonte
Ecosystem 2000	Representative	S. Dover
Sanomaro Esa indigenous women organization	Chairman	H. Vreedzaam-Joeroeja
Chamber of Commerce and Industry	Biosafety coordinator	R. Verwey
Conservation International Suriname	Lawyer	R. Nelson
Conservation International Suriname	Representative	H. Berrenstein
Amazon Conservation Team	Representative	A. Monorath
ASFA, Association of Surinamese Industry	Representative	G. Tjon En Soe
VSB, Association for Industry	Representative Biosafety	R. Ramautar
Embassy of the Netherlands	Environmental assistant coordinator	S. Bhairo
Odany-Jewa natural products company	Representative	N. Cheuk-A-Lam
National Democratic Party 2000	Representative	C. Verwey
NGOs/Consumers association	Representative	N. Waagmeester
Ravaksur labour organization	Representative	F. Waterberg
Chamber of Commerce and Industry	Chairman	R. Ameerali
Chamber of Commerce and Industry	Representative	A. Gesser

Organization	Function	Name
Private Sector		
Consultant	Legal affairs	I. Jaspers
Consultant	Environmental planning	S. Adhin
Consultant	Plant pathology	R. Power
Hatcons consultancy		H. Telgt
Phytotech NV.	Manager tissue culture facilities	S. Silos-Gangadien
Consultant		H. Morroy
Tabiki Productions	Public awareness specialist	K. Tojo-Lachmising
Plantprop NV.	Representative	M. Kurban
BHP Billiton	Environmental officer	A. Moredjo
Staatsolie	Environmental coordinator	R. Ramautar
Consultant	Biotechnology	S. Algoe
Polyformis consultants	Director	S. Mac Donald
Consultant	Environmental planning	E. Naarendorp
Consultant	Agriculture	G. Del Prado
Consultant	Risk assessment	M. Fuchs
Consultant	Risk assessment	D. Gonsalves

ANNEX 7: BIBLIOGRAPHY

Author	Title	City	Year
Ministry of LTDE	National Biosafety Survey in Suriname	Paramaribo	2004
Ministry of LTDE and University of Suriname	Report of the scientific seminar "Biotechnology and Environment"	Paramaribo	2004
Ministry of LTDE	Report of "Training workshop on risk assessment and management in biotechnology"	Paramaribo	2004
Ministry of LTDE	Report of first worskhop on biotechnology in Suriname	Paramaribo	2003
Ministry of LTDE	Report on legal, technical, administrative and open consultations for NBF development	Paramaribo	2004
Buursink Internat. Consultants in Env Mngt,	Enhancing the capacity of Suriname to conserve biodiversity. UNDP.	McLean, VA	1999
Buursink Internat. Consultants in Env Mngt	Formulation of a national biodiversity action plan for the implementation of the national biodiversity strategy. UNDP/NIMOS	McLean, VA	2001
Emanuels-Smith, G	Note on Biosafety in Suriname	Paramaribo	2001
Kooye van der, R	Environmental Awareness Survey	Paramaribo	2003
Nahar, E.R., C.A.F. Pigot, J.H. Pinas and Teunissen (Eds)	Suriname Planatlas. National Planning Office of Suriname (SPS), Regional Development and Physical Planning Department HARPRO) / Organization of American States. 33 pp, 25 maps.	Washington DC.	1988
UNEP/GEF	Report on the sub-regional meeting for SIDS on Public awareness and participation and Risk assessment and Management	Fiji Islands	2003
UNEP/GEF	Toolkit phase 0,1,2,3 for the UNEP/GEF project on the development of National Biosafety Frameworks	Geneva	2003/2004
UNEP/GEF	Report of the sub-regional meeting for SIDS on development of a regulatory regime and administrative framework	Trinidad and Tobago	2004

ANNEX 8: ROSTER OF EXPERTS FOR BIOSAFETY REGULATION IN SURINAME

	Name	Area of expertise	Institution
AGRICULTURE, ANIMAL HUSBANDRY, FORESTRY AND	C. Rahan-Chin Msc. J. Muller Msc. P. Milton Msc. ng. Ausan Dr. R. van Kanten L. Joyette-Jubitana Msc. R. Autar	Plant breeding Horticulture/agrobiodiversity Seed technology Weed science Agroforestry Natural resource management Pesticide expert	University of Suriname University of Suriname AAHF University of Suriname CELOS University of Suriname AAHF
PLANT & ANIMAL SANITATION	Dr. H. van de Lande Dr. R. Power Ing. T. Nanden G. van der Kooye Drs. F. Grauwde Ing. A. van Sauers-Muller K. Burke Msc. L. Bannse-Issa DVM H. Resida DVM R. Resopawiro DVM P. Ramkalup DVM R. Siriram DMV Msc. E. Rozenblad DMV Msc. S. Ganpat DMV	Plant sanitation Plant sanitation Plant sanitation Plant sanitation Plant sanitation Plant sanitation Plant sanitation Animal sanitation Animal sanitation Animal sanitation Animal sanitation Animal sanitation Animal sanitation Animal sanitation	University of Suriname Consultant AAHF SML AAHF AAHF University of Suriname Consultant Consultant Consultant Consultant AAHF AAHF AAHF
BIOLOGY	Drs. B. de Dijn rs. M. Werkhoven Dr. J. Mol Drs. H. Tjon A Joe Dr. P. Ouboter Drs. P. Teunissen Y. Berenstein Msc.	Entomology Botany Fish biology Biology & tissue culture expert Zoology Vegetation specialist Fish biology	STINASU University of Suriname University of Suriname University of Suriname University of Suriname. Consultant Conservation Int.
MOLEC. BIOLOGY	Ir. F. Klas J. Tjoe A Wie Msc. G. Emanuels-Smith Dr. G. Balkema	Plant virology Plant breeding Biotechnology Genetics	University of Suriname ADRON Consultant IOL
BIOCHEMISTRY/ HUMAN SCIENCES	Drs. E. Khodabaks Dr. M. Adhin Drs. E. Brunings Dr. Mans Dr. Bipat Dr. J. de Kom Dr. J. Codringhton J. Ausan Msc. Drs. G. Wesenhagen	Biochemistry Biochemistry Cell biology Physiology Physiology Toxicology Clinical chemistry Biochemistry (medicinal plants) Chemistry	University of Suriname University of Suriname University of Suriname University of Suriname University of Suriname University hospital University hospital Consultant University of Suriname
SOCIAL SCIENCES	Dr. M. Schalkwijk Drs. J. Mencke Ir. W. Ramautarsing Ir. W. Caldeira Mr. N. Del Prado Mr. I. Jaspers Mr. A. Narain	Sociologist Sociologist Agricultural economist Agricultural economist Legal expert environment Legal expert environment Legal expert agriculture	Consultant Consultant Consultant Consultant NIMOS Consultant MAAHF
FOOD SCIENCE	R. Stutgard Msc. Ir. S. Mac Donald R. Tevreden Msc. Dr. R. van Ravenswaay	Food technologist Food technologist Food technologist Animal nutrition	University of Suriname Consultant Surinam Airways CELOS

Note: Environmental impact assessment expertise is vested in groups/firms consisting of individuals listed.

ANNEX 9: NATIONAL COORDINATING COMMITTEE FOR DEVELOPING THE NBF

The NCC consisted of representatives from the Government, NGOs, industry and academia as listed below.

Organization	Name of Representative
Ministry of Labour, Technological Development and Environment	Ms. H. Uiterloo (Chairman)
Ministry of Natural Resources	Ms. M. Held
Ministry of Trade and Industry	Mr. J. Dankerlui
Ministry of Agriculture, Animal Husbandry and Fisheries	Mr. A. Kartoredjo
Ministry of Justice and Police	Ms. M. Rommy
Ministry of Foreign Affairs	Mr. T, Shameem
Chamber of Commerce and Industry (KKF)	Mr. R, Verwey
Foundation for a Clean Suriname, Foundation for Food Safety and Consumers association	Mr. N. Waagmeester
Marroon Womens Movement	Ms. P. Bonte
Sanomaro Esa indigenous womens movement	Ms. H. Vreedzaam-Joeroeja
Suriname Industry Association (VSB)	Ms. R, Ramautar
National Institute for Environment and Development in Suriname (NIMOS)	Mr. C. Nelom
University of Suriname	Ms. S. Carilho
Project Coordinator NBF project	Ms. G. Emanuels-Smith