Strategic Environmental Assessment

Support of Modernization of

Public Agricultural Services

SU-L1033

Prepared for:

Inter-American Development Bank

and

Suriname Ministry of Agriculture (LVV)

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# INTRODUCTION

## Project Description

The Inter-American Development Bank and the Suriname Ministry of Agriculture, Animal Husbandry and Fisheries (LVV) are preparing a Policy Based Programmatic Loan (PBP consisting of three individual operations in support of a series of institutional and policy reforms in the agriculture sector, to support sector policy reforms aimed at increasing long term agricultural growth in Suriname. The specific objectives of the Program are to develop institutional and policy reforms to enhance farmers’ access to improved public agricultural and natural resources management services. The program activities will play an important role in developing new plans and legislative reforms, as well as increasing the institutional capacity to deliver key public agricultural services.

The specific areas to be supported by the PBP are:

* Agricultural Statistics
* Agricultural Innovation (research and extension)
* Agricultural Health and Food Safety (including plant and animal health)
* Irrigation and Agricultural Drainage
* Fisheries

## Environmental Evaluation Requirements

The Inter-American Development Bank has established policy directives[[1]](#footnote-1) requiring the evaluation of environmental and social impacts of projects and the development of environmental and social management plans that identify necessary measures to mitigate potential adverse impacts of proposed operations and the institutional mechanisms for carrying them out. For Policy-Based Loans such as this one, which are programmatic in nature and involve the reform or development of new policies, plans and institutional structural changes, the Bank requires a Strategic Environmental Assessment (SEA). The SEA analyzes whether policies and/or institutional changes will have significant and direct effects on the country’s environment and natural resources. An action plan must be prepared, in the event of significant negative effects.

The first step in the Strategic Environmental Assessment process for this PBP was the preliminary assessment carried out by the Bank’s team in accordance with the Bank’s screening process.[[2]](#footnote-2) This assessment concluded that, because the program involves institutional strengthening activities, there are no associated adverse environmental or social risks. Furthermore, it is expected that the policy and institutional reforms to be implemented during Program execution will have positive social and environmental impacts over the long term. Nonetheless, potential adverse impacts and risks as well as opportunities for increasing environmental and social sustainability in policies and institutional reforms were evaluated as part of project preparation, in accordance with Bank Directive B.13 (which requires a strategic environmental evaluation of policy-based loans) and Directive B.05 (which provides general guidelines for the SEA process), and Bank Technical Note on the Implementation of Strategic Environmental Assessments(IDB-TN-227).[[3]](#footnote-3)

## Purpose and Content of the Strategic Environmental Assessment

The purpose of the Strategic Environmental Assessment (SEA) is to identify and analyze any potential social or environmental risks, and more importantly, the opportunities for incorporating elements of environmental and social sustainability into future agricultural policies and plans to be financed under the operation. In addition the SEA presents a series of recommendations that form an SEA action plan.

This SEA report presents:

* a brief description of the environmental setting in Suriname;
* a summary of the institutional and legal framework for environmental management in Suriname that are relevant to the project;
* a discussion of potential impacts or risks and a table summarizing possible impacts or risks of anticipated policies and plans, and identifying opportunities and recommendations for incorporating environmental and social sustainability in policy and plan development;
* Suggested means of monitoring the implementation of the recommendations to increase environmental and social sustainability of policies and plans; and
* Public consultation processes.

# II. ENVIRONMENTAL SETTING

## 2.1 Location and Climate

Suriname is located on the northeast coast of South America. It is bordered by the Republic of Guyana on the west, Brazil on the south, and French Guyana on the east. The country has a total land area of 166.000 km2 and a 370 km long coastline along the Atlantic Ocean in the North.

With a tropical climate, the country has temperatures ranging from 21°C and 32°C. Rainfall averages about 320 cm per year, primarily between June and August, and again from November to January.

## 2.2 Ecosystems

There are five main ecological zones in Suriname:[[4]](#footnote-4)

* Marine Zone, including all off and near shore environments;
* Young and Old Coastal Plains –
  + Young Coastal Plain including coastal beaches, estuaries, mudflats, mangrove communities, and swamp and coastal forest environments; and
  + Old Coastal Plain, including higher sandy ridges, inland swamps, wetlands and forests;
* Savannah Belt (50-60 km. wide), including a mix of open grasslands, xerophytic forest, deciduous forest and rainforest communities; and
* Interior Forests, including wet tropical lowland and sub-montane forests and some massifs as high as 1,255 m above sea level, which cover about 75% of the country’s land surface.



Source: Suriname National Biodiversity Strategy

Suriname is drained by many rivers. The Corantijn River forms the border between Suriname and Guyana on the west. The Marowijne River forms Suriname’s eastern border. Other major rivers include: the Nickerie in the west; the Coppename and Saramacca Rivers in the center of the country; the Suriname, which flows through the capital of Paramaribo; and the Commewijine and Cottica Rivers on the east. The Suriname River has a large dam and reservoir, which provides hydroelectric power for Paramaribo. The Nickerie and other rivers in the west provide important irrigation and drainage services, particularly for rice production.

## 2.3 Socio-Economic and Agricultural Characteristics

Of Suriname’s population of over 500.000 about 95% lives in the coastal plains and another 5% in the interior (Maroon communities and native Amerindians).

Suriname’s total land area is around 15.6 million hectares. About 1.5 million hectares have agricultural potential, but less than 6% of these lands are actually being farmed. Some 85% of the agricultural lands are located in the coastal plains.[[5]](#footnote-5) These areas, largely characterized as low-lying and swampy, were diked and drained by early colonists. Only about 16% of the population is dedicated to agricultural production, with the most important activities being: rice production (80-85% of harvested cropland, concentrated mostly in the Nickerie region and characterized by large farms and mechanization); bananas (a single, state-owned company); and fruits and vegetables (small family farms). Livestock production is very limited. Subsistence agriculture is practiced by indigenous cultures in the interior.[[6]](#footnote-6)

The fisheries industry.in Suriname consists of commercial off-shore fisheries for such species as seabob (a Marine Stewardship Council certified fishery that exports directly to Europe), a bottom fish (trawling) fishery, a shrimp fishery, a yellow snapper fishery (Venezuelan fleet) and artisanal fisheries

in coastal waters, estuaries and rivers. There is a very small aquaculture industry (white shrimp and tilapia) in the country, composed of one major producer and several subsistence farmers.[[7]](#footnote-7)

# III. INSTITUTIONAL AND ENVIRONMENTAL LEGAL FRAMEWORK

## 3.1 **Institutional Setting for Environmental Management**

A National Council for the Environment (NMR) was established in 1997 as an advisory body to the government and consists of 5 members appointed by the president and five members representing the trade and industry, unions, Amerindian and Maroon communities and consumer organizations. The National Institute for Environment and Development in Suriname (NIMOS) was created in 1998 to support the NMR in implementation and research and to create national framework for environmental policy and management. NIMOS’s current responsibilities include environmental and social assessment of proposed projects, environmental monitoring and enforcement (in support of permitting agencies, and education and outreach.[[8]](#footnote-8)

An Environment Section was later created in the Ministry of Labour, Technological Development and Environment (ATM), which was converted to a Directorate in 2011. The Environment Directorate is responsible for formulating and coordinating environmental policy and environmental legislation. It’s priority areas are: biodiversity, waste management, chemical management, climate change, water management, sustainable land management and renewable energy. NIMOS’ role is evolving to one of enforcement as a technical arm of the Ministry.[[9]](#footnote-9)

Environmental management and policy is dispersed among several other ministries in addition to ATM and NIMOS, as summarized below:

* Ministry of Natural Resources: forestry, water resources policy, drinking water supply (groundwater and small community drinking water systems not served by the state water company), energy resources, and mineral resources.
* Ministry of Spatial Planning – management of protected areas
* Ministry of Public Works – management of surface water and urban drainage management, hydrology monitoring, meteorology, sewage treatment
* Ministry of Health – drinking water quality, food safety
* Ministry of Agriculture – pesticide management

## 3.2 National Environmental Legislation

The policy of the Government of Suriname on environmental management was specified in the Government Declaration 2000-2005 and the corresponding Long-Term Development Plan 2000-2005. The plan focused on the following priority action areas[[10]](#footnote-10):

* Formulation of national regulations, standards and guidelines to comply with international regulations;
* Use of sustainable agricultural practices and reduction of pesticides;
* Formulation of national climate change regulations;
* Strengthening the waste management system;
* Promoting sustainable development of natural resources and energy; and
* Strengthening public participation systems for local communities

There is no over-arching law for environmental management in Suriname. A draft law to establish and environment management framework was proposed in 1998 and submitted to the Council of Ministers, which then submitted it to Parliament. As of yet, the law has not been passed. There are some laws and regulations adopted in Suriname that govern occupational health and safety, drinking water quality, fisheries, forestry and pesticide use. Resources are very limited and there is little enforcement of the regulations. There are no regulatory standards for water quality, air quality, or chemical wastes.

The Country has ratified many international environmental accords and developed related management strategies, as summarized in the next section.

NIMOS has developed guidelines for studying environmental impacts of proposed projects and procedures for their review and enforcement of mitigation measures, but they are not mandatory. However, NIMOS reports that numerous international companies voluntarily subject themselves to the guidelines and follow the procedures, including the preparation environmental management and monitoring plans. Generic guidelines have been developed for the classification of proposed projects, and the type of environmental evaluations required, as well as specific guidelines for some sectors, including agriculture. There are no written guidelines for evaluation of policy projects or programs, although two strategic environmental assessments have been prepared and evaluated by NIMOS (one in forestry and one on small-scale mining).

## 3.3 Key International Accords and Corresponding National Policies and Programs

3.3.1 Kyoto Protocol to the United Nations Framework Convention on Climate Change. An inventory of CO2 emissions has been done and a National Climate Change Strategy has been prepared.

3.3.2 Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. Ratified I 2000. Two pesticides have been banned by Suriname to date (Dieldrin and Monocrotophos) and the country has notified its “No consent to import” for 26 other chemicals.[[11]](#footnote-11) Although Suriname has a pesticide law (2005), monitoring and enforcement capacity is minimal.

3.3.3 Stockholm Convention on Persistent Organic Pollutants. Ratified in 2011. A National Implementation Plan has been prepared. A National Chemical Profile was prepared in 2006 and updated in 2010.

3.3.4 Convention on Biological Diversity. Ratified in 1996. A Strategy for Biodiversity was prepared in 2006 as well as a Biodiversity Action Plan. Suriname has 16 protected, proposed for protection, and special multiple-use areas totaling over 2 million acres.[[12]](#footnote-12)

3.3.5 Cartagena Protocol on Biosafety to the Convention on Biological Diversity. Suriname has developed a National Biosafety Strategy (NBF), presented in 2004, with the participation of LVV and other organizations. The NBF applies to the research, development, handling, transport, use, trans-boundary movement, release and management of Genetically Modified Organisms (GMOs). It consists of a policy and regulatory framework; an administrative system to handle requests; a mechanism for risk assessment, monitoring and enforcement; mechanisms for public participation, and a system to provide information to stakeholders.

3.3.6 Convention on Wetlands of International Importance especially as Waterfowl Habitat. (RAMSAR). Came into effect in 1985. Suriname has one site designated under RAMSAR – Coppenamemonding in the Saramacca region (12,000 ha.).[[13]](#footnote-13)

3.3.7 Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal. Approved on February 15, 2011. Suriname has no related law or regulations governing the management of hazardous wastes, nor any in-country capacity for the proper storage and disposal of such wastes. However, ATM and LVV have collaborated in collecting banned and expired pesticides and placing them into storage for eventual treatment/disposal (which may involve shipping them to approved pesticide treatment and disposal facilities in another country). The Fisheries laboratory in Paramaribo has also begun segregating chemical wastes and storing them until there is a solution for their proper disposal[[14]](#footnote-14). There is reportedly a medical waste disposal service provider in Suriname that operates an incinerator and has contracts with hospitals and clinics for medical waste disposal. It is uncertain whether veterinary clinics or laboratories that generate biological wastes (including LVV laboratories) utilize this service.

## 3.4 Environmental and Social Management in LVV

The Ministry of Agriculture (LVV) does not have an environmental management unit or any staff designated for that function. There are no written policies or plans for ensuring good environmental management of LVV facilities. It should be noted that the plant and animal health laboratories are not currently in operation – they are being rebuilt after a fire destroyed them in 2010. The Fisheries Laboratory is in operation and has procedures in place for sterilization of biological wastes, management of sharps, and is now segregating its chemical wastes for temporary storage until hazardous waste disposal options become available.

LVV has some experience in development of biological pest control technologies (there is an ongoing project to test the use of biological predators to control the carambola fruit fly (a pest that also affects other fruits in Suriname). LVV also is working on a project to develop integrated pest management approaches for rice production. However, it is not clear if these kinds of approaches for environmentally sustainable agricultural practices are prioritized in the country.

# IV. KEY SOCIO-ENVIRONMENTAL ISSUES RELATED TO THE OPERATION, EXPECTED IMPACTS/RISKS, AND RECOMMENDATIONS

## 4.1 Potential Environmental and Social Impacts

In carrying out the Strategic Environmental Assessment, existing environmental and social issues related to the proposed components of the PBP, and the types of policies and plans to be formulated, were evaluated and the potential risks and impacts of the proposed policies and plans assessed.

Based on these assessments it can be concluded that the proposed policy changes will likely have positive environmental and social impacts over the long term as they are implemented and will benefit farmers because of improved agricultural services delivery. Irrigation will be made more efficient, reducing the over-use of water and allowing for improved equitable distribution of water to farmers, who will also have more control over the management of water. Food safety will be improved with subsequent positive social impacts for Suriname’s citizens. Agricultural innovation (research and extension services) will contribute to improved yields and health for crops and improved animal health, thus benefitting farmers and consumers. This component also provides opportunities for making plant health practices more environmentally sustainable, through the development, validation, and transfer of technologies for biological pest control and integrated pest management. The fisheries sector will be strengthened with new tools and resources for fish stock monitoring and enforcement, thus improving the sustainability of the marine and freshwater ecosystems. The fisheries component also provides opportunities for developing policies to promote an environmentally and economically sustainable fishery in Suriname, both for the export sector and Suriname consumers.

The SEA report presents recommendations to improve the environmental and social sustainability of the anticipated policies, plans, and programs to be developed through the PBP.

## 4.2 Environmental and Social Risks

No significant expansion of agricultural activities into areas that are fragile or sensitive is anticipated, because there is already a large supply of formerly agricultural land available and not in use. It is hoped that the policies, plans and institutional changes will increase not only agricultural productivity, but also expansion into the agricultural lands now lying fallow.

There are risks associated with the development of aquaculture production, if policies are not put in place to ensure its sustainable development, taking into account, management of wastes, antibiotics, food sources, mechanisms for containment of exotic species, and the protection of fragile ecosystems. Table 1 provides a recommendation for incorporating such considerations into policy development.

Other risks are associated with the operation of LVV facilities regarding biosafety and waste management. Recommendations are included in this report to improve environmental and occupational health and safety of the operations.

The results of the SEA are summarized in Table 1, along with the recommendations.

Table 1. Summary of SEA Findings, Key Socio-Environmental Issues and Impacts, Recommendations to Improve Sustainability of Policies and Plans

| **Component** | **Objectives** | **Expected Indirect Socio-Environmental Impacts of Policies** | **Key Environmental or Social Issues** | **Policies and Plans Three Programmatic Loans** | **Recommendations to Improve Environmental and Social Sustainability** |
| --- | --- | --- | --- | --- | --- |
| 1. Policy Support for Agriculture Statistics Modernization | Improve data collection and analysis | Positive social impacts. Data collection plan will include characterization of farmers in the country, which will help to improve agricultural services | Lack of data characterizing farmers (agricultural census data from 2009 not yet available) | Annual Program for Agricultural Statistics  Operation manual for Agricultural Information System (AIS)  Long term data collection plan and update of methods of collection and analysis  Training for new statistical methodologies | Include in data collection plans- collection of information on women farmers and identification of vulnerable cultural group affiliation |
| 1. Policy Support for Agricultural Health and Food Safety | Improve food safety services | Positive health impacts for society | Health risks to population - insufficient inspection, detection, and enforcement capacity to ensure food safety for population | Food Safety Strategy (prepared by Inter-Ministerial Working Group)  Food Safety Legislation & Protocols  Food Safety Human Resources Plan/Implementation  Food Safety Infrastructure & Equipment Plan | Include training for health and safety for laboratory and inspection staff  Include health and safety features and equipment in plan to protect field and lab staff.  Ensure measures for adequate environmental management of wastes in laboratories and other facilities (solid waste, pathological waste, effluents, emissions, chemicals) |
| Improve animal health services | Improved meat safety for consumers, improved well-being of animals, improvement in safety and environmental conditions in slaughterhouses |  | Legislation on slaughterhouses & meat inspection; animal production, health and welfare; animal feed  Plan for diagnosis, risk analysis, emergency response, traceability  Human resources plan  Infrastructure & equipment plan  National Animal Disease Surveillance & Monitoring Plan  Protocols/rules for border control and quarantine  Strategy for disease-free certification for key animal diseases | Incorporate requirements to ensure that slaughterhouses have adequate waste management (liquids and solids)  Ensure that training plan includes health and safety training and medical monitoring for inspectors, laboratory workers  Ensure that health and safety features &equipment are included in plan and infrastructure for adequate environmental management of wastes and protection of personnel.  Ensure adequate biosafety measures included in rules (containment, treatment/disposal). |
| Improve plant health services | Health benefits for population from safer fruits and vegetables & to agricultural workers for reduction in pesticide use  Long term reduction in pesticide use (due to measures to reduce pesticide residuals on products)  Increase in yields and incomes of farmers (improved seed quality, improved crop quality) | Use of highly toxic pesticides banned in-country or not accepted for import and of pesticides banned by importing countries; pesticide residuals exceed importer standards. Institutional capacity for testing for pesticide residuals not yet in place  Pesticides banned by Suriname continue being imported and used in-country (sometimes mis-labeled). No in-country capacity for testing active ingredients of pesticides being imported.  No system in place for disposal of unused pesticides or empty containers | Plant Protection Act to Parliament, regulations drafted  Decree on pesticide, storage, labeling of pesticides  Plant health organizational study  Plant Health Strategy  Plans for improving technical capabilities in diagnosis, risk assessment, emergency response (includes Human Resources  Plan, Infrastructure & Equipment Plan)  National plant pest surveillance and monitoring plan & implementation protocols  Rules/protocols for border control & quarantine | Ensure incorporation of biosafety regulations to protect biodiversity and human health following the National Biosafety Framework  Include requirements for safety and environmental safeguards for storage facilities  Establish pesticide importation enforcement/monitoring plan and identify resources for developing laboratory capabilities to analyze content of pesticides being imported.  Prioritize the use of biological pest control and IPM for all crops  Ensure that training plan includes health and safety training for inspectors, laboratory workers, quarantine officers. Include plan development of capacity for detection of genetically modified organisms and pesticide testing capabilities.  Ensure that health and safety features/equipment are included in plan as well as infrastructure for adequate environmental management of wastes.  Ensure adequate biosafety measures included in rules (containment, transport, treatment/disposal). |
| 1. Policy Support - Modernization of Agricultural Innovation | Improve agricultural innovation services[[15]](#footnote-15) | Opportunities for positive impacts on environment if sustainable technologies are developed, transferred and adopted by farmers/processors | Outdated facilities without necessary safeguards for occupational health and safety and management of wastes. | Agriculture Innovation Strategy  National Agriculture Innovation Board (recommends research projects)  Human Resources Plan  Infrastructure & equipment plan | Where the strategy applies to agricultural technologies and extension services for farmers in the interior, consider development of culturally-appropriate approaches for working with indigenous and Maroon communities.  In operating procedures for the project selection process include a criterion to not fund investigations that could have significant, negative environmental or social impacts.  Ensure that investigation projects include identification of appropriate environmental and social safeguards and consider potential long-term environmental and social impacts of technology adoption.  Include appropriate health and safety training programs for laboratory workers, laborers in experiment stations, pesticide applicators.  Ensure that health and safety (including biosafety) infrastructure and equipment are included in plan, as well as infrastructure for adequate environmental management of wastes. |
| 1. Policy Support - Modernization of Drainage and Irrigation[[16]](#footnote-16) Services | Improve management effectiveness & sustainability of drainage and irrigation systems | Better management of and rehabilitation of existing irrigation systems will reduce overuse of water & help reduce saltwater intrusion into rivers.  Better management of systems and involvement of farmers in water boards will help improve equitable distribution of irrigation water | Inefficient irrigation delivery system: over extraction of water for irrigation (contributing to saltwater intrusion from marine tides reaching further up-river); no equitable means of distribution (some farmers don’t get any water or don’t get it when most needed).  Canals with weed growth often treated with herbicides – potential human health impacts from harvesting fish in canals; potential downstream ecological impacts to canals and other surface waters | Inter-Ministerial Coordination Working Group on Irrigation and Drainage (IMCWGID)  National Vision for Irrigation and Drainage  Rehabilitation[[17]](#footnote-17) plans and projects for polders  Program to develop, execute and monitor infrastructure investments.  Creation, training of Water Boards made up of farmers & preparation of operations and maintenance plans | Ensure that vision considers climate change and water supply and water quality (of drainage water) sustainability issues  Encourage in Water Board operations and maintenance plans, manual weed removal from canals instead of herbicides for cleaning canals |
| 1. Policy Support for Sustainable Fisheries Management | Improve LVV capacity to manage the fisheries sector  Strengthen the monitoring, statistical analysis, fisheries research, and management functions of the Fisheries Sub-Sector | Updated legislation and plans, improved data collection and improved enforcement capacity will contribute to long-term environmental sustainability of fisheries/ecosystem (avoidance of overfishing) | Lack of data on artisanal fishery catch and of recent data on other stocks. Possible overfishing of shrimp.  Lack of data on by-catch and ecological effects of trawling for bottom fish.  Illegal fishing & piracy in Surinamese waters.  Insufficient enforcement and monitoring due to lack of sufficient staffing and equipment. Insufficient staff to deal with cross-boundary fisheries management issues | Monitoring, Control & Surveillance System with Coast Guard  Updated Fisheries Management Plan  Updated & integrated Fish Stock Protection Act and Fisheries Act  National Fish Information System  Cooperation in bi-lateral research and fisheries management with neighboring countries  Fisheries staff trained in data collection, analysis, stock assessments  Aquaculture development plan and law | Ensure the incorporation of environmental and social sustainability for aquaculture management, including adequate means of waste management and antibiotic use, prevention of escapes of exotic species, protection of important estuarine habitat, wetlands and rivers and sustainable sources for feeding that will not adversely affect natural ecosystems. |

# V. MECHANISMS FOR MONITORING IMPLEMENTATION OF RECOMMENDATIONS

The recommendations in Table 1, designed to promote increased social and environmental sustainability in new policies and plans, are linked to specific deliverables identified in a policy matrix for the operation, to trigger each stage of the three PBPs, and agreed between the Bank and the Suriname Government. As such, the implementation of the recommendations will be able to be verified by the Bank when the specified products and means of verification are provided to the Bank. The Bank will need to review each plan or policy submittal and determine if the recommendations were incorporated.

# VI. PUBLIC CONSULTATION PROCESS

LVV and specialists preparing studies and recommending policy reforms have carried out numerous consultations with stakeholders (meetings, interviews) to obtain their input on key issues to be addressed. For example representatives of the fisheries industry were consulted during the preparation of the operation. LVV has already been working directly with rice farmers in Nickerie to discuss the formation of new waterboards (and is providing training to a newly formed regional Water Board in the Nickerie District). The Drainage and Irrigation Component of the Operation includes provisions for ample public consultation in the development of the “Vision” for drainage and irrigation.

Additional public consultations are planned by LVV for the Agricultural Innovation Component. A meeting is planned in October 2013 to meet with farmers, processors and exporters to obtain input on the strategy for innovation.

1. Environmental and Social Safeguards Policy – OP 703, IDB, Policy Document GN-2208-18, 2006 [↑](#footnote-ref-1)
2. IDB Safeguards Policy Filter Report and Screening Form [↑](#footnote-ref-2)
3. Nota Técnica para la Implementación de la Evaluación Ambiental Estratégica, BID, 2010 [↑](#footnote-ref-3)
4. National Biodiversity Strategy, National Institute of Environment and Development & Ministry of Labour, Technology Development and Environment, UNDP Suriname and World Wildlife Fund March, 2006 [↑](#footnote-ref-4)
5. Roseboom, Johanne, Modernization of Agricultural Services, A Policy Analysis, 2012. [↑](#footnote-ref-5)
6. “ [↑](#footnote-ref-6)
7. Seijo, Juan Carlos, Sustainable Management of Suriname Fisheries, May 2013. [↑](#footnote-ref-7)
8. NIMOS, personal communication, 17 September 2013. [↑](#footnote-ref-8)
9. ATM, Environment Directorate, personal communication, 17 September, 2013. [↑](#footnote-ref-9)
10. National Biosafety Strategy for Suriname, April 2004, ATM, [↑](#footnote-ref-10)
11. Rotterdam Convention website, <http://www.pic.int/>, September 2013 [↑](#footnote-ref-11)
12. Suriname, Fourth National Report on the Convention on Biological Diversity, ATM, 2013. [↑](#footnote-ref-12)
13. RAMSAR Convention website, <http://www.ramsar.org/cda/en/ramsar-home/main/ramsar/1_4000_0__> [↑](#footnote-ref-13)
14. Fisheries Food Safety Inspector, personal communication, 24 September, 2013 [↑](#footnote-ref-14)
15. Innovation services include research and extension services [↑](#footnote-ref-15)
16. Policy mostly directed at rice production in Nickerie region, may expand to other regions & other crops in future years [↑](#footnote-ref-16)
17. Rehabilitation means leveling of fields to improve irrigation effectiveness and rice yields [↑](#footnote-ref-17)