

ENVIRONMENTAL AND SOCIAL ANALYSIS AND MANAGEMENT PLAN

Sustainable Agricultural Development
Programme (GY-L-1060)

Prepared for the Ministry of Agriculture, Guyana

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ENVIRONMENTAL AND SOCIAL ANALYSIS & MANAGEMENT PLAN

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1. Introduction

This document aims to address the social and environmental impact of the proposed Program considering the fragility of impacted ecosystems and the vulnerability of groups living in the areas where the Program will be developed. This report will help the Guyana Ministry of Agriculture comply with national environmental legislation and regulations, as well as with IDB's environment and safeguards policy.

The report responds to the consultancy's TOR¹ addresses the socio environmental context at the national and local level, addresses the indigenous and gender issue, describe and analyze the institutional and regulatory framework, develop and environmental strategic analyze of the program and the lays out a proposed Environment and Social Management Plan.

The report includes data from the interviews conducted in July and August 2016 to different stakeholders of the public sector and some NGO's in Georgetown, Region 9 and 10 (see list of interviews in Annex 2) and the public consultation developed in 18 August at Lethem (see Annex 3: Public Consultation Report).

2. The Program

2.1 Program description

The program aims to increase agricultural and livestock productivity in Guyana while maintaining a sustainable use of natural resources and enhancing climate change adaptation and mitigation in strategic regions (5, 9 and 10).

The program consists of three components:

- a) **Strengthening of the agricultural innovation and extension system.** The loan will finance the implementation of a comprehensive strategy for innovation, extension and

¹ Annex 1 TOR's IDB Environmental and Social analysis and management plan.

management of natural resources in the country. Agriculture centers will be established / improved, to contribute to local and regional development, including technology transfer, demonstration and training. This includes support to strategic innovation by funding adaptive agricultural innovation projects, with an emphasis on validation of technologies and their transfer to farmers. Two research centers have been identified by the MoA: Lethem / Manari (Region 9) and Ebini (Region 10). In both sites, infrastructure, equipment and innovation programs will be designed and implemented. Research / demonstration programs, identified through a prioritization exercise, will be implemented in collaboration with national and international research and technology transfer centers. These programs will identify specific beneficiary groups, technology transfer and monitoring and evaluation mechanisms, and deliver technology products as expected results. Agriculture Centers will also support activities in other regions of the country. Part of the Agriculture Center activities will focus on reducing vulnerability to climate change through multiplication and conservation of genetic material, including drought resistant varieties;

- b) **Information for policy making and natural resource management.** This component will include the review and design of an Agricultural Information System (AIS), including the preparation and implementation of an Agricultural Census;; and the strengthening of the Monitoring and Evaluation capabilities of the MoA;
- c) **Support for compliance with sanitary and phytosanitary standards.** Access to markets and infrastructure will increase the value and sales volume of meat and dairy products. To this end, the program will finance: (i) the review and update of standards and codes related to products destined for export markets as well as local markets, both current and potential; (ii) the implementation of pilot facilities for meat (and perhaps dairy) processing to evaluate the feasibility and unit costs of complying with standards; and (iii) training and technical assistance for the GLDA and producers associations.

2.2 Main infrastructure and extension services to be developed by the Program

2.2.1 Region 9

a) Agriculture Center - infrastructure

The facilities to be constructed for the agriculture center are:

- Buildings
 - Accommodation and Living Quarters
 - Training and Research
 - Administrative Functions
 - Central Workshop

- Agriculture Facility
 - Livestock Fence
 - Germoplasm Storage

b) Agriculture center - Land use

The development of the infrastructure for the agriculture center in Region 9 will use 16,772 acres that are under the property of the government and is in process to be transferred to the Ministry of Agriculture.

Illustration 1: Land Use in site 5 and possible extension

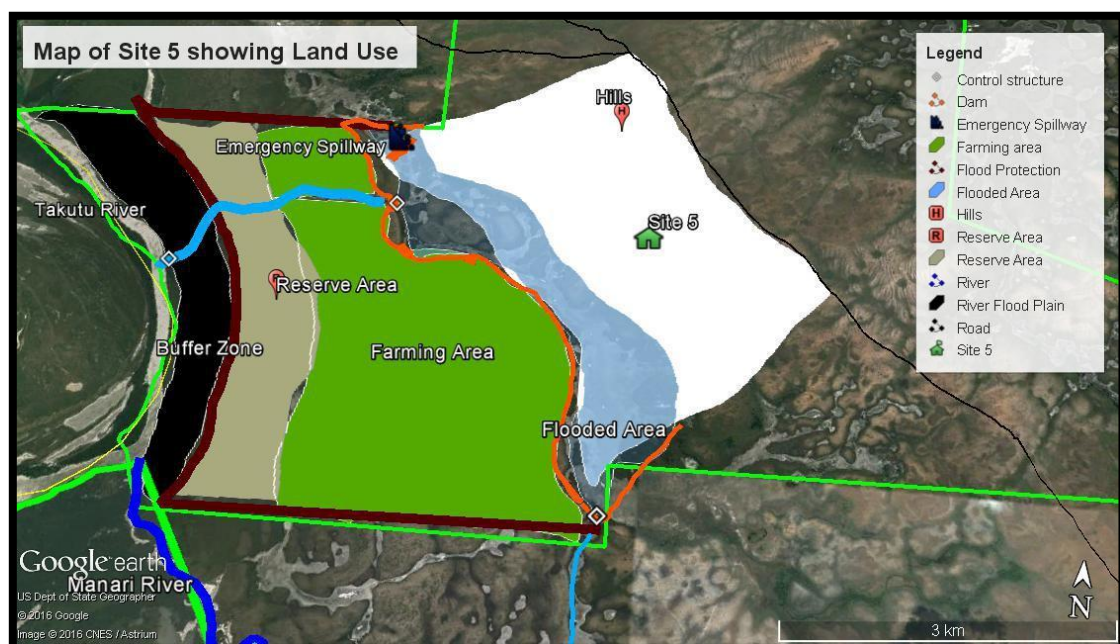


Table 1: Land use for the agriculture center in Region 9²

#	Land Use	Area (Acres)
1	Reservoir upstream Catchment	1641
2	Farming	2059
3	Reserve	768
4	River Floodplain	660

² Ministry of Agriculture. National Drainage and irrigation Authority. Flatts Fredrick. Site Reconnaissance Report. 2016.

5	Flooded area (Reservoir)	836
6	Unused	10,808
	Total	16,772

c) Agriculture center - research activities developed

In the Rupununi, research activities are expected to be carried out in farmers' fields until the research station is constructed. This will allow for the direct transfer of developed technology. Farm schools will also be used to carry out this research under the direct supervision of GLDA and NAREI.

Table 2: Program Activities - Component 2³

Proposed research programs and technology transfer	Objectives	Outcomes expected
Feeds and feeding systems Pasture Research	<p>Improving the nutritional level of the livestock through the introduction and evaluation of new forage grasses and legumes species.</p> <p>Introduce into the Rupununi Savannahs forage species with high nutrition quality and adaptability to the climatic extremes of the area.</p> <p>Select forage species which can provide better quality and quantity of forage to grazing animals than the native savannah grasses.</p> <p>Develop and provide planting material of selected forage species to the farming community</p> <p>Develop and extend appropriate technologies for production of selected forage species to the farming community</p>	<p>Identified species of good quality grass and legume forage species for the Rupununi Savannahs</p> <p>Plant material for the selected grass and legume forage species</p> <p>Technological packages for the development of grass and legume forage pastures in the Rupununi Savannahs</p>
Livestock Research	Promote the sustained increased production of livestock (Beef cattle, Sheep) through improved breeding and breeding techniques in the	<p>Identified target breeds and breed types</p> <p>A structure established to breed and multiply selected breeds of</p>

³ Anderson W. Support of Sustainable Agriculture Program GY-L1060. August 2016.

	<p>Rupununi savannahs.</p> <p>Increase the availability of sufficient numbers of high quality livestock breeding stock</p> <p>Distribute high quality livestock breeding stock and semen for artificial insemination to the farming community</p> <p>Train farmers in the husbandry practices for the production livestock in the Rupununi savannahs</p> <p>Address the impact of Climate Change on livestock production and vice versa</p>	<p>beef cattle, sheep and goats</p> <p>A facility for collection and storage of semen and artificial insemination</p> <p>Requisite information products developed for the training of farmers in the production of livestock in the Rupununi Savannahs</p> <p>Marketing mechanism for animal genetic resources established and operating in the Rupununi Savannahs</p>
Perennial crops (orchard crops) research	<p>Select crop species and cultivars with high general and specific adaptability for the Rupununi Savannahs (citrus, guayava, mango, passion fruit, acai berry)</p> <p>Include cultivar resilience to climate change in the selection process.</p> <p>Produce and distribute adaptable, high yielding seeds, seedlings and planting material to the farmers and producers.</p> <p>Develop and extend appropriate technologies for production of selected Orchard crop species in the Rupununi Savannahs.</p>	<p>Identified target crop species of the Orchard crops of interest</p> <p>Seeds and seedling production of the identified orchards crop species</p> <p>Information products for the production of orchard crop in the savannah areas</p>
Promote the commercial production of selected annual crops in the Rupununi savannahs	<p>Crops of Interest are: Cassava, Corn, Peanuts, Rice and Soybeans</p> <p>To select high yielding crop cultivars with general and specific adaptability to the Rupununi Savannahs</p> <p>Include cultivar resilience to climate change in the selection process</p> <p>Produce and distribute adaptable, high yielding seeds and planting material to the farmers and producers.</p>	<p>Identified target crop cultivars</p> <p>Seeds and planting material production of the identified crop cultivars</p> <p>Information products for the production of the identified crop cultivars in the Rupununi Savannah</p>

	Develop and extend appropriate technologies for production of the selected crop species in the Rupununi Savannahs	
Soil management	<p>Assess the efficacy of selected soil amelioration practices on soil productivity on the acid, infertile and drought prone soils of the Rupununi Savannahs.</p> <p>Sensitize farmers to the benefits of using appropriate soil amelioration practices and teach them to use these practices.</p> <p>Assess the level of soil carbon sequestration possible through the widespread use of biochar in agricultural production in the Rupununi Savannahs</p>	<p>Specific soil management practices developed for the appropriate management of the soils of the Rupununi savannahs</p> <p>Information products developed for the management of the soils of the Rupununi Savannahs</p> <p>Estimates of soil carbon sequestration made for possible Carbon trading</p>
Technology transfer	<p>To provide the necessary technical support to agricultural producers to facilitate technology uptake thru:</p> <p>a) On-farm trials and demonstration plots</p> <p>b) Field day and workshops</p> <p>c) Distribution of information production from research activities</p> <p>d) Use of ICT products and facilities</p>	<p>On-farm trials and demonstration plots</p> <p>Field day and workshops</p> <p>Factsheets, newsletters, brochures and pamphlets</p> <p>Early warning weather bulletins</p>

d) Agriculture center - Water Catchment

In the process of selecting the site for the development of a water catchment the team composed of experts within the various departments and agencies of the Ministry of Agriculture (MOA, GLDA, NAIRI) proposed a selection criteria including: Land (soil type, availability of land, topography), water resources (adequate supply of suitable water quality, site resilient to drought and flooding), infrastructure (proximity to air strip, proximity to navigable river, year-round road access, existing farm infrastructure, communication infrastructure), environmental impact (effect of proposed works on the natural environment and/or protected areas), social impact (proximity to the nearest town/village, probability of conflict / litigation with existing occupants/ locals).

Site No. 5, located in Manari North (bordered by the Manari and Takutu Rivers), is the preferred site based on the evaluation criteria used and will therefore be taken forward to a detailed analysis, despite an unfavourable ranking for the criteria that assessed existing farm infrastructure, as there are no existing facilities and all farm infrastructures will have to be constructed. All other sites ranked similarly low for this criterion except for Pirara Ranch, which is currently occupied by a farmer.

According to current agricultural land use the demand for water is 910,350m³/month. The size of the water storage reservoir required calculated using the rainfall and water demand data is 10,512 Acres.

The proposed land use of the Agriculture Station was utilized together with the average water consumption of each planned activity to determine the volume of water required. This is presented in Table 3. The first column of the table provides the activities of the station that require water. The second column gives the planned quantity of each, while the third column gives the rate of use for each activity. The monthly demand for each activity is calculated in the fourth column which gives a grand total of 4,903, 268 \approx 5,000,000 cubic meters per month⁴.

Table 3: Agriculture Station water demand⁵

Description	Quantity	Rate	Water Demand
Consumption	(heads)	L/day	(30/1000)m3/month
Cattle	500	60	900
Ruminants	5000	11	1,65
Consumptive Use	(acres)	mm/day	(4046x30/1000)m3/month
Aquaculture	10	2.5	9,104
Reservoir	1000	7,5	910,35
Pasture	1040	10	1,262
Crops	500	10	606,9
Rice	500	12	728,28
Reserve	950	12	1,383,732
Total			4,903,268

e) Abattoir at Lethem

The selection of the new area for the construction of the abattoir in Region 9 is on the edge of Lethem, beside the road, with access to electricity of the public system and water of a well. The land owner is the Ministry of Agriculture.

⁴ Ministry of Agriculture. National Drainage and irrigation Authority. Flatts Fredrick. Site Reconnaissance Report. 2016.

⁵ Ministry of Agriculture. National Drainage and irrigation Authority. Flatts Fredrick. Site Reconnaissance Report. 2016.

2.2.2 Region 10

a) Agriculture center – infrastructure to be improved

In region 10 the program is focusing in the improvement of the facilities that exist in the actual agriculture research center at Ebini Station. This improvement consists in:

- upgrading the actual infrastructure,
- improve the facilities for water harvesting,
- improve the road access and storage,
- implementation of soil laboratories,
- Improve the areas for livestock.

b) Agriculture center - Land use

The land use for the infrastructure activities is located in the area used by MOA and it has no land tenure issues associated with it.

Various creeks presently supply water to the Ebini station. These creeks however do not persist during long dry period aspect that has to be take care in the improvement of the facilities of the agriculture center.

c) Agriculture center- research activities developed

Proposed research programs and technology transfer ⁶	Objectives	Expected Outcomes
Perennial crops (Orchard crops) Research	<p>To select crop species and cultivars with high general and specific adaptability for the Intermediate Savannas which can generate economic benefits to farmers greater than that produced by existing species/cultivars</p> <p>To include cultivar resilience to climate change in the selection process</p> <p>To produce and distribute adaptable, high yielding</p>	<p>Identified target crop species of the Orchard crops of interest</p> <p>Seeds and seedling production of the identified orchards crop species</p> <p>Information products for the production of orchard crop in the savannah areas</p>

⁶ Simpson Leslie. Preliminary Report of the Consultant for Component 2: Strengthening of the agricultural innovation and extension system. 2016.

	<p>seeds, seedlings and planting material to the farmers and producers.</p> <p>To develop and extend appropriate technologies for production of selected Orchard crop species in the Intermediate Savannahs.</p> <p>Promote commercial production of selected orchard crops: Citrus, Avocado, Papaya, Passion Fruit, Sour soup and Water melon</p>	
Feeds and Feeding systems research	<p>Pasture Research:</p> <p>To introduce into the Intermediate Savannahs forage species with high nutrition quality and adaptability to the eco zone</p> <p>To select forage species that can provide better quality and quantity of forage to grazing animals than those presently available.</p> <p>Develop and provide planting material of selected forage species to the farming community</p> <p>Develop and extend appropriate technologies for production of selected forage species to the farming community</p>	<p>Identified species of good quality grass and legume forage species for the Intermediate Savannahs</p> <p>Plant material for the selected grass and legume forage species</p> <p>Technological packages for the development of grass and legume forage pastures in the Intermediate Savannahs</p>
Byproduct Feed Research	Assessing the use of the byproducts of crop	Identified high quality byproduct feeding material

	<p>production and processing as feed stock</p> <p>Produce high quality livestock feeds from the byproducts of crop production</p> <p>Test the relative performance of various byproduct feeds on the performance of select livestock species in the Intermediate savannahs</p>	<p>from the Intermediate Savannahs crop program</p> <p>Facility established for the production of byproduct feeds</p> <p>Facility established to carry out feeding trials</p>
Livestock Research	<p>Promote the sustained increased production of livestock in the Intermediate Savannahs.</p> <p>Livestock of interest: Beef Cattle and small ruminants (sheep).</p> <p>Increase the availability of sufficient numbers of high quality livestock breeding stock</p> <p>Distribute high quality livestock breeding stock and semen to the farming community</p> <p>Train farmers in the husbandry practices for the production livestock in the Intermediate savannahs</p> <p>Address the impact Climate Change on livestock production and vice versa</p>	<p>Identified target breeds and breed types</p> <p>A facility established to breed and multiply selected breeds of beef cattle, sheep and goats</p> <p>Requisite information products developed for the training of farmers in the production of livestock in the Intermediate Savannahs</p> <p>Marketing mechanism for animal genetic resources established and operating in the Intermediate Savannahs</p>
Soil Management	Remove key constraints to crop production through soil	Specific soil management practices developed for the

	<p>plant environment modification in the savannahs.</p> <p>Ameliorating practices to be used like liming, biochar addition, organic matter addition and agroforestry systems.</p> <p>Assess the efficacy of selected soil amelioration practices on soil productivity on the acid, infertile and drought prone soils of the Intermediate Savannahs.</p> <p>Sensitize farmers to the benefits of using appropriate soil amelioration practices and teach them to use these practices.</p> <p>Assess the level of soil carbon sequestration possible through the widespread use of biochar in agricultural production in the Savannahs.</p>	<p>appropriate management of the soils of the Intermediate savannahs</p> <p>Information products developed for the management of the soils of the Intermediate Savannahs</p> <p>Estimates of soil carbon sequestration made for possible Carbon trading</p>
Technology transfer	<p>Transfer of technological information to agricultural producers in the Intermediate savannahs.</p> <p>Provide the necessary technical support to agricultural producers to facilitate technology uptake thru:</p> <p>a) Farm visit</p> <p>b) On-farm trials and</p>	<p>On-farm trials and demonstration plots</p> <p>Field day and workshops</p> <p>Factsheets, newsletters, brochures and pamphlets</p> <p>Early warning weather bulletins</p> <p>ICT products and facilities</p>

	demonstration plots c) Field day and workshops d) Distribution of information on production from research activities e) Use of ICT products and facilities	
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3. Environmental and Social Context

3.1 Country Context

Guyana is divided into 10 Administrative Regions and each Region is administered by a Regional Democratic Council (RDC) which is headed by a Chairman. The Regions are divided into Neighbourhood Democratic Councils (NDCs). Georgetown and Guyana's other major cities are important generators of wealth, employment and productivity growth and play a leading role in the national economy. Guyana's rural hinterland accounts for 95% of the land area and 10% of the population, and is home to a number of important economic activities, including agriculture, forestry and mining.

In Guyana, natural resources and biodiversity provide a wide range of goods and services which are critical to the growth and development of the economy and well-being of Guyanese. In 2013, the value that foreign exchange earnings gave to the Guyana economy shows that more than 95% of the earnings were related to use of natural resources and biodiversity/ecosystem services (Table 4). This is expected to increase in the future with proposed increased investment in agriculture, ecotourism and the extractive sector.

Table 4: Contribution of Natural Resource to Guyana Exports

ITEM	VALUE (US\$'000)	CONTRIBUTION (%)
Gold	648,537.6	47.1
Rice & Paddy	239,826.4	17.4
Bauxite	134,646.3	9.8
Sugar	114,197.9	8.3
Shrimp and Prawns	53,111.2	3.9
Timber	38,491.6	2.8
Prepared Foods	26,675.4	1.9
Fish and By-Product	22,851.8	1.7
Rum & Alcohol	19,700.4	1.4
Diamond	12,158.2	0.9
Other Exports	52,029.5	3.8
Re-Exports	13,669.6	1.0
TOTAL	1,375,895.9	100.0

Source: Bureau of Statistics, 2014⁷.

Agriculture

Agriculture played a crucial role in moving Guyana up from a least developing, highly indebted country in 1990 to being a low middle income country, as well as contributing significantly to the national economy. Approximately 40% of total exports come from agriculture. In 2013, rice exports amounted to US\$ 243 M (14% of total exports), sugar US\$ 132.2 M (9.5%), shrimp and fish US\$ 63.9 M (4.6%), timber US\$ 39 M (2.8% of total exports), and other crops (fruits & vegetables) accounted for US\$ 4.7 M (0.3% of total exports)⁸.

The livestock sub-sector contributes approximately 13.6% of the agricultural GDP is responsible for the production of poultry meat, eggs, beef, pork, mouton and milk and with exception of milk Guyana could be considering to be self-sufficient. Livestock in Guyana is composed of 200,000 beef cattle and 70,000 dairy cattle. The per capita consumption of beef and pork is less than 5 kilograms⁹. The GLDA provides some data for livestock (2015) and meat and milk production from 2010 to 2015. Beef production peaked in 2015 at almost

⁷ <http://www.statisticsguyana.gov.gy/trade.html#partners1>.

⁸ Guyana. National Biodiversity Strategy 2012-2020.

⁹ FAO Report of Agriculture in Guyana.

2,000,000 kilograms, and milk production at over 55,000,000 litres. In 2015, the total cattle population for Guyana is reported as 270,000¹⁰.

The agriculture sector is the mainstay of income and employment in many rural communities that are increasingly threatened by climate change and climate variability. The sector is essential to Guyana in terms of its significance for food security, poverty reduction, employment generation and foreign exchange earnings. The agriculture sector in 2009-2013 contributed on average to approximately 20% of Guyana's GDP and accounted for, on average, 40% of the country's total export earnings per annum. Agriculture is a critical livelihood activity, both for subsistence and commercial purposes, and provides revenue generating income for about 25,000 farming households, of which approximately 90% are concentrated in coastal areas and 10% in the hinterlands¹¹.

Biodiversity

Guyana's forest ecosystems and biodiversity are, in many ways, key factors which support community based activities related to culture, recreation, scientific research, and education and ecotourism opportunities. Guyana's species status as of 2010 stood at an estimated 8,000 plant species, 467 fish, 130 amphibians, 179 reptiles, 814 birds, 225 mammals, 1,673 arthropods, over 1,200 fungi, 33 bacteria, 13 nematodes, 44 algae, 17 molluscs, and an estimated 30 viruses. Of the species known to occur in Guyana, 4.5% of mammals, 0.4% of birds, 3% of amphibians, 3.3% of reptiles, and 0.3% of freshwater fish are threatened¹².

Historically, relatively low deforestation rates have been reported for Guyana. As at January 2012, approximately 87% of the land area is covered by forests – approximately 18.5 million has. A comparatively low deforestation rate is reported, ranging between 0.02% and 0.079% per annum¹³.

Climate Change

In a 2008 policy decision, the Government signalled its intention and commitment to embark on a climate resilient low carbon approach to development, adopting the "Low Carbon Development Strategy". For the past six years, the Government has worked at the multilateral level to establish a Reducing Emissions from Deforestation and Forest Degradation (REDD+) framework through which Guyana is paid for forest climate services its forests provide and which has set the stage for payments for forest conservation and sustainable forest management. To date (2014), Guyana has earned three consecutive payments from Norway totalling US\$ 115 million within the policy framework of the LCDS. In

¹⁰ Anderson W. Report for Support of Sustainable Agricultural Development Program (GY-L1060). August 2016.

¹¹ Ministry of Agriculture. A National Strategy for Agriculture in Guyana 2013 -2020, 2013.

¹² World Wildlife Fund (WWF) Guyanas, 2012. Wetlands of Guyana – An insight into the ecology of selected wetlands with recommendations from WWF – Guyanas.

¹³ Guyana's Forestry Commission. 2013.

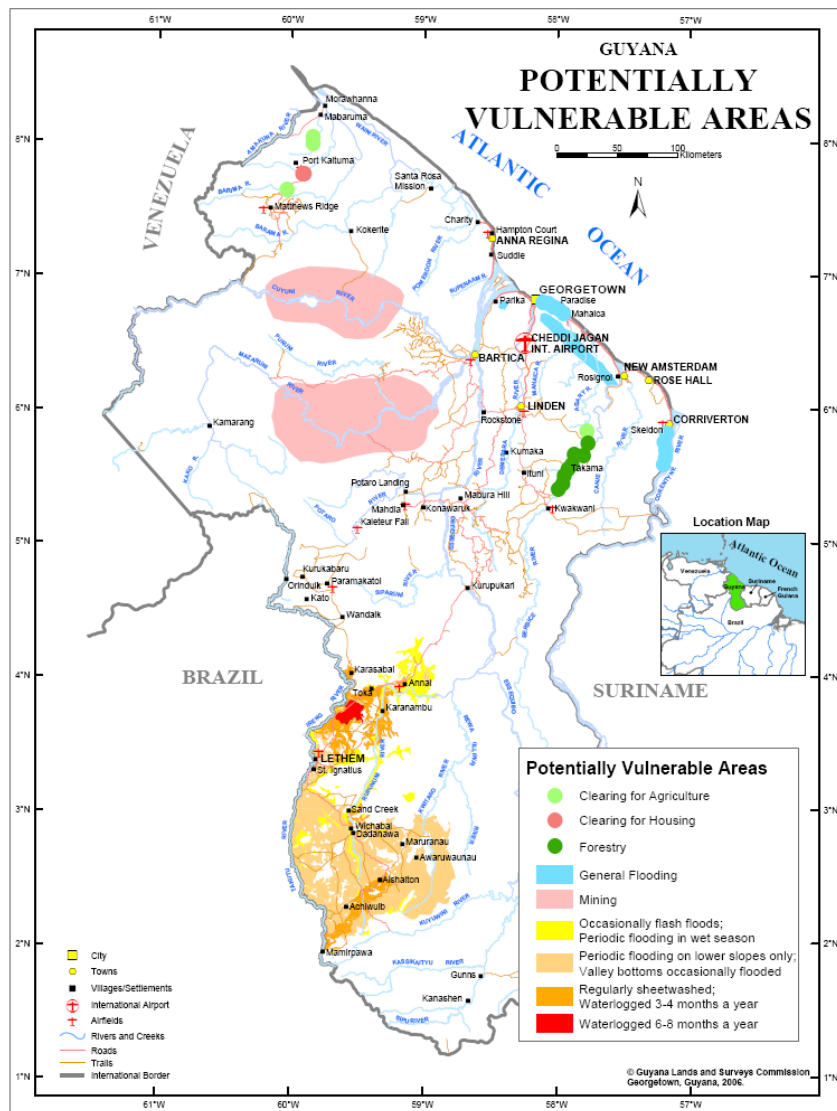
the last quarter of 2013, the annual third party audit of Guyana's performance under the partnership established with Norway was completed, clearing the way for a fourth payment.¹⁴

The development of the LCDS made the government commitment to reorienting Guyana's economy to a low-carbon, "green" development pathway clear. The Guyana Government decision to sustainably manage forestry resources to derive benefits for the economy and create livelihood opportunities for the people of Guyana has had an influence in achieving one of the lowest deforestation rates in the world. In doing so, new economic opportunities created through avoided deforestation (REDD+) allowed Guyana to be one of the first countries to benefit from financial incentives.¹⁵

¹⁴ National Budget , 2014. National Assessment of Land Degradation in Guyana – Diagnostic Report – Lands and Surveys Commission, UNDP & GEF, 2008.

¹⁵ Guyana National Biodiversity Strategy 2012-2010.

Illustration 2: Potentially Vulnerable Areas¹⁶



In agriculture, key impacts of climate change include: i) decrease in crop yields as temperature increases, ii) loss of crop yields from inundation and salinization, iii) crop loss and yield reduction due to increased severity of droughts and intensity of floods, iv) reduced yields due to general reduction in available run-off¹⁷.

Guyana's Low Carbon Development Strategy addresses some key directions to be pursued within the agricultural sector: i) combining forests with agriculture, such as agroforestry systems, which could generate about US\$ 580 million per annum (LCDE), ii) investment and

¹⁶ Guyana Lands & Surveys Commission, 2006.

¹⁷ Ministry of the Presidency. Office of Climate Change, 2016. Guyana's Climate Resilience Strategy and Action Plan.

employment in Low Carbon Economic Sectors, including the commercial production of fruits and vegetables and aquaculture.

An important challenge in the agriculture sector is the lack of technical knowledge, financing and technology available to farmers for responding to and managing the impact of climate change on their farms, livelihoods and communities. Additionally, the existing legislative environment and institutional support needs to be assessed to ascertain if they enable small farmer development and knowledge expansion in the wake of climate change. Given the important linkages between agriculture productivity, food security, forest management, and livelihoods, the potential impacts of climate change on the agriculture sector could have far reaching impacts on society; therefore, addressing the vulnerability of the agriculture sector to climate change is of high priority to the people of Guyana¹⁸.

Stakeholder consultations in Regions 9 and 10 highlighted that the capacity of the sector to deal with climate impacts is affected by a number of informational, technological, institutional, and regulatory barriers. These include the fact that most agriculture is undertaken by small farmers who lack the technical knowledge, funding and technology to respond to and manage the impacts of climate variability and change. At the institutional level, there is a lack of cooperation and coordination among agencies, creating overlapping responsibilities and gaps. Stakeholders also commented that policies and regulations are poorly enforced, which potentially increases the exposure of agricultural activities to climate impacts (e.g. land-use planning policies and exposure to flooding, water abstraction regulations and exposure to droughts)¹⁹.

Indigenous Groups

Guyana has a growing Amerindian²⁰ indigenous population that possesses communal lands, organized in Amerindian villages or Amerindian communities that are governed by Village Councils. These villages have been provided with primary health facilities and elementary schools. “The standard of living was lower than that of most citizens, and they had limited access to education and health care. Little reliable data existed regarding the situation of women and girls in indigenous communities, although indigenous women tended to face threefold discrimination and vulnerability on the basis of gender, ethnicity and reduced economic status.” (Department of State, n.d.; Amerindian Act, 2006; CEDAW, 2010).

¹⁸ Ministry of the Presidency, Office of Climate Change, 2016. Guyana’s Climate Resilience Strategy and Action Plan.

¹⁹ Interviews of different stakeholders in July and August 2016; see Annex 2.

²⁰ For the purposes of this report I will refer to “indigenous communities”, since this is the category adopted by the Government, although the term Amerindian is widely used by the indigenous peoples, who name and identify themselves as such.

There are nine groups of Amerindian peoples in Guyana – Wai Wais, Macushis, Patomonas, Arawaks, Caribs, Wapishana, Arecunas, Akawaios, and Warraus²¹ – each of which has a distinct cultural identity and heritage, language and traditional economic activities. Amerindian communities are at varying stages of integration with the national economy. The communities are typically characterized by the co-existence of well-preserved traditional lifestyles and cultural freedoms with various kinds of income-generating activities. Gradual integration into the production and consumption structures of the national economy is an ongoing process. (Ministry of Indigenous People's Affairs, 2016)

The 2012 Census shows that Guyana's population consists of six main ethnic groups and a "mixed heritage group". One of these groups is the Amerindian group, composed of the indigenous population, which represents 10.5% of the population in Guyana.

The Amerindian population represents the largest ethnic group in Region 9 (20,808 inhabitants) and the fourth largest group in Region 10 with 3,205 habitants (Census Compendium 2, 2012: p. 7). It's worth noting that most of the Amerindian population of the country lives in Region 9. (Census Compendium 2, 2012: p. 67)

Table 5: Indigenous Demographic Indicator

	Households (HH)	HHs headed by women		Size of the family	Native language
		Total	Percentage		
Region 9	345	27	8%	5.42	Macushi (47%), Wapishana (39%), Portuguese (5.5%)
Region 10	223	98	44%	4.18	Guyanese Creole (11%)
Total	568	125	22%	4.59	Guyanese Creole (58%), Macushi (54%), Wapishana (45%)
Average	284	63	26%	4.80	Guyanese Creole (19%), Macushi (16%), Wapishana (13%)

Source: Inter-American Development Bank

Based on Table 5, 44% of households in Region 10 are headed by women, in contrast to 8% in Region 9. This could be based on a series of factors ranging from migration (both internal as well as overseas), as the net migration for 2015 is 4.8. In addition, communities in Region 9 speak three different languages Macushi (47%), Wapishana (39%), Portuguese (5.5%), whereas in communities in Region 10, Guyanese-Creole (11%) is spoken. These differences are additional indicators of the stark differences between Regions 9 and 10 which need to be accounted for when implementing the Project.

According to the Guyana Lands and Surveys Commission, most of the 170 communities have been titled largely thanks to the Amerindian Act, and currently there are only 30 still in

²¹ For further information please refer to the Ministry of Indigenous' Peoples Affairs' description at <http://indigenouseoples.gov.gy/amerindian-villages/>

the process. Some of the challenges they have faced have to do with demarcation. The Ministry of Indigenous Affairs, with the support of UNDP, are in charge of the consultation for the land demarcation. Based on their experience, they now require written signatures from the community accepting the boundaries. Not long ago the acceptance of the boundaries was done verbally. In those cases, when the team in charge of doing the official titling arrived, many would say that they hadn't agreed with the demarcation. In addition, there is no legislation that protects religious or sacred land.

The livelihoods of many indigenous peoples are inherently vulnerable to climate change, due to a number of factors that increase sensitivity and exposure, including dependence on ecosystem services and agriculture, and isolation from main infrastructure and transportation networks²².

The indigenous communities are heavily dependent on small-scale agriculture, particularly for the provision of their main staple, cassava. Agriculture itself is sensitive to climate change due to the close connections between climatic conditions, plant development and animal health, which in turn increases the sensitivity of indigenous peoples' communities²³.

In the interviews with the authorities of the Ministry of Indigenous Affairs and NGOs we found that the capacity to deal with climate impacts by indigenous peoples is affected by a number of barriers: informational, technological, institutional, and regulatory, among others. There is also a need for empowerment at the local level and for community members to be able to contribute to policy processes. Information is also limited, consisting of traditional knowledge, available Hydrometer data and a climate change community manual that are not adequately utilized. Furthermore, due to the hinterland location of many indigenous peoples' communities, education opportunities are limited or not readily accessible. As a result, language and concepts related to climate change are not readily understood. Finally, the availability of financial resources to build climate resilience is perceived as low. Although financing is available to various agencies, such as the RDCs and National Drainage and Irrigation Authority (NDIA), for activities that may be classified as resilience building, stakeholders did not refer to this during interviews.

A crucial component for facilitating access is increasing knowledge in the science of agriculture, from use of seeds, types of soil, safe handling of pesticides and other technology and agricultural practices, to information about the weather that has a direct impact on their lives.

The major constraints for Amerindian lands is the delay in issuing titles and extensions prolongs uncertainty which can have a knock on effect such as for REDD+ payments. Other constraints relate to the management of Amerindian lands in that they may not

²² Ministry of Presidency, Office of Climate Change. Guyana's Climate Resilience and Action Plan.2016.

²³ Ministry of Presidency, Office of Climate Change. Guyana's Climate Resilience and Action Plan.2016.

fit in with Government or regional objectives, and there is also actual and potential conflict with other land users regarding mining, logging and agricultural developments²⁴.

Gender Issues

Guyana has made significant efforts to overcome gender violence and gender inequalities in the last decade. Some steps taken toward improving the quality of life for women and children in rural areas include constitutional and legal reforms providing advances for equality, a renewed institutional framework for the three branches of the State and increased spending for the social sector in areas such as education, health, water, sanitation, and housing²⁵.

Decentralized gender units throughout the country have helped organize the civil society organizations, providing a forum for consultation and advocacy. In addition, access to a reliable supply of potable water, legal protection of women's property rights, equal access to employment, education, social security, and health care are protected by affirmative action to ensure priority access for women to these services. Furthermore, due to the significant number (29%) of female-headed households, in 2009 the State introduced a Single Parent Assistance Programme to lend support to these heads of households with financial assistance for day care and skills training and/or retraining (CEDAW, 2010)²⁶.

Political participation of indigenous women is limited among the local indigenous leaders, known as Toshaos. There are only five women out of 219 Toshaos at the national level. This is another measurable indicator of the gender disparity historically present regarding access to power positions. According to CI-Guyana Report (2016), one of the major problems that indigenous women face in this regard is lack of self-esteem, which in turn makes them ill-prepared to run for office as they won't develop the skills, networks and know-how required to have community support. As the position is highly political and tied to one of the political parties, these challenges limit indigenous women's access to candidacies. Therefore, leadership training is crucial to foster the optimal participation of women²⁷.

The Ministry of Social Protection provided relevant information on some of the programmes as pertaining to gender and indigenous communities. Many of these programmes have actively involved women in agroprocessing (jam, wine, preserved fruit) in Region 1, and cassava production in different regions throughout Guyana, including Region 9. Based on their experience, women are more involved in agriculture-based agroindustry than in any

²⁴ Ministry of Natural Resources and Environment. Guyana National Land Use Plan.2013.

²⁵ CEDAW, 2010

²⁶ CEDAW, 2010; Women and Gender Equality Commission 2013.

²⁷ Viteri, M., Report of strategy to mainstreaming gender and indigenous peoples' issues. Program GY-L1060, August 2016.

other activity such as fishing or logging, which fall within the realm of men's traditionally assigned roles²⁸.

According to the Institute for Gender Studies at University of Guyana, access to resources is one of the major challenges faced by women in the rural areas (mostly indigenous) when it comes to having active economic and social involvement in the agricultural spheres. In agriculture, a large percentage of women are involved in the processing of crops. Hence, there is a great need to access new technologies in addition to training in canning, bottling, packaging, and marketing. As was made evident in the case of a prior pineapple canning project conducted in Regions 3, 4 and 6 (Rouffiange, 1993), if the women are unable to sustain a supply of raw material, the project will not be sustainable.

3.2 Region 9 – Rupununi

a) Socioeconomic Context

The Rupununi has a population of 24,212 inhabitants in an area of 57,750 km², where 89% of the population are Amerindian communities (Wapishana, Macushi, Wai-Wai, and Patamona). Amerindians represent the largest ethnic group in this area²⁹.

Rupununi is an indigenous mixed-economy consisting of four sets of influences, namely, customary arrangements, the State, the market system and non-governmental organizations (NGOs). The predominantly indigenous population owns 27% of the land in the Rupununi³⁰.

Households in the Rupununi are engaged in several activities (mixed farming, agroprocessing and wage labour) to provide their livelihoods. A very significant recent development is the overall trend in the Rupununi towards a market-based economy. Over the years money has been replacing barter as a means of exchange and more and more communities are producing for the market or earning wages³¹.

The Rupununi population generates low annual incomes but has strong dependencies on natural resources to meet household needs. Households utilize a number of economic activities for their livelihoods. The top three economic activities at the household level are i) agroprocessing, ii) crop production, and iii) paid labour. However, many households (60%) still engage in traditional activities such as hunting, fishing and gathering³².

The economic activities which generate the most cash income in households are paid labour (mainly outside of the village), logging, agro-processing, and crop production. These activities account for 78% of the cash incomes in the Rupununi. The data also reflect the

²⁸ Interviews applied in July and August 2006 to different stakeholders.

²⁹ Report of Population and Housing Census 2012

³⁰ Conservation International, Practical Action, 2013. Rupununi Economic Baseline Conditions.

³¹ Conservation International, Practical Action, 2013. Rupununi Economic Baseline Conditions.

³² Conservation International, Practical Action, 2013. Rupununi Economic Baseline Conditions.

dependence on the agriculture sector to support community livelihoods. For instance, even though agroprocessing only generates 16% of the income in the region, 70% of the households are involved in this activity. It is troubling that the need for paid labour outside of the villages is causing villagers to migrate in search of employment opportunities³³.

a) Agriculture Sector

In this region the predominant agricultural activity has been cattle rearing on natural pastures. Although the total herd population has dwindled to 13,000 heads from a reported high of 65,000, there is still a sense that beef ranching remains the main cultural niche of the indigenous population. The Rupununi Livestock Producers Association (RLPA) appears to be the most vibrant agricultural producer association and its 60 to 70 members are beef and small ruminant producers.

Crop agriculture is undertaken mainly in forests and forest islands, employing mixed farming systems to produce cassava and a range of other crops generally aimed at meeting households food needs. Crop agriculture has grown very little over the years and major increases in the production of traditional and new crops will require significant inputs of new technologies, financial investments, training, and technical assistance. Other limiting factors have been that family labour employs only rudimentary farming tools, lack of guaranteed markets and poor transportation network and infrastructure³⁴.

The main foods consumed in the Rupununi are cassava products (including *farina*, *casareep*, cassava bread) and fish. However, households are increasingly consuming imported food, which means that more cash will be required to support these purchases. Households use firewood to cook food, including the main staple, *farina*. Cooking gas is used, but the majority of households cannot afford to use it on a daily basis. Hence, firewood is very important for local livelihoods, and its scarcity poses a threat to community wellbeing. Other sources of energy consumed by households are solar panels and generators which are used to provide electricity.

According to SOFA³⁵, livestock research appears to be the most feasible intervention priority for the region with pasture and feeding material being the primary area, followed by improved breeding efficiencies and breeds. Also of importance, but perhaps as support to this programme, should be a value chain study of the Rupununi cattle industry to determine the range of products which can be provided by this sector.

The high expenditure on external inputs, particularly food, opens up the possibility of investing in food security strategies. In addition, food sovereignty opens up opportunities for

³³ Conservation International, Practical Action, 2013. Rupununi Economic Baseline Conditions.

³⁴ CI. The State of Food and Agriculture in Rupununi SOFA. . 2015.

³⁵ CI. The State of Food and Agriculture in Rupununi SOFA. 2015.

small business development in poultry, milled rice and fruit processing, which are presently not being developed³⁶.

For SOFA, growing crops in savannahs has several advantages; for example, that mechanical equipment could be used and hence more land could be brought into cultivation, crops would grow closer to farmers' homes and there would be no need to clear forest. However, several challenges will have to be addressed, including farmers' lack of experience and technical skills in using savannah lands which are shallow, nutrient poor and will require soil supplementation, flooding during wet seasons and need for fencing. Recent investments in the region by Santa Fe and Waikin Ranch mega farms may demonstrate approaches to dealing with some of these challenges, including sustainable ways of utilizing the region's natural resources and ecosystem in compliance with the government's Low Carbon Development Strategy.

b) Biodiversity and Ecosystem Services

The Rupununi Savannah is one of Guyana's most unique and diverse ecosystems and among the last great wilderness areas on Earth. It is home to over 9,000 species, including over 2,000 vertebrates and many species that are highly endangered globally (Hollowell and Reynolds, 2005; DIREN, 2006; Conservation International, 2003; Funk et al., 2007). This high diversity is the result of a mix of Amazonian and Guyana Shield fauna, extremely diverse and closely packed habitats, and marked seasonal variability, including extensive flooding³⁷.

According to CI until recently the region's ecosystems have been protected by its isolation. Increasing interest in the region for gold mining, petroleum extraction, and large-scale agriculture is beginning to threaten the spectacular wildlife and natural habitats of the Rupununi.

The Rupununi wetlands region is particularly interesting from evolutionary and biogeographically standpoints, as it represents a potential avenue of species exchange between Essequibo and Amazon basins during torrential rains seasons. Extensive flooding of the savannahs between the Takutu and Rupununi basins is thought to promote this potential route of species transfer and gene flow. As such, fish provide a fascinating system in which to examine the history of faunal crossover and interaction in a complex geological and hydrological region³⁸.

³⁶ CI, Practical Action. Rupununi Economic Baseline Conditions.2013.

³⁷ WWF Guyanas, Global Wildlife Conservation, 2013. South Rupununi Biodiversity Assessment Team Expedition (BAT).

³⁸ Taphorn, D., Kolmann, M., Kalicharan, L., Ignace, M., Fishes in Rupununi BAT. 2013.

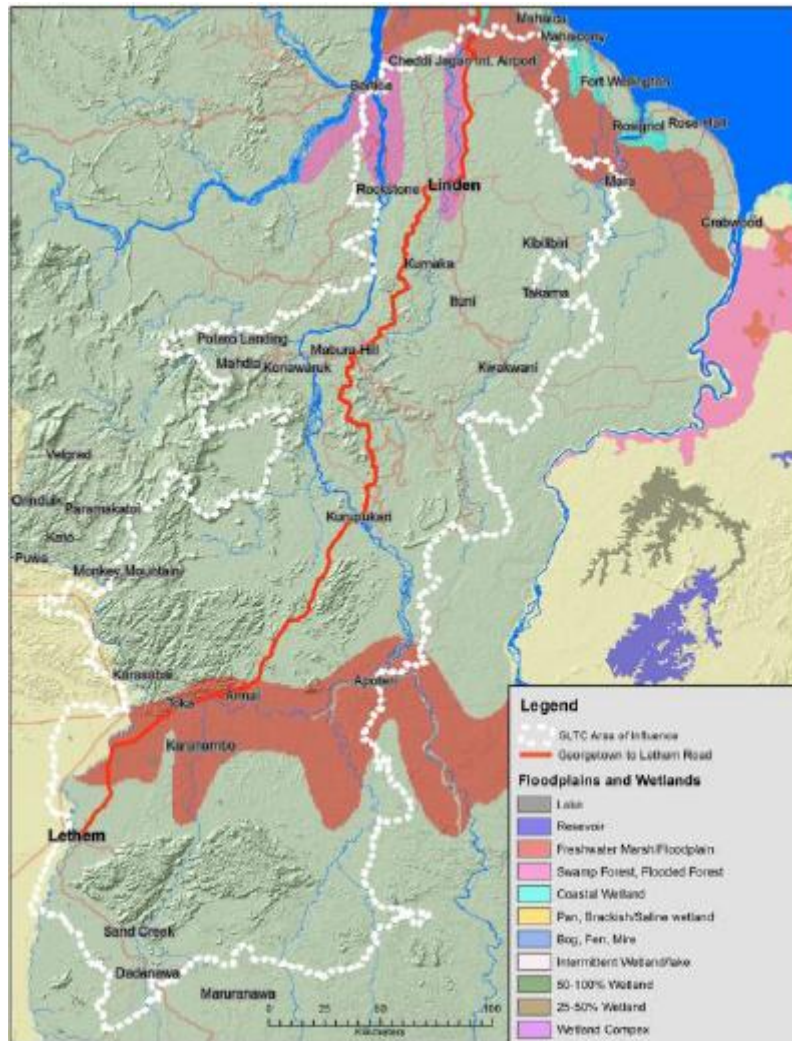
Illustration 3: Suggested area to increase connectivity between the protected areas³⁹.



According to CI the wetlands, savannah and forested areas between these two protected areas are critical for the maintenance of their integrity and for the movement of wide ranging species. There has been a suggestion that this area could be proposed for the establishment of a RAMSAR site.

³⁹ CI. Biodiversity and Ecosystem Services Assessment for the Expansion of the Road Georgetown - Lethem. 2014.

Illustration 4: Wetlands in Region 9⁴⁰



The Rupununi Wetlands have been found to play a key role in evolutionary processes as a result of the connectivity between the amazon and Essequibo watersheds with occur within it (de Souza, Armbruster and Werneke, 2012).

Forests and forest islands are the most important natural capital for livelihoods in the region and are the source of wild fruits, nuts, timber for sale, and home-building, the areas where people primarily farm, and the habitats for a range of wild animals which are hunted for food. Aside from subsistence and economic value, forest and wetlands feature prominently in indigenous culture and folklore, and have significant aesthetic value, serving as a primary place of

⁴⁰ Wetlands distribution in Guyana. The north Rupununi is the area most important identified. Wetlands data sourced from the global lakes and wetlands database.2014.

recreation and hunting. Wild and domesticated animals and fish in particular are the main protein sources for villagers⁴¹.

The Rupununi Savannah is divided into two almost equally sized parts by the Kanuku Mountains – the North and South Rupununi. Despite a reportedly high diversity and unique species composition, biological data, particularly from the Southern Rupununi, are still lacking (Watkins et al., 2010). As pressure to develop the region increases, it is essential to have a strong baseline of species and habitat information for the Southern Rupununi in order to make sound management and conservation decisions.

The savannahs are mostly open, hot and dry areas shaped by frequent and regular fires, with a pronounced seasonality characterized by periods of rain and drought that have an impact on activities such as agriculture and water availability. Common trees of the savannah include *Curatella americana* (sandpaper tree) and *Byrsonima verbascifolia*, which is used by the local people as an anti-malaria and anti-diarrhoea cure. The bush islands consist of small patches of forest which are often elevated and rocky within the savannah, with trees often not higher than 10 m. Rocky outcrops form an important part of the savannah; examples include Kusad Mountain, Saddle Mountain, and Shiriri Mountain. The rocky outcrops and mountains are among the most vulnerable of vegetation types, as they are unique in the regional context. Large parts of the savannah are drainage systems of the larger rivers (Takatu, Ireng, Rupununi) with rivers bordered by gallery forests, providing habitats for many other organisms.

Water availability in the Rupununi: there is likely to be excess water during the rainfall period, but a serious deficit in the dry period has implications for livelihoods and agriculture. There is therefore a need, in both places, to provide some form of on-station water storage.

The water areas, creeks and wetlands of the Southern Rupununi are used by the indigenous peoples for domestic purposes, including drinking and food preparation, among others; as such, a water quality assessment identifies whether the waters are safe for these purposes. Moreover, this water quality survey contributes to the limited baseline data available that should be considered in the establishment of water quality standards for surface waters in Guyana and the management of water resources⁴².

c) Climate Resilience

Climate change is a major threat to the Rupununi because of the fragility of its ecosystems. The diverse sources of food (from the forests and crop production) indicate that the Rupununi population is somewhat resilient to the effects of climate change in terms of food security. The people also possess traditional ecological and agricultural knowledge that may help them to overcome a potential food production issue linked to climate change. However,

⁴¹ Ministry of Agriculture. State and Food Agriculture in the Rupununi (SOFA).2014

⁴² Simmons, D., La Cruz, N. Water Quality in Rupununi BAT. 2013

with an increasing dependence on imported food, and declining fish stocks, the population can quickly become food insecure, especially if agro-ecological systems are negatively affected by the effects of climate change.⁴³

Proper management of natural resources is also critical for the maintenance of households. Timber provides significant income for households, and firewood consumption is high. Firewood is essential for the preparation of *farina*, the major staple of the region. Nature based tourism has also begun to generate income for some households⁴⁴.

The adaptive measures proposed by the Climate Change Office for the Rupununi are in the Climate Change Adaptation Plan, involving the participation of NGOs. The plan is focused on: i) building a local monitoring system, establishing a monitoring process of at least 30 years to track changes in the climate. This can be done by identifying strategic sites to install weather stations in 2 or 3 of the sub- districts, organizing an inter-agency group to monitor climate change which must be led by the regional authorities or the hydro-meteorological office, etc.; ii) implementing adaptation measures based on ecosystems and traditional knowledge/practices; e.g., water harvesting systems, climate resilient agriculture.

Mainstreaming climate change in the context of the Rupununi means the integration of climate change adaptation and resilience considerations into various programmes, projects, plans, strategies, and policies implemented in the region. This will ensure local awareness of climate change issues, and help communities to adequately prepare for its negative effects. Investments to develop the region must be aligned with the Low Carbon Development Strategy to promote effective mainstreaming of climate change. These actions are part of the Program (GY-L1060).

d) Indigenous Issue

The Rupununi Savannah is home to 5,000 indigenous people. Until recently, the region has been protected by its isolation. With improving accessibility, beginning with a road from Georgetown 20 years ago, a bridge across the Takatu River to Brazil in the past five years, and the promise of the paving of the road from the Lethem (Brazil border) to Linden over the coming five years, there is increasing interest in the region for gold mining, petroleum extraction, and large-scale agriculture. These developments are already threatening the spectacular wildlife and natural habitats of the Rupununi, as well as the traditional ways of life of the indigenous communities⁴⁵.

Indigenous participants at the St. Ignatius village meeting in Lethem, Region 9, suggested the need to have some sort of formal schooling in agriculture, such as at a school of agriculture developed by the government. Indigenous women emphasized the need to

⁴³ Rupununi Climate Change Vulnerability & Adaptation Plan, Conservation International

⁴⁴ CI, FAO, IADB, The State of Food and Agriculture in the Rupununi.

⁴⁵ Fredericks, P., Buckley, C., 2013, Natural Resource Use Assessment.

access technical knowledge, such as the best type of cassava to grow based on soil type, seeds and weather conditions. All the participants demand the improvement of knowledge on how to deal with climate change which is affecting their crops.

Cassava, as a crop native to the forest, has cultural significance in the communities in addition to its nutritional value. Cassava is used to make as many as ten different products, ranging from cassava bread to tapioca⁴⁶.

In the interviews the indigenous people explained that an obstacle that affects all of the communities around Lethem is the difficulty in having a niche market to sell their products, in addition to transportation.

e) Gender Issue

In the interviews applied in Lethem to different stakeholders we found that women are increasingly taking up leadership roles in the household and are contributing significantly to the households' economy. Thirteen percent (13%) of households were headed by youths (≤ 29 years). Youth have on average 2.5 times more income than older persons in households. Main sources of income are logging, external work, agroprocessing, and livestock⁴⁷.

According to the Permanent Secretary of the Ministry of Communities, 70% of organized groups across the country are women. In Region 9 we can see a successful example, like the peanut project, where women from North Rupununi started producing and selling peanuts as one of the main crops in the savannah. With the support of the Universities of Georgia and Florida they started the Collaborative Research Support Programme in 2002, slowly growing into a peanut butter factory thanks to the Canada Fund and the US Ambassadors Self-Help Fund⁴⁸.

Women have traditionally played a role in conventional food supply and agriculture practices. In most communities women perform tasks such as planting crops and transporting produce from farms, while maintaining tasks such as child bearing, cooking, washing, and other household chores. The roles have been changing over the years as many women are now participating more in the labour market or engaging in income generating activities⁴⁹.

In terms of gender division of roles in cassava planting, men are the ones who traditionally prepare the soil and women do everything else. Women in Guyana have been at the forefront of agriculture, although, as other countries' experiences illustrate, they are still marginalized and their contribution is mostly invisible. These findings are consistent with the FAO's research on agriculture and gender that illustrates that globally, female farm labourers'

⁴⁶ Interviews of indigenous stakeholders in July 2016 at Lethem (see Annex 2).

⁴⁷ CI, Rupununi Economic Baseline condition, 2013.

⁴⁸ Interviews with representative of Guyana University and Ministry of Community. July 2016.

⁴⁹ CI, Preliminary Study of Gender, 2016.

wages are lower than men's while low-paid tasks in agroprocessing are routinely "feminized"⁵⁰.

The challenge for the Program is to involve the gender perspective in the extension services that will be provide by the MOA.

3.3 Region 10 – Ebini

a) Socioeconomic Context

Region 10, Upper Demerara-Upper Berbice, is found in north-central Guyana. It is bounded by the Essequibo River and Regions 7 and 8 to the west and south, by Region 6 to the east, and by the coastal regions to the North. It has an area of 6,555 square miles (17,040 square kilometres, 1,671,975 has.) and lies south of the Coastal Plain, which is approximately 150-250 km wide.⁵¹

The landscape is characterized by a relatively flat to very gentle undulating plateau in the north and east of the region, with a hillier and more dissected topography to the south and west. Region 10 is part of the 'Hilly Sand and Clay' and 'Highland Forest' zone of Guyana (FAO, 2014).

Groundwater resources are in abundance in the north and east of the region at depths of 3, 75 mm. This includes the Dakoura Creek watershed which is approximately 8 km at its widest point, has an estimated annual flow of 52 mm³ and drains an area of 41.3 km². This watershed is of utmost importance, since it replenishes the fresh water supply for Region 4 and most of Guyana's coastline.

This Region has a population of 39,452 (2012), the majority of which are Afro-Guyanese. The Region is also home to ten Amerindian settlements up the Demerara River, in the Berbice River and at Rockstone. There are also a small percentage of East Indian inhabitants. English is spoken by all, but most of the population communicates with a local dialect, Creolese. The majority of the population of the region, about 70%, is found in Linden — the largest of several communities within the region, and its town.

Table 6: Communities of Region 10

Communities	Population (approximate)
Linden	29,232
Ituni	713

⁵⁰ <http://www.fao.org/gender/gender-home/gender-why/why-gender/en/>

⁵¹ Plan of Action for Regional Development in Region 10, 2016-2020.

Kwakwani	2,401
Rockstone	165
Hururu	264
Coomacka	577
Wikki	236
Tacama	50
Riversview	527
47&58 Miles	290

Source: Statistical Bureau Population Census 2002 and RDC

According to the 2005 household poverty status, 13% of Region 10 households are in absolute poverty and 5% are in critical poverty. This compares with 27% and 13% respectively at the national level, and is appreciably less than the poverty rates in rural and hinterland communities (68% absolute poverty and 56% critical poverty)⁵².

b) Agriculture Sector

The agricultural sector in Region 10 is composed of small-scale subsistence farms spread across the region. These farms are geared towards satisfying local food demand, but not large-scale commercial production. Thus, production is small in scale, with low to average yields, and is associated with little investment, and limited employment opportunities. Surplus produce not consumed by the family is sold in the region's markets, but falls far short of meeting regional food demand. In fact, Region 10 imports more than 85% of the food it consumes. Nonetheless, there is great potential for the expansion of agriculture in the region. Unlike the Coast, agricultural areas in the region are not prone to flooding and there is an abundance of land within the region — a key agricultural input. The Intermediate Savannahs represent the second major frontier for agriculture in Guyana. This area is 292,038 hectares (703,813 acres), 30 m above sea level, with 87,078 hectares (209,860 acres) of brown sand soils, which are well drained, easily mechanized and responsive to fertilization. It is ideal for the establishment of medium/large scale agricultural operations.

Table 7: Main Crops in Region 10

Traditional crops	Black eye peas, bora, cabbage, <i>boulanger</i> (egg plant), hot pepper, bell pepper
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⁵² Regional Development Plan Region 10 – 2016-2010

Traditional fruits	Pineapple, carmabola, mango, orange, lime, grapefruit, guava, cherry, avocado, sapodilla, passion fruit.
Non-traditional crops	Broccoli, cauliflower, sweet corn, cantaloupe, butternut, squash, zucchini, iceberg lettuce.
Other crops	Maize, peanut, soybean, cowpea, pigeon pea.

Enhanced agricultural production, particularly in Linden and the Upper Berbice River area, is thus essential to the sustainable development of Region 10. However, the transition from subsistence to commercial farming is hindered by a number of factors, including: i) limited technical and managerial capacity of crop and livestock farmers to run commercial farms; the current national programme, which offers technical assistance to farmers, is hindered by inadequate financial and human resources, resulting in low outreach, little impact, and lack of focused interventions in Region 10; ii) minimal access by farmers to agricultural implements such as seeds and seedlings; iii) lack of agricultural credit to allow farmers to invest in new technologies, improve efficiency, and diversify production. Farmers often cannot meet the collateral requirements of commercial banks, as the Region has significant land tenure issues. When available at microfinance institutions, agriculture credit carries prohibitively high interest rates.

c) Biodiversity and Ecosystem Services

Much of the biodiversity in Region 10 is concentrated in the intermediate savannahs that are located south of the coastal savannahs and north of the southwestern Rupununi savannahs, where abundant wildlife exists, ranging from the small invertebrates (such as bullet ants) to larger mammals (such as pumas)⁵³. There are four discrete areas: i) Wiruni, ii) Tacama/Ituni, iii) Kibilibiri/Ederoabo, iv) Ebini/Kimbria/Torani. The intermediate savannahs extend in a south-westerly direction on both sides of the Berbice River to the upland rainforest regions and cover a total area of approximately 270,00 has. They are characterized by rolling to gently rolling topography, and range in vegetation cover from open savannah to a rather sparse scrub savannah with what appears to be typical forest subclimax vegetation.

The soils are mostly coarse-textured, ranging from sands to sandy loams, and are characterized by location-exchange capacity, a high percentage of aluminium saturation, low base saturation, and low available phosphorus, and most of the other nutrients. They are low in organic matter and structurally highly unstable.

⁵³ Global Wildlife Conservation, 2014. Berbice Survey.

Environmental management in the region is ad hoc. While there is a National Environmental Policy, there are no clear regional environmental guidelines. The result is the improper use of the region's natural resources (for example, mining and timber production are not guided by a regional environmental policy) and disregard for the environment (for example, waste management and disposal in Region 10 does not adequately factor in the environment and poses significant risks to the region's abundant water resources). There is water pollution (primarily from sewage, agricultural and mining chemicals, and garbage), deforestation and, although not significant, air contamination in the region.

In addition, the introduction of renewable, stable, cheap energy is critical to both the social and economic development of the region. Fortunately, the Government of Guyana has set a green development agenda and prioritized the establishment of mechanisms to harness renewable energies.

As the region seeks to diversify its economy, it will also strive to enhance its environmental sustainability. This will be facilitated by the development of a regional environmental policy that will guide the use of the region's natural resources for development. Specifically, given their importance to public health, quality of life, and protection of ecosystems, Region 10 will enhance the management and protection of its watershed and establish Resource Protected Areas. The expected result is that the renewable internal freshwater resources per capita will increase by 2% by 2020, and the region will place minimal stress on its water resources towards the achievement of a low rating for intensity of freshwater resource use. Additionally, only a 10% reduction in the volume of forest resource stocks is expected.

d) Climate Resilience

Region 10 lies within the tropical, humid, lowland climate. Temperatures vary between 19 (minimum) and 32 (maximum) degrees Celsius. The average annual precipitation is 2,250 mm and the rainy seasons are from April to July, and October to December.

In interviews with local people, the main challenge associated with climate change raised was the loss of crops such as cassava and fruit trees.

e) Indigenous Issue

According to the population and Housing Census 2002, only 7.1% of the population in Region 10 are Amerindians. In the indigenous community of Wikki/Caicuni, located in Ebini, Region 10, where we had a meeting with Toshaos and indigenous men and women, they explained some of the main obstacles limiting productivity in the agricultural field, among which is water access and flooding, further aggravated by climate change. Community members in Ebini mentioned the additional obstacle they face in transporting products and the inexistence of links between their products and a viable market. They traditionally plant red beans, pineapples, cassava and corn on a small scale.

Due to high levels of unemployment, coupled with low incentives and scarce opportunities of acquiring knowledge in the agricultural field or technology, many young men leave the communities and go to Georgetown, Brazil or other countries such as the U.S.⁵⁴, sometimes permanently.

f) Gender Issue

In terms of gender and access to land, women complained that they have no access to farm lands and are left without any income or possibilities of gaining knowledge that could be both useful and empowering. Women mentioned their skills, willingness and readiness to work on any agricultural endeavour as well as in handicrafts, given the knowledge they have producing the latter, provided they have a market to sell their products in, and know-how, including technology⁵⁵.

The lack of access to education in these communities is cause for concern. Women rarely finish high school, while young men and also women are lured by promises of well-paid jobs which end up in harsh working conditions in mining fields or forced prostitution. Among the factors are both accesses to schools and trained teachers, as well as unwanted early pregnancies. Incest was reported as another problem engrained in the Amerindian communities (further data needs to be collected to avoid making a correlation between a particular ethnicity and sexual abuse, as it exists across ethnicities)⁵⁶.

4 Legal and institutional framework for socio environmental issues

4.1 Legal and regulatory framework

Current national environmental policies are based on an integrated approach to environmental management and the need to work towards the goals of sustainable development. The commitment to sustainable development is firmly established in the MOA as well as national development plans based in a Government's "Vision 2020" green economy.

a) Legislation pertaining to social and environmental issues

The main laws of social and environmental significance to agriculture development in Guyana are:

- The Environmental Protection Act and his regulations
- Litter enforcement regulations 2014

⁵⁴ Guyanese community is fifth-largest immigrant community in New York

⁵⁵ Interviews in Region 10. August 2016.

⁵⁶ Viteri M. Report of strategy to mainstreaming gender and indigenous peoples' issues. Program GY-L1060. August 2016.

The other regulations are indirectly related to the programme, all the regulations are laid out in Table 6. The document presents a complete list of legislation to guide the planning and development prior to and during project implementation, and sets out the relevant legal environment on which the investment programme is expected to operate.

Table 8: Relevant legal instruments

#	Legal Instrument	Brief Description	Natural Area or Issue Covered	Implementing Agency
1	The Environmental Protection Act EP Act 1986	Environmental protection/management is governed by the Environmental Protection Act (EP Act) 1996. The act is the first comprehensive environmental legislation in Guyana and established the EPA. The Act provides for “the management, conservation, protection and improvement of the environment, the prevention and/or control of pollution, the assessment of the impact of economic development on the environment, the sustainable use of natural resources and for matters incidental thereto connected therewith”. Under the Act the EPA is mandated to coordinate environmental management and outlines the legal process for undertaking sustainable and effective management of the natural environment.	Control of environment impact and regulate the use of natural resources.	EPA
2	Environmental Impact Assessment Part IV of the Environment Protection Act	Stipulates the process governing EIAs. The Act requires that an EIA be conducted prior to authorization of any project, which may significantly affect the environment. The EP Act mandates the EPA to execute the following functions relating to environmental assessment: To take steps, as are necessary, for the effective management of the natural environment so as to ensure conservation, protection and sustainable use of natural resources; To promote the participation of members of the public in the process of integrating environmental concerns in planning for development on a sustainable basis; To ensure that any development activity which may cause an adverse effect on the natural environment be assessed before such activity commenced and that such adverse effect be taken into account in deciding whether or not such activity should be	Describe in detail the processes involved in the preparation and evaluation of EIA's.	EPA

		<p>authorized; and</p> <p>To provide first development consent regarding any development project.</p> <p>The EPA has determined that for a project of this nature, an ESIA is a mandatory requirement before the issuance of an environmental authorization.</p>		
	EIA Process Guidelines	Describe the process of environmental evaluation.	Revises the schedule of developments that require EIA	DOE
3	Environment protection Regulation part of the Environment Protection ACT	<p>The Environmental Protection Regulations, made under the Environmental Protection Act, were gazette in 2000. These regulations govern Water Quality, Noise, Air Quality and Hazardous Waste Management and are aimed at preventing pollution by regulating discharges and emissions. These pollution management regulations will regulate and control the activities of development of each project in Guyana during construction and operation.</p> <p>The Act also requires measures to be implemented to prevent environmental pollution. Part V Section 19 (1) states that A person shall not (a) Undertake an activity that causes or is likely to cause pollution of the environment unless the person takes all reasonable and practicable measures to prevent or minimize any resulting adverse effect; (b) Discharge or cause or permit the entry into the environment of any contaminant in any amount, concentration or level in excess of that prescribed by the regulations or stipulated by an environmental authorization. The Act ultimately aims toward improvement of environmental quality through the management, conservation and protection of resources and the sustainable use of natural resources.</p>	Regulate water Quality, Noise, Air Quality and Hazardous Waste Management	EPA
4	Water Quality Regulation 2000	<p>These regulations require registration and environmental authorization by any person whose construction, installation, operation, modification or extension of any facility cause the discharge of effluents. They cover parameter limits of effluent discharges, new sources of effluent discharges, fees</p> <p>for registration and environmental authorization, sampling points, records and reports and general provisions for the registration of water effluent,</p>	Water regulation	EPA and The Guyana National Bureau of Standards (GNBS)

		<p>biological integrity, spills or accidental discharges and</p> <p>Standards methods of analysis. Guidelines on the discharge of effluents and disposal of sludge are detailed in these regulations.</p> <p>The Guyana National Bureau of Standards (GNBS) has established Interim Effluent Discharge Standards which have been adopted by the EPA. The Standard sets out discharges limits that should be complied with by various operations.</p>		
5	Air Quality regulations 2000	<p>These regulations require the registration and environmental authorization by persons with facilities that emit air pollution from any process into the atmosphere are outlined in these regulations.</p> <p>Elements related to parameter limits on air contaminants and emission samplings are also stated in the regulations.</p> <p>The list of air contaminants for which parameter limits are to be set by the Agency are also detailed in the regulations. No air quality standards have been developed for abattoir operations to date.</p>	Air	EPA
6	Noise Management Regulations 2000	<p>Under these regulations operations that emit noise in the execution of various activities such as construction, transport, industry, commerce and any institution are required to apply to the Agency for an environmental authorization. The GNBS is responsible for the establishment of standards for permissible noise levels in industry, construction and other areas. The categories for which permissible noise levels are to be fixed by the GNBS were identified as follows: Residential, Institutional, Educational, Industrial, Commercial, Construction, Transportation and Recreational. The EPA has in collaboration with the GNBS developed interim noise standards which stipulate level of:</p> <p>45 decibels during the night for residential areas</p> <p>55 decibels during the day for residential areas</p> <p>70 decibels during the night for industrial areas</p>	Noise	EPA GNBS
7	The environmental Protection	<p>Explain the process to present to the authority the waste management: The document is a EPA</p>	Regulate the management of waste	EPA

	Hazardous Waste Management Regulations 2002	<p>Identification that contain:</p> <ol style="list-style-type: none"> 1. Name, address, telephone number and facsimile number of the applicant 2. Generators of the waste and the site of generation 3. Disposer of the waste and size of disposal 4. Designation and physical description of the waste and its composition and information on the special handling requirements including emergency provisions in case of accidents. 5. Types of packaging envisaged (e.g. bulk, drummed, etc.) for storage, accumulation etc. 6. Estimated quantity weight and volume 7. Process by which waste is generated 8. Method of treatment, disposal 9. Information concerning the contract between the transporter, disposer as the case may be 10. Information relating to insurance <p>The following hazardous wastes shall not be subject to the requirements of these Regulations: “agricultural wastes including agricultural return flows and pesticide residues”, “residues from recycling processes”, “hazardous waste generated in raw material, product storage, and process unit waste”.</p>	hazardous	
8	Litter enforcement regulations 2014	Regulate the solid and liquid material or product or combination of solid or liquid materials like animal remains, animal waste.	Solid or liquid material disposal	EPA with the municipal authorities
9	The Animal Health Act No. 7 2011	<p>Regulate the control and movement of animals into and within Guyana and to prevent the introduction and spread of animal diseases within Guyana and from other countries, and to ensure the safe and humane movement of to and from Guyana and to regulate the importation and production of animal products and livestock feeds and other matters related thereto and connected therewith.</p> <p>Establish standards for animal welfare during the life of an animal as well as during its slaughter and</p>	Animal Health	Guyana Livestock Development Authority

		destruction; No regulations are explained for the management of abattoir.		
11	Public Health Ordinance	There are ante-mortem and post-mortem guidelines which are not regulated. Similarly there are Port of entry Quarantine guidelines which are not legislated There is no animal feed legislation	Control the abattoir	Ministry of Health – Veterinary Public Health Unit
12	Occupational Health and Safety Act	This Act deals with the regulation and registration of workplaces and the occupational health and safety of workers. It gives authorization for OH&S inspectors to enter and inspect workplaces. Under this Act the employer has a responsibility to establish a joint workplace safety committee consisting of four (4) persons. When the workplace has more than fifty (50) persons, the committee should consist of six (6) persons of which at least half the numbers should be workers who do not exercise managerial functions and should be selected by the workers themselves. The employer can select the remaining members from managerial staff of the committee. Workplace safety and health representatives must be selected by non-managerial workers and not by any person who exercises a managerial function. If however, workers are unionized, the majority may agree that their trade unions can select the safety and health representative(s). The Act requires the employer to display publicly an abstract of the Act, and other sections addressing various issues addressed in the Act.	Health and Safety in workplaces	Ministry of Social Protection
13	Amerindian Act 2006	The Amerindian Act guarantees the cultural and economic rights of the Amerindian people, and provides for the administration of Amerindian communities. The land rights of the Amerindians are also addressed by the Act. Under the revised Act the recognition of Amerindian land rights is probably the most significant. Amerindians will now be granted lands under the State Lands Act which is “absolute and forever.” The old Act had a number of restrictions on the lands granted, including one which states that the Minister can increase or decrease the land granted at any time. The Minister was not required to have any consultations with the community. That restriction has now been removed. This would mean that no operations can be carried	The Minister may apply this Act or regulations to any area or tract of private land that are indigenous group	Ministry of Indigenous Affairs

		<p>out by the developer without the prior consultation with the communities involved.</p> <p>Importantly, under the new Act Amerindians will now be able to lease their land. However, to ensure that the communities always maintain the majority of their titled land, they will only have the authority to lease up to 10% of the titled area.</p> <p>Under the revised Act, communities will maintain their exclusive rights over the forest resources on their titled land. Furthermore, the new Act makes provisions for the communities to seek the assistance of GFC, if necessary, inclusive of the need to inventory their forest stock. Another important aspect of the</p> <p>Act is that it requires persons, inclusive of the developer, desirous of conducting commercial forestry operations to abide with the GFC regulations. This is a very important provision since many communities have had problems with agreements of this nature.</p>		
13	Labor Act	<p>The Act and its conditions specify the conditions that an employer must observe in the contracting of employees. For example Part V specifies that the entire wages of the employee must be paid as money and not otherwise. However, in occupations where it is customary to make partial payment of allowances in the form of food, toiletries, housing etc. these are acceptable and not considered illegal, if both the employer and employee are agreed on such terms.</p> <p>Wages should be payable either weekly, fortnightly or monthly, except otherwise agreed.</p>	Labor concern	Ministry of Social Protection
15	The Wildlife Management and Conservation Regulations were gazette in 2013	Protection of trade and conservation of the wildlife species in Guyana.	Protection of the wildlife	Ministry of Natural Resources Wildlife management Authority
16	State lands Act 1903	Administration of state lands	Land tenure	Guyana Lands and Surveys Commission

17	Cultural Heritage Act, 1993	Anthropological and archaeological research and publication	Cultural heritage	Ministry of Culture, Youth and sports Ministry of Indigenous Affairs
18	Protected Area Act 2011	Regulation of protected areas and of the Protected Areas Commission (PAC) and two new protected areas (Kanuku Mountain Protected Area and the Shell Beach Protected Area), efforts to create the National Protected Areas Trust Fund, development of a strategic plan for the PAC, development of a plan for the National Protected Areas System (NPAS), management plans for individual protected areas, and establishing field presence in protected areas.	Protected Areas	Ministry of Natural Resources Protected Areas Commission

b) Policies, plans and regulations

In terms of relevant policies, plans and other regulatory instruments, current national environmental policies are based on the need to take an integrated approach to environmental management and the need to work towards the goal of sustainable development. This section summarizes the policies and plans most relevant to the proposed Project.

The Guyana Constitution (1980), articles 2:25 and 2:36 provides de basis for a national environmental policy.

The Guyana Country Strategy (2012 -2016) sets out the primary development policy framework for Guyana, demonstrating government policy commitment to environmental management and sustainable development. Attention has been given to monitoring and enforcement actions to improve environmental management practices and the Strategy covers aspects related to the promotion of cross-sectoral coordination and integration for environment and natural resources management across the sector.

The National Environmental Action Plan (NEAP) 1994 outlines the focus of government as it relates to environmental management. The plan presents a 12 point approach reflecting sound principles of environmental management and ideal sustainable development.

A draft National Land Use Policy (LUP) 2005 has been prepared by the Guyana Lands and Surveys Commission (GLSC). The draft policy aims to streamline land use planning and to create conditions necessary to achieve types of land uses which are sustainable, socially desirable and environmentally compatible. It provides the framework for coordination among land uses and facilitates integration of land uses and the preparation of a National Land Use Plan. The Commission also aims to prepare regional plans for specific Administrative

Regions of Guyana. To date the Commission has prepared two (2) Regional Land Use Plans: (i) Region 6 – East Berbice Regional Land Use Plan; and (iii) Region 9 – Rupununi Sub Region 1. Additionally, Corridor Land Use Plans for the Lethem – Linden and Linden to Soesdyke road corridors have been prepared.

Guyana has identified food security as a way to end poverty and hunger by 2025 and views agriculture as the vehicle to achieve this. Guyana's vision for agriculture seeks to change the view that agriculture is for subsistence livelihood while promoting agriculture as a wealth generator and entrepreneurial enterprise, producing food and non-food commodities to meet local and export demands. This vision is based on the premise that agriculture is central to food and nutrition security and to sustained economic growth for Guyana. Agriculture is also seen as the most feasible way to provide economic opportunities for poor, rural and vulnerable communities⁵⁷.

NAREI's Strategic Plan (2013- 2020) envisions NAREI as the major facilitator for a prosperous, food secure and environmentally sustainable Guyana. This will be achieved through enhancing agricultural productivity and quality of produce through generation and dissemination of newer and efficient technologies and services reduced import of agri-produce and products, reduced malnutrition and environmental degradation and enhanced exports taking into consideration the changing global and business environments.

The Low Carbon Development Strategy for Guyana was launched in 2009,. The LCDS aims to transform Guyana's current economy to that of a "low carbon economy" while addressing issues related to climate change through a compensatory scheme by marketing Guyana's standing forest. The strategy is built on Guyana's vision to encourage investments/economic development while protecting and maintaining its forest cover. The strategy has three pillars: i) investment in low carbon economic infrastructure; ii) investment and employment in low carbon economic sectors; and iii) investment in communities and human capital. As part of Guyana's low carbon economic framework, forestry activities will continue to be highly regulated to ensure compliance with national requirements and international best practice. Guyana has identified 6 priority low carbon economic sector that two of them are in the agriculture sector: fruit and vegetables and aquaculture. Also include for REDD+ project the land of indigenous people that many of those project are concentrated in Region 9 for his richness in forest and indigenous land.

Guyana's Climate Resilience Strategy and Action Plan 2016⁵⁸ is a framework for planning and implementing climate resilience actions so as to achieve the Government's 'Vision 2020' for a green economy. This Climate Resilience Strategy and Action Plan (CRSAP) addresses this gap and aims to provide a comprehensive and overarching framework for adapting and building resilience to climate change impacts. The CRSAP builds on the work that has been

⁵⁷ Ministry of Agriculture. A National Strategy for Agriculture in Guyana 2013 -2020.2013.

⁵⁸ Ministry of The Presidency, Office of Climate Change. 2016. Guyana's Climate resilience Strategy and Action Plan.

undertaken in Guyana over the years and identifies key climate risks and priority resilience building actions. The Strategy and Action Plan are underpinned by the five cross-cutting pillars of adaptation identified in the Second National Communication, namely information, research and systematic observation; institutions and capacity building; policy and legal frameworks; infrastructure and technology; and finance.

Among the main topics is **Building climate Resilient Agriculture Systems** by improving water management, developing climate proof sustainable farm systems and building the adaptive capacity of the sector to reduce the vulnerability of farmers, in particular small and medium scale farmers. The other is **Strengthening Drainage and Irrigation Systems**, by improving the capacity of the network starting with the most critical areas, upgrading the existing drainage and irrigation system with a focus on the agriculture sector, institutional strengthening of the National Drainage and Irrigation Authority (NDIA) and development of a training curriculum on drainage and irrigation.

The Poverty Reduction Strategy Paper (2011- 2015)⁵⁹ reinforces provisions of the Environmental Protection Act to ensure sustainable use of national resources for social development like sustainable agriculture.

The National Strategy for the Conservation and Sustainable Use of Guyana's Biodiversity (1997), provides the basis for the development of the NBAP and identifies Guyana's national position in respect to the study of conservation and sustainable use of biodiversity.

Guyana's National Biodiversity Strategy and Action Plan (2012 – 2020)⁶⁰ provides a framework for the promotion and achievement of biodiversity conservation, sustainable use of its components, support for fair and equitable benefit sharing. It outlines specific objectives to assess national capacity, identify gaps propose actions and to encourage involvement of stakeholders to support the implementation of the plan. It has nine strategic objectives that are related to agriculture sector, reflects mainstreaming of biodiversity in priority sectors such as agriculture, mining and ecotourism, and in situ and ex situ conservation of biodiversity and promotion of soil health through the prudent utilization of biological, chemical and physical methods in an eco-system agronomic approach.

The National Forest Action Plan (2001) articulates specific measures inclusive of conservation, environmental education, awareness, research and training in order to address the relation between forest and development.

The National Protected Area Strategy (2003) provides a framework for establishing an integrated national system of protected areas.

⁵⁹ Guyana Government 2011. Guyana Poverty reduction Strategy Paper 2011-2015

⁶⁰ Ministry of Natural Resources and the Environment, EPA. 2014. Guyana's National Biodiversity Strategy and Action Plan 2012 – 2020.

NBAPII (2007 – 2011), provides for a general planning process for biodiversity use and conservation and within the same framework of NBAP I, with an added emphasis on stakeholders involvement.

Guyana`s National Policy on Access to Genetic Resources and the fair and equitable sharing of benefits arising from their utilization (2008), articulate a national policy on access and benefit sharing that is consistent with other national policies and regulations, and with international treaties to which Guyana is contracting party.

The National Biosafety Framework Policy (2007) provides a framework for controlling and monitoring Genetically Modified Organisms (GMO) and Living Modified Organism (LMO) while preventing adverse effects on the conservation and sustainable use of biological resources in Guyana.

The National Strategy of Agriculture in Guyana (2013 - 2020), Guyana's vision for agriculture, is one which seeks to promote and develop the sector to produce food and non-food commodities to meet local and export demands. The Strategy seeks to not only expand subsistence agriculture but also to push entrepreneurial enterprise and to diversify agriculture by embracing non-traditional crops and support large-scale agriculture expansion. The Vision for Agriculture 2020 is a mandate for Guyana to use its natural resources and advantages for agriculture as efficiently and sustainably as possible. This will require continuous research, training and adaptation, especially in view of the vicissitudes of climate change, evidenced by more frequent and more intense climate events such as droughts, floods and pests and diseases.

Although Guyana has not subscribed to ILO Convention No. 169, the policy and regulation related indigenous people are cover in the Amerindian Act. Related to the land tenure the government has undertaken to guarantee that titles are awarded to all Amerindian peoples and settlements. Titled villages of indigenous peoples own the forests within their titled village areas. Also the Amerindian law of 2006 gives Amerindian veto power in matters of small and medium scale mining within their village and adjacent areas. This include mining in streams and rivers that pass through their titled lands⁶¹.

Guyana is committed to promoting the equality of women in all spheres based on its obligations arising out of CEDAW⁶² and other Human Rights instruments/standards so that women can realize their full potential as equals in society. The Government of Guyana reaffirms its belief in and commitment to upholding fundamental human rights and, it holds that all rights are universal, indivisible, interdependent and mutually reinforcing. New legislation has been introduced which will enhance the capacity of the courts to address crimes affecting women and children and allow for greater protection. To this end, Guyana

⁶¹ IFAD. Guyana Indigenous People. Technical Report.

⁶² United Nations. 2010. Convention on the elimination of All Forms of Discrimination against women Guyana CEDAW.

has amended the Prevention of Crimes Act, Act No. 11 of 2008 to allow for the mandatory supervision of persons convicted of scheduled offences, which include domestic violence, molestation, rape, sexual exploitation, pornography, incest, prostitution and kidnapping.

The State Party also wishes to report that Guyana has enacted a package of children's legislation (2005 – 2010) which has radically altered the framework for the protection of children. These are the Criminal Law Offences Act No. 16 of 2005; the Marriage (Amendment) Act 2005; the Child Care and Protection Agency Act No. 2 of 2009; the Adoption of Children Act No. 18 of 2009; the Status of Children Act No. 19 of 2009 and the Protection of Children Act No. 17 of 2009⁶³.

The State Party has comprehensively approached the challenge of reducing poverty and reducing inequalities and disparities in the society. It has holistically addressed the political, social and economic environment through its pro-poor policies and programs⁶⁴.

c) International Conventions

In order to fulfil its sustainable development agenda, Guyana has signed several important regional and international conventions and agreements and is a member to many regional organizations involved in the management and protection of biological resources. Those that impact biodiversity, cultural and natural heritage and sustainable development are listed below:

- United Nations Convention on Biological Diversity (ratified in August, 1994)
- Cartagena Protocol on Biosafety (2008)
- Nagoya Protocol on Access to Genetic resources and the Fair and equitable Sharing of Benefits arising from their utilization (2014)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (1977)
- Cartagena Convention for the Protection and Development of the Marine environment of the Wider Caribbean Region (2010)
- Specially Protected Areas & Wildlife (SPAW) Protocol (2010)
- International Plant Protection Convention (1970)
- Convention on the Protection of the World Cultural and Natural Heritage (1977)
- United Nations conventions on Climate Change (signatory 1992, ratified in 1997)
- Montreal Protocol (1993)
- The UNFCCC (1992) (Guyana signed on in 1992) & other conventions.
- Kyoto Protocol (2003)
- Vienna Convention on the protection of the Ozone Layer (1993)
- United Nation convention to Combat Desertification (signatory 1996, ratified 1997)

⁶³ Guyana State Party Report to CROC April 2010.

⁶⁴ Guyana has one of the region's lowest ratios inequality. Poverty Assessment Survey Guyana 2008.

- International Convention for the Prevention of Pollution (1997)
- Basel convention on the control of Trans-boundary Movement of hazardous Waste and their Disposal (2001)

Stockholm Convention on Persistent Organic Pollutants (2007)

- (a) Rotterdam Convention on Prior Informed Consent for certain Chemicals and Pesticide in International Trade (2007)
- (b) Guyana's submission to the IACHR on the Legal framework of Property and Land Rights of Indigenous Peoples on October 7, 2009
- (c) Minamata Convention on Mercury (2013)

Within the Caribbean and Latin America, Guyana is a member or official signatory to the following:

- (a) Caribbean Planning for the Adaptation to Climate Change.
- (b) Mainstreaming Adaptation for Climate Change.
- (c) Caribbean Regional Environmental Programme.
- (d) Caribbean Environmental Programme and its Specially Protected Areas and Wildlife Programme.
- (e) Latin American Network for Technical Cooperation in National Parks, Protected Areas and Wildlife.
- (f) Treaty for Amazon Cooperation.
- (g) Guiana Shield Initiative and Guiana Shield Facility.
- (h) Guyana is receiving support under the CLME project.

In addition to the Conventions listed above, Guyana participates in activities of the Ramsar Convention on Wetlands (1971) and is a party to the Rio Declaration on Environment and Development (1992)⁶⁵.

d) EIA process in Guyana for development projects

The development of the program will require adherence to national sustainable development laws, policies and regulations. The dominant structure vetting potential projects in the country is the Environmental Impact Assessment Process. The Environment Protection Authorization Regulation (2002) involves the accomplishment of the Environmental Protection Air Quality, Protection Water Quality, Protection Hazardous Waste Management and Noise Management Regulations for all project that demand an environmental authorization.

⁶⁵ Guyana National Biodiversity Strategy 2012 – 2020.

An Environmental Impact Assessment (EIA) is a study best carried out at the planning stage of a project to identify and assess the effects, both positive and negative; a project may have on the environment and human well-being. Measures are proposed to lessen negative effects and enhance the positive. The study will also outline a plan for monitoring these effects, and the effectiveness of the mitigation measures put in place, and identifies people and institutions that will carry out these functions.

The EIA is done by a team of independent consultants selected by the developer and approved by the EPA. Each consultant must have knowledge and experience relating to at least one relevant area of the project, and together, the team must be able to comprehensively assess the impacts of the project on all areas of the environment, including the human population.

The EIA process in Guyana is comprehensive and contains elements that are typically used in the region. It normally includes the following stages:

- Screening,
- Scoping,
- Baseline studies,
- Public consultation,
- Review process, and
- Preparation of an Environmental Management Plan (EMP)⁶⁶.

The process consists of an initial conceptual stage of project design, a screening phase (to determine if an ESIA is needed), a scoping phase to determine the extent of the ESIA, a preparation stage, a vetting stage and follow-up activities (to ensure that any requirements identified by the ESIA are satisfied).

Studies to support the process include establishment of an environmental baseline, description of the proposed project, identification of and prediction of potential impacts, identification of mitigation measures, evaluation of project alternatives, and selection of the preferred alternative, and preparation of an Environmental Management Plan (EMP).

The ESIA process also calls for various levels of public consultation. This includes meetings with key stakeholders in order to elicit their views and inputs with an emphasis on local communities. At the final stage of approval, the EPA requires the project owner (“developer”) to sign an EMP, a legal document to which the developer needs to adhere.

The EMP should focus on the relevant environmental factors for the proposed/existing development, and these should be agreed in consultation with the Agency and other stakeholder agencies when necessary. The following points should be covered in the EMP:

⁶⁶ EPA. 2013. Environmental Guidelines for Preparation of an Environmental Management Plan.

- A description of the surrounding environment
- Summary of impacts associated with the proposed activity
- Description of mitigation measures.
- Description of a monitoring program that could comprise three aspects; i) Baseline measuring, ii) Impact or performance monitoring and iii) Compliance monitoring
- Implementation schedule and reporting procedures.
- Procedure to provide information on the progress and results of mitigation and monitoring measures.
- Cost estimates
- Training and environment awareness
- Documentation and record keeping
- Reporting procedures
- Auditing
- Emergency response Plan (ERP)

The Environmental Impact Assessment Guidelines outlines the process taken and this commences with the submission of a project application for environmental authorization to the EPA. EPA requires specific information and these include a project summary, design and size of the project, potential environmental impacts [positive and negative] etc. The EPA screens the application and makes a determination whether an ESIA is required or not and then notify the proponent. The proponent is also required to submit a draft

ToR to the EPA and the EPA subsequently publishes a notice in the printed media. The public is given 28 days to submit any written comments/concerns related to the project and its effect on their environment. These submissions detail questions and matters which members of the public consider relevant to the deliberations of the EIA.

A public scoping meeting is also held to present the proposed project and to garner additional comments/concerns from the public, thus, aiding the EPA with the finalization of the ToR. The EPA submits the ToR to the developer and the consultants for the preparation of the environmental impact statement (EIS). During the environmental impact process the consultants are required to conduct field studies to collect baseline information and to consult members of the public, interested bodies and organizations to gather secondary information. All the data are collected and a written report – the EIS –is prepared and submitted to the EPA for evaluation and recommendations.

Upon receipt of the EIS the EPA publishes a notice in the daily print media informing the public that the EIS has been prepared and is available for review within a timeframe of 60-days. EPA also engages relevant sector agencies and, as necessary, other relevant institutions to review the document to ensure their concerns have been addressed. The EPA also facilitates a public meeting for to present the project findings and to provide another opportunity for members of the public to contribute towards designing the management framework for the proposed project by raising environmental concerns related to the project.

The EAB is a body which provides an independent contribution to the development and finalization of the EIA and makes recommendations which uphold the principles of the EP Act. In order to carry out its functions, the EAB is involved in the development of the EIS from the point of EIA scoping to establishing conditions for the issuance of an Environmental Permit. The EAB evaluates the EIS and recommends to the EPA whether it should be accepted and the terms and conditions of its acceptance which are reasonably necessary to protect human health and the environment.

The EPA then takes into account the recommendations of the EAB, sector agencies, comments of the public and its own review, and decides whether or not the project should be approved. For approved projects, the EPA issues an Environmental Permit the terms and conditions necessary to effectively manage the environment.

The National Biodiversity Strategy 2012 – 2020 stipulates that the ESIA process and guidance should be updated and expanded to effectively promote the protection of biodiversity and the sustainable management of living natural resources at all levels of project development including the exploratory and project closure phases.

4.2 Institutional Framework

Governmental agencies, institutions and management committees which have responsibilities for the protection and conservation of natural resources including biodiversity related to agriculture sector are: i) Ministry of Agriculture (including NAREI and GLDA agencies), ii) the Ministry of Natural Resources (Environmental Protection Agency, Protected Area Commission), iii) Ministry of Health, iv) National coordinating Committee on Biosafety and Biosecurity, v) Ministry of the Presidency Climate Change Office, vi) Ministry of Indigenous People's affair. The local government authorities at region 9 and 10 and also the NGO's that are developing different program in both regions.

The Ministry of Agriculture MOA is the head authority for agricultural development in the country.

- The National Agricultural Research & Extension Institute (NAREI) has developed the capacity for genetic characterization of economically important species, such as coconut, mango, cassava and avocado by means of a joint initiative between the NARI and United States of America Department of Agriculture (USDA), with funding provided through USAID.

The National Agricultural Research & Extension Institute (NAREI) is the premier organization responsible for spearheading agricultural research and extension activities for productivity enhancement and diversification of the non-traditional crops sector (fruits and vegetables), biofuel development as well as for plant quarantine services. NAREI's vision is "to ensure food security, prosperity and livelihoods of all, using technological innovations in agriculture". The Institute is actively engaged in

adaptive research that focuses on improving crop production/ productivity for enhanced food security and rural development. Emphasis is placed on crop diversification from high volume-low income to low volume-high income crops such as spices and other cash crops, new vegetables (cauliflower, broccoli, red cabbage and sweet pepper). The promotion of Climate Smart Agricultural Practices inclusive of protected agricultural systems for year round vegetable production, hydroponics and drip irrigation is also given prominence.⁶⁷

- The thrust of the Guyana Livestock Development Authority (GLDA) is to “promote greater efficiency in the livestock product industry and to provide enhanced services in livestock husbandry, livestock health and research so as to make provision for effective administration and regulation of trade, commerce and export of livestock or livestock products and for matters related and incidental.” As one of the newest agencies under the Ministry of Agriculture, it delivers public services related to animal production, animal health, animal genetics, marketing, training and extension services as well as regulatory services⁶⁸.

The challenger of the administration of MOA will place greater emphasis on large-scale private investment in farming, especially in the Intermediate Savannas and Region 9. Some of the crops identified for diversification in the hinterland areas are corn, soybean, cassava and legumes⁶⁹.

The GLDA and NAREI has lack of capacities to deal with the inclusion of indigenous people and gender issues in the activities of the program, also to deal with environment issues related to the program.

The Ministry of Natural Resources is responsible for the sustainable management of the natural resources in Guyana.

- The Government of Guyana, through the EPA, enacted the Environmental Impact Assessment Regulations. This and the Environmental Protection Act (EPA), and its specific regulations for water, soil, noise, are the primary legislative instruments pertaining directly to the EIA process, including the administration, vetting and approval of proposed projects for which EIAs have been prepared.
- The EPA has the responsibility for the implementation and enforcement of the provisions of the Environment Protection Act (1996). Specifically to implement the law and enforcement of environmental issue in Guyana. The Agency is governed by a Board of Directors, but falls under the direct supervision of the Office of the President. All the activities in the country are required to prepare an EIA under the EIA Regulations.

⁶⁷ Ministry of Agriculture. <http://agriculture.gov.gy/narei/>

⁶⁸ Ministry of Agriculture. <http://agriculture.gov.gy/glda/>

⁶⁹ Interviews with the stakeholders. July 2016.

- In addition, some government bodies with direct responsibility for the protection of biodiversity and Guyana's natural and cultural resources include the Guyana Forestry Commission Department and Protected Area Commission (PAC).
- In the different interviews with the representative of the EPA we can see that they have a professional staff to address different impact of the agriculture sector but it hasn't offices and personal at the regional level and enough budgets to conduct monitoring and supervision process to environmental issue in field.
- The challenger for the EPA is to have enough budgets to implement a unit of supervision at the regional level.

The Ministry of Health with the Safety and Health Commission is the authority charged of the health and sanity surveillance of the abattoirs,

- Current legislation is the Public Health Ordinance, there is a Veterinary Public Health Unit; there are ante-mortem and post-mortem guidelines which are not regulated. Similarly there are Port of Entry Quarantine guidelines which are not legislated; there is no animal feed legislation⁷⁰.
- There are lacks of capacities to monitoring the abattoir at the regional level.
- There are lacks of guidelines and procedures to surveillance the health and sanitary issues related the abattoir process.
- The challenger of this institution is to develop and appropriate legislation and supervision system for the abattoirs in Guyana with international standards.

The Ministry of Indigenous People's Affairs has the responsibility to enable the Amerindian Act and all the issues related the access the management of land and natural resources of the different indigenous group in Guyana. The Ministry is responsible for the implementation of the processes of land titling, demarcation and extension as described in the Amerindian Act. The Ministry also supports the National Toshaos Council (NTC) and meetings of this council.

- This institution is in process of enforcement his capacities and conduct program for indigenous people.
- The challenger is to work closely with the indigenous communities and have an interrelation with the others institution of the government for to address appropriately the indigenous issue.

The Ministry of Labour, Human Services & Social Security - Women's Affairs Bureau in Guyana, are charged of gender issues. The role of this institution is monitoring the result of the program in terms of gender issues.

⁷⁰ Anderson W. Support of Sustainable Agricultural Development Program (GY-L1060)- compliance with sanitary and phytosanitary issues. August 2016.

Several Non – governmental Organizations (NGOs) are directly involved in activities which contribute to the protection and conservation of biodiversity like Conservation International Guyana, WWF- Guianas, Iwokrama International Center for Rainforest Conservation and Development, Kanuku Mountain Community Representative Group, North Rupununi district Development Board, South Rupununi Conservation Society.

At the regional level we can found the Regional Government, in Region 9 has a division for environment issues that was created 3 months ago. The role of this authority is to be involved in the performance of the abattoir concerning health and sanitary condition of operation.

In conclusion at the institutional level we can found different lacks of capacities and budget to address appropriately the socio environment issues of the program is for this reason we recommended some action to address this issues in the ESMP.

5 Analysis of compliance with IDB Operational Policies

According to IDB's Safeguards Policy (OP 703), the operation was classified as "B". An Environment and Social Analysis (ESA) will be conducted to guarantee that any possible impact from the small works is minimized and to avoid possible risks from climate change impacts; particularly those related to water availability in savannah environments are considered.

Classification:	B
Safeguards Policies triggered	B1 (OP 704, OP 765), B2, B3, B4, B5, B6, B7, B9, B11, B16, B17

OP 703 Environment and compliance with safeguards and 2006 Guidelines

B1: The project has the potential to benefit indigenous peoples, improving their agricultural management in such a way as to make them resilient to climate change, improving food security and increasing family income through the sale of agricultural products.

B2: Guyana has extensive regulations regarding the environment which coincide with the Operational Policies of IDB. In relation to indigenous peoples, although the country has not ratified ILO Convention 169, it possesses specific legislation, the Amerindian Act, for indigenous peoples. It has no legislation in relation to gender matters. The project must consider specific actions for improving the conditions of women in the agricultural sector and must have the indicators needed for their measurement, particularly regarding indigenous women.

B4: Regarding the institutional characteristic of socio-environmental follow-up and monitoring, the EPA is the institution in charge of realizing these activities, although it does not have local offices, specifically not in Regions 9 and 10, nor does it have staff for realizing appropriate monitoring of the project. The MOA does not have staff specialized in socio-environmental matters, which implies that the capacity for carrying out socio-environmental monitoring of the project is limited to the institutions in charge of carrying it out.

Thus, in order to assure that the socio-environmental matter be made transversal in all of the project activities, it is suggested that there be an environmental specialist within the MOA for accompanying all project actions, and who is able to develop specific guidelines on environmental matters for the agricultural sector.

On the matter of other risks, there are those regarding poor local capacity for adapting to the impacts generated by climate change, a matter which will be one of the focal points of the project, and the development of technical capacities and technology in order to be able to implement a sustainable agricultural system which is resilient in the face of climate change, through low levels of water consumption and that is friendly towards the environment, in this way is recommended that the program assume and sustainable approaches for the development of the agriculture practices.

B6: A consultation process will be carried out during the design of the project in the framework of the IDB Guidelines.

B9: The project infrastructure is located in areas in which there have already been interventions like region 10 and bare land like region 9, due to which it does not represent an impact in soil movement, deforestation or disturbance of the local fauna.

Region 9 is one of the most important regions of Guyana in biodiversity. It has important wilderness areas, such as the Rupununi, which is in the process of definition and declaration as a Ramsar site for the protection of the wetlands. For water Under B9 this area is considered critical natural habitat. Another factor which must be integrated in the project is the trend towards developing sustainable agriculture in such a way as to avoid the use of pesticides and herbicides which have an impact on the soil, on water and on biodiversity.

B11: The operation has the potential to pollute the environment, specifically due to the activities of the abattoir, which generate solid and liquid waste which must be handled under a closed system so as not to generate local pollution. In order not to incinerate the solid waste, it is suggested that management of this waste be developed, such as through the production of cold meats, thus favoring the efficient use of waste in the location, as well as generating income.

OP 704 Natural disaster risk management and guidelines for the construction and operation of the plant

The geographical areas selected for the project are prone to periods of intense drought and floods; therefore, the construction carried out must take into account these climate fluctuations which may present the risk of floods and drought which could directly affect the results of the project in matters of agriculture.

It is suggested that soil stabilization measures be considered for the construction of the water reservoir, including a hydrological analysis identifying the recharging locations in order to implement environmental protection measures, to consider evapotranspiration data for measuring the loss of water as a result of this factor, and to consider the capacity of the reservoir in the face of possible periods of flooding.

The area of the project's location requires studies on the hydrology dynamics, in order to be able to sustainably manage crops without having a negative impact on biodiversity.

OP 761 Gender equity in development

The Policy identifies two lines of action: (i) proactive measures actively promoting gender equity and women's empowerment in all IDB interventions; and (ii) preventive action which integrates safeguards for preventing or mitigating negative impacts on women or men for reasons of gender as a result of actions of IDB through its financial operations. In the context of this Policy, gender equity implies that women and men have the same conditions and opportunities for the exercising of their rights and for reaching their social, economic, political, and cultural potential. The Policy recognizes that seeking equality requires actions aimed at equity, which implies the provision and distribution of benefits or resources in such a way as to reduce existing gaps, recognizing at the same time that these gaps may harm both men and women. The empowerment of women is understood as the expansion of the rights, resources and capacities of women for decision-making and for acting autonomously in the social, economic and political spheres. Under this concept, the general objective of the Operational Policy allows the active participation and inclusion of women in the project to be developed.

In gender matters it was possible to identify, in the interviews held, that this transversal theme is not being worked on within government institutions, or at the level of the local actors.

However, interviews were held with women's associations which may be strengthened in the framework of the project on matters of sustainable agriculture.

The group of women who manage the abattoir is a group that the project may strengthen on matters of the organization, the financial management and technical aspects of the project.

The project has the challenge to develop the conditions needed for adequately including the transversal theme of gender in its activities, and to achieve impacts in this sphere.

OP 765 Indigenous peoples

The project is aimed at improving the production conditions of the Amerindian communities of Guyana. Although this country has not ratified ILO Convention 169, it does have particular legislation for indigenous peoples through the Amerindian Act, which regulates relations with indigenous peoples, protecting their rights of access to their territory and natural resources.

Guyana is in the process of strengthening the institutions which safeguard the rights and development of indigenous peoples. Under this vision, the Ministry of Communities was created, which is in charge of promoting the development of local communities, including indigenous communities. Also present are the Ministry of Indigenous Affairs – in charge of protecting the rights of and safeguarding the access of indigenous peoples to their land and resources –, and the Ministry of Social Protection. One of the problems identified in the interviews held is that there is no inter-institutional coordination on matters of indigenous peoples, with each ministry having its own work agenda and no coordination between them for achieving better results.

Another relevant aspect is that, although there are no land holding problems, given that the areas in which the project will be carried out and its infrastructure are the property of the Ministry of Agriculture or of the State, it has been observed that in Regions 9 and 10 there is no soil use management plan allowing the adequate planning of the use and management of natural resources serving both for conservation and for use by indigenous peoples and the local population. It is expected that such a planning instrument be developed in the future.

Table 9: Compliance of the program with IDB policies

Policy	Compliance with IDB policies	Action to ensure the compliance
Access to information (OP 102)	The project considers, in its spheres of preparation and operations, to disseminate the scope of the project with the inhabitants of the area of influence through consultation mechanisms appropriate for the socio-cultural and linguistic characteristics of the stakeholders.	Consultation during the design of the Program Public consultation
Gender equity in development (OP 270)	The realization of the project envisions promoting the development and participation of women economically and socially, mainly through support in the organization and empowerment of women's associations involved in agriculture.	Participation of women in the different trainings courses that the program promote
Women in development (OP 761)		
Involuntary resettlement (OP)	Does not apply, since the entire infrastructure to be developed in the	Non apply

Policy	Compliance with IDB policies	Action to ensure the compliance
710)	framework of the project is located in land belonging to the State or to the Ministry of Agriculture.	
Indigenous peoples (OP 765)	The objective of the project is to improve the agricultural production conditions of the indigenous communities in such a way as to increase their food security and their income.	Participation in the process of by design, in the public consultation and in the trainings promote by the program
Compliance with environmental legislation and regulations of the country	The institution in charge of the management of the project must monitor the builders and operators of the works to be realized through the project, assuring that they comply with all of the environmental regulations in force in the country, in all phases: execution, operation, infrastructure maintenance and abandonment.	EPA supervision of the program infrastructure and extension
Risks related to very sensitive environmental concerns	In Region 9 the program infrastructure and activities has to take care in all their interventions the ecosystem fragility and the importance of the application hydrological studies and management plan for less impact in the environment.	Studies and supervision of the EPA
Public consultation	<p>Prior to the execution of the project, it will be necessary for the population directly affected to be consulted and that their perceptions be included in the socio-environmental measures, within the framework of the environmental legislation of Guyana. Furthermore, the project design has considered the interviews of the different stakeholders and has prepared a consultation in the framework of IDB's policies.</p> <p>Consultation in the framework of the environmental legislation of Guyana also takes into consideration mechanisms for respecting the own norms and procedures</p>	<p>Public consultation under the IDB policy in the development of the Strategic Socio environment Assessment and in the public consultation demanding for the environment licences for the infrastructure of the program</p> <p>Creation of local comities with the participation of local stakeholders</p>

Policy	Compliance with IDB policies	Action to ensure the compliance
	of the indigenous peoples.	
Natural habitats (protected areas) and cultural heritage spots	<p>The project may possibly affect a wetland; therefore, in the application of LIDAR, there shall be information supporting the setting of limits of the wetland, which will imply the project considering all mitigation measures in the construction and operation in order to minimize impacts on the wetland.</p> <p>The project must develop low-impact sustainable agriculture which consumes small amounts of water efficiently, less use of pesticides and herbicides or implement organic production in order not to affect high biodiversity areas.</p>	<p>EPA monitoring</p> <p>List of species uses by the program</p> <p>Compliance of the Environmental Management Plan propose in the Strategic socio environmental assessment</p>

6 Environmental and Social Impacts, Risks and Mitigation

This section assesses, based on the physical, ecological and socio-economic environment, the potential impacts of the proposed Program.

The potential impacts are described based on the bio-physical and socio-economic effects during the design, construction, operational and closure phases of the project. The significance of the impact is based on the degree and duration, high probability of occurrence and its effect on sensitive receptors.

Significance is determined by:

- direct,
- indirect,
- cumulative.

The impacts are assessed by:

(+) high, medium or low

(-) high, medium or low

Where high, medium and low measure the intensity of the impact produce by the Program in the environment.

The impacts are addressed considering the area of the infrastructure related the total area of the regions.

Also described are the measures to avoid, minimize or mitigate these impacts or to compensate for them.

6.1 Identification of “key” environmental impacts of the operation

The key environmental impacts of the operation have been identified and classified essentially based on the main activities of intervention included in the different Components of the Program, identifying activities related to the implementation of infrastructure as key according to what follows:

Component 1 – information for policy-making natural resources management

Component 2 – strengthening of agricultural innovation and the extension system

Component 3 – support for compliance with sanitary and phytosanitary standards

Analysed by the different phases of the operation

- Design
- Construction
- Operation
- Closure

a) Evaluation of environmental impacts agricultural research centers

The following table summarizes the main impacts identified for the agricultural research centers' construction phase:

Table 10: Assessment of environmental impacts for the research center construction phase

Impact	Description / assumptions	Assessment	Need to apply prevention / mitigation measures
Increases in soil	The operation on the	(-) medium,	Having plans for

Impact	Description / assumptions	Assessment	Need to apply prevention / mitigation measures
contamination risks due to possible spills of fuel, lubricants and oils in the operation and transit of heavy machinery	construction site of heavy machinery is anticipated, as is the transport of material and supplies to the work site.	direct, temporary	responding to contingencies, their application and having sites adequate for the final disposal of contaminated waste at a site authorized by the environmental authority
Increase of erosion risks due to land movement and/or alteration of natural or artificial drainage in the sites where civil works are to be realized	Construction activities are anticipated in savannah areas which are flat or have only a slight slope or moderate slope, which may be susceptible to flooding.	(-) medium, direct	Care for considering in the design the existence of adequate rain drainage systems and erosion control works when needed
Generation of solid domestic waste from the day-to-day activities of construction staff	It is anticipated that the construction activities not require the installation of camp sites especially designed for this purpose and that staff employ the services present in the town or at the Ebini center.	(-) medium, direct, temporary	To have, in all work areas, procedures for the selection, collection and delivery of solid waste to the local services
Increase in demand for water from construction activities	It is anticipated that construction activities demand the use of water from local supply sources like wells.	(-) medium, direct, temporary	Rational use of the resource Control of water use for construction activities
Alteration of landscape and flora	Considered is the likelihood of alteration of the landscape and fauna due to the construction of the center in Region 9, Manari.	(-) low, direct	Care for the landscape design to be compatible with the surroundings and with the use of soil patterns corresponding to the location site Limiting effects to what is

Impact	Description / assumptions	Assessment	Need to apply prevention / mitigation measures
			<p>strictly necessary as per the design</p> <p>Apply assessment of the flora and fauna habitat before the construction</p>
Moving of soil during ground preparation works	The soil will be moved only within the area delimited for the establishment of the infrastructure of the agricultural centers.	(-) low, direct, temporary	None
Generation of dust and noise / vibration during the works for preparing the ground (through moving of soil or as a result of the transit of vehicles / equipment)	The use of heavy machinery is anticipated, as is the moving of soil restricted to the limits of the site or the zone delimited for the establishment of the centers.	(-) low, direct, temporary	<p>Preventive and corrective maintenance of machinery and equipment</p> <p>Based on the availability of water, wetting the areas of vehicle transit</p>
Generation of solid waste from remains of construction material (cement, concrete, iron, boxes, bags and other packaging, etc.)	It is anticipated that the construction activities generate construction material waste.	(-) low, direct	Planning of activities, compliance with local stipulations, and requests for the applicable authorization to dispose of this waste in adequate sites
Risks of work accidents due to inadequate hygiene and occupational safety practices	Work accidents are considered possible.	(-) low, direct, temporary	Contracting companies must have hygiene and occupational safety protocols and practices.
Generation of temporary employment in construction activities	It is anticipated that during construction, local manual labour be employed.	(+) medium, direct, temporary	The company in charge of construction must develop a plan for contracting local manual labour.

The table indicates that in general the impacts typical of any civil construction activity may be expected, with the most important ones being related to effects on the soil in the savannah, the use of water in this phase and the construction activities and risks they generate. No considerable positive impacts are expected.

The following table summarizes the main impacts identified for the operation phase of the centers:

Table 11: Assessment of environmental impacts for the operation phase of the Agricultural Centers

Impact	Description	Assessment	Need to apply prevention / mitigation measures
Potential to encourage use of invasive species, excessive use of pesticides and herbicides and water	The agricultural extension services has a potential tendency to encourage the use of invasive species in the pasture, pesticides/herbicides, water demand crops	(-) Medium direct	<p>Develop a list of invasive species that must not be used or promoted, and training as to the risks of their use</p> <p>Carry out training on topical and efficient herbicide and pesticide use focusing on Integrated pest management practices</p> <p>Ensure crops are chosen and methods of irrigation developed that reduce water use</p>
Increase in the demand for potable water for the realization of the centers' activities	It is expected that water be used from wells and from the catchment to be built.	(-) medium, direct	<p>Including, in the infrastructure of houses, tanks allowing to collect rainwater</p> <p>Catchment management in such a way as to efficiently employ this resource in the area</p>
Generation of wastewater (sewage and greywater) from the day-to-day activities of staff and users of the center	The generation of sewage and greywater is anticipated as a result of the day-to-day activities of staff and users of the	(-) medium, direct	Having collection / segregation and treatment systems of the effluents for guaranteeing compliance with the environmental regulations for the disposal of domestic discharge

Impact	Description	Assessment	Need to apply prevention / mitigation measures
	center.		
Generation of domestic solid waste from the day-to-day activities of staff and users of the centers	The generation of solid waste is anticipated from the day-to-day activities of the centers' staff.	(-) medium, direct	<p>Having systems for the collection / segregation and temporary storage of domestic solid waste for guaranteeing compliance with municipal and national environmental regulations on the matter</p> <p>Producing, with organic waste, compost which may serve to improve crops</p>
Increase in energy demand due to the realization of activities at the agricultural centers	It is anticipated that the centers require electricity for their operations.	(-) low, direct	<p>Assuring the supply of energy to the centers</p> <p>It is suggested that an analysis be made of the possibility of employing renewable sources such as biofuel from animal waste.</p>
Improvements in the management of soil information	The population will be able to access soil laboratory services, thus generating improvements in their agriculture.	(+) high, indirect	The centers must have conditions appropriate for providing laboratory services and for giving advice to the population based on the results of the crops.
Improvements in climate information	Improvements are anticipated in climate information with the establishment of weather stations at each center.	(+) high, indirect	Having weather stations generates information for the farmers which allows them to prepare early warnings for improving their crop yield. The information will also serve to determine what genetic improvements should be carried out in the different crops.
Incentives for technology adoption for small farmers	The improvement of technology is sought for the agriculture of	(+) high, indirect	The aspects in which technology improvement is required must be established,

Impact	Description	Assessment	Need to apply prevention / mitigation measures
	small farmers.		and it must be provided taking into consideration the socio-cultural conditions of the beneficiaries. Providing technical assistance to women dedicated to agriculture
Development of research for supporting improvements in agricultural systems	The interviews in both regions allowed identifying that a need of the population is to have responses to the problems of crops due to climate change.	(+) high, indirect	Developing a means for prioritizing research and a means for it to be accessible to the population which requests it
Technical support for farmer associations or cooperatives	The interviews identified the need for technical support for the associations in organizational matters, crop management and markets.	(+) high, direct	Developing a technical assistance plan for these organizations, considering transversal themes such as gender, food security and the environment
Improvements in the infrastructure of the centers, benefitting the population	Infrastructure improvements are expected at both centers.	(+) medium, indirect	The construction and improvement of the two agricultural centers will imply improvements in research and agricultural extension, benefitting the population.

Medium negative impacts have been identified in the operation phase related essentially to the normal operating conditions of the agricultural research centers, for which the efficient use of water and energy, and the proper handling of solid and liquid waste must be anticipated in such a way that they demonstrate their sustainability with pilot projects for the generation of alternative energy and water management through rainwater collection. Control / mitigation measures may be established for all of the impacts identified, in order to reduce their magnitude, guaranteeing compliance with the environmental regulations in force.

It has been observed that the positive impacts of the operation will be high, as they will benefit and improve the agricultural production conditions of small farmers in the two regions, which implies an improvement in the quality of life of the population surrounding the two centers; however, protocols for the use of these spaces must be established for their proper operation and care, and for the services provided by them to be efficient.

b) Water catchment, Region 9

No environmental impacts are anticipated in the design phase.

The following table summarizes the main impacts identified for the water catchment construction phase:

Table 12: Gauging of environmental impacts of the water catchment construction phase

Impact	Description / assumptions	Gauging	Need to apply prevention / mitigation measures
Alteration of hydrological conditions flows in the area	<p>The location will be in a flooding area.</p> <p>The use of runoff is expected to cover 10.500 acres that will be used for the catchment.</p>	(-) Medium, direct, cumulative	<p>Carrying out hydrological studies prior to the delimitation of the catchment area</p> <p>Carrying out stability studies of the catchment</p> <p>Giving consideration to extreme events in the construction of the catchment</p>
Alteration of landscape, flora and fauna	It is expected that the landscape, and the flora and fauna be affected as a result of the construction of the water catchment.	(-) medium, direct, cumulative	<p>Care that the landscape design be compatible with the surroundings and with the use of soil patterns of the site</p> <p>Rescuing fauna and relocating it</p> <p>Limiting effects to what is strictly necessary, as per the design</p> <p>Consider the seasonal</p>

Impact	Description / assumptions	Gauging	Need to apply prevention / mitigation measures
			importance of the wetland for wildlife particularly for migratory birds.
Moving of soil during the ground preparation works	The soil will be moved only within the areas delimited for the establishment of the infrastructure.	(-) medium, Direct	Care that the moving of soil not affect biodiversity interest sites
Increase in erosion risks due to the moving of soil and/or alteration of natural drainage	The execution of construction activities is anticipated in areas susceptible to flooding in flat zones with slight slopes or moderate slopes which may flood.	(-) medium, direct, cumulative	Care that in the design of the ground topography, consideration be given to the natural drainage and that ground erosion control works be applied when needed

There is a potential medium negative impact from the construction of the catchment which may affect the hydrology of the area. Mitigation measures are suggested for minimizing this impact.

Table 13: Assessment of the environmental impacts for the operation phase of the water Catchment

Impact	Description	Assessment	Need to apply prevention / mitigation measures
Changes in the water course in the area	Changes are anticipated in the water course; this may alter the fauna and flora, and affect inhabitants downstream	(-) medium, direct, Cumulative	Applying a management plan for the catchment which takes into consideration all changes
Sedimentation and proliferation of weeds in the catchment	Presence of sediment and weeds in the catchment	(-) medium, Direct	Removing woody vegetation from the reservoir zone prior to flooding it (eliminating nutrients) Having measures for controlling brush

Impact	Description	Assessment	Need to apply prevention / mitigation measures
			<p>Harvesting vegetation for compost, forage or biogas</p> <p>Regulating the discharge of water and manipulating its levels in order to hinder the growth of brush</p>
Degradation of the water quality in the catchment		(-) medium, direct, cumulative	<p>Removing woody vegetation from the reservoir zone prior to flooding it (eliminating nutrients)</p> <p>Controlling the use of land, the discharge of waste water and the application of agrochemicals in the water basin</p> <p>Limiting the retention time of the water in the reservoir</p> <p>Installing exits at different levels in order to avoid the discharge of water without oxygen</p> <p>Measuring salinity, pH, temperature, conductivity, turbidity, phosphates, and nitrates; doing limnology sampling of micro flora, micro fauna, and benthic organisms</p>
Increase in water-related diseases	Because there will be stagnant water, an increase in diseases from the transmission of vectors is expected.	(-) medium, direct	<p>Design and operate the dam in such a way as to reduce the vector habitat</p> <p>Controlling the vector</p> <p>Employing prophylaxes and treating the disease</p>
Alteration of the humidity	Evapotranspiration is	(+) high, indirect,	Realizing measurements for

Impact	Description	Assessment	Need to apply prevention / mitigation measures
levels	high in the area in which the catchment will be located.	cumulative	applying mitigation plans allowing to manage this indicator
Changes in water availability	It is expected that this infrastructure will allow having water available in the drought season. Also is expected for fauna – increased densities due to a new water source	(+) high, indirect	Environmental care of the refilling areas Planning in the use of water by the different users, involving them in caring for the water Take care of the new fauna that probably using the water catchment

c) Abattoir in Region 9

The table which follows summarizes the main impacts identified in the abattoir construction phase:

Table 14: Assessment of environmental impacts of the abattoir construction phase

Impact	Description / assumptions	Assessment	Need to apply prevention / mitigation measures
Increase in flooding risks due to the alteration of natural or artificial drainage at the sites of the execution of civil works	The execution of construction activities in zones with slight or moderate slopes susceptible to flooding is anticipated.	(-) high, direct	Care for the design to consider the inclusion of adequate rain drainage systems, considering that the ecosystem is a savannah
Increase in erosion risks due to the moving of soil and/or the alteration of natural or artificial drainage at the sites of the execution of civil works	The execution of construction activities in zones with slight or moderate slopes susceptible to erosion is anticipated.	(-) medium, direct	Care for the design to consider the inclusion of erosion control works when needed
Generation of solid	It is expected that the	(-) medium,	To have, in all work areas,

Impact	Description / assumptions	Assessment	Need to apply prevention / mitigation measures
domestic waste from the day-to-day activities of construction staff	construction activities not require the installation of campsites especially designed for this purpose and that staff use the services which exist in the town.	direct	procedures for the selection, collection and delivery of solid waste to the applicable municipal services.
Generation of solid waste from remains of construction material (cement, concrete, stone, sand, iron, boxes, bags and other packaging, etc.)	It is expected that the construction activities generate construction material waste.	(-) medium, direct	Planning of activities, compliance with local stipulations and requests to the applicable authorities for disposing of this waste in adequate locations
Increase in the demand for water for construction activities	It is anticipated that the construction activities require water from local supply sources, well.	(-) medium, direct, temporary	Rational use of the resource Control of the use of water for construction activities Use the water of the well and avoid the use of water from the creek
Alteration of the landscape and flora in the savannah	The possibility of effects on areas with no interventions in the savannah within land belonging to the Ministry of Agriculture is expected.	(-) low, direct	Care that the landscape design be compatible with the surroundings and with the use of land patterns applicable to the area of the site Limiting effects to what is strictly necessary as per the design
Moving of soil during the ground preparation works	Soil will be moved only within the area delimited for the infrastructure site.	(-) low, direct	Minimizing the moving of soil to what is strictly required by the infrastructure

Impact	Description / assumptions	Assessment	Need to apply prevention / mitigation measures
Risks of occupational accidents due to inadequate hygiene and occupational safety practices	Worker accidents are expected.	(-) low, indirect, Temporary	The contracting companies must have hygiene and occupational safety measures and protocols.
Generation of temporary employment in construction activities	It is expected that local manual labour be employed during construction.	(+) medium, direct, Temporary	The company in charge of building the centers must establish a plan for the contracting of local manual labour.

It may be said that, in general, significant impacts are expected in the construction phase, mainly related to the particular conditions of the area in which the abattoir shall be established, which is a savannah. It is therefore necessary to consider all of the particular restrictions and/or requirements for the use of land and water. No considerable positive impacts are expected.

Table 15: Assessment of environmental impacts for the abattoir operation phase

Impact	Description	Assessment	Need to apply prevention / mitigation measures
Animal welfare issues	space and water demands, and where and how the meat will be transported away from the site	(-) High, direct	Abattoir design to reduce animal stress, to address the demand of food and water
Generation of residual material and waste	The generation of residual material useful for the fabrication of sub products is expected, as well as waste to be destroyed and/or deposited in dump sites.	(-) high, direct, cumulative	Processing waste when it is fresh Refrigerated storage of waste until it is processed Use of closed containers Treatment of exit air Manure should be used

Impact	Description	Assessment	Need to apply prevention / mitigation measures
			<p>for agricultural ends.</p> <p>Entrails and other solid waste may be employed in the processing of cold meats.</p> <p>Avoiding the use of solvents in final products</p>
Generation of waste water by the day-to-day activities of the abattoir (slaughtering and cutting)	A considerable flow of waste water with blood is expected from the process of slaughtering and cutting, as well as from the cleaning of the abattoir.	(-) high, direct, cumulative	<p>Education on environmental mitigation measures for abattoir staff</p> <p>Establishment of technical devices allowing a better separation of the blood in the waste water systems</p> <p>Prior to wet cleaning, picking up the large pieces from the floor of the production locations</p> <p>Setting up buckets for mud in the floor drains</p> <p>Setting up sifting mechanisms for the waste water in order to separate solid elements (these elements have a high protein content and may be employed in another abattoir process)</p> <p>Setting up mud collectors and grease separators</p>

Impact	Description	Assessment	Need to apply prevention / mitigation measures
			Flotation plants (mechanical treatment through flotation); complementary biological filtering as a second phase of filtering following the mechanical filtering
Increase in demand for water	The abattoirs employ water in their processes. 20.000 liters /day (3 day slaughter per week)	(-) medium, direct	Employing an efficient water supply system Use the water of the well and avoid the use of water of the creek
Increase in the demand for energy for the realization of day-to-day activities	An increase in the use of energy is expected during the operation phase. The place is near to the line power transmission	(-) medium, direct	Employing energy-efficient systems Making use of waste for producing energy and solar energy to produce the own energy to complement the electric energy.
Noise emission	The activities of the abattoir generate different types of noises which affect the environment.	(-) medium, direct	Setting up silencers in ventilation systems Encapsulating machines Including anti-noise walls
Air contamination due to the emission of odours from the different abattoir processes	The emission of odours is expected from the animals themselves and due to changes occurring in organic matter	(-) medium, direct, cumulative	Establishing a closed-circuit process Setting up floodgates Avoiding the accumulation of matter which emits odours Including an air exit

Impact	Description	Assessment	Need to apply prevention / mitigation measures
			system with bio-filters
Generation of residual heat	Caused by the installation of boilers and slaughter ovens	(-) medium, direct	Always employing heat recovery systems
Risk of occupational accidents due to inadequate hygiene practices and occupational safety	It is expected that workers operating the abattoirs be exposed to the possibility of occupational accidents.	(-) medium, indirect	All occupational safety and hygiene measures regulated at the national and international levels must be applied.
Emission of greenhouse gases	The abattoir generates greenhouse gases such as CO ₂ .	(-) low, direct, Cumulative	Making frequent measurements Developing practices for compensating for these emissions, such as planting trees around the abattoirs
Lack of capacity in running the abattoir	The Producer Association need to develop capacities in the management of the abattoir	(-) Medium direct	Provide training and support to the producer association including women's in management, accounting and technical meat handling skills
Lack of capacity of government (EPA, Local Government) to monitor abattoir construction and running	The government at the national level (EPA, MOA) and at the local level (Municipalities) don't have technical human resources with knowledge in management and safety and environment standards of an abattoir	(-) Medium direct	Provide training to EPA, environment Unit of the Local government and Ministry of Agriculture

Impact	Description	Assessment	Need to apply prevention / mitigation measures
Improvements in abattoir infrastructure under international sanitary standards, benefitting the population	It is expected that infrastructure improve with the project.	(+) high, direct	Considering climate change resilience aspects
Improvements in the standards of abattoir management	An improvement in the handling standards is expected.	(+) high, direct	Including closed handling measures, seeking to make use of waste
Improvement in the skills of the meat producer associations involved in the program	Improvements are sought in skills, use of standards, best practices, and environmental protection.	(+) high, direct	Developing a technical assistance program for supporting the associations, concentrating particularly on women and indigenous peoples

Impacts are expected in the operation phase, related essentially to the normal operating conditions of the abattoirs, where there will be a strong emphasis in the handling of solid and liquid waste generated by the productive process and the demand of water of the process that comes to the creek source. Mitigation measures have been identified for these impacts.

An important mitigation measure identified for the abattoirs is to seek to employ all waste by producing cold meats, grease or other products, thus supporting the establishment of a closed circuit which minimizes environmental impacts.

The emission of greenhouse gases is also anticipated. This must be compensated for by planting trees around the abattoir and through the application of mitigation measures to minimize the emissions.

In the social sphere, it has been observed that there are considerable positive impacts, given that the sanitary conditions of meat production will tend to improve, that skills will be developed within the meat producer associations, and that women be involved.

6.2 Environmental viability of the program

This section deals with a comparison of the negative environmental impacts and the environmental and social benefits of the operation, in order to evaluate its environmental viability, taking into consideration the effectiveness of the control measures of the negative impacts and the verification of compliance with the criteria and standards of the environment and for the prevention of environmental risks.

In this regard, based on the previous points, it may be concluded that notwithstanding the existence of considerable risks and negative impacts gauged to be of high magnitude, particularly in the activities of the operation of the abattoirs and in the construction of the water catchment, which may be controlled with the adoption of adequate control measures, particularly given that the positive impacts are considerably transcendent because of their direct relationship with an improvement in the living conditions of the local inhabitants, access to better agricultural production conditions, and improvements in the meat production standards which have a direct impact on the quality of life of small farmers of the Amerindian communities and of the inhabitants of the areas of influence of the project, the execution of the operation is recommended.

6.3 Summary of the positive and negative impacts of the operation

a) Positive impacts

There are several environmental benefits associated with promoting the sustainable agricultural development program. Guyana's sustainable growth in the agriculture sector is linked with food security, improvements in the quality of life of Amerindian communities and small and medium farms, and the health of its natural environment. Protection and management of the natural resources of the country is essential for the development of agriculture in Guyana. In that sense, sustainable agriculture, particularly in Regions 9 and 10, is the response of the development of the two savannah areas that are considered to be the next frontiers for agricultural development in the country.

As emphasized in the Proposal for Operational Development, biodiversity, the ecosystem services it provides, and climate change resilience are fully mainstreamed into the proposed program's design. In this context, the operation is expected to have positive environmental and social impacts as a result of the strengthening of the government's capacity for: (i) the establishment of agricultural centers to contribute to local and regional development, including technology transfer, demonstration and training for small and medium farmers in Lethem and Ebini, an integrated management plan for the use of natural resources, environment and disaster risk management, and climate change adaptation sectors; (ii) the

enhancement of natural, cultural and agricultural assets in a manner that integrates gender, biodiversity, ecosystem services, and climate resilience; (iii) the control of the sustainable development of the agricultural frontier in both regions; and (iv) the inclusion of the local population, among them, lower income households and Amerindian communities, in the development of the emerging sustainable agriculture.

The program addresses the national priority of food security, climate change and integrating indigenous groups in a region-based approach to sustainable development. The set of interventions have been identified to increase the number of agriculture and livestock production systems that are resilient to climate change in Region 9 and 10.

This vision is centered on the “hub and spoke” farm model system. The hub and spoke farm model allows the inclusion of commercial and smallholder farming in a symbiotic relationship leading to the sustainable development of smallholder farmers. Investments have focused on providing the greatest social and economic gains at the lowest environmental cost, taking into account three key elements: (i) a customized approach to sustainable agriculture development, whereby: (a) gradual growth through the development and innovation of agriculture products, while ensuring the management of natural resources, the cultural heritage of indigenous groups and protection of the environment, which is protected and enhanced in a sustainable and inclusive manner; and (b) controlled growth and stepped-up management of infrastructure to mitigate the negative impacts of unplanned agriculture growth combined with climate change and exposure to natural disasters; (ii) development of facilities for research in agriculture that improve the management of crops for small farms and indigenous communities; (iii) ensuring that the benefits of the program accrue to the local people.

The operation will result in positive environmental impacts in terms of:

- The operation is expected to have significant positive social impacts in terms of best practices in agriculture for small farmers, improving their income. It is estimated that, at a minimum, the program will directly benefit 900 small farmer and Amerindian households of people involved in agriculture, of which an estimated 450 will be women in Region 9 and 10. If well planned, agriculture development can bring about an improvement in the provision of services (water supply, wastewater treatment) for local communities.

The following analysis of positive, direct and indirect environmental impacts of the project provides an insight into the benefits associated with undertaking the project.

According to the assessment conducted during the preparation of the program, the improvements in agricultural centers combined with the institutional strengthening activities will result, among others, in the following direct environmental benefits:

- Improved land use planning, integrating ecological factors and disaster vulnerability with information collected in the census for the development of the agriculture
- Improved waste management in the abattoirs to ensure best practices in their management and to achieve the international standards that benefit the population
- Adaptive capacity and development of technology for improving the management of agriculture in the savannah's areas with risk management tools for disaster risk and climate change planning, with a focus on ecosystems management, and associated training
- Improved skills of local associations in the management of the abattoirs and agriculture, focusing on indigenous groups and gender issues, thus contributing to the welfare of this population.
- Develop an efficient use of water for agriculture issue and wildlife.

Positive social impacts are expected in terms of increased quality of life for farmers and indigenous groups through improved infrastructure, research, services, and opportunities for the sustainable management of agriculture. Specific activities included in the program will ensure opportunities are offered for strengthening the local associations of women involved in agriculture and in the management of the abattoir, benefiting women and members of indigenous groups, such as Amerindians.

The program has the chance to address the main problems identified in the field, such as weakness in knowledge for addressing climate change, which directly impacts crop production, water scarcity in the drought season, and floods that impact agriculture and the lives of local people.

b) Negative impacts

The identification and consideration of direct and indirect negative impacts and the mitigation measures included in project design demonstrate that the negative impacts are not potentially significant and are controllable or can be mitigated. The predominant potential negative impacts as a result of the program are linked to the operation of the abattoirs and the water catchment; these are:

- Increase in resource use (e.g. water, electricity) which could impact surrounding communities
- Increase in solid, liquid and other waste (e.g. sewage, garbage, emissions) that may result in pollution of the environment.
- The water catchment is located in an area which is sensitive in terms of environmental protection. In these areas, projects must strike a delicate balance between development and the environment.

Most impacts related to facility and infrastructure construction are reversible if well located, in the sense that an affected area can return to a pre-existing condition after construction

occurs. To mitigate impacts, the ESMP includes specific requirements for siting and design of works.

In general, potential negative impacts are easily identifiable, minor to moderate in magnitude, temporary in duration, and spatially restricted. They are all preventable or controllable with widely available and cost-effective mitigation measures that are outlined in the ESMP. Potential impacts during construction include: (i) soil erosion and temporary increases in sediment runoff resulting from earth movement for the construction of the agricultural centers and the water catchment; (ii) physical disturbance of the flora and fauna resulting from the construction of the water catchment; (iii) generation of dust, noise and gases associated with the operation of construction equipment and vehicles.

These negative impacts will be mitigated through (i) the requirement to undertake appropriate environmental and social impact analysis according to national environmental regulations, obtaining environmental permissions and IDB policy requirements for assessment; (ii) site specific Environmental and Social Management Implementation Plans including specific measures such as waste management and other measures as defined in the ECP; and (iii) the requirement that the construction of each new facility comply with the corresponding environmental impact analysis according to the national environmental regulations and IDB policies.

In addition, the potential direct negative impacts will be largely mitigated through effective application of environmental mitigation specifications that will be included in tender documents and contracts for construction and supervision, as established in the ESMP. These will be included in the ECP to be agreed on with the environmental authority (EPA), which will be part of the tender documents for civil works.

There are risks associated to the siting of works in areas vulnerable to natural disasters. These will be mitigated through: (a) the mainstreaming of disaster risk management measures in physical land use planning processes for the entire infrastructure; and (b) the inclusion of structural risk reduction measures for the works to be financed by the program (i.e. flood- and wind-proofing, retrofitting, and measures designed to stabilize unstable areas).

The program also includes strategic safeguard measures in its components and execution management structure, including (i) improving the skills of national and local small agriculture farmers and indigenous groups in management for the effective implementation of climate resilience; and (ii) inclusion of the different agencies that deal with agriculture in Guyana for the purposes of environmental review of proposed agriculture enhancement projects and subsequent monitoring of compliance with EMPs; (iii) inclusion of a socio-environmental management specialist as part of the project team in ASDU; and (iv) measures to strengthen local agriculture associations, including specific support for the gender issue, upgrading of product and services quality, including internationally recognized sustainable agriculture

standards and other specialized certifications, and conversion to cleaner and green technology.

The program also builds on an intensive consultation process with national and local level stakeholders organized in local agriculture associations, once having received capacity-building training on key aspects of the management of crops, water and measures to be resilient to climate change impacts.

7 Environmental and Social Management Plan

The plan to ensure the environmental and social sustainability of the program consists of the following components: (a) siting and design criteria; (b) ESMP supervision and enforcement; (c) monitoring, indicators, measurements and responsibilities; (d) training and capacity building; e) Duties and responsibilities for compliance of the ESMP; f) Public information and consultation of sustainability agricultural development centers program; g) Cost estimates of environmental and social management.

The proposed infrastructure in this project is of small scale. The plan focuses only on mitigating those risks with potentially high and medium impact.

7.1 Siting and design criteria

New Infrastructure in Region 9

New infrastructure will be located within savannah areas in Region 9 that are sensitive sites for biodiversity and ecosystem services. Part of this area has been proposed as a future protected area.

Prior to initiating procurement of any civil works, the MOA will obtain all permits and licenses from the applicable authorities, including the EPA for environmental licence via the submission of EIAs for new infrastructure and the water catchment.

New infrastructure should be developed with the use of local materials which blend in with the local environment and that are compatible with existing zoning schemes and management plans.

The infrastructure should be resilient to normal flood and drought cycles, as well as increased flooding under climate change predictions.

The design of the water catchment will take into consideration the hydrological system, considering the replenishment of the catchment and the impacts which could arise downstream due to the damming of the creek. Stability studies must also be considered in order to include measures for dealing with floods due to climate change. The hydrological cycles and wildlife habitat have to be considered in the design.

Abattoir in Region 9

The abattoirs in Regions 5 and 9 designs must follow best international standards and include in their design systems for the management of solid and liquid waste in such a way as to not have an impact on the environment. Sources of water for each abattoir that are

sufficient and reliable and do not conflict with other users must be identified. Consideration must be given to the treatment reutilization of water at the abattoirs prior to discharging it into the environment.

Research and training courses

The operation manual for research and training courses has to include details that invasive species (including Genetically Modified Organisms that are invasive), crops requiring high herbicide and pesticide use and crops or livestock with high water demand must not be researched or promoted during the project.

7.2 ESMP supervision and enforcement

Project Activity	Potential Environmental / Social Impacts	Proposed Mitigation Measures	Institutional Responsibilities to implement mitigation measure	Cost Estimates
<i>Construction and operation of abattoir in Region 9 (Component 3)</i>	Site chosen prone to flooding in Region 9	Ensure design takes flooding risk into account	MoA	Included within project design (3.1.2 Design and supervision of new agricultural center in Region 9)
	Animal welfare issues	Follow international standards in design Improve national legislation in animal welfare	MoA	Included in design (3.1.2 Design and supervision of new agricultural center in Region 9) and (3.4 Update of legal framework and regulations)
	High water demand for animals and meat processing	Ensure water source does not affect local creek ecosystem service and biodiversity or users	MoA	Included in design (3.1.2 Design and supervision of new agricultural center in Region 9)
	Abattoir waste causing environmental pollution	Follow international standards in design including option of composting or incineration of waste	MoA	Included in design (3.1.2 Design and supervision of new agricultural center in Region 9)
	Weak supervision of construction risk related to environmental and safety issues	Construction firm has an Environmental supervisor who ensures these risks are minimized	Construction Firm	Included in project component (3.1.2 Design and supervision of new agricultural center in Region 9)
	Lack of capacity in running the abattoir	Provide training and support to women's group in management, accounting and technical meat handling skills	MoA	Including in project component 3.2.1 Strengthening of the producer association in Region 5.
	Lack of capacity of government to monitor abattoir construction and operation	Provide training to EPA, Ministry of Agriculture including GLDA, NAIRI and Environment Unit of the local municipality	MOA	Included in project component (3.3 Training in Sanitary and Phytosanitary and food safety standards for workers and

				inspectors).
<i>Construction of agricultural center in Region 9</i>	Site chosen prone to flooding	Ensure design takes flooding risk into account	MoA	Design and supervision of new agricultural center in Region 9
	The infrastructure should be constructed outside of the proposed Ramsar site	Ensure design takes the proposed area for the Ramsar site into account	MoA	Design and supervision of new agricultural center in Region 9
	Potential high water and energy demand	Ensure design considers renewable energy sources, and rainwater catchment	MoA	Design and supervision of new agricultural center in Region 9
<i>Agricultural extension services</i>	Potential to encourage use of invasive species, excessive use of pesticides and herbicides and water	Develop a list of invasive species that must not be used or promoted, and training as to the risks of their use Carry out training on topical and efficient herbicide and pesticide use focusing on Integrated pest management practices Ensure crops are chosen and methods of irrigation developed that reduce water use	MOA – NAREI	Included in project (line 2.5 NAREI and GLDA trained)
	Potential to exclude women and indigenous groups in training courses	Ensure trainers and courses incorporate techniques to ensure inclusion women and indigenous groups	MOA- NAREI- GLDA	Included in project (line 2.5 NAREI and GLDA trained)
<i>Construction of water catchment</i>	Catchment site prone to heavy flooding	Ensure design takes flooding risk into account	MOA	Included in project 2.1.2 Design and supervision of new agricultural center in Region 9
	catchment reservoir may affect hydrology of the area	Carry out studies to understand this potential impact better	MOA	2.1.2 Design and supervision of new agricultural center in Region 9
	Water quality may deteriorate inside the catchment reservoir	Develop a water monitoring program and as necessary mitigation measures	EPA	
<i>Strengthening of EPA (within component 2)</i>	EPA may not be able to monitor aspects of the projects due to few staff, low capacity and lack of mobility	Develop a plan to ensure EPA can carry out regular inspection of the new facilities in construction and operation, and including the agricultural research and extension program.	EPA	Included in project component (2.6 Support to EPA for supervision)

7.3 Monitoring, indicators, measurements, responsibilities

The monitoring and supervision of the application of socio-environmental and risk-reduction mitigation measures and management are presented in the tables. These include the indicators that will be used to ensure compliance with the ESMP:

a) Monitoring Construction and operation of abattoir in Region 9

Proposed Mitigation Measure	Indicators	Measurements (Incl. equipment, methods, location)	Frequency of Measurement	Responsibilities Incl. review, reporting)
Design takes into account the condition of the area for disposal waste management	Design content (EIA)	Review of document	1	EPA
Design takes flooding risk into account Region 9	Design content (EIA)	Review of document	1	EPA
International standards followed in design	Design content (EIA)	Review of document	1	EPA
National legislation improved for animal welfare	Legislation content	Review of content	1	MOA
Avoid source of water that affects local creek ecosystem service and biodiversity	Design content (EIA)	Review of content	1 per year	EPA Environment Unit al Regional Level
Provide training and support to Producer Association	Audit of running of abattoir	Audit review	2 per year	MOA – GDLA
Provide training to EPA and MOA health and safety of abattoir management	Audit of running of abattoir	Audit review	1 per year	International Audit
Construction complies with national health and safety and environmental standards	Reports from construction firm on training of staff, activities to reduce environmental impact and number of accidents,	Report	2 per year	Construction firm

b) Monitoring construction of agricultural centers in region 9 and 10

Proposed Mitigation Measure	Indicators	Measurements (Incl. equipment, methods, location)	Frequency of Measurement	Responsibilities Incl. review, reporting)
Design takes flooding risk into account	Design content (EIA)	Review of content	1	EPA

Design considers renewable energy sources, and rainwater catchment	Design content (EIA)	Review of content	1	EPA
Construction complies with national health and safety and environmental standards	Reports from construction firm on training of staff, activities to reduce environmental impact and number of accidents,	Report	4 per year	Construction firm

c) Monitoring of agricultural extension services

Proposed Mitigation Measure	Indicators	Measurements (Incl. equipment, methods, location)	Frequency of Measurement	Responsibilities Incl. review, reporting)
Develop a list of invasive species that must not be used or promoted, and training as to the risks of their use	List species	List exists	1	MOA-NAREI to be submitted to IDB (ESG) for approval
Carry out training on topical and efficient herbicide and pesticide use focusing on integrated pest management practices	Training course attendance Farm demonstration Implementation by farmers	Number of attendees Number of attendees Number of cases of implementation	1	MOA-NAREI
Ensure crops are chosen and methods of irrigation developed that reduce water use	Training course attendance Farm demonstration Implementation by farmers	Number of attendees Number of attendees Number of cases of implementation	1 per year	MOA-NAREI
Ensure women and indigenous groups are included in the trainings	List of participants	Numbers of attendees	1 per year	MOA- NAREI – GLDA

d) Monitoring the water catchment

Proposed Mitigation Measure	Indicators	Measurements (Incl. equipment, methods, location)	Frequency of Measurement	Responsibilities Incl. review, reporting)
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Design takes flooding risk into account	Design content EIA	Review of content	1	EPA
Studies to understand the potential impact of reservoir catchment on area hydrology	Study results	Review study	1	EPA
The infrastructure has to be constructed outside of the proposed Ramsar site	Allocation of infrastructure (EIA)	Review the EIA	1	EPA
Water monitoring program and as necessary mitigation measures	Water quality metrics	Simple water quality measurement by kit	2 per year	EPA

7.4 Training and Capacity Building

Training Activities and Capacity Building	Participants. Focus Group	Scheduling	Cost Estimates
Environmental measures and international standards of safety in the management of the abattoir	EPA Environment Unit of the Municipality	Link with beginning of abattoir operation	Included in EPA budget (line 2.6 support to the EPA for supervision)
Techniques to ensure inclusion of women and indigenous groups in training courses	MOA – NAREI-GLDA	During the preparation and development of the training process	Included in training budget in MOA (line 2.5 NAREI and GLDA trained)

7.5 Duties and Responsibilities for compliance of the ESMP

a) The Construction consulting firm(s) contracted for the development of the infrastructure

The Contractor(s) must submit to the MOA an Environmental Management Plan to be implemented during the construction period. This implementation plan, detailing the stipulations of this ESMP, will be approved by the MOA and will be attached to the contract. It will describe the environmental and social safeguard measures to be adopted for the infrastructure.

The Contractor will have the duty to:

- Ensure Health and Safety measures are met;
- Ensure no trees or waterside vegetation are removed except those required for the execution of the works;
- Ensure no contamination of land or water by polluting substances. In case of any accident or potentially hazardous / environmentally damaging situation, the Contractor has to notify the MOA and Supervisor who will inform the EPA;
- Use local labour , where possible;
- Ensure that building material is sourced locally where possible. Thatch used for roofing must adhere to sustainable harvesting guidelines and wood should be sourced from sustainably managed forests;
- Use ecologically friendly materials wherever practicable throughout the construction process;
- On completion of work, all constructions, surplus materials, rubbish, scaffoldings, and temporary works of every kind shall be cleared away and removed from the sites and the sites are to be left in a clean condition and/or rehabilitation of the intervention area is to be realized;

In addition, the Contractor's environmental obligations imply, without prejudice to other official arrangements in force, that:

- The Contractor respects the environmental and socio-cultural laws, regulations and arrangements in force, including the rules promulgated during the project performance period.
- The Contractor respects the contractual arrangements of the present project, as well as the conditions established by the various authorizations required by, and released to, the Contractor for the implementation of the works.
- The Contractor fully assumes the consequences of his choices and actions. In particular, he shall repair at his expenses, according to best practices and in the shortest delay – depending on site sensitivity – harm caused to the environment and the residents by non-compliance of authorizations, administrative arrangements or applicable technical prescriptions, and shall pay the fines, damages or other penalties he is liable to.
- The Contractor mobilizes all his means to assure the environmental quality of the works, notably by applying the relevant prescriptions and arrangements.

The Contractor shall consider the execution of works of an environmental nature as well as risk-reduction measures as being part of the general works implementation program.

To fulfil these obligations, the Contractor will:

- Appoint a manager responsible for environmental, social, health and safety aspects as applicable, reporting directly to the Contractor's Project Director;
- Control, through regular inspections, implementation of the ESMP;

- Provide 6 monthly reports to the MOA for every incident, accident or deterioration caused to the environment by the works, to be formalized in a specific document countersigned by the MOA;
- Provide training for workers to ensure compliance with health and safety procedures and proper use of protective equipment;
- Apply sanctions against staff who does not respect the environment.

b) The Environment Environmental Protection Agency

The EPA is responsible for the following tasks:

- Via the EIA process ensure that location of the new infrastructure falls outside of sensitive areas for biodiversity and ecosystem services.
- Via the EIA process, verification that the design of the new infrastructure (agricultural centre, abattoirs) comply with National Law, are resilient to flooding, will not have significant impact in the areas, meet international standards (abattoirs) and that the water catchment will not have significant impacts on the biodiversity or hydrology of the area.
- Supervision of the construction firm to ensure they follow their ESMP.
- Supervision of the waste management of the abattoirs.
- Approve the list of species and varieties to be used in the agricultural research centres.
- Monitor water quality within the catchment reservoir at the agricultural centre in Region 9.

Also the EPA is about to open an office in Region 9 to ensure better supervision of the facilities and the Rupununi biodiversity in general.

c) The Ministry of Agriculture

The Ministry of Agriculture is responsible for the following tasks:

- Provide a list of species and varieties to be used in the agricultural research centres for approval by IDB and EPA.
- Carry out research and extension programs according to the operations manual.
- Ensure programs are inclusive of women and the Amerindian population.
- Map the actors involved in the research process, their roles and the obstacles to full participation they might face based on access to knowledge which goes hand-by-hand with technology.
- Ensure that NAREI support the development of internship and training courses where young men and women from the indigenous communities can be actively involved.

- Ensure the development of capacities of local producers associations for the management of the abattoirs with national and international standards.
- Ensure that the agricultural technological packages will include training and extension services, a methodology that includes an intersectional strategy that incorporates a perspective on gender, indigenous communities and the environment as mutually inclusive.
- Ensure the establishment of a grievance mechanism via the community steering committee throughout the construction and operation phase of the project.
- Ensure that the Census include environmental information like use of pesticides, herbicides, GMOs and use of soil and water in the livestock and crops.
- Ensure that the Census includes gender and indigenous information related the participation of those actors in the agriculture practices.
- Continue the participatory process through the next phase of finalization of the program and will also be an integral part of execution of the program, especially in the consolidation of sustainable agriculture. Semi-annual local public meetings will be held in the both areas (Lethem and Ebini) to inform local people of progress in implementation of the action plans and to provide an opportunity to voice views on how to improve implementation. The EIAs required for new infrastructure as per the national regulations, will entail further consultations. Annual progress reports, evaluations and other project-related information will be published on the MOA website.
- Establish a public information mechanism to capture and resolve people's concerns related to the program in a timely manner and have these properly documented.

d) Ministry of Health

The Ministry of Health is responsible for the following tasks:

- Monitoring that the abattoirs are operated and that the quality of the meat produced meets international standards.
- Ensure all new legislation and regulations pertaining to animal welfare and abattoir hygiene are upheld.
- Provide sanitary certificates to the abattoirs only when standards are met.

7.6 Cost estimates of environmental and social management

The costs associated with environmental and social management are incorporated into the different program components. The cost for training and support of EPA in monitoring and supervision of the project is USD 130,000.

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ANNEX 1**GUYANA****CSD/RND****Support of Sustainable Agricultural Development Program (GY-L1060)****Environmental and Social analysis and management plan****TERMS OF REFERENCE****Background**

The Government of Guyana (GoG) requested IDB funding for a loan operation for the agricultural sector. The “Sustainable Agriculture Development Program” (GY-L1060) will focus its activities in Region 9 and Region 10. Its objective is to increase the productivity of the agricultural sector while maintaining a sustainable and climate resilient use of natural resources in Guyana. Higher productivity will also reduce pressure on forest and fragile ecosystems and, at the same time, increase incomes for small- and medium-sized farmers. At the same time, the Program will support the implementation of Guyana’s Climate Resilience Strategy and Adaptation Plan (CRSAP).

The preliminary design of the loan is based on three components:

- a) **Strengthening of the agricultural innovation and extension system.** The loan will finance the implementation of a comprehensive strategy for innovation, extension and management of natural resources in the country. Agriculture centers will be established / improved, to contribute to local and regional development, including technology transfer, demonstration and training. This includes support to strategic innovation by funding adaptive agricultural innovation projects, with an emphasis on validation of technologies and their transfer to farmers. Two research centers have been identified by the MoA: Lethem / Manari (Region 9) and Ebini (Region 10). In both sites, infrastructure, equipment and innovation programs will be designed and implemented. Research / demonstration programs, identified through a prioritization exercise, will be implemented in collaboration with national and international research and technology transfer centers. These programs will identify specific beneficiary groups, technology transfer and monitoring and evaluation mechanisms, and deliver technology products as expected results. Agriculture Centers will also support activities in other regions of the country. Part of the Agriculture Center activities will focus on reducing vulnerability to climate change through multiplication and conservation of genetic material, including drought resistant varieties;
- b) **Information for policy making and natural resource management.** This component will include the review and design of an Agricultural Information System (AIS), including the preparation and implementation of an Agricultural Census; a LIDAR survey of the North Rupununi (Region 9) and Region 10; strengthening of the Monitoring and Evaluation capabilities of the MoA; identification of buffer zones for sensitive wetlands

(with potential to designate a RAMSAR site) in Region 9; and identification of potential water catchment sites for improved agricultural production and climate change adaptation in Region 9;

- c) **Support for compliance with sanitary and phytosanitary standards.** Access to markets and infrastructure will increase the value and sales volume of meat and dairy products. To this end, the program will finance: (i) the review and update of standards and codes related to products destined for export markets as well as local markets, both current and potential; (ii) the implementation of pilot facilities for meat and dairy processing to evaluate the feasibility and unit costs of complying with standards; and (iii) training and technical assistance for the GLDA and producers associations.

The Program will be financed as an investment loan, up to 15 million USD. It is expected that the implementation period will be six years. The Program has been prioritized by the Government and included in the CPD 2016. The loan proposal will be submitted to the Board by December 2016.

This consultancy is part of the feasibility and technical studies needed for IDB Board approval. Several consultancies to address specific issues have been contracted through the Technical Cooperation Project GY-T1126.

Based on IDB's environmental, gender, diversity and other policies, this study will help the GoG to evaluate the likely impacts of the proposed program on the environment and vulnerable groups in the country. This study will help the GoG to comply with national environmental legislation and regulations, as well as to comply with IDB's environment and safeguards policy. Specific activities, identified by this study will be included in the management plan and used in the design of the Project.

Consultancy Objective

The overall objective of the consultancy is to complete an Environmental and Social Analysis and an environmental and social management plan (ESMP) for the Sustainable Agricultural Development Program (GY-L1060).

The specific objectives are: i) identify the potential negative impacts of the program (social and environmental impacts, distinguishing between direct, indirect and cumulative), and measures to avoid, minimize or mitigate these impacts or compensate for them; ii) identify the positive potential impacts and opportunities to enhance them; iii) prepare an Environmental and Social Management Plan (ESMP) and propose sub-components focused on the socio-environmental management program; iv) design a socio-environmental monitoring system; and v) provide input for the public consultation process of the program.

The findings of this analysis will provide orientation and technical inputs to guide the work of the design the Program.

The scope of the consultancy will be the territory of Guyana, but with specific focus on priority program Regions 5, 9 and 10.

Activities

The contractual will collaborate with other consultancies being implemented for the design of the Program. There are five studies being prepared for the design of the Program that are related to the present consultancy: i) design of component 1, agricultural information system; ii) design of component 2, research, innovation and extension, which included the construction of one agriculture center and refurbishment / update of another agriculture center; iii) design of component 3, pilot facilities for processing meat and dairy; iv) costs and engineering design of infrastructure in components 2 and 3; v) diversity and gender, with a focus on Amerindian communities and extension services; and vi) financial and fiduciary arrangements for the implementation of the Program. The contractual will receive inputs from all of these studies.

In collaboration with the MoA and the Bank, the contractual shall perform the following activities:

General activities:

- a) Review the background and relevant documents related to the conceptual logic of the program.
- b) Review the IDB Safeguard Policies and identify the requirements for the program and the necessary actions to ensure compliance. In particular the Environment Policy (OP-703) and the Indigenous Peoples Policy (OP-765); identify and review national legislation applicable to procedures for environmental and social evaluation, land titling and indigenous rights; identify gaps between the applicable national legislation and Bank safeguard policies and propose measures to close identified gaps.
- c) Collect the primary information needed to achieve the objectives of the consultancy through field visits in regions 9 and 10, as well as conducting meetings, interviews and focus groups with authorities, officials, social organizations and beneficiaries of the program, as well as representatives of other institutional actors.
- d) Participate in relevant meetings during IDB missions to Georgetown and provide inputs for documents and discussions.
- e) Collaborate with the project team – MoA and the Bank – in the preparation of other specific issues related to environmental and social issues of the project, which should be incorporated into the Proposed Operation Development (POD) and the Environmental and Social Management Report (ESMR) of the Bank.

General Assessment of impacts and risks:

- a) Identify potential environmental and social impacts of the Program (distinguishing between direct, indirect and cumulative), and make recommendations to minimize or mitigate potential negative impacts and enhance positive impacts. The contractual should distinguish between impacts associated with the design, construction and operational, and closure phases of the project.

Social impacts:

- a) Analyze the dynamics, causes and extent of conflicts linked to extension and technology adoption.

- b) Analyzing the rights and access of women to land and resources and their participation in agricultural production.

Indigenous People:

- a) Specifically identify the potential impacts of the Program on Indigenous Populations - distinguishing between direct, indirect and cumulative, and taking into particular consideration impacts on land use, rights, access to natural resources, food security and uses social and cultural land - and make recommendations to minimize or mitigate potential negative impacts and enhance positive impacts.

Environmental impacts:

- a) Identify potential risks to the environment associated with Program activities, particularly in relation to construction and operation of the proposed research centers and pilot milk and meat processing plants.
- b) Analyze the possible future impacts of agricultural development on priority areas for biodiversity conservation. Risks related to the potential use of collected LIDAR data for the identification of potential water catchment sites in agricultural lands should be addressed.
- c) Identify the potential impact of proposed water catchment programs on water stocks and flows, and potential impact to biodiversity and wetland ecosystems in the intermediate savannah.

Institutional capacity assessment:

- a) The contractual will evaluate the capabilities in social and environmental management at the central and local levels for the implementation of program activities during the construction and operational phases.
- b) Evaluation of the capacity of producers associations in charge of pilot plants
- c) Identify the distribution of responsibilities at the institutional level for regulation and management issues closely related to SPS, including - but not limited to standards, compliance with national and international standards and collaboration with national agencies.
- d) Review the institutional arrangements for the environmental monitoring by the MoA and the EPA during Program implementation.

Product development:

- a) Prepare the Strategic Environmental and Social Assessment in order to comply with the IDB's environment and safeguards compliance policy .
- b) Prepare the Environmental and Social Management Plan (ESMP). Mitigation measures should be submitted in the following format: description of the environmental or social impact, and identified mitigation activities to implement the mitigation measure, responsibility for implementation, schedule and costs.
- c) Identify potential environmental and social indicators to be incorporated into the program monitoring system. These indicators should be feasible to collect and possible base line set at a reasonable cost.

- d) Collaborate with the IDB team member assigned to the EIA aspects of the project to respond to any issues raised or refinement required in the EIA or ESMP.
- e) Propose a system of environmental monitoring establishing a baseline, defining indicators, frequency and means of measurement, responsibilities and costs. This proposal will include a methodology for participatory monitoring program by the beneficiaries and their social organizations, based on an analysis framed in the Law on Social Control experiences.
- f) Coordinate with the contractual in charge of institutional and fiduciary analysis and to assure that the M&E system is designed to collect and track the key environmental and social impact information to provide effective supervision and evaluation.

Public participation:

- a) The contractual will support in the preparation and implementation of public participation processes, in line with OP-703. These processes are necessary in the context of the environmental and social analysis of the operation and the dissemination of information in a socio-culturally appropriate format for the public process participation; a minimum of one public consultation is required.
- b) Integrate the relevant results of the participation process, including agreements reached on a final version of the Plan of Social and Environmental Management.

Reports / Deliverables

The Contractual shall provide the following products:

- a) **Product # 1.** A Draft report presenting i) Environmental and Social Analysis, ii) Environmental and Social Management Plan (ESMP), and iii) methodology for social and environmental monitoring.
- b) **Product # 2.** Report of the public participation process, which includes inputs for public participation activities necessary to implement in the context of the environmental and social analysis of the operation.
- c) **Product # 3.** A final report presenting final versions of i) Environmental and Social Analysis; ii) Environmental and Social Management Plan (ESMP); iii) methodology of social and environmental monitoring; and iv) account of how the results of public consultations have been incorporated into the final documents.
- d) The documents should be concise and to the point, with no unnecessary information, with the focus on a practical and relevant ESMP that allows for the program to clearly identify those aspects that need to be integrated into the project in the planning, construction and operation phases.

The Bank is required to receive printed copies and two electronic copies (one copy in PDF and other format Microsoft Word, Excel, PowerPoint or other acceptable program by the Bank). In addition, it requests that the electronic copy in PDF format will be consolidated into a single document. Zip files will not be accepted as final reports, due to Records Management Section regulations. All reports must be written in English. All products, reports, data and documents resulting from this consultancy will be property of the IDB. The IDB reserves the right to publish final reports, under its own name on its website or in print, with or without changes to the content of the document presented by the contractual.

Payment Schedule

The payment schedule will be as follows:

- 30% of the total payment after contract signing;
- 30% after submission and approval of Product #s 1 and 2;
- 40% will be paid after the submission and approval of Product #3.

Qualifications

- *Academic Degree / Level & Years of Professional Work Experience:* Master's degree or equivalent and a minimum of 10 years of relevant professional experience, or the equivalent combination of education and experience.
- The Contractual should hold an advanced professional degree in a relevant field such as environmental science, biology, rural sociology, or project planning and preparation. The contractual should have an established track record in environmental and social impact assessments, preferably including projects in the agricultural sector. The candidate should have experience working with investment projects involving management of land and natural resources, preferably with experience in Guyana. Experience working in indigenous communities is essential.
- *Languages:* Ability to read, write and speak Spanish or English.
- *Area of Expertise:* Environmental and social impact assessment in Latin America and the Caribbean, Proven experience working with the Environmental and Social Policies of multilateral development banks.

Characteristics of the Consultancy

- *Consultancy category and modality:* Products and External Services Contractual, Lump Sum
- *Contract duration:* From July to September 2016.
- *Place of work:* The contractual's home base and Guyana (primarily Georgetown and Regions 9 and 10).
- *Travel:* At least two visits to Guyana, each of 8 days. La Paz (Bolivia) – Georgetown (Guyana), two trips. Georgetown (Guyana) – Lethem (Guyana) – Georgetown (Guyana), two trips. Visits to Region 9 and Region 10.
- *Coordinator:* Natural Resources Specialist (CSD/RND), email jmattos@iadb.org and Natural Resources Lead Specialist (RND/CBL), email sibyllen@iadb.org. The MoA will designate the principal technical counterpart for the Contractual who will in turn serve as the liaison between the Contractual and the contacts to be made with public and private institutions and individuals. This will include the Ministry of Environment and the Guyana Environmental Protection Agency. The Contractual will need to interact with other contractuales or staff members during the preparation stage under the guidance of the

IDB task manager. This may include, but will not necessarily be limited to, the provision of detailed cost information to the project economist, cost and specifications to the procurement specialist, any environmental or social impact information to the Bank's environmental and social safeguard specialist and interaction with institutional design specialists regarding the organization and implementation plans for the investments.

Specific inputs will be required at various stages within that period to be set by agreement between the Contractual team Coordinator and the IDB task manager. The Contractual team members will travel to Guyana where their base will be Georgetown with travel to different parts of the country by road as required to complete their respective tasks. The remainder of the assignment will be conducted from the respective contractual's home base, communicating by email and telephone with those required as part of the implementation and coordination of the assignment.

Payment and Conditions: Compensation will be determined in accordance with Bank's policies and procedures. In addition, candidates must be citizens of an IDB member country.

Consanguinity: Pursuant to applicable Bank policy, candidates with relatives (including the fourth degree of consanguinity and the second degree of affinity, including spouse) working for the Bank as staff members or Complementary Workforce contractuels, will not be eligible to provide services for the Bank.

Diversity: The Bank is committed to diversity and inclusion and to providing equal opportunities to all candidates. We embrace diversity on the basis of gender, age, education, national origin, ethnic origin, race, disability, sexual orientation, religion, and HIV/AIDs status. We encourage women, Afro-descendants and persons of indigenous origins to apply.

Annex 2: CONTACT LIST, GUYANA

July 25th – August 2nd 2016

ORGANIZATION	CONTACT NAME	TITLE	EMAIL	PHONE NUMBER
EPA	Dr. Indarjit Ramdass	Executive Director	iramdass@epaguyana.org	592-2252062
EPA	Camille Adams		Caadamsepagy@gmail.com	
EPA	Ronn Sullivan		Sullivanronn@gmail.com	
EPA	Angela Franklin	Senior environmental Officer	Alfranklin-epa@gamil.com	
Ministry of Indigenous Peoples' Affairs	Sherie Samantha Fedee	Deputy Permanent Secretary	psdeputy@indigenouseoples.gov.gy	592-2270279
Ministry of Ameridian Affairs	Sharon Hicks	Management Development Officer	sharon-hicks@hotmail.com	612-7309/225-6645
Ministry of Amerindian Affairs	Jude Da Silva	Programme Coordinator	silvajude@hotmail.com	
Women's Miner's Organization	Quyanna Powers Elliott	Quyannaelliott1@yahoo.com		
WWF	Aiesha Williams	Country Manager	awilliams@wwf.gy	2237801-2
Women's Miner's Organization/Global Sea Food Distribution	Allison Batters-Grant	Chief Executive Director	allisonbattersgrant@gmail.com	917-244-4393
Women's Miner's Organization	Betma Charlie		guyanawomenminers@yahoo.com	
Women's Miner's Organization	Stephanie Miguel		guyanawomenminers@yahoo.com	
Women's Miner's Organization	Urica Primus		guyanawomenminers@yahoo.com	

Women's Miner's Organization	Rosalind Permus			690-6037
Conservation International	David Singh	Executive Director	dsingh@conservation.com	
Conservation International	Dianne Balraj	Environmental Policy Coordinator	dbalraj@conservation.com	227-8171 ext 213
Ministry of Communities	Emil Mc Garell	Permanent Secretary	permsecmc@gmail.com	592- 2256452
Ministry of Communities	Martin Peutab		epmahu@yahoo.com	592- 2256452
Ministry of Communities	Jason Fraser	Housing economist		592- 2256452
UNDP	Ms. Shabnam Mallick	Deputy Resident Representative	Shabnam.mallick@undp.org	225-6962
UNDP	B. Andrea Heath-London	Planning, Monitoring and Evaluation Analyst	andrea.heath-london@undp.org	226-4040 ext. 246
UNDP	Patrick Chesney	Proyecto GSf	Patrick.chesney@undp.org	2250922 ext235
Guyana Livestock Development Authority	Richard Nigel Cumberbatch	Chief Executive Officer	richngcumb@yahoo.com	2206557
Ministry of Agriculture	George Jarvis	Permanent Secretary	ps.moagy@gmail.com	600-2896 (mobile), 227-5527
Ministry of Agriculture	Christopher Ross	M&E specialist	Christopherross007@gmail.com	2262219
Ministry of Agriculture	Jennifer Daziel	Finance Office ASDU	trisiad@yahoo.com	6149493
LETHEM – Saint Ignatius Amerindian Community meeting				

St. Ignatius Village	Yusa Xavier	Toshao ¹		685-3886
St. Ignatius Village	Dennis Benedict	Deputy Toshao		
St. Ignatius Village	Emeril Francis	Conseillor		
St. Ignatius Village	Phillip Buetto	Conseillor		
St. Ignatius Village	Paneta Baretto	Council		
St. Ignatius Village	Roxabe Farias	Council Secretary		
St. Ignatius Village	Eric Williams	Counciller		
St. Ignatius Village	Ramesh	Pastor		678-5129
LETHEM - community meeting				
Conservation International (CI)	Egbert Ralph			683-7399
Community Development Assistance (CIG)	Kayla Epiona	Responsible Livestock Producers	Kayla-epionaQ4@yahoo.ca	
Guyana Rice Development Board (GRDB)	Wilfred McInroy			683-1331
Lethem Hospital	Juanita Williams	Public Health Official		671-7051
Calvert City	Gillian Foo D'Aguiar	Farmer		643-0670/693-2007
Lethem Women's Groups	Ubol McDonald			675-6358
Lethem Women's Groups	Cecilia Williams			673-5567
Farmer	Kasslyn Singh			698-0329
Farmer	Cheddi Glasgow			668-2518
Farmer	Sandra Glasgow			668-2518
Women's Mining	Linda Primus			690-6037

¹ Among one of only 4 women Toshias in the country, out of 90 Toshao men or so

Association				
Women's Mining Association	DeShona Mentis			
Women's Mining Association	Amina Semple			670-0504
Women's Mining Association	Erlene McDonald			685-7912
National Agriculture Research Extension Institute (NAREI)	Joseph Gonzales			643-2413
Farmer	Elroy Young			677-8589
Rupununi Livestock Producers' Association (RLPA)	Kayla de Freitas			668-8562
Rupununi Livestock Producers' Association (RLPA)	Leroy Ignacio			663-8888
Toshao	Walter Henricco			688-8562
Toshao	Cyril Anthony			698-7566
NAREI	Vitus Spencer			682-6973
Guyana Livestock Development Authority (GLDA)	Darren Halley			684-3529
Vice Chairman (RDC Lethem)	Kal Singh			604-1160
Regional Executive Officer	Carl Parker			679-0840
Rupununi Livestock Producers' Association (RLPA)	Rebecca Faria	Vice-chairman	beckyfaria@gmail.com; rupuninilivestock@gmail.com	Cell phone: 592-696-8600

MoA	Dr. Halley	Responsible MOA Region 9	dr.halley@yahoo.com	
MoA	Alvin Khendall	Agriculture office	Khemdall.alvin@gmail.com	
Ebini – Region 10- Wikki/Caicuni community meeting				
MOA	Andrea Kippins	Agricultural engineer	Joylyte75@gmail.com	592 6280533
Calcuni Community	Pearly Hernandez			
Calcuni Community	Amil Wilson			
Calcuni Community	Daniel DeQuoy			
Calcuni Community	Julius Kersler			
Calcuni Community	Cornell Adrians			
Calcuni Community	Natali Johnson			
Calcuni Community	Lovell Lambert			
Calcuni Community	Ken Campbell			
Calcuni Community	Jillian John			
Calcuni Community	Dean John			
Calcuni Community	Esther John			
Calcuni Community	Devennie Gohn			
Calcuni Community	Janess Gohn			
Calcuni Community	Eula France			
Calcuni Community	Patricia Rogers			
Calcuni Community	Juanita Rogers			
Calcuni Community	Solven Goma Johnson			
Calcuni Community	Hector Adrian			
Calcuni Community	Francis John			
Calcuni Community	Maybase Rogers			
Calcuni Community	Nevesha La Rose			
Calcuni Community	Leo William			
Calcuni Community	Destiny Campbell			
Calcuni Community	Rayona La rose			
Calcuni Community	Uton Rogers			

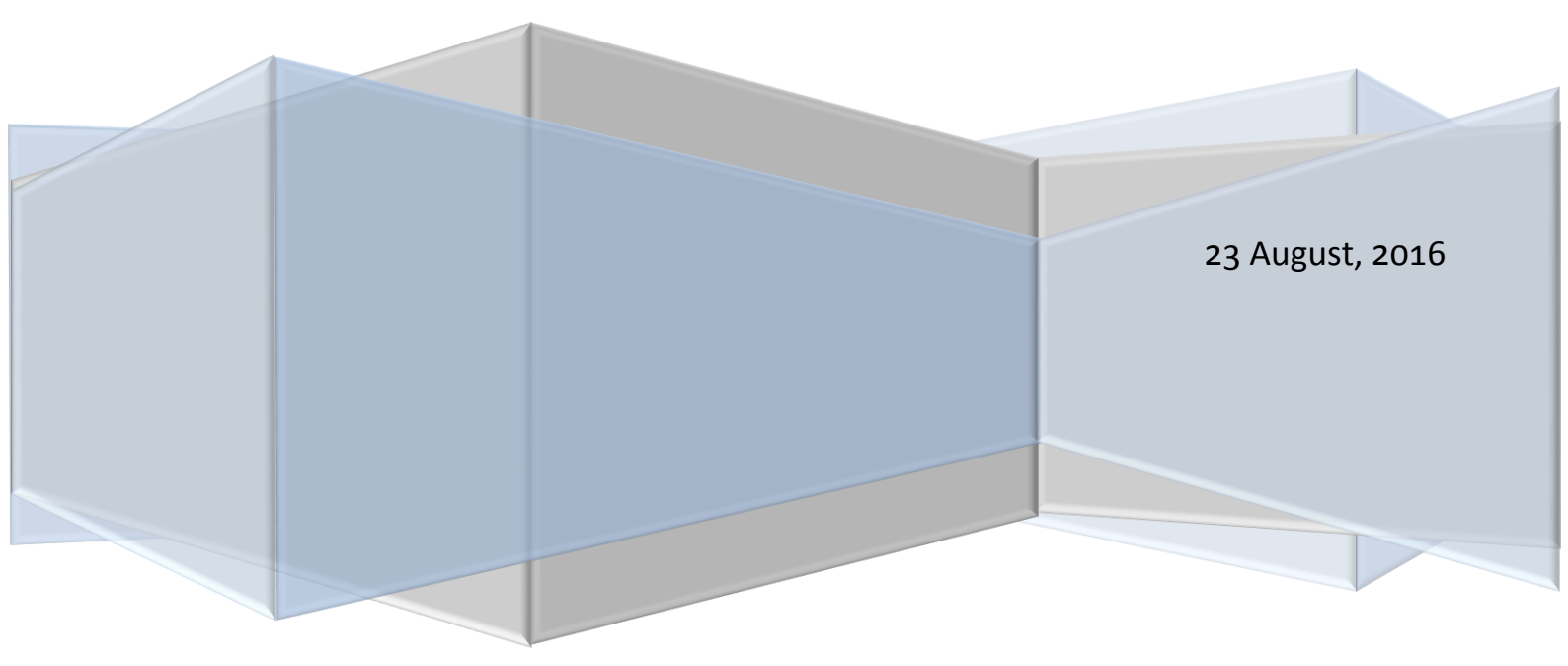
Sustainable Agricultural Development Programme (GY-L-1060)

Strategic, Environmental and Social Assessment

Public Consultation Report

Consultant: Mónica Castro Delgadillo

23 August, 2016



STRATEGIC, ENVIRONMENTAL AND SOCIAL ASSESSMENT

PUBLIC CONSULTATION REPORT

Lethem, Thursday 18 August 2016

1. Background

In the framework of IADB policies, and particularly OP 703 Environment and compliance with safeguards and Guidelines, which indicates in point B6 that all category B programmes or projects must include public consultation, such consultation was realized for the project, with the presence of the actors to be directly affected by the impacts of the project.

The city of Lethem was chosen for realizing the consultation, given that it is the location where most of the infrastructure of the project will be developed.

For this purpose, a presentation was prepared which shows the most important impacts and risks of the project, with their respective mitigation measures.

2. Realization of the consultation



Photo: Public Consultation Lethem

The regional government provided its meeting room for realizing the consultation with the participation of different actors (16 participants) of Region 9, among which were representatives of indigenous communities, farmers, producer associations, etc. (see Annex 1, List of Participants).

The representative of the Ministry of Agriculture presented the scope of the project with its different components.

Following this, the scope of the strategic study on socio-environmental impacts was presented, which identified the main socio-environmental risks and impacts of the project, particularly regarding the project's development of infrastructure (see Annex 2, Presentation).

The presentation focused on:

- The impacts and risks in the abattoir operation phase
- The impacts and risks in the water catchment construction and operation phase
- The impacts and risks in the construction and operation phases of the agricultural centre

The mitigation measures and benefits were presented for each of these.

The potential positive and negative impacts of the entire programme were also presented.

Following this, there was a session for participant concerns, contributions and questions.

3. Stakeholder concerns

In general the participants expressed their satisfaction with the programme, since it is contributing towards resolving problems faced by the region.

The contributions of the participants regarding the abattoir centred on the need for a detailed study on how the farmers will take their livestock to the abattoir: what facilities will be provided for transporting cattle to the abattoir.

Regarding livestock breeding, they mentioned that Lethem was declared free of foot-and-mouth disease, but that this is not the case in nearby Brazil. The participants asked what the government is planning to do in order for Lethem's cattle not to have problems as a result of proximity to the livestock-breeding area of Brazil.

Also mentioned was the fact that livestock-breeding requires many services, among which are veterinary services, vaccines and other inputs which serve to conserve cattle's health. The question was presented whether these elements are also being considered in the programme.

Another aspect mentioned was that of the market: how this will be dealt with and whether analysing the possibility of exporting has also been considered, which would necessitate improving the road between Lethem and Georgetown.

Regarding the producer association, its members mentioned that the association has recently been consolidated and that now, for the first time, women are included in it, with almost half the members being women. They consider it very fitting that the programme provides them with support for managing the abattoir.

Regarding the new location of the abattoir, it was mentioned that it is considered proper, given that there is access to electricity and to the road, which will facilitate the entry of cattle, but that work must be done with the farmers in order that they make use of the service and not slaughter on their own farms.

Also mentioned was the need to train the regional authority, given that this person has a responsibility regarding the proper operation of the abattoir, and that the new location of the abattoir must be taken into consideration when developing the urbanization of Lethem.

In relation to the construction of the water catchment, satisfaction was expressed, since a serious problem for the region is that of access to water during the dry season. The question of whether the reservoir would also be used by the population was made. This matter was explained by the representative of the Ministry of Agriculture, who stated that it is a pilot project and that consideration will be given to how it operates in order to replicate the initiative in the communities.

In relation to the agricultural centres, satisfaction was expressed in having one at Lethem. It was proposed that the courses be hands-on and be held at the farms, and that work be done on pasture management for improving livestock nutrition. The suggestion was made for working on the different fruit trees which exist in the area, which have considerable market potential, as well as working with the different crops identified by the programme.

On the matter of biodiversity, it was stated that the area is one of the richest in Guyana in this regard, making important the mitigation measures of the programme for controlling the use of invasive species, pesticides and herbicides, but also mentioned was the fact that it would be appropriate to consider the impact of endemic species when realizing infrastructure works, and to consider the relationships between agriculture, livestock breeding and biodiversity in the operation of the project.

The question was made whether the project considers incentives for farmers to adapt to the new practices.

The regional government representative mentioned that the institution has, at the regional level, information on the farms, including type and number of cattle, area cultivated, etc., which may serve for the census. This information is used in compensating for the impacts of climate change.

An aspect not considered by the programme, the inclusion of which was recommended, is marketing for the sale of products, given that this is a weakness farmers have for being able to sell their products and increase their income.

Finally, it was explained that the infrastructure to be developed by the project must have the corresponding environmental licence and follow the process stipulated by environmental law in Guyana.

4. Results of the public consultation

The different concerns and recommendations which arose at the consultation regarding socio-environmental matters have been included in the SEA and in the management plan.

Sustainable Agriculture Development Program (GY-L-1060)

Public Consultation - Participant Registration

Lethem, Guyana

Thursday 18 August 2016

Nº	NAME - LAST NAME	OCCUPATION	Institution/ Organization/ Community	MAIL/ Address	SIGNATURE
	Paul Singh	R.V.C	R.V.C. Log #9	Paul.singh@yahoo.com	Paul Singh
	Rodgers King	Agri Centre (the change) DC Keryn.			Rodgers King
	Robert Ralph	Entrepreneur Crop Extension Officer	CI	robert@yahoo.com	Robert Ralph
	Edmond Emmiss	NAREE	NAREE		Edmond Emmiss
	Colfred Mistry	Co-ordinator - GRDS (Lethem) GRDS		colfredmistry@yahoo.com	Colfred Mistry
	Dr Indray Prasad	Child/Adolescent Health		prasadindray@yahoo.com	Dr Indray Prasad
	JOSEPH BENJAMIN	Farmer	NAREE		Joseph Benjamin
	GEORGE HENRY	DRIVER/W.C.C	M.T.C		George Henry
	KARON FORAMKON	General Manager KARON FORAMKON	V.P.H.U	karonforamkon@yahoo.com	Karon Foramkon
	William Joseph		Chambers (R.C.I)	williamjoseph@yahoo.com	William Joseph
	Kerry Ignatius	Team Leader	ALPHA/SECS	shirleykerry@yahoo.com	Kerry Ignatius
	CARLTON STELLER	Mayor Lethem	N.L.T.C Lethem	116 Lethem	Carlton Steller

SUSTAINABLE AGRICULTURE DEVELOPMENT PROGRAM GY-L1060

**Strategic Environment & Social
Analysis
Consultation**



Consultation

The Inter-American Development Bank is financing the Program

The Bank requires an independent Public consultation is carried out with the people who may be affected by the project

The consultation is a “constructive dialogue between the parties”.

Your concerns, fears, and recommendations will be seriously considered and, wherever possible, addressed in the development of the project.

Environment and Social Analysis

Scope

- identify the potential negative social and environmental impacts of the program
- identify the positive potential impacts and opportunities to enhance them
- prepare an Environmental and Social Management Plan
- design a socio-environmental monitoring system;



The presentation
focuses on the
socio
environment
impact of the
new
infrastructure:

The abattoir

The
agricultural
centers

The water
Catchment

ABATTOIR AT LETHEM

SEA

Construction Phase

- Site prone to flooding. The building should be constructed to reduce this potential risk.



Operation Phase

Impact and risk focuses on:

- Animal welfare
- Water demand
- sanitary disposal of waste
- Local capacities to manage the abattoir
- Government capacities to oversee management
- Lack of sufficient legislation



Mitigation Measures

- Abattoir design to reduce animal stress
- efficient use of water and well dedicated to the abattoir
- more efficient use all parts of carcass and incineration or composting waste
- Training for the women's association
- Auditing the abattoir for compliance with the international standards
- Elaboration of legislation

Project benefits

- Benefit for the consumers: availability of meat produced under sanitary conditions
- Benefit for meat producer association: strengthen skills of the women in accounting, technical skills and management
- Benefit for government: improve the sanitary legislation and procedures



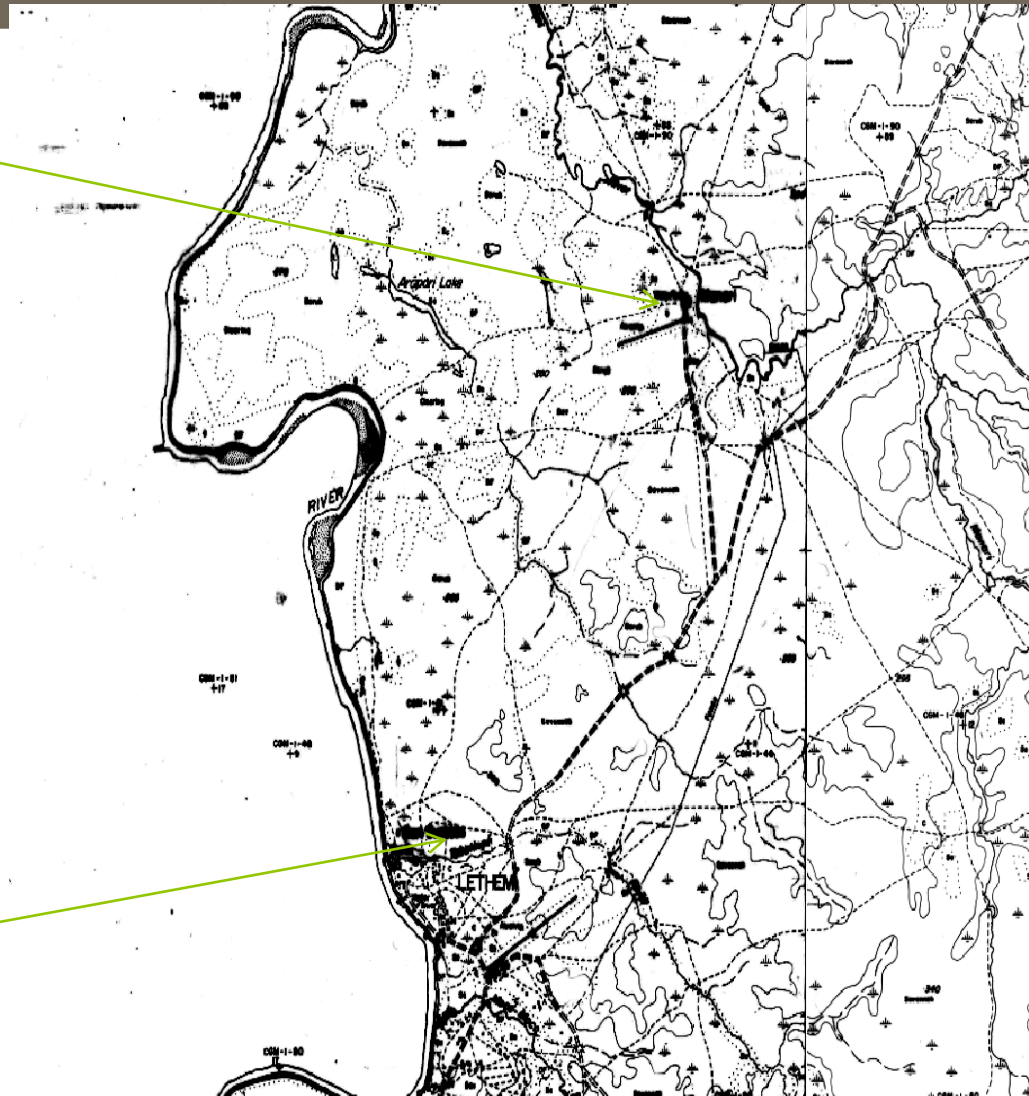
SEA

AGRICULTURE CENTER

Site prone to flooding. The building should be constructed to reduce this potential risk.

Manari

Lethem



Operation Phase

Agricultural centres water and energy use

- **Impact:** Possible high demand in water and energy
- **Mitigation:** Demonstrate sustainability with pilot projects for the renewable energy generation and water management through rainwater collection.

Agriculture extension services

- **Impact:** Potential use of invasive species, excessive use of pesticides / herbicides and intensive water demanding crops
- **Mitigation:** Training to improve sustainable agricultural practices avoiding invasive species and pesticides/herbicides use

Benefit of the project

Benefit for the communities:
improve the agricultural production
for small farmers and help
agricultural management adapt to
climate change

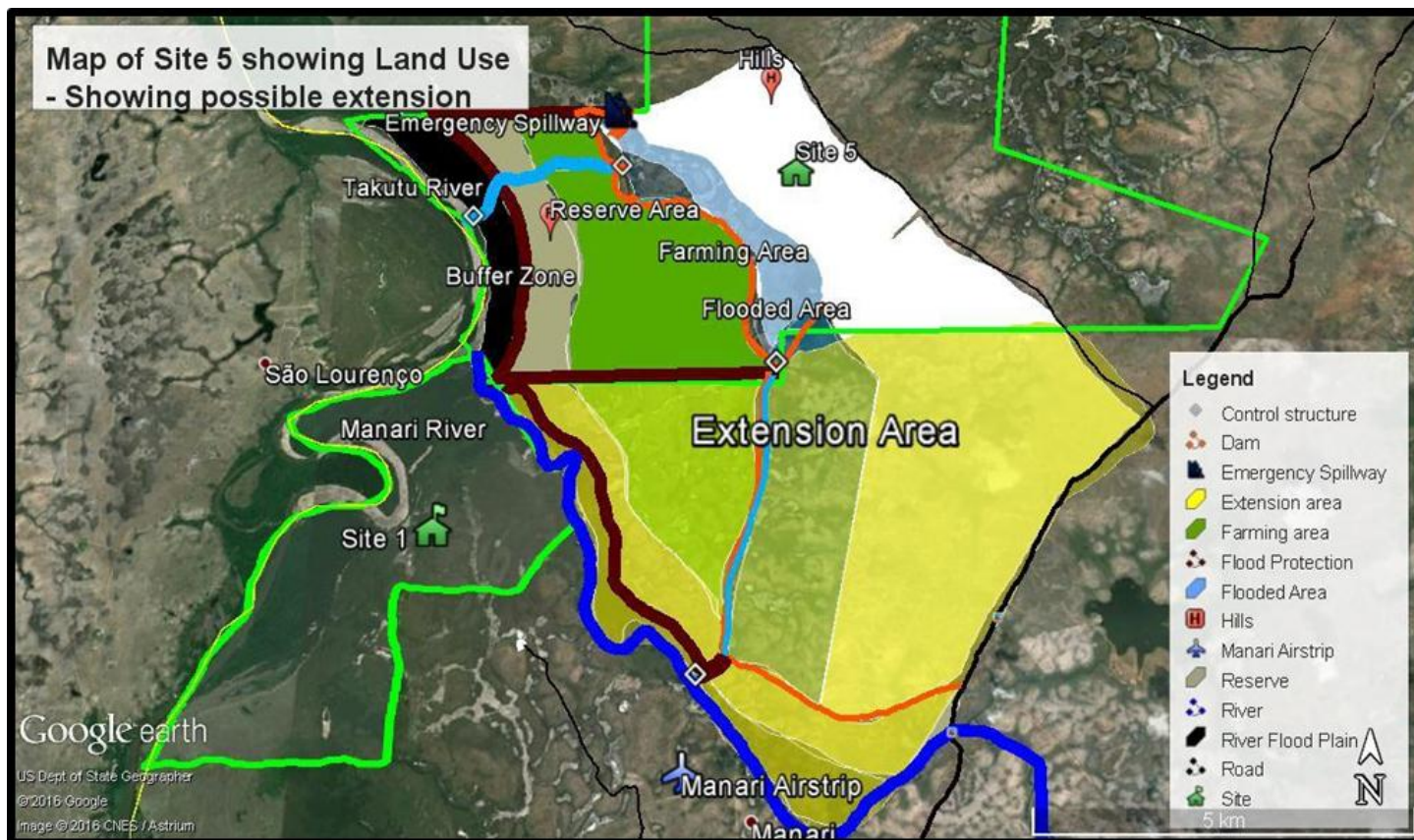


WATER CATCHMENT

SEA

Construction Phase

- Risk: Building of a catchment in flood site (10.500 acres)
- Mitigation: The reservoir should be constructed to withstand flood and drought seasons in the area.



Maintenance of the catchment

Risk

- Catchment may affect the hydrology of the area.
- The quality of the water may change in the catchment

Mitigation

- Studies to understand the hydrology of the area
- Monitoring the water quality

Positive Impact of the Program in agricultural extension

- Develop best practices in agricultural production for small farmers, improving their income.

“the program will directly benefit 900 small farmer and Amerindian households of people involved in agriculture, of which an estimated 450 will be women in Region 9 and 10”.

- Enhanced ability of the agricultural sector to manage and mitigate agricultural risks related to climate change impacts

Positive Impacts of the Program meat production

- Enhanced food security and safety with international standards

General

- The strengthening of farm organizations, producer groups and the development of value chains for products of interest are a positive impact on the lives of local people.



Thank You