



Food and Agriculture
Organization of the
United Nations



ANNUAL REPORT

2022

Mainstreaming Sustainable Land Development and Management (SLDM) Project

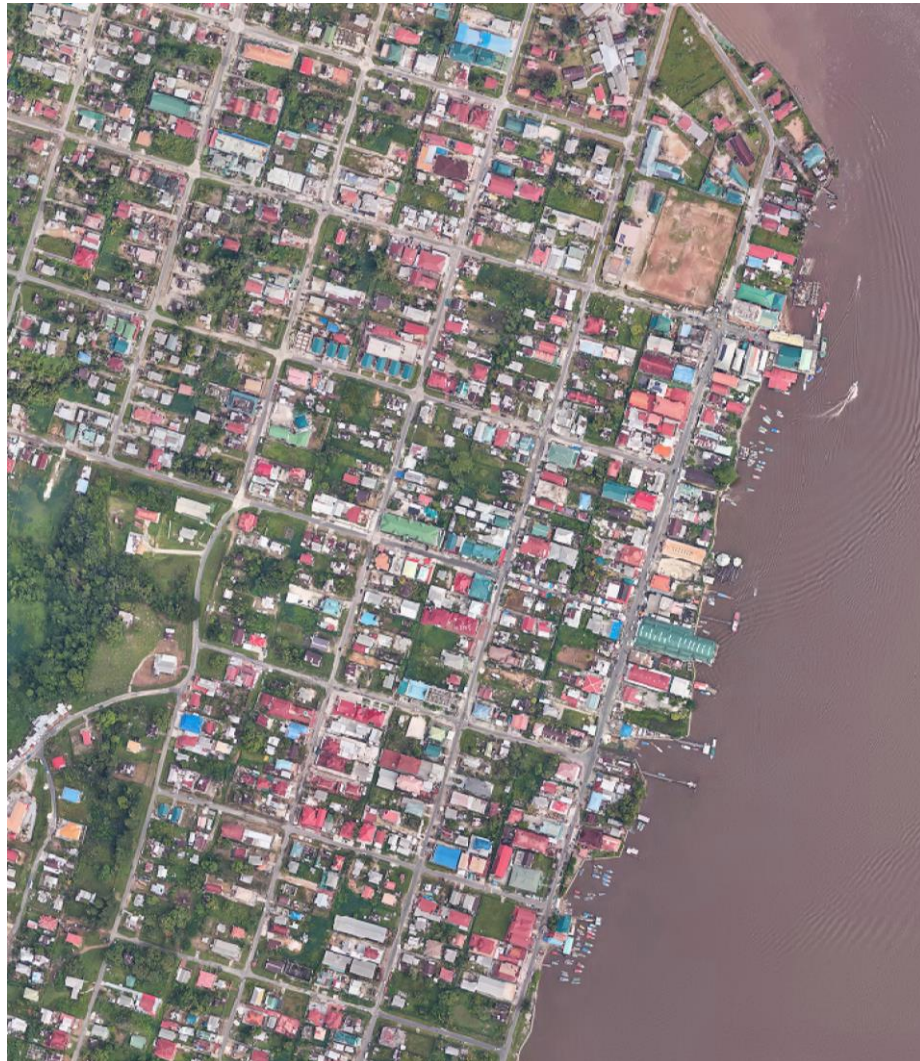


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1. OVERVIEW

The Mainstreaming Sustainable Land Development and Management (SLDM) Project is oriented towards the achievement of three (3) main outcomes:

- **Outcome 1:** - Sustainable Land Development and Management Mainstreamed in Policy, Institutional and Governance Mechanisms to Prevent Degradation and Restore Degraded Lands.
- **Outcome 2:** - Strengthened Institutional and Human Capacity for Participatory and Integrated SLDM.
- **Outcome 3:** - Local Governance Strengthened in 3 Regions for Implementing SLDM.

Additionally, the operations of Project management, Monitoring and Evaluation are achieved under **Outcome 4** – Monitoring and Evaluation Framework and Communication Strategy to ensure that results are delivered in a timely manner and experiences shared.

Guyana's Context – The Project's implementation strategy addresses key issues that affect Sustainable Land Management in Guyana, including:

- **Increased demand for land and need for strengthening of capacities of the GLSC in key technical areas:** The expansion of land-based investment over the years and housing/urbanisation in the coastal plain, in addition to the recent influence from the oil-related sector, have increased the demand for land.
- **Fragmented Governance:** The multiple institutions dealing with land create various issues. These include legal gaps, overlapping of acts and mandates and the lack of comprehensive legal and monitoring frameworks with a shared vision as well as duplication of information such as maps and address database.

2. PROJECT PROFILE

Country	Guyana	
Project Symbol	GCP /GUY/003/GRI	
Project Title	Mainstreaming Sustainable Land Development and Management	
Resource Partner	Guyana Redd Investment Fund (GRIF)	
Reporting Period	January to December 2022	
Actual EOD	11th April 2018	
Actual NTE	30th June 2023	
Budget Holder (name)	Dr. Gillian Smith	
Lead Technical Officer (name)	Mr. Vladimir Evtimov	
National Project Coordinator	Andrea Mahammad	
Chief Technical Advisor (name)	Mr. Javier Prieto	
Participating Organizations	The Guyana Lands and Surveys Commission (GLSC)	
Implementing Partners (List):		
Name	Type (NGO/CBO/Gov.)	Total Funds Transferred
The Food and Agriculture Organization of the United Nations (FAO) Guyana Representation	Intergovernmental	USD 300,000 In kind
Guyana REDD+ Investment Fund (GRIF)	Governmental	USD 14,792,277
Contribution to Programmatic Framework		
Organizational Outcome(s)	SO2 (Making agriculture, fisheries and forestry more sustainable and productive) and contribute to SO5	

	(Increase the resilience of livelihoods to threats and crises) and SO1 (Help eliminate food insecurity and malnutrition).
Regional Priorities / Regional Initiative(s)	R13 Sustainable use of natural resources, adaptation to climate change and disaster risk management
UNDAF Outcome(s) (or those from an equivalent UN common country programme document) if applicable	N/A
CPF Output(s)	Outcome 2: Sustainable management and use of natural resources, climate change & resilience of livelihoods to disasters: Output 2.1 National capacities strengthened for sustainable management and use of natural resources. Output 2.2. National governance frameworks that foster sustainable NRM strengthened; and Outcome 3: Agriculture, forestry, fisheries, hinterland and rural development. Output 3.2 Capacity building provided to improve crop, livestock, forestry and fisheries production and productivity and their uptake facilitated as well as the promotion of integrated farming systems.

3. FINANCIAL DATA

Budget:	USD 14,792,277
Expenditure* (Actual + Committed):	USD 9,441,531
Delivery:	63.9%

**as at 31st December 2022*

4. TECHNICAL PROGRESS STATUS

Outcome 1:	100%
Outcome 2:	51%
Outcome 3:	22%
Outcome 4:	80%

5. OVERVIEW OF IMPLEMENTATION PROGRESS FOR 2022

In 2022, the SLDM project has been able to maintain its momentum and progress well in its implementation, moving ever closer to the overall project objectives, which are closely aligned to the Government of Guyana’s strategic direction and the Low Carbon Development Strategy (LCDS).

The strong, collaborative partnership with the national counterparts, has allowed multiple complex packages of work to be rolled out simultaneously, and despite challenges faced, all outputs under each of the three technical Project Outcomes have either been completed or are currently under implementation. In 2022, the project has been able to complete:

- i. Over 40% of Flight execution for LIDAR data capture for the updating of Guyana’s Base-maps.
- ii. The improvement of GLSC’s surveying capabilities, networking infrastructure, data use and management and field activity mobility through procurement.
- iii. The strengthening of land management and administration services being offered by GLSC through several capacity building programmes.
- iv. The acceleration of digital processing of lease applications in Guyana through the upgrading of the Land Information System and development of a Spatial Data Infrastructure application and which is specifically tailored for the Guyana Lands and Surveys Commission.
- v. The compilation of a geospatial database, with over thirty-five (35) layers of graphical information and imagery, in a common reference framework, using existing institutional, GLSC software capacities and skills in ArcGIS.
- vi. Land degradation diagnostics assessments in two target regions and recommendations on suitable intervention options available for implementation.

In recognition of the limited time remaining for implementation (project NTE is June 2023), the Project Management Unit (PMU) through GLSC was requested to undertake a Critical Path Analysis (CPA), to determine the time and resources required to successfully complete implementation of the ongoing project actions. It was found that there are certain project

actions that are still in the initial stages and would need additional time beyond the current project end date of June 2023 for successful completion. For instance, certain key outputs, under the SLM work to be carried out in the target regions is still pending a round of consultations, decision-making and most significantly the implementation of the land interventions. The major contracts under the project have now been signed, except for 1 out of 4 of the lots for the Construction and Renovation of regional offices, which will require a re-design and retender if it is to be carried out. Another key project output is the Base Map of Guyana using LIDAR technology, which has so far completed the data collection phase for the urban areas but the data collection for the rural areas as well as data processing is yet to be completed. All these key outputs also include a capacity building aspect to ensure their sustainability.

The PMU has also concluded that the project does not require additional funds to support this extension, since the remaining project funds are sufficient to cover all costs.

A more in-depth description of the project status is provided in the sections below.

6. ACHIEVEMENTS AND ONGOING WORK IN 2022

Outcome 1: Sustainable Land Development and Management (SLDM) Mainstreamed in Policy, Institutional and Governance Mechanisms to Prevent Degradation and Restore Degraded Lands (100% completed)

Under this outcome, the Guyana Lands and Surveys Commission (GLSC) has enhanced policy development at National Level under GLSC mandate, and strengthened the institutional collaboration across land related sectors, levels, and agencies by facilitating the harmonization of the geospatial data and the interoperability. It has supported the development and mainstreaming of national strategies and frameworks on sustainable land management in alignment with the LCDS.

Implementation Status and Key Achievements

Outputs	Status	
Output: 1	National Land Use Policy Paper	100%
Output: 2	Strategic and Business Plan for GLSC	100%
Output: 3	National Spatial Data Infrastructure (NSDI) Action Plan Developed	100%

All outputs and activities under Outcome 1 have now been fully completed. While, the three main deliverables mentioned above, were completed prior to 2022, their implementation is ongoing, led by the Government of Guyana and the GLSC:

- a) *The Draft National Land Use Policy Paper* is being incorporated into the National Land Use Policy that is currently being developed by the Ministry of Legal Affairs through the Office of the President.
- b) *The Strategic and Business Plan* is being utilized by GLSC in achieving financial sustainability and its support of national and socio-economic development through the NSDI Action Plan developed. Under the S&B Plan, the project is also supporting and implementing capacity building and Sustainable Land Management.
- c) *The National Spatial Data Infrastructure (NSDI) Action Plan* was completed and validated and is being implemented by the GLSC. The NSDI helps to standardize data and assures its quality, avoid duplication of efforts, and optimize resources. It also

helps the interoperability with other agencies and other existing data in the country. The foundation of studies completed by the SLDM Project, and knowledge and exposure received facilitates and promotes further support of the National Policy on Geographic Information. Further, the National Topographic Base mapping is being updated with Light Detection and Ranging (LIDAR); a complimentary, ongoing output of the SLDM project.

Outcome 2: Strengthened Institutional and Human Capacity for Participatory and Integrated Sustainable Land Development and Management (54%)

This outcome focuses on strengthening physical technical and human capacities development within the GLSC. It focuses on all areas of sustainable land management (SLM) including planning, land information system, geodesy, cadastre development, and land governance for SLDM and reclamation required to meet national and international commitments. Additionally, it will increase capabilities in integrated geospatial information systems and tenure governance.

Implementation Status and Key Achievements

Outputs	Status
Output: 1 Improving Land Administration and GIS Services	38%
Output: 2 Improving Infrastructural Capacity of GLSC (Construction and renovation to expand its services in Regions 1, 6 and 7)	25%
Output: 3 Improving Technical Capacity of GLSC (Procurement)	76%
Output: 4 Strengthened Human Capacities in Land Governance, Tenure and SLM	78%
Output: 5 Updating Base maps in Guyana using Light Detection and Ranging (LIDAR)	20%
Output: 6 Improving Geodetic Network and its Continuously Operating Reference Stations (CORS) *	15%

The main achievements and ongoing actions under this outcome in 2022 are detailed by outputs:

A. Land Administration and GIS Services Improved

To accelerate the digital processing of lease applications, GLSC is upgrading its land information system to an integrated workflow with an enhanced internal spatial database infrastructure to integrate spatial and non-spatial lease and other land

tenure records, to create a tenure security system. Under this consultancy, the University of Twente has developed the following products:

- | | | |
|--|--------------------|----------------------|
| i. Next Generation Lease Management System/ Tenure Security | LEASE REGISTRATION | LAND RENT MANAGEMENT |
| | MAPPING | REPORTING |
| ii. Spatial Data Infrastructure application | LANDUSE PLANNING | MAINTENANCE |
| iii. Application for the transformation of cadastral plans scans | LEGAL | |
| iv. Standard Operating Procedures (SOPs) developed for upgraded lease application processes, tasks and roles | | |

Following the completion of a gap analysis, work is ongoing on analyzing legacy data and the first version of the GLSC Spatial Data Infrastructure architecture has been developed and tested to create a tenure security system. Data migration plans are now being made for financial data and land parcels with GIS datasets that have all administrative boundaries already created and ready for geo-referencing. This is being done also under LADM, Land Administration Domain Model with ISO 19152. The Land Administration Domain Model (LADM) aligns the data model standards into a global vocabulary for land administration, data interoperability to be shared and incorporated from other sources.

As an international standard, it inspires land administration systems that support sustainability and societal drivers such as poverty eradication, gender equality, acknowledging indigenous peoples, adequate housing, sustainable agriculture, food security, addressing climate change, and good governance. It is therefore well suited to incorporate GLSC spatial data into an improved Next Generation Lease Management System (NGLMS), including land parcel, surveying data, geometry and topology, and land tenure and with its updated design, a tenure security system.

The partnership with the University of Twente is building the human capacity and knowledge transfer through a hands-on learning method and close supervision of essential elements for the long-term growth and development of GLSC. Integrated teams have transitioned through data gap analysis, data curation, data migration and data integrity. Key among the work with the UoT has been the quality controls and good practices in information management and tracking of versions and metadata availability. Additionally, procedures and protocols for data digitization and quality are also being addressed.

B. Infrastructural Capacity of the GLSC Improved

In order to satisfy the constantly growing demand for decentralized land administration services, the challenges of permanence, and greater effectiveness of GLSC's operations, the project will conduct Construction and Rehabilitation Works of GLSC regional offices in Mabaruma and Port Kaituma–Region 1, Black Bush Polder–Region 6, and Bartica–Region 7.

For the four new regional office buildings and accommodation spaces as well as one rehabilitation of a regional office, the design architect has produced the building site designs, design specifications, scope of works, and appraisal of existing structures and spaces, and engineers' estimates. Three contracts were awarded and signed in Dec 2023, while the fourth one (Lot 2: Port Kaituma) may need to be re-designed and re-tendered due to high variance. The re-bid of specific external items from the other three construction areas that were excluded from the three contracts signed will also be considered. The supervision contract was also awarded and signed in December 2022.



GROUND FLOOR PLAN
ISOMETRIC 3D VIEW



FIRST FLOOR PLAN
ISOMETRIC 3D VIEW

PRELIMINARY DESIGN
GLSC – MABARUMA REGIONAL OFFICE

C. Physical and Technical Capacity Improved



The project has continued to undertake procurement of equipment and software to improve GLSC's surveying capabilities, networking infrastructure, data use, and management, field activity mobility and build internal

capacities to utilize new and emerging technologies.



(i) Equipment and materials

Materials, equipment, and related services were procured in 2022 including:

- 3 Double Cab Pickups
- CORSNet Hardware & Software(8 GNSS Receivers & CORs Network Software; 8 Routers & Assorted Antenna Cables)
- Network Equipment (1 Network production and 1 replication server , three 2U Rack Mounted Servers, 8 Network Switches)
- 1 Soil Testing Equipment
- 2 Projectors
- Land Surveying Equipment (18 GNSS Receivers, 2 Surveying Smart Stations, 2 Automatic Total Stations, 1 Robotic & 10 Manual Total Stations, 16 Liquid Prismatic Compasses; 2 Precise Levels)
- GTI Survey Equipment (2 Total Stations; Single Prism with Optical, Plummet and Four 5-meter Aluminum Prism Poles, Ranging Rods Automatic Level Kits, with Tripod, Level & Staff 2 Aluminum Boats & 2 Outboard Engines and Assorted Boat Accessories)
- Additional Desktop Computers (130 Word & 30 Data Processing)
- Additional Survey Equipment (12 Survey tapes, 2 steel band tapes, etc.)
- 2 Tablets for Drones & 2 Overhead Book Scanners



- 6 External Signs for GLSC Head and regional offices (Mabaruma, Bartica, Port Kaituma, Black Bush Polder)

(ii) Ongoing procurement actions

The following are in process:

- Servers and other IT equipment
- CORNet Hardware & Software
- CORNet power supply

D. Strengthened Human Capacities

The following are the main capacity building programmes that have been undertaken in 2022:

(i) Land Valuation Diploma Programme at the University of Guyana.

Under the land Valuation Diploma Programme at the University of Guyana, twenty-eight (28) staff were trained in various areas of land valuation, land uses and characteristics. The Valuation Programme was concluded in June-July 2022.

(ii) Land Administration and Management Programme

The SLDM project is financing the second iteration of the Diploma in Land Administration Program at the University of Guyana. Eighteen (18) Staff from GLSC and other land-related agencies have benefited from the knowledge and technical skills to improve work performance in land administration and management. The eighteen-month programme commenced in March 2022. The improved knowledge base will support the institutional transformations of these critical land agencies in Guyana.

(iii) Monitoring environment and use of the System for Earth observation, data Processing, and Analysis for Land Monitoring (SEPAL)

The capacity building provided supports GLSC with tools, skills and knowledge to produce the reporting on land degradation with more accurate information and would help Guyana in the monitoring of its environment and to identify land degradation

trends and restore lands in line with its responsibilities as the National Focal Point to report to the UNCCD.

Several training sessions were held between January 24 to March 3, 2022, on the IT tool developed by FAO under the SEPAL platform. SEPAL is a cloud computing and satellite image-processing platform that provides high spatial and temporal resolution information which for our purposes can be used to monitor the environment and track land degradation. The training also included the practical use of Google Earth Engine, Quantum GIS, Google Earth Pro, and FileZilla Client.

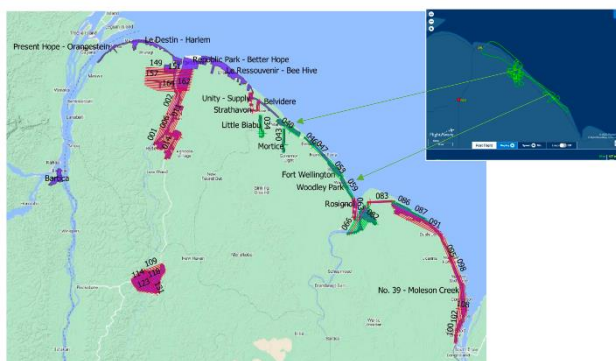
Twenty-five (25) staff from GLSC and seventeen (17) staff from eight (8) agencies including the Guyana Geology and Mines Commission, the National Agricultural Research and Extension Institute, the Ministries of Amerindian Affairs, Natural Resources, and Agriculture, the Guyana Forestry Commission, Department of Environment and Climate Change and the Central Housing and Planning Authority were included.

(iv) Sentinel Multispectral Imagery Training; Identification, Downloading & Processing and National Geospatial Database Training

In December 2022, the Geospatial Database was transferred to the GLSC server and released for broader access and use within GLSC. In parallel, training sessions were conducted with key staff of GLSC that relate to the direct background of this more technical data processing work using Sentinel Multispectral Imagery Processing.

E. Base maps Updated in Guyana using Light Detection and Ranging (LIDAR)

The LIDAR mapping is being undertaken in regions: 3, 4, 5, 6, 8, 9, and 10. The resulting data from the exercise—terrain, aerial imagery, and extracted features, will become national base map and a key product for many other agencies and projects such as hydrographic, housing, environmental, agriculture and forestry etc. They will have

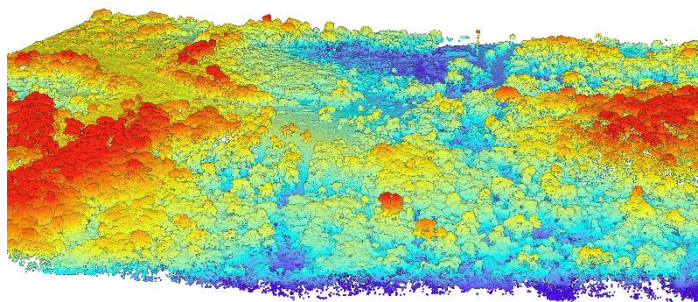


precise inventory of specific physical evidence for their needs related to planning, zoning, elevation etc. The project covers 545 km² of the urbanized area (nearly all of Guyana's urban buildings footprint) and another 15,736 km² of rural area.

A contract was signed in July 2022 for the provision of the airborne topographic LIDAR data mapping and images of the territory plus capacity-building services for the GLSC on this latest mapping technology. In October 2022, the supplier, Medici Land Governance (MLG), crew aircraft and equipment arrived in Guyana and commenced data capture. The following has been completed as of Dec 2022:



- Ground Control Survey that supported the Lidar data collected. All survey activity was performed to achieve ground control accuracies that meet or exceed the project requirements.
- Flight execution for a total of 40% of the total data to be captured. The main focus was the urban areas where high density of data was required (10 ppm).
- Initial data processing. Urban areas that were fully captured went to the post



processing stage. This will allow for delivery of vector maps containing Infrastructure, 3D building models, water features and building footprints. Orthophoto

imagery for the completed areas is also being delivered.

MLG will also support GLSC by increasing their capacity on LIDAR technology and data processing. This training will introduce LIDAR technology to GIS Analysts and other relevant technical practitioners working for the GLSC, with a focus on concepts, applications, and implementation. LIDAR is a powerful and complicated technology that requires solid capacity in geography, applied mathematics, computer science, and survey science. Trainees will be capable of recognizing potential LIDAR applications, effectively performing basic tasks required by the GLSC, and mastering more advanced elements over time.

The updating of base-maps will allow GLSC to provide a better service to the citizens of Guyana in terms of urban and rural planning, management of agricultural land, management of natural resources, conservation and others.

F. Geodetic Network and its Continuously Operating Reference Systems (CORS) Improved

The re-operationalization of the CORS Network is a key project deliverable that will incorporate the following aspects:

- Densification, expansion, operationalization and maintenance of Guyana CORS Network.
- Capacity building on the use of CORS Network by new and experienced Surveyors and other stakeholders, inclusive of role in developing a national integrated geospatial information framework.
- Development and testing the processes and procedures to support the transformation of historical cadastral data into data of GLSC's LADM-inspired database.
- Development and testing of the processes and procedures to support a fully digital office-field-office cadastral surveys in support of the creation of cadastral parcels by GLSC surveyors and private sector surveyors taking full advantage of the CORS Network.

The contract with the Service Provider, Ordnance Survey International was signed in December 2022 for Phase 1 of the CORSNet and is expected to run from December 2022 to end of April 2023. The improvement of the Geodetic Network and its CORS will allow any survey done in Guyana or mapping exercise (including the one under this project with LIDAR) to be in same coordinate system and geographically positioned and all mapping exercises from any agency will have the same positioning (coordinates), therefore allowing the coordination of mapping in the same coordinate system.

The service provider is expected to supervise the densification of CORS and support horizontal and vertical controls for increased accuracy in surveying operations. Additionally, Cadastral Development would entail processes and procedures to support the transformation of historical cadastral data into data of GLSC meeting the Land Administration Domain Model (LADM) to be adopted and the new Guyana centric coordinate system. This would strengthen the office to field to office procedures to collect control information to support a higher accuracy transformation and transformation of CAD data to geospatial data. Training for the maintenance of CORS, geodetic transformation and cadastre is also considered for the strengthening of the sustainability of the systems to be developed and operationalized.

Outcome 3: Local Governance Strengthened in 3 Regions for Implementing SLDM (22%)

This outcome focuses on Sustainable Land Management in the targeted regions with emphasis on strengthening and knowledge improvement. It will enhance regional insight and capacity in the status of land degradation, improved land management and land restoration options.

This outcome is being implemented with an international specialist who was appointed in August of 2022 to lead this aspect of the project, with support from a short-term specialist. The three main outputs of this outcome are included in the table below.



Implementation Status and Key Achievements

Outputs		Status
Output: 1	Development of central data repository to improve the understanding of land status and trends	25%
Output: 2	Pilots for intervention in regions 4, 7 and 10, covering old and new farmlands, areas with degraded lands from mining and deforestation.	5%
Output: 3	Development of national level mapping for Land Cover and Land Use	25%

The main achievements and ongoing actions under this outcome in 2022 are detailed by outputs:

A. Development of Central Data Repository

The geospatial database compilation is well advanced, with over thirty-five (35) layers of graphical information and imagery, in a common reference framework, using existing institutional, GLSC software capacities and skills in ArcGIS, for insightful overview and planning of SLM project activities. The database will allow exploration of “resource base conditions”, of any area under consideration or review, particularly the

SLDM pilot areas, for which prior to any field mission a fieldwork plan needs to be drawn up.

B. Pilots for SLM intervention in target regions

Over 2022, SLM work at different technical levels and involving distinctly different aspects of land and land degradation were initiated. It hereby opened up a multi-scaled set of processes and a broader set of stakeholders, represented by different government agencies, inclusive of GLSC.

Land degradation diagnostics have been conducted in the two target regions using the SEPAL platform, identifying land cover changes. This was complemented with the soil analysis and field work and the assessments were completed and recommendations developed for intervention.

The improvement of sustainable land management practices under Outcome 3 of the project will contribute towards Guyana's achievement of Land Degradation Neutrality (LDN) Targets in its agreement with UNCCD as well as its monitoring of the environment aligned to the LCDS as monitoring of land, particularly forests is critical since they are the world's largest carbon sink and contribute significantly to reduced CO2 emission.

C. National level mapping for Land Cover and Land Use

Training has been provided with relevant staff of GLSC and GFC to produce 2020-2021 Land Cover Classification maps. Land cover and land use products on a national scale are being prepared. Degradation indicators were assessed from imagery analysis for land use change in target Regions 4 (Timehri to Yarowkabra), 7 (Puruni) and 10 (Intermediate Savannas), while land productivity and soil organic carbon assessment methods are currently being put in place. Remedial recovery options will be outlined and evaluated against the local context information of the cases arising from target regions. This will be led by the SLM specialist who is currently on the ground, with the participation of different stakeholders. Scaling relationships may be drawn to similar areas across the country.

Outcome 4: Project Management Structures and Mechanisms Including M&E Framework Strengthened

Main Expected Results

This outcome will ensure effective Project management and monitoring. It also supports work planning and budget allocations for efficient implementation and communication among partners and key stakeholders.

Key Achievements

Main Output: Project staff hired as well as specialists and firms to achieve project objectives. Management structures in place, for effective partnerships, stakeholder engagement, communications, procurement and monitoring and evaluation.

a) Recruitment of Consultants and Firms

- A long-term Sustainable Land Management Specialist was hired in 2022 to provide technical advice and coordinate the on-the-ground implementation of land reclamation/restoration in order to enable Sustainable Land Management. This is being done in collaboration with national stakeholders including GGMC, GFC and NAREI to ensure that the SLDM project applies an integrated approach.
- Ordnance Survey International Services Limited was hired in 2022 under the SLDM Project to provide cadastral and continuously operating reference stations (CORS) Network optimization services and capacity building of the Guyana Lands and Surveys Commission.
- A LIDAR Mapping Supplier, MLG, was contracted in 2022 to deliver airborne topographic LIDAR data mapping and images that will be utilized in the updating of Guyana's base-maps. Additionally, a Consultant to monitor, supervise, and oversee the SLDM Project's LIDAR mapping exercise and capacity building activities, was recruited. The Specialist provides technical guidance to the project team and the beneficiary, GLSC, to enable the successful delivery of MLG's LiDAR mapping and capacity building activities.

b) Project Management Unit

The Project Steering Committee (PSC) meeting was held in September 15th 2022, in GLSC, allowing the guidance and recommendations from the different agencies with institutional mandates, responsibilities and interests in promoting sustainable land management. The close involvement of the PSC agencies is needed now more than ever as the SLM land assessment and interventions work in target regions are being rolled out.

Guyana has adopted a UN Assistance Framework, which is the strategic planning framework designed jointly for a better coordination and harmonization of their activities in the country.

The current implementation modality joint PMU formed by FAO and GLSC serve to meet the objective of Outcome 4, which is related to improving management capacity. The project is implemented under GLSC direction and FAO will be responsible for the provision, with due diligence and efficiency and to disburse the funds received from the Resource Partner in accordance with its regulations, rules and policies.

c) Monitoring and Evaluation

M&E mechanisms have been developed to allow for Monthly – Quarterly and Annual Reporting. Progress on Project indicators are updated periodically into the Results Framework and shared with the PMU to inform corrective actions and work planning. Additionally, periodic reports are shared with the GGGI for their feedback and recommendations and for reporting to GRIF.

d) Critical Path Analysis

The Project Management Unit (PMU) through GLSC was asked to undertake a Critical Path Analysis (CPA) of the SLDM project implementation, to determine the time and resources required to complete the project actions. It was found that there are certain project actions that would need additional time beyond the current project end date of June 2023 for successful completion. The PMU has also concluded that the project does not require additional funds to support this extension, since the remaining project funds are sufficient to cover all costs and all that is needed is a redistribution of the funds across the budget lines to better cater for the remaining activities. If the project is not extended, there is need to commence management closure and evaluation activities by April 2023. Due to the above-mentioned factors, it has been concluded that to achieve the objectives, the project needs a 12-month extension with a new end date of June 2024.

7. RISKS, CHALLENGES AND MITIGATION MEASURES

1. Overload of the current PMU

Execution of project management operations was focus on primarily technical and administrative activities. Management functions such as coordination, finance, operations and communication and stakeholder engagement were insufficient. Going forward, the PMU will be provided this support either through the recruitment of the respective officers or FAO backstopping.

2. Taxing workload of GLSC

The GLSC is facing rapidly increasing demands for leases, resulting in an expansion of its staff's workload. To mitigate further output delays, several additional skilled human resources are recommended to support the work of the project:

- Project Manager specialised in Sustainability/ Business Models
- Geospatial SLM Short-term Specialist (Support Outcome 3)
- Land Admin GIS Specialist (supporting UoT)
- 2 IT developers

3. Timely completion of the LIDAR mapping exercise is dependent on good weather conditions

It has been observed that mapping of the rural areas could not have been completed in Nov – Dec 2022 due to adverse weather conditions. The service provider is scheduled to return in February 2023 to complete the data capture exercise. This will delay the data processing and validation/quality control and delivery to August 2023 and final submission of deliverables by Dec 2023, in a worse-case scenario.

4. Delays to Construction timeline due to re-design and retendering among other factors (supplies, labour, weather etc.)

Taking into consideration, the possible negative impacts of the remoteness of locations of some of the sites, the weather conditions, high demand on construction materials, as such, the latest expected and more realistic completion time for completion of three lots signed would be December 2023.

Additionally, the Port Kaituma lot will require redesigning and retendering due to the high variance of engineer's estimate and the bidders' price. The re-tender process can only be done after the extension is approved and works may only be completed by April 2024.

5. Insufficiently coordinated management and customer service at GLSC

Findings are that the divisions of GLSC still operate to some extent in silos and without adequate customer service delivery and management. This is a significant risk to the sustainability of the actions being implemented and GLSC's operations. The recommendation, which has been incorporated into the critical path, is that the project support management workshops/seminars to improve the level of collaboration and increases the efficiency of its services to customers and improve Institutional strengthening.

6. Delay in the implementation of geodetic network (CORS) component

The current CORS contract for Phase 1, is expected to run from December 2022 to end of April 2023 (CORS Network Support and Cadastral Development). The project target also includes Geodesy, Stakeholder engagement, Business strategy and return on investment, Capacity building and knowledge transfer. Implementation of this second phase of work would require until March 2024.

7. Delay in the completion of SLM Intervention in Target Regions

The assessment of the third and final target site has been scheduled to early 2023. However, the most important and time-consuming elements of this outcome are the decision making (multi-stakeholder platform) and land interventions/reclamation on those degraded lands in 3 target sites. Considering that land interventions demand extraordinary efforts and considering weather conditions, complexity of the administrative and procurement actions or agreements to be finalized with service providers, it is anticipated that this Output will be completed in June 2024.

8. BUDGET STATUS

Overview of Budget delivery status: As at the 31st of December 2022, **USD 9,441,531** was expended; this represents approx. 63.86% of the project budget of USD 14,792,277. Of the expenditure, approx. 34% represents committed funds for activities such as the procurement of equipment, Densification of the CORS Network and Lidar Mapping Services. The available budget for the remaining implementation period is USD 5,305,746.

For more details, see **Annex: 1 Budget Monitoring Report Extract as at 31st December 2022**

Line Items	Expenditure
Human Resources	1,570,679
Contracts	3,449,926
Travel and Training	667,428
Procurement	2,778,983
General Operating Expenses	356,845
Direct Cost	617,670
Grand Total	9,441,531