

## CONSULTANCY 1.1: CAPACITY BUILDING ON EARTH OBSERVATION DATA ANALYSIS FOR ENVIRONMENTAL POLICING

### TERMS OF REFERENCE

#### 1. Background and Justification

- 1.1** Almost 95% of the Republic of Suriname is covered by rainforest, earning it the informal title of greenest country on earth. However, the country's deforestation rate is among the highest globally and expected to exceed 0.5% by 2025<sup>1</sup>. The increasing rate of forest coverage is due in large part to the illicit outflows of natural resources through activities such as illegal logging and informal gold mining using labor-intensive, low-technology techniques called Artisanal and small-scale goldmining (ASM). For example, ASM has become a major source of income for Surinamese particularly in the remote hinterland regions of the country, but a major element of the practice involves mercury that, when left unrecovered, leads to the salinisation of rivers and creeks, impacting not only the environment but also the health of nearby communities<sup>2</sup>. Additionally, these communities are vulnerable to social harms related to ASM such as the extensive networks of organised crime elements who facilitate ASM illegally through trafficking in persons for sexual slavery; forced labor; migrant smuggling; and money laundering<sup>3</sup>.
- 1.2** Over the past five years, the Government of Suriname initiated a series of reforms to regularise ASM and minimise its harmful socio-environmental impacts. Reform activities under the Ministry of Natural Resources (MNR) such as the Gold + project of the United Nations Development Programme seek to detect where illicit activities occur, map the supply chain for illegal gold to international markets and identify the concomitant financial flows towards reducing the appeal and profitability of illicit trafficking of state resources. However, recent evaluations of these initiatives commonly cite the inadequacy of baseline geospatial data - a critical tool in environmental policing<sup>4</sup>. Earth observation (EO) data and information, which include satellite, airborne, land and marine-based data can provide real-time insights to inform decisions on how and where environmental management assets can be deployed. Earth observation data systems are also cost-effective, with multiple country case studies illustrating contributions to national economies<sup>5</sup>.
- 1.3** Utilising earth observation data for environmental policing in Suriname is constrained by the multiplicity of state actors who maintain geospatial databases within a suboptimal governance framework. A 2017 Integrated Geospatial Information Framework Summary

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<sup>1</sup> <https://surinameredd.org/en/reddplus-suriname/>

<sup>2</sup> Ottenbros, I. B., Boerleider, R. Z., Jubitana, B., Roeleveld, N., & Scheepers, P. T. J. (2019). Knowledge and awareness of health effects related to the use of mercury in artisanal and small-scale gold mining in Suriname. *Environment international*, 122, 142-150.

<sup>3</sup> Wagner, L., & Hunter, M. (2020). Links Between Artisanal and Small-Scale Gold Mining and Organized Crime in Latin America and Africa. In *Illegal Mining* (pp. 77-104). Palgrave Macmillan, Cham.

<sup>4</sup> Purdy, R. (2010). Using earth observation technologies for better regulatory compliance and enforcement of environmental laws. *Journal of Environmental Law*, 22(1), 59-87.

<sup>5</sup> [Unlocking Data for A Better, Greener, Safer Future.](#)

Assessment, conducted by the Management Institute for Land Registration and Land Information System (MI-GLIS)<sup>6</sup>, found that no policies or systems exist to facilitate coordination in geospatial data collection or analysis. MI-GLIS to compile existing geospatial data sources launched a national geospatial online repository in 2019 but without clear guidelines and systems for updating the information, the repository is under-utilised and increasingly outdated<sup>7</sup>.

- 1.4 In May 2021, the Ministry of Defense (MoD) requested the Bank's support in strengthening the state's surveillance capacity mitigation of illegal economic activities on land and in the waters of Suriname by strengthening the government's surveillance capabilities using digital solutions and services. In servicing this request, the MoD and IDB convened critical stakeholders on geospatial data for a series of consultations to discuss the governance framework. The agencies represented throughout these consultations include MI-GLIS, MNR, the General Bureau of Statistics, and the Ministry of Spatial Planning and the Environment (ROM).
- 1.5 Arising from the series of consultations with government stakeholders, capacity building in geospatial data analysis was highlighted as a second constraining factor to effective environmental policing. The value of an improved supply of geospatial information would be diminished given the lack of technical capacity among personnel in stakeholder agencies to use the data to guide policy and operational responses. Through support from the Islamic Development Bank Institute (IsDBI), the Government of Suriname is now receiving support from the Global Partnership for Sustainable Development Data (GPSDD) to train government personnel on using earth observation data and methodologies for environmental monitoring. Building on this initiative to develop a pilot for these trained personnel to apply their knowledge in a multi-agency surveilling exercise of illegal gold mining and its socioenvironmental impact was therefore proposed as an important demonstration of enhanced national surveillance capabilities for environmental policing.

## **2. Objectives**

- 2.1. The general objective of the consultancy is to support a pilot exercise to ensure the transfer of data analysis skills for earth observation data towards improving environmental policing outcomes. The pilot exercise will culminate a series of customised training sessions to approximately 30 technical personnel across government agencies in Suriname with geospatial analysis capacities and responsibilities. This capacity building exercise will result in the application of more advanced geospatial analysis methodologies and production of a use case report detailing good practices in the collaborative monitoring of ASM in Suriname using geospatial data applications.

## **3. Scope of Services**

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<sup>6</sup> <https://miglis.sr/wp-content/uploads/2018/12/4.-Assessment.pdf>

<sup>7</sup> [www.miglis.sr/spatialcatalog](http://www.miglis.sr/spatialcatalog)

Category and Modality of Consulting: Contractual of External Products and Services, Lump Sum - PEC

Duration of the Contract: Six (6) calendar months counted from the contract signature date.

Place(s) of work: External consultancy

Travel: The consulting firm is expected to make at least one trip to Suriname of a maximum of 8 days in duration.

#### **4. Key Activities**

**4.1.** The selected firm must undertake the following activities:

- a) Develop an implementation strategy and workplan including a summary of planned consultations and details on the proposed methodology and approach for delivering the training course and subsequent pilot exercise.
- b) Collaborate with relevant local stakeholders in completing a baseline analysis of the policy and legal framework for environmental monitoring, describing current institutional capacities and training needs for geospatial analysis as well as stakeholder expectations of opportunities for capacity development in the next three (3) years. The baseline analysis should also examine the funding structure based on current and future funding needs.
- c) Deliver in-person training in earth observation data analysis at an intermediate level for at least thirty (30) civil servants from various government agencies, as evidenced by a post-training report that communicates details on the training process; empirically measures the capacity development by training participants; reports evaluative feedback from participants on the training experience; and provides copies of training materials.
- d) Support the training participants in the collaborative development and execution of a pilot exercise to undertake earth observation data analysis for ASM monitoring. While the support for each group of officers from the participating agencies will vary as it relates to their institutional capacities and responsibilities, the need to accommodate dialogue with and feedback from officers within other government agencies must be prioritised in producing the final use cases.
- e) Produce a final report on the collaborative pilot exercise based on the firm's expert analysis and stakeholder feedback. The report should also include recommendations on subsequent capacity development activities with details on costs and accessibility included.
- f) Presentation of final report to relevant stakeholders.

#### **5. Expected Outcome and Deliverables**

The consulting firm must submit the following reports for review and approval by the IDB Supervisor:

1. Implementation strategy and work plan that includes details on the methodology to be used and the activities to be carried out.
2. Situational analysis with recommendations on capacity development needs.
3. Post-training report on earth observation data analysis training experience and outcomes.
4. Final report and presentation on pilot exercise and recommendations for further capacity development.

## **6. Project Schedule and Milestones**

- 6.1.** The consulting firm will be free to propose their specific working methods and schedules in their submission. However, the consulting firm should anticipate a combination of milestone and routine reporting in the conduct of the consultancy and submission of deliverables. The proposed project schedule for submitting deliverables under this consultancy is as follows:

<b>Project Deliverable Schedule</b>		
<b>No.</b>	<b>Description of Deliverable</b>	<b>Timeline</b>
1	Implementation Strategy and Work Plan	Within four (4) weeks of contract signing
2	Situational analysis	By the end of ten (10) weeks
3	Post-training report	By the end of sixteen (16) weeks
4	Final report and presentation	By the end of twenty-two (22) weeks

## **7. Reporting Requirements**

- 7.1.** The performance of all tasks will require a review and synthesis of information gathered from primary and secondary sources. The consulting firm will proactively seek feedback on the proposed measures through detailed discussions with government personnel and their clients. All information submitted by the consulting firm must be accompanied by information regarding its source, always privileging official sources of information. The experience of the contractual party will not be sufficient justification for the inclusion of prescriptive assessments on the quality of the regulations and /or institutions. Reports will be delivered in an editable electronic file for review and validation in English and Dutch.

## **8. Acceptance Criteria**

- 8.1.** The first deliverable of a work plan should provide an accurate description of the methodology which shall be used by the consulting firm to reach all the objectives of this consultancy.
- 8.2.** The second deliverable should be in accordance with the approved work plan and contain a concrete overview of the current situational analysis.

- 8.3. The third deliverable should reflect integrated solutions that advance upon the current situational analysis.
- 8.4. The fourth deliverable shall contain strategic information and clear roadmap containing the different steps needed for sustainable capacity development.
- 8.5. All deliverables will be reviewed and approved by the IDB.

## 9. Other Requirements

- 9.1. The selected firm must retain key personnel inclusive of a technician and /or professional specialising in geospatial analysis and digital cartography with more than 10 years of experience related to the management and/or regulation of government geospatial analysis systems. Candidates with experience in organisational management or environmental monitoring will be preferred. Professional experience in Suriname and/or projects financed by the IDB is also desirable.
- 9.2. In accordance with applicable Bank policy, candidates with relatives (including fourth degree of consanguinity and second degree of affinity, including conjugate) who work for the Bank as an officer or contractual of the complementary contractual force, will not be eligible to provide services to the Bank.
- 9.3. The Bank is committed to diversity and inclusion and equal opportunities for all candidates. We embrace diversity based on gender, age, education, national origin, ethnicity, race, disability, sexual orientation, religion, and HIV/AIDS status. We encourage women, Afro-descendants and people of indigenous origin to apply.

## 10. Supervision and Reporting

- 10.1. The Consulting Firm will report directly to the IDB Public Management Sector Specialist serving as Technical Lead for the Technical Cooperation Agreement or his designate.

## 11. Schedule of Payments

- 11.1. Compensation will be determined in accordance with the Bank's policies and procedures.

<b>Payment Schedule</b>	
<b><i>Deliverable</i></b>	
1. Submission and approval of the implementation strategy and work plan	20%
2. Submission and approval of the report of the current situation for geospatial data analysis	20%
3. Submission and approval of the post-training report	30%
4. Submission and approval of the final report and presentation on the pilot exercise	30%
<b>TOTAL</b>	<b>100%</b>

## **CONSULTANCY 2.1: FEASIBILITY ANALYSIS OF AN ENVIRONMENTAL SURVEILLANCE SYSTEM**

### **TERMS OF REFERENCE**

#### **1. Background and Justification**

- 1.1** Almost 95% of the Republic of Suriname is covered by rainforest, earning it the informal title of greenest country on earth. However, the country's deforestation rate is among the highest globally and expected to exceed 0.5% by 2025. The increasing rate of forest coverage is due in large part to the illicit outflows of natural resources through activities such as illegal logging and informal gold mining using labor-intensive, low-technology techniques called Artisanal and small-scale goldmining (ASM). For example, ASM has become a major source of income for Surinamese particularly in the remote hinterland regions of the country but a major element of the practice involves mercury that, when left unrecovered, leads to the salinisation of rivers and creeks, impacting not only the environment but also the health of nearby communities. Additionally, these communities are vulnerable to social harms related to ASM such as the extensive networks of organised crime elements who facilitate ASM illegally through trafficking in persons for sexual slavery; forced labor; migrant smuggling; and money laundering.
- 1.2** Over the past five years, the Government of Suriname initiated a series of reforms to regularise ASM and minimise its harmful socio-environmental impacts. Reform activities under the Ministry of Natural Resources (MNR) such as the Gold + project of the United Nations Development Programme seek to detect where illicit activities occur, map the supply chain for illegal gold to international markets and identify the concomitant financial flows towards reducing the appeal and profitability of illicit trafficking of state resources. However, recent evaluations of these initiatives commonly cite the inadequacy of baseline geospatial data - a critical tool in environmental policing. Earth observation (EO) data and information, which include satellite, airborne, land and marine-based data can provide real-time insights to inform decisions on how and where environmental management assets can be deployed. Earth observation data systems are also cost-effective, with multiple country case studies illustrating significant contributions to national economies.
- 1.3** Utilising earth observation data for environmental policing in Suriname is constrained by the multiplicity of state actors who maintain geospatial databases within a suboptimal governance framework. A 2017 Integrated Geospatial Information Framework Summary Assessment, conducted by the Management Institute for Land Registration and Land Information System (MI-GLIS), found that no policies or systems exist to facilitate coordination in geospatial data collection or analysis. MI-GLIS to compile existing geospatial data sources launched a national geospatial online repository in 2019 but without clear guidelines and systems for updating the information, the repository is under-utilised and increasingly outdated.
- 1.4** In May 2021, the Ministry of Defense (MoD) requested the Bank's support in strengthening the state's surveillance capacity mitigation of illegal economic activities on land and in the waters of Suriname by strengthening the government's surveillance capabilities using digital

solutions and services. In servicing this request, the MoD and IDB convened critical stakeholders on geospatial data for a series of consultations to discuss the governance framework. The agencies represented throughout these consultations include MI-GLIS, MNR, the General Bureau of Statistics, and the Ministry of Spatial Planning and the Environment (ROM). These agencies reached consensus that a modern, centralised environmental surveillance system must be devised to consolidate national geospatial data management. Owing to previous efforts at data management coordination being less than successful, coupled with the keen interest to use digital solutions that are novel to the context, it is prudent to gauge the viability of such a system within the current regulatory framework.

## **2. Objectives**

- 2.1.** The objective of this consultancy to assess the feasibility of existing law enforcement capacities and governance arrangements for developing a comprehensive environmental surveillance system housed on a digital platform. At a minimum, this activity will involve (i) conduct of a requirement's analysis examining legislative, institutional and technological factors; (ii) design of a costed roadmap for creating the most feasible centralised monitoring system based on the right technological solutions; and (iii) facilitation of fora for stakeholders to share perspectives and receive information on the proposed system in an open and credible manner.

## **3. Scope of Services**

Category and Modality of Consulting: Contractual of External Products and Services, Lump Sum - PEC

Duration of the Contract: Six (6) calendar months from the contract signature date.

Place(s) of work: External consultancy

Travel: The firm is expected to make at least three trips for a total of 10 mission days, including travel days.

## **4. Key Activities**

- 4.1.** The selected firm must undertake the following activities:

- a) Identify dependencies among relevant systems that support data sharing between entities;
- b) Conduct penetration testing and report on those results with appropriate recommendations;
- c) Provide a baseline security assessment and report on the vulnerabilities identified in the computer systems, networks, IoT devices, and security tools being utilised;
- d) Develop technical and operational requirements to achieve strategic goals;
- e) Design and propose an implementation strategy for installing a surveillance management system for environmental resources;
- f) Generate a comprehensive procurement plan for achieving the business objectives;

- g) Recommend appropriate measures for providing good governance in environmental surveillance and compliance with industry standards and best practices; and
- h) Recommend a preventative maintenance strategy for protection of investment.

## **5. Expected Outcome and Deliverables**

**5.1.** The consulting firm must submit the following reports for validation by the IDB Supervisor:

- a. Work Plan and Methodology that includes and describes in detail the methodology to be used and the activities to be carried out.
- b. Baseline security assessment with recommendations on next steps.
- c. Concept design for surveillance management system that includes recommended features for building a customised, interoperable data exchange ecosystem for environmental monitoring.
- d. Strategic document on the roadmap for implementation of environmental surveillance system.

## **6. Project Schedule and Milestones**

**6.1.** The consulting firm will be free to propose their specific working methods and schedules in their submission. However, the consulting firm should anticipate a combination of milestone and routine reporting in the conduct of the consultancy and submission of deliverables. The proposed project schedule for submitting deliverables under this consultancy is as follows:

<b>Project Deliverable Schedule</b>		
<b>No.</b>	<b>Description of Deliverable</b>	<b>Timeline</b>
1	Work Plan and Methodology	Within four (4) weeks of contract signing
2	Baseline security assessment	By the end of ten (10) weeks
3	Concept Design for surveillance management system	By the end of sixteen (16) weeks
4	Strategic document on implementation roadmap	By the end of twenty-two (22) weeks

## **7. Reporting Requirements**

**7.1.** The performance of all tasks will require a review and synthesis of information gathered from primary and secondary sources. The consulting firm will proactively seek feedback on the proposed measures through detailed discussions with government personnel and their clients. All information submitted by the consulting firm must be accompanied by information



regarding its source, always privileging official sources of information. The experience of the contractual party will not be sufficient justification for the inclusion of prescriptive assessments on the quality of the regulations and /or institutions. Reports will be delivered in an editable electronic file for review and validation in English and Dutch.

## **8. Acceptance Criteria**

- 8.1. The first deliverable of a work plan should provide an accurate description of the methodology which shall be used by the consulting firm to reach all the objectives of this consultancy.
- 8.2. The second deliverable should be in accordance with the approved work plan and contain a concrete overview of the current situational analysis.
- 8.3. The third deliverable should include a clear governance structure as well as the different steps necessary in order to reach a full interoperability solution.
- 8.4. The fourth deliverable shall contain cost estimates, procurement plans and timelines for implementing the surveillance management system.

## **9. Other Requirements**

- 9.1. The selected firm must retain key personnel with a tertiary level educational qualification in the area of environmental sciences; certified in Penetration Testing, and/or Certified ICT risk and vulnerability assessment; and no less than 5 years' experience in the field of network and system security. History of implementation of similar projects; knowledge of the latest international methodologies and standards; ISO 27001 certified or other related international certification; Conversance with the NIST Cybersecurity Framework and professional experience in Suriname and/or projects financed by the IDB is also desirable.
- 9.2. In accordance with applicable Bank policy, candidates with relatives (including fourth degree of consanguinity and second degree of affinity, including conjugate) who work for the Bank as an officer or contractual of the complementary contractual force, will not be eligible to provide services to the Bank. The Bank is committed to diversity and inclusion and equal opportunities for all candidates.
- 9.3. We embrace diversity based on gender, age, education, national origin, ethnicity, race, disability, sexual orientation, religion, and HIV/AIDS status. We encourage women, Afro-descendants and people of indigenous origin to apply.

## **10. Supervision and Reporting**

- 10.1. The Consulting Firm will report directly to the IDB Public Management Sector Specialist serving as Technical Lead for the Technical Cooperation Agreement or his designate.

## **11. Schedule of Payments**

- 11.1. Compensation will be determined in accordance with the Bank's policies and procedures.

<b>Payment Schedule</b>	
<b>Deliverable</b>	
1. Work Plan and Methodology	20%
2. Baseline security assessment	20%
3. Concept Design for surveillance management system	30%
4. Strategic document on implementation roadmap	30%
TOTAL	100%