

# AI-Powered Environmental and Social Impact Assessment Platforms of the World Bank



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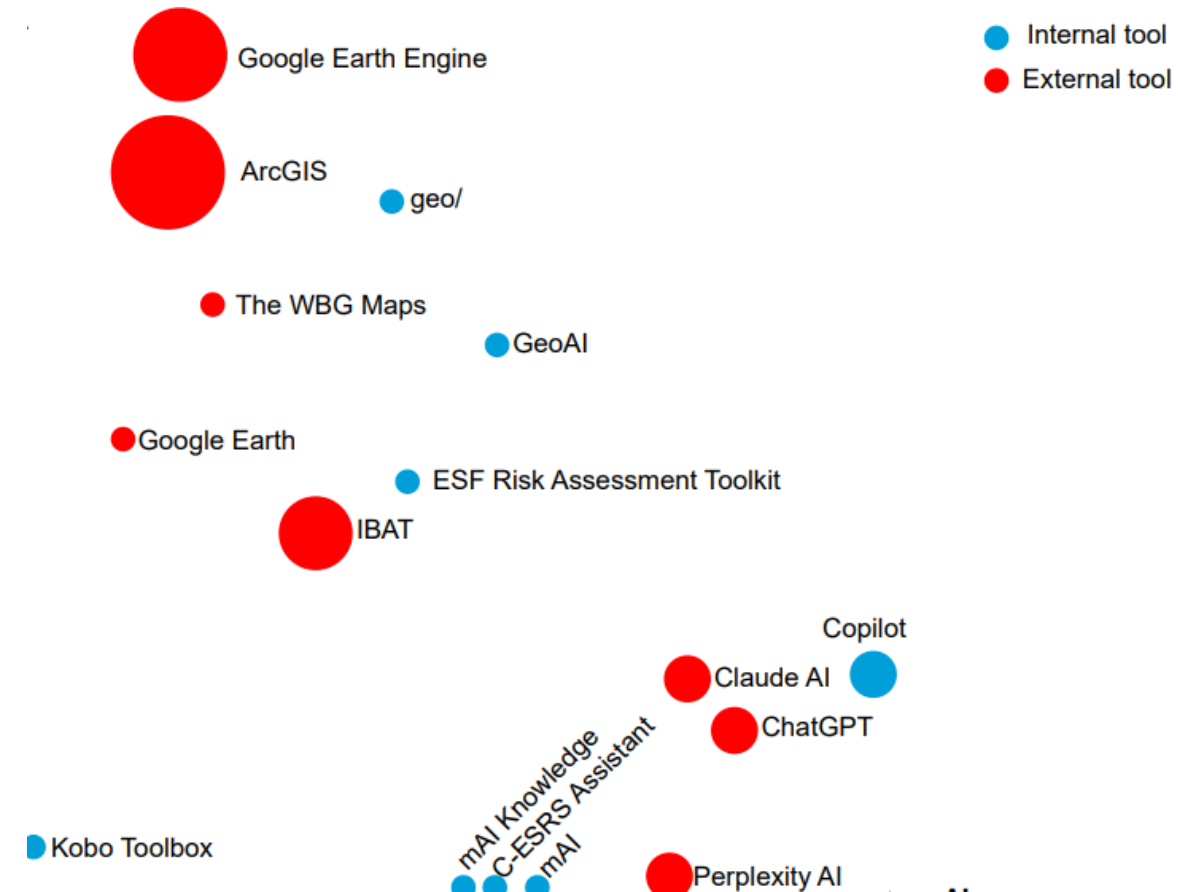
# Intro of The World Bank Tech-for-ESF Initiative

“How can we use existing technology to increase the efficiency of design and implementation of the ESF?”

- **Tech-for-ESF (Technology for ESF) program** was launched at the WB Environment Global Department to provide support to E&S Specialists in the field by:
  - (1) streamlining the **adoptable existing technologies**
  - (2) sharing **good practices cross-regionally**
  - (3) **Developing & piloting the emerging tech** that can be useful for ESF in a practical way
- Tech-for-ESF rolled out the WB project “Integrating AI-GPT Technology to ESF”, and started to upgrade and streamline AI applications for ESIA

# Existing Technologies that can be used for ESIA & Safeguards

- a. Drones (UAVs)
- b. On-the-Ground Survey Tool (e.g., Kobo Toolbox)
- c. Remote sensing (Satellite Images)
- d. AI Applications
- e. GIS & Geospatial Toolkit
- f. Biodiversity Data and Analytics (IBAT, etc.)
- g. Digital GRM (Grievance Redress Mechanism)
- h. Impact assessment database/applications
- i. ... and more



What sort of technology do you use in your field for your project? (e.g., drones, satellite imagery, IBAT, AI, etc.)

Open text poll 28 responses 25 participants

- |                                 |  |
|---------------------------------|--|
| Anonymous<br>Chat got           | Anonymous<br>ChatGPT                     |
| Anonymous<br>Not much. Maps     | Anonymous<br>Satellite imagery           |
| Anonymous<br>AI, RS images      | Anonymous<br>ARCGis Geoesf               |
| Anonymous<br>IBAT, ESF Tool kit | Anonymous<br>IBAT                        |
| Anonymous<br>Satellite          | Anonymous<br>Ibat                        |
| Anonymous<br>GeolFC             | Anonymous<br>AI, satellite imagery, dat  |
| Anonymous<br>Drones, IBAT       | Anonymous<br>Satellite imagery           |
| Anonymous<br>Imagery            | Anonymous<br>Google Earth                |
| Anonymous<br>Telephone.         | Anonymous<br>All of these - also in-situ |
|                                 | Anonymous<br>IBAT, GEMS                  |
|                                 | Anonymous<br>AI                          |

## Survey Results from the WBG AI Tech for ESF Forum – June 2024

### 28 responses:

- 1) 30% - AI
- 2) 21% - Satellite Imagery
- 2) 21% - IBAT (Integrated Biodiversity Assessment Tool)
- 3) 18% - GIS, Google Earth, ArcGIS, Maps
- 4) 7% - Drones
- 5) 1% - KoboToolbox
- 6) ...



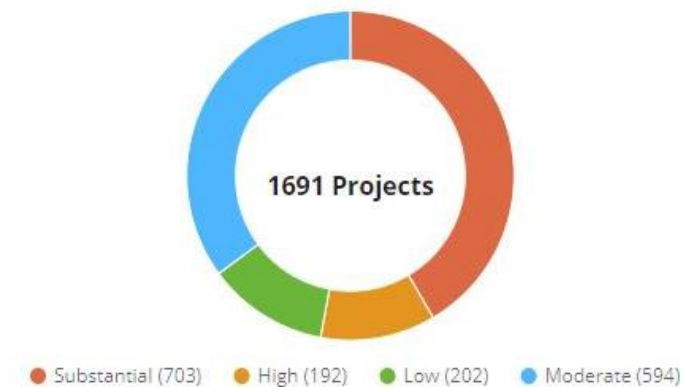
# World Bank is developing enterprise-approved versions of ChatGPT and other AI tools

- WB is partnering with Microsoft, OpenAI and Google to develop secure, enterprise-grade generative AI tools with **built-in safeguards for staff and institutional interests**.



## → Quickly bringing AI to be a practical tool to support our ESF/Safeguards work

- **What is ESF (Environmental and Social Framework) of the World Bank?**
  1. The ESF is a set of guidelines with **10 E&S Standards** developed by the World Bank to ensure the sustainability of development outcomes to support Borrowers' projects
  2. **ESF applies to all Investment Policy Financing (IPF) projects** initiated after October 1, 2018.
- **Some of the issues in the ESF context:**
  - ✓ Difficult to get the right information at the right time, and also from the hundreds of pages of E&S documents.



Source: WB [ESMS](#)

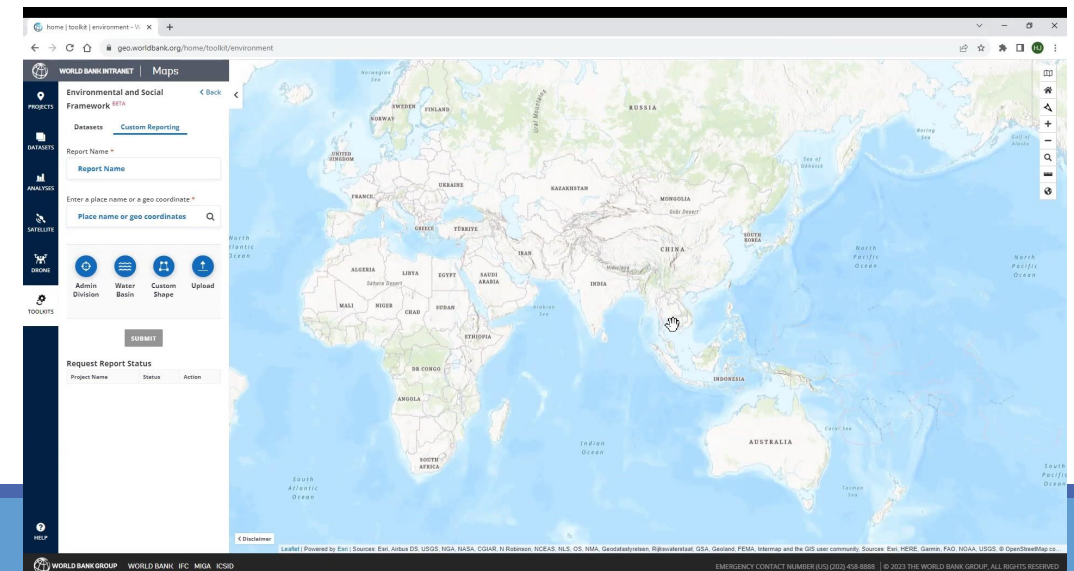
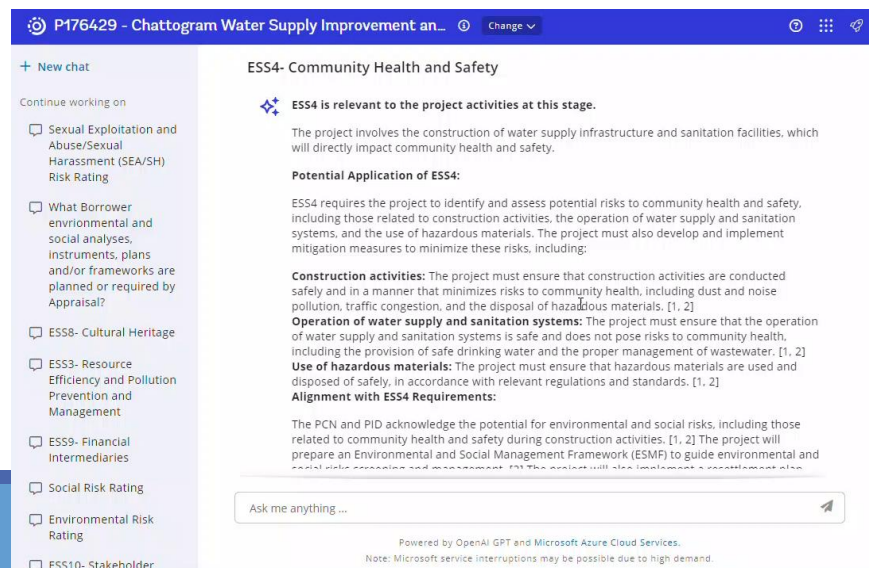
# World Bank AI applications for ESF

## 1. C-ESRS AI Assistant: Leverage AI to generate a draft Concept ESRS template

- ❑ **Output:** Automatically populated draft content for each section of the Concept ESRS (Environmental and Social Review Summary), drawing from internal World Bank data repositories and any uploaded documents.
- ❑ **Pilot:** Rolled out pilots to more than 35+ WB E&S Specialists in 2025

## 2. Geospatial ESF Risk Assessment Toolkit: Leverage AI to assess potential E&S risks and perform quick screening using 190+ public geospatial data layers and internal World Bank datasets

- ❑ **Output:** Interactive web-based report with ESS-specific summaries, geospatial data, graphs, and maps for the project area.
- ❑ **Pilot:** Rolled out pilots to more than 25+ WB Project teams in 2023-2024



**Concept ESRS preparation** is a detailed process that can take several weeks, depending on project complexity, data availability, and stakeholder engagement needs, etc.

**Current method includes:**

1. Reviewing core project documents (e.g., PCN: Project Concept Note)
2. Referring to country- or sector-specific sources
3. Manually searching for relevant studies and data
4. Relying on personal and peer knowledge of local context
5. Using technical tools for ESS-specific analysis
6. Engaging with clients and project teams (incl. TTL)






The screenshot shows a Microsoft Word document titled "Concept ESRS - F179727 - Clouds - FID.docx". The document is a template for a "Concept Environmental and Social Review Summary" at the "Concept Stage (ESRS Concept Stage)". It is generated with Claude AI and uploaded as document F179727 PID.

The document is divided into two main sections:

- A. Basic Project Data**: This section contains a table with the following columns: Country, Region, Project ID, and Parent Project ID (if any). Below this table is a section for "Project Name" and "Practice Area (if any)".
- B. Is the project being prepared in a Situation of Urgent Need of Assistance or Capacity Constraints, as per Bank IF Policy para. 3.17?**: This section contains a table with the following columns: Financing Instrument, Estimated Approval Date, Estimated Board Date, and Total Project Cost. Below this table is a section for "Proposed Development Objective".

At the bottom of the document, there is a section for "Summary Description of Proposed Project Activities" with a note: "(Description imported from the Concept Data Sheet in the Portal providing information about the key aspects and components/sub-components of the project)".


**C-ESRS AI Assistant** World Bank developed this AI LLM-powered tool that **leverages the World Bank’s knowledge repository to automate and generate draft content for each section of the C-ESRS for review and refinement by E&S Specialists**—improving efficiency and reducing preparation time.

 P176429 - Chattogram Water Supply Improvement an...  [Change](#)   

[Home](#) / [C-ESRS Assistant](#) [ESRS Assistant Help](#)

## Concept ESRS

Generate content for specific sections of the C-ESRS document with this AI.

 As with any AI, results may be inaccurate or misleading. Please explore responsibly and apply judgment before incorporating into your work.

### Select a section to get started

**Environmental Risk Rating**  
  
Environmental and Social Risk Classification (ES...


**Social Risk Rating**  
  
Environmental and Social Risk Classification (ES...

**Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) Risk Rating**  
  
Environmental and Social Risk Classification (ES...

**ESS1- Assessment and Management of Environmental and Social Risks and Impacts**  
  
Relevance of Standards and Policies at Concept ...

**ESS2- Labor and Working Conditions**  
  
Relevance of Standards and Policies at Concept ...

**ESS3- Resource Efficiency and Pollution Prevention and Management**  
  
Relevance of Standards and Policies at Concept ...

[View All](#) 



## ✓ What data and source documents are linked?

- Fully integrated with all historical World Bank data
- Key source documents include:

### 1. PCN (Project Concept Note) & PID (Project Information Document)

### 2. E&S Documents from the Same Country & Same Sector (e.g., completed ESRS of other relevant projects, context specific relevant studies, ESIA, ESMP, ESCP, ESMF, SESA, CIA, LMP, BMP, CHMP, etc.)

**P172499 - Jamuna River Sustainable Management Proj...** Change ▾

Home / ESS4

**ESS4: Community Health and Safety**

Manage documents (0)

Response below based on:

- Working Documents PID & PCN
- E&S Documents from the Same Country
- E&S Documents from the Same Sector

**ESS4 Community Health and Safety (P172499)**

**1. Overview:**

ESS4 is relevant to the Jamuna River Sustainable Management Project 1 (P172499) due to the project's potential impacts on communities residing along the Jamuna River in Bangladesh. The project involves riverbank protection, navigation channel development, and institutional strengthening, all of which could interact with communities and create potential health and safety risks. Key areas of ESS4 likely relevant to this project include: traffic and road safety due to construction activities and

to communities will be detailed in the ESMP and a Security Management Plan. The PCN does not mention security personnel, so further assessment is needed.

**Sources**

- [0] Project Concept Note (PCN)
- [1] Concept Project Information Document (PID)
- [0] P508058 - Bangladesh - Stakeholder Engagement Plan - BD-Bangladesh Sustainable Recovery, Emergency Preparedness and Response Project -- P508058
- [1] P508058 - Bangladesh - Environmental and Social Commitment Plan - BD-Bangladesh Sustainable Recovery, Emergency Preparedness and Response Project -- P508058
- [2] P508058 - Bangladesh - Environmental and Social Review Summary - BD-Bangladesh Sustainable Recovery, Emergency Preparedness and Response Project -- P508058
- [3] P169880 - Bangladesh - Environmental Assessment - BD-Western Economic Corridor and Regional Enhancement Program -- P169880
- [4] P169880 - Bangladesh - Environmental Assessment; Social Assessment; Environmental and Social Assessment - BD-Western Economic Corridor and Regional Enhancement Program -- P169880
- [5] P169880 - Bangladesh - Environmental Assessment; Environmental and Social Assessment; Social Assessment - BD-Western Economic Corridor and Regional Enhancement Program -- P169880

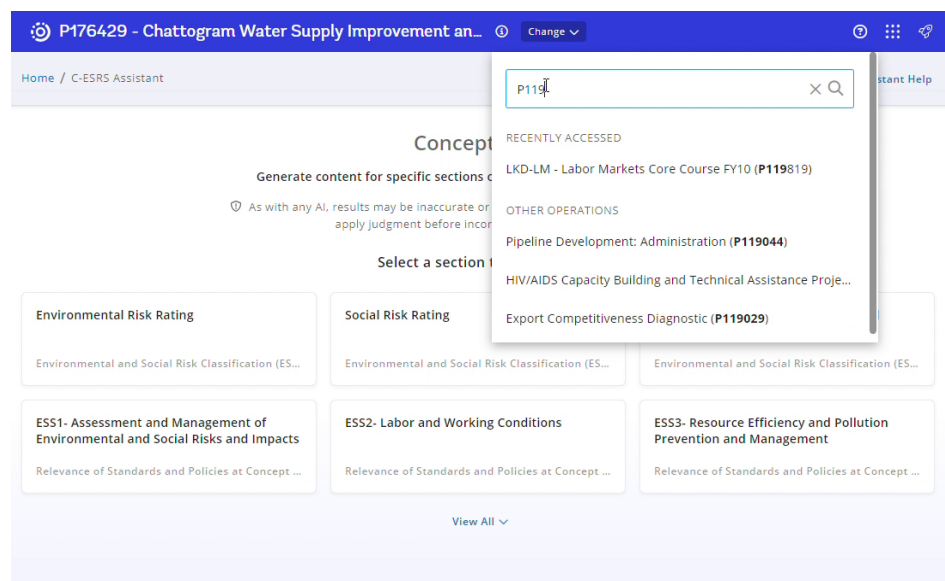
Enter your prompt to refine the response

Powered by OpenAI GPT and Microsoft Azure Cloud Services.  
Note: Microsoft service interruptions may be possible due to high demand.

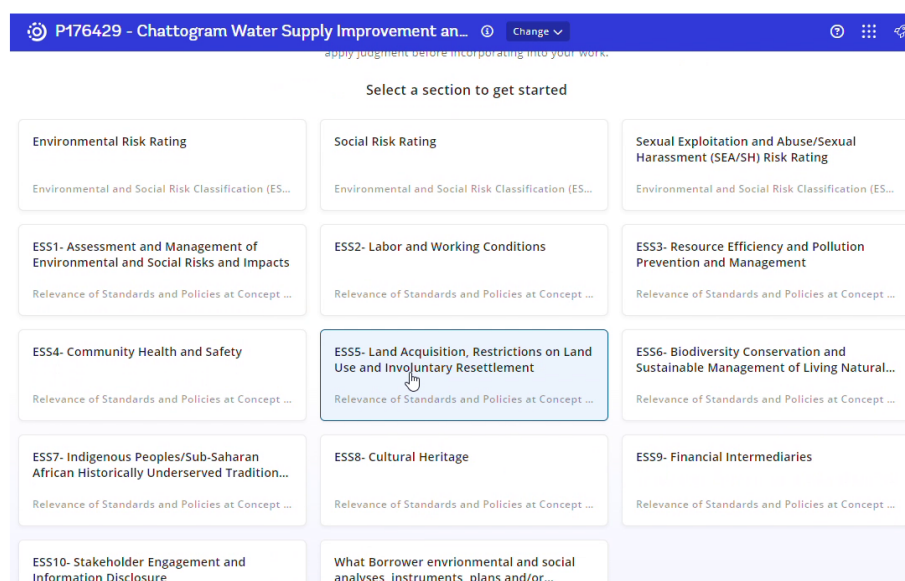
# Methodology:

1. Establish linkage with all relevant existing data (baseline setup).
2. Apply effective prompt engineering using well-structured and context-specific prompts.
3. E&S Specialist-friendly interface and customized functionalities:
  - ❑ Allow ESF Specialists to upload additional files and inputs via prompts
  - ❑ Show a list of all source documents found
  - ❑ Provide advanced filtering options for more flexible document selection.

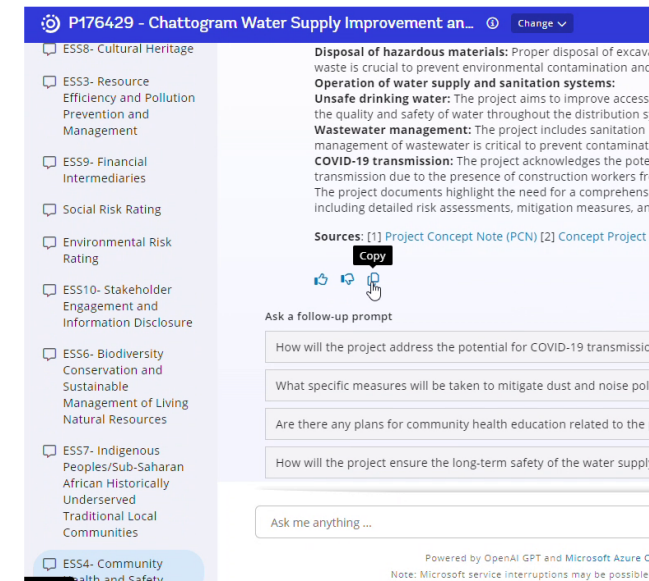
## Step 1: Select the project from the WB portal



## Step 2: Select a Section (e.g., ESS4, ESS8, etc.)




## Step 3: Upload additional files, enter further prompt, check the list of sources



Development Timeline:

1. Prompt engineering and testing using various external and internal AI LLMs (2023)
2. Prototype development and internal testing through multiple iterations (2024–2025)

✓ Includes prompt refinement, identification of additional source documents, and interface enhancement based on feedback
3. Pilot testing with 35+ E&S Specialists across regions - ongoing enhancements for improved performance (2025)
4. Official launch scheduled for early June 2025 

April 2025 version of the prompt for one section

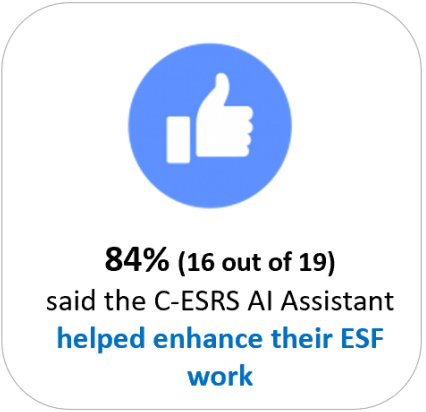
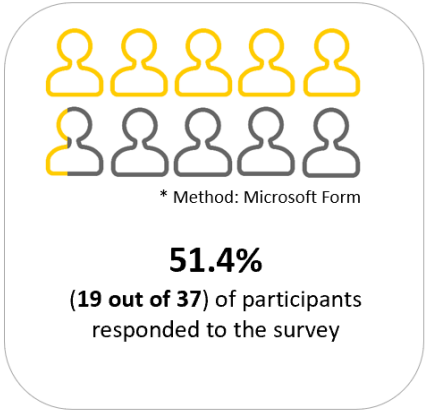
|                                |   |                |   | Concept ESRS  |   |   |  |
|--------------------------------|---|----------------|---|---|---|---|--|
|                                | Document Sections   | Context Source | Prompts provided by Business  | Prompt (Version 1)  | Updated Prompt (Version 2)  | Updated Prompt (Version 3) 1/30/2025  | Updated Prompt (Version 4) 4/01/2025   |
|                                | ESS9 - Financial Intermediaries   | PID/PCN        | Please assess and determine whether Environmental and Social Standard 9 (ESS9), which pertains to Financial Intermediaries, is relevant for this project. If ESS9 is relevant, provide a brief overview of its application, ensuring to stay within a maximum character limit of 1000.  | Evaluate the relevance of Environmental and Social Standard 9 (ESS9) concerning Financial Intermediaries for this project. If ESS9 is relevant, give a brief overview of its application and discuss how existing practices align with or need modification to meet ESS9 requirements. Ensure the maximum character limit is 250. If ESS9 is not relevant, just print "ESS9 is not relevant to the project activities at this stage. The project is not expected to involve any financial intermediaries."  | Based on the PCN and PID Source Documents, Evaluate the relevance of Environmental and Social Standard 9 (ESS9) concerning Financial Intermediaries for this project. If ESS9 is relevant, give a brief overview of its application and discuss how existing practices align with or need modification to meet ESS9 requirements. Ensure the maximum character limit is 500. If ESS9 is not relevant, just print "ESS9 is not relevant to the project activities at this stage. The project is not expected to involve any financial intermediaries." | Evaluate the relevance of Environmental and Social Standard 9 (ESS9) concerning Financial Intermediaries (FIs) for this project, using the available source documents. ESS9 outlines the role of FIs in assessing, managing, and monitoring environmental and social risks in the projects they finance, ensuring that sustainable financial practices are integrated into portfolio management.<br><br>If ESS9 is relevant:<br>- Identify the role of the Financial Intermediary (FI) in the project, including the nature and scope of funding provided by the FI.<br>- Assess the effectiveness of the FI's Environmental and Social Management System (ESMS) in identifying, managing, and mitigating the environmental and social risks associated with the subprojects it finances.<br>- Evaluate how the FI ensures that subprojects align with good environmental and social management practices, including any procedures for risk assessment, monitoring, and reporting.<br>- Discuss the capacity of the FI to manage and monitor the overall portfolio risks in accordance with ESS9, and identify any strengths or gaps in the ESMS framework.<br>- If applicable, evaluate how the FI promotes sound human resources management practices, ensuring the capacity of its staff to effectively manage environmental and social risks.<br>If ESS9 is not relevant:<br>- Provide a clear justification, supported by evidence, that the project does not involve an FI or intermediated financing, and therefore does not require the application of ESS9. Confirm this through financial assessments, project structure, or other relevant documentation. | Objective: Generate a preliminary draft for the 'ESS9 Financial Intermediaries' section of a new World Bank Project's Concept Stage ESRS. The output must be suitable for refinement by a WB E&S Specialist. The primary task is to accurately determine if ESS9 is relevant, which requires explicit confirmation that the project involves providing financial support through a Financial Intermediary (FI), based EXCLUSIVELY on the Target Project's available information (PCNPID first, then Metadata), identified by its unique Project ID. If, and only if, relevance is confirmed, the draft should be intelligently enriched using Analog Project Documents for typical ESMS requirements and practices. The output must strictly adhere to standard ESRS narrative structure, professional tone, and conciseness.<br>Target User: World Bank Environmental & Social (E&S) Specialist.<br>Input Documents (Provide these to the AI):<br>1. Target Project Information:<br>○ Required: Project Metadata (Including Target Project ID, Country, Region, Sector, PDO, Summary Description).<br>○ If Available: Project Concept Note (PCN) or Project Information Document (PID). (Primary source for project specifics, identified by Target Project ID).<br>2. Analog Project Documents (Examples from FI projects in similar contexts, if available):<br>○ Completed ESRS documents, relevant sections from ESIs/ESMFs, ESMS descriptions/audits from analogs.<br>ESS9 Core Principles & Key Definitions (Internal Guidance for AI):<br>• Goal: Ensure FIs assess/manage E&S risks of their subprojects; promote good E&S practices in subprojects; promote good HR management within the FI itself (linked to ESS2 applicability to the FI).<br>• Key Concept: Financial Intermediary (FI) - An entity receiving Bank support to channel financial resources (loans, equity, guarantees) to end-user/subprojects for productive business activities.<br>• Critical Trigger for Relevance: The Target Project description (PCNPID/Metadata) explicitly states or unambiguously implies that Bank funds will be channeled through one or more FIs to finance subprojects.<br><br>Core Task:<br>1. Identify Target: Lock onto the Target Project ID.<br>2. Analyze Target Info: Extract project characteristics, activities, context, scale from Metadata & PCNPID. Critically scan ONLY the Target Project info for explicit mention or clear description of an FI financing mechanism.<br>3. Determine ESS9 Relevance (CRITICAL STEP - Default is NON-RELEVANT):<br>○ Based strictly on the analysis of Target Project Info, determine if the Critical Trigger is met.<br>○ If there is NO explicit evidence of an FI financing mechanism in the Target Project description, conclude ESS9 is NOT relevant. Proceed directly to Step 6 (Justify Non-Relevance). This is the expected outcome unless proven otherwise.<br>○ If, and ONLY IF, there is CLEAR and EXPLICIT evidence of FI involvement in the Target Project info, conclude ESS9 IS relevant. Proceed to Step 4 (Analyze Analogs) and Step 5 (Draft ESS9 Section).<br>4. Analyze Analogs (Only if ESS9 relevance is confirmed): Review Analog FI Project Documents to identify typical patterns: standard ESMS components (policy, procedures, capacity, monitoring), common risk categorization approaches, typical ESS requirements applied to subprojects, FI internal HR/ESS2 application.<br>5. Draft ESS9 Section (Only if ESS9 relevance is confirmed): Synthesize findings into a draft following the Output Requirements below. Emphasize the need for ESMS development/assessment.<br>6. Justify Non-Relevance (Default Case): Provide a concise justification explicitly stating why ESS9 is not relevant, referencing the absence of an FI mechanism in the Target Project Information (e.g., "ESS9 is not relevant as the project, based on the PCN/Metadata, involves direct financing for [activities] and does not utilize Financial Intermediaries.").<br><br>Output Requirements:<br>1. Structure & Style: |
| B.2 Legal Operational Policies |   |                |   |   |   |   |  |
| B.3 Other Salient Features     |   |                |   |   |   |   |  |
|                                | B.4 Summary of Assessment of Environmental and Social Risks and Impacts | PID/PCN        | Write a comprehensive yet succinct summary, adhering to a maximum character limit of 1000, that encapsulates the assessment of Environmental and Social Risks and Impacts associated with the project. Ensure your summary precisely addresses the following aspects:<br>•Outline the overall scope of the environmental and social assessment, including the geographical, temporal, and thematic boundaries considered.<br>•Identify and describe the key environmental and social risks associated with the project, ensuring to delineate between direct, indirect, and cumulative impacts.<br>•Identify and discuss any vulnerable and marginalized groups that may be particularly impacted by the project, detailing the nature and extent of potential impacts.<br>•Detail the proposed mitigation and management measures that will be implemented to address identified risks and impacts, ensuring alignment with relevant environmental and social standards.<br>•Discuss the regulatory and policy context within which the assessment | based on the PCN and PID source documents, write a comprehensive summary, adhering to a maximum character limit of 1000, that encapsulates the assessment of Environmental and Social Risks and Impacts associated with the project. Ensure your summary precisely addresses the following aspects:<br>•Outline the overall scope of the environmental and social assessment, including the geographical, temporal, and thematic boundaries considered.<br>•Identify and describe the key environmental and social risks associated with the project, ensuring to delineate between direct, indirect, and cumulative impacts.<br>•Identify and discuss any vulnerable and marginalized groups that may be particularly impacted by the project, detailing the nature and extent of potential impacts.<br>•Detail the proposed mitigation and management measures that will be implemented to address identified risks and impacts, ensuring alignment with relevant environmental and social standards.<br>•Discuss the regulatory and policy context within which the assessment | No Change   |   |  |

# C-ESRS AI Assistant Pilot Overview – April 2025

| Department  | Number of Pilot Teams |
|-------------|-----------------------|
| Environment | 25                    |
| Social      | 11                    |
| RSA         | 1                     |
| Total       | 37                    |

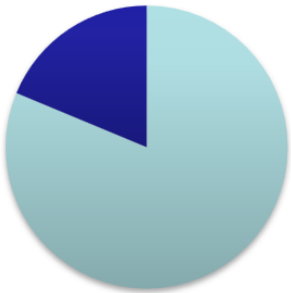


| Region | # of pilots |
|--------|-------------|
| AFE    | 5           |
| AFW    | 5           |
| ECA    | 13          |
| EAP    | 3           |
| LAC    | 7           |
| MENA   | 2           |
| Global | 2           |
| Total  | 37          |



**84%** (16 out of 19) of participants indicated that the C-ESRS AI Assistant’s **strongest point** is that it **increased saved time**.

**58%** (11 out of 19) of participants indicated that the toolkit’s **second strongest** point is that it **identified relevant available E&S documents**.



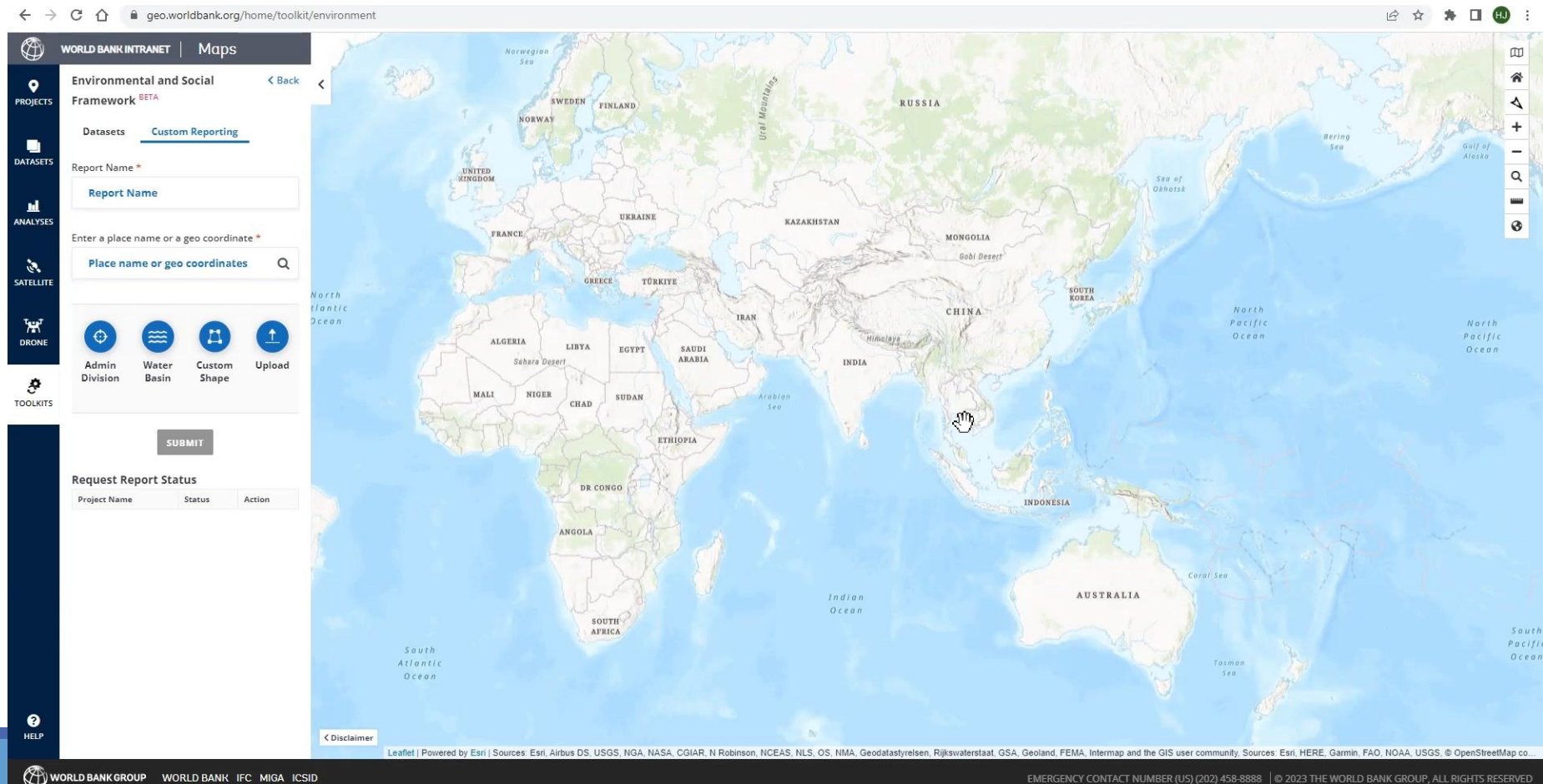
■ Yes ■ No



# WB's Geospatial ESF Risk Assessment Toolkit: Leverage AI to conduct quick screening using 190+ publicly available geospatial data layers and internal World Bank datasets, assessing potential E&S risks.

## ❑ **Output** – Interactive web-based report (Printable as PDF) with:

- ✓ Detailed baseline information on project sites (+ buffer zones) including geospatial data, graphs, tables, and maps
- ✓ ESS-specific summaries, list of relevant past World Bank projects, key technical issues, including previous specialists' comments and cited data sources



# Toolkit - ESF Report

[PRINT REPORT](#) 

Project Name: Mindanao Transport Connectivity Improvement Project - (P177017)

[Quick Screening](#)[Full Report](#)[Knowledge Base](#)[Recommender System](#)

## Quick Screening

The quick screening uses publicly available Geospatial data to flag prominent environmental and social risks. A lack of warning indicator does not indicate a lack of risk as these are based on available data where there may be gaps.

**Generate info from external data – 190+ publicly available data layers**

**Generate info from all WB internal historical data including E&S (ESRS, etc,)**

[Quick Screening](#)

## Quick Screening

The quick screening uses publicly available Geospatial data to flag prominent environmental and social risks. A lack of warning indicator does not indicate a lack of risk as these are based on available data where there may be gaps.

### Basic Data on the Area of Interest

|                             |   |           |
|-----------------------------|---|-----------|
| Name/ID of the user request | Report: Mindanao Transport Connectivity Improvement Project (P177017) requested by stop@wbi@the-world-bank.org  |           |
| Date of the report          | Dec 5, 2022   |           |
| Type of Area                | Position of the area of interest  | Area (ha) |
| Proygen                     | Philippines - Region 10 - Bukidnon<br>Philippines - Region 11 - Davao del Sur<br>Philippines - Region 12 - South Cotabato<br>Philippines - Region 12 - Sarangani<br>Philippines - Region 12 - Cotabato<br>Philippines - Region 10 - Misamis Oriental<br>Philippines - Region 12 - Sultan Kudarat<br>Philippines - Region 11 - Davao Occidental<br>Philippines - Region 11 - Davao del Norte | 1,204,970 |



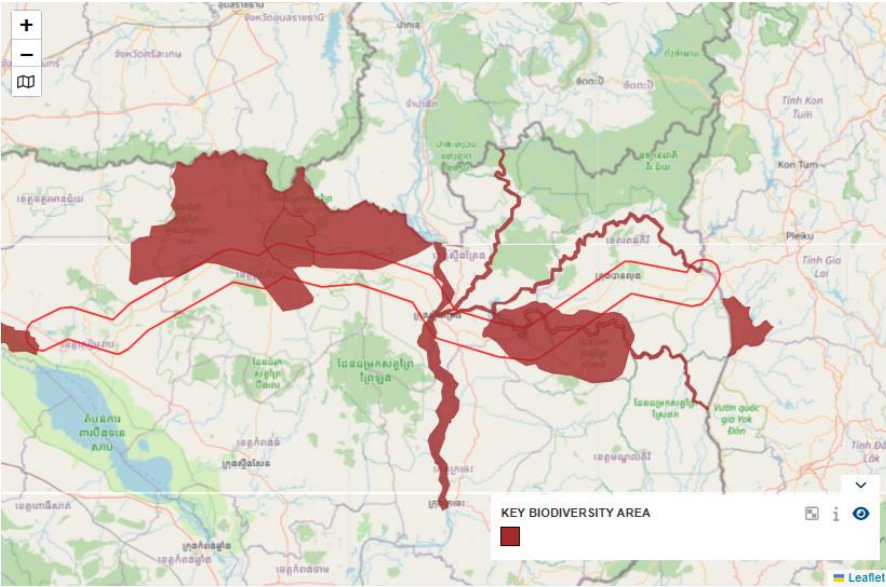
ESS6 - Biodiversity Conservation and sustainable Management of Living natural resources

Forest Cover / Deforestation

|                         | Area of Interest |         | National wide |        |
|-------------------------|------------------|---------|---------------|--------|
|                         | (ha)             | (%)     | (ha)          | (%)    |
| Forest cover 2000       | 225,711          | 154.701 | 8,819,646     | 48.562 |
| Forest Gain (2000-2021) | 3,436            | 2.355   | 109,412       | 0.602  |
| Forest Loss (2000-2021) | 110,176          | 75.513  | 2,455,835     | 13.522 |

KBA overlapping area of interest and 10 km buffer zone

| International name                 | Protection  |
|------------------------------------|-------------|
| Chu Prong                          | Little/none |
| Sekong River                       | Little/none |
| Preah Net Preah / Kra Lanh / Pourk | Little/none |
| Upper Stung Sen Catchment          | Most        |
| O Skach                            | Little/none |



✓ ESF reports generated by this AI toolkit can:

1. Help project teams engage in strategic dialogue with key government agencies
2. Guide consultants conducting technical studies as part of project preparation (e.g., E&S screening)
3. Support detailed project preparation by the client (implementing agency)
4. Be printed as a PDF or hard copy and shared with colleagues, clients, consultants, and stakeholders involved in the same project.

Sources of data

BirdLife International (2019). World Database of Key Biodiversity Areas. Developed by the KBA Partnership: BirdLife International, International Union for the Conservation of Nature, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Global Wildlife Conservation, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, Wildlife Conservation Society and World Wildlife Fund. Available at [www.keybiodiversityareas.org](http://www.keybiodiversityareas.org) KBA status is triggered by the presence of key biodiversity criteria, informed by the IUCN Red List of Threatened Species™. KBA mapping builds upon the work of a number of existing partnership-supported initiatives - such as BirdLife International's Important Bird Areas, PlantLife International's Important Plant Areas, IUCN's Important Sites for Freshwater Biodiversity and sites identified by the Alliance for Zero Extinction - to map important sites for a wide range of critical biodiversity in marine, freshwater and terrestrial biomes. Data on KBA sites is compiled from an international network of local, national and international partners in NGOs, academic institutions and government agencies, and is compiled into the World Biodiversity Database (WBDB) managed by BirdLife International and Conservation International. The global inventory of terrestrial Important Bird Areas is nearly complete. Completeness of coverage varies for other taxa and biomes.

Endangered and Threatened Species in AOI

| Total Species | Mammals | Birds | Amphibians | Reptiles |
|---------------|---------|-------|------------|----------|
|---------------|---------|-------|------------|----------|

|    |   |   |   |   |
|----|---|---|---|---|
| 12 | 3 | 6 | 2 | 1 |
|----|---|---|---|---|

Endangered and Threatened Species national wide.

|    |    |    |   |   |
|----|----|----|---|---|
| 26 | 13 | 11 | 1 | 1 |
|----|----|----|---|---|

Sources of data

IUCN, BirdLife International, World Bank Group  
Detailed discussions of the methodology are in the following reports:  
Dasgupta, Susmita; Wheeler, David. 2016. Minimizing Ecological Damage from Road Improvement in Tropical Forests. Policy Research Working Paper: No. 7826. World Bank, Washington, DC. © World Bank. Danyo Stephen, Susmita Dasgupta and David Wheeler. 2018. Potential Forest Loss and Biodiversity Risks from Road Improvement in Lao PDR. World Bank Policy Research Working Paper 8569. World Bank, Washington, DC. © World Bank. Damania Richard, Jason Russ, David Wheeler and Alvaro Federico Barra. 2018. The Road to Growth: Measuring the Tradeoffs between Economic Growth and Ecological Destruction, World Development, Elsevier, vol. 101(C), pages 351-376. <https://datacatalog.worldbank.org/dataset/terrestrial-biodiversity-indicators>  
Biodiversity indicator values (scores) for grid cells at 1-kilometer resolution, derived from over 25,000 range maps of species provided by IUCN and Birdlife International.



Cambodia is home to a variety of endangered and threatened species. The Asian Elephant is listed as endangered by the International Union for Conservation of Nature (IUCN). The population of Asian Elephants in Cambodia has declined by more than 50% in the last three generations due to poaching, habitat loss, and human-elephant conflict. The Javan Rhino is also listed as critically endangered by the IUCN. There are only an estimated 60-70 individuals left in the wild, and none are known to exist in Cambodia. The Siamese Crocodile is also listed as critically endangered by the IUCN. It is estimated that there are only 250-400 individuals left in the wild, and none are known to exist in Cambodia. The Bengal Florican is listed as endangered by the IUCN. It is estimated that there are only 1,000-2,000 individuals left in the wild, and none are known to exist in Cambodia. The Giant Ibis is listed as critically endangered by the IUCN. It is estimated that there are only 250-400 individuals left in the wild, and none are known to exist in Cambodia. The White-shouldered Ibis is also listed as critically endangered by the IUCN. It is estimated that there are only 250-400 individuals left in the wild, and none are known to exist in Cambodia. The Siamese Fireback is listed as endangered by the IUCN. It is estimated that there are only 1,000-2,000 individuals left in the wild, and none are known to exist in Cambodia. The White-rumped Vulture is listed as critically endangered by the IUCN. It is estimated that there are only 250-400 individuals left in the wild, and none are known to exist in Cambodia. The Greater Adjutant is listed as critically endangered by the IUCN. It is estimated that there are only 1,000-2,000 individuals left in the wild, and none are known to exist in Cambodia. The conservation of these species is of utmost importance to ensure their survival and to protect the biodiversity of Cambodia. Conservation efforts must focus on protecting their habitats, reducing human-wildlife conflict, and increasing public awareness of the importance of these species.

<https://geo.worldbank.org/home/esf-report/2w0wkbk2njlv5kxmt>

29/37

4/18/24, 4:45 PM

World Bank Group Geospatial Platform

Table of Endangered and Threatened Unique Species in 10km Buffer Zone of Cambodia

| Species Name             | Estimated Population | Conservation Status   |
|--------------------------|----------------------|-----------------------|
| Asian Elephant           | <1000                | Endangered            |
| Bengal Tiger             | <200                 | Critically Endangered |
| Siamese Crocodile        | 250                  | Critically Endangered |
| Eld's Deer               | <200                 | Critically Endangered |
| Gaur                     | <200                 | Endangered            |
| Malayan Sun Bear         | <200                 | Vulnerable            |
| Clouded Leopard          | <200                 | Vulnerable            |
| Asian Small-Clawed Otter | <200                 | Vulnerable            |
| Smooth-Coated Otter      | <200                 | Vulnerable            |
| Asian Giant Tortoise     | <200                 | Vulnerable            |

Source: Open AI GPT

Generate a quick summary write-up for each ESS using OpenAI-GPT. All outputs should be reviewed and verified by E&S specialists.

## Public geospatial datasets used in this ESF Toolkit:

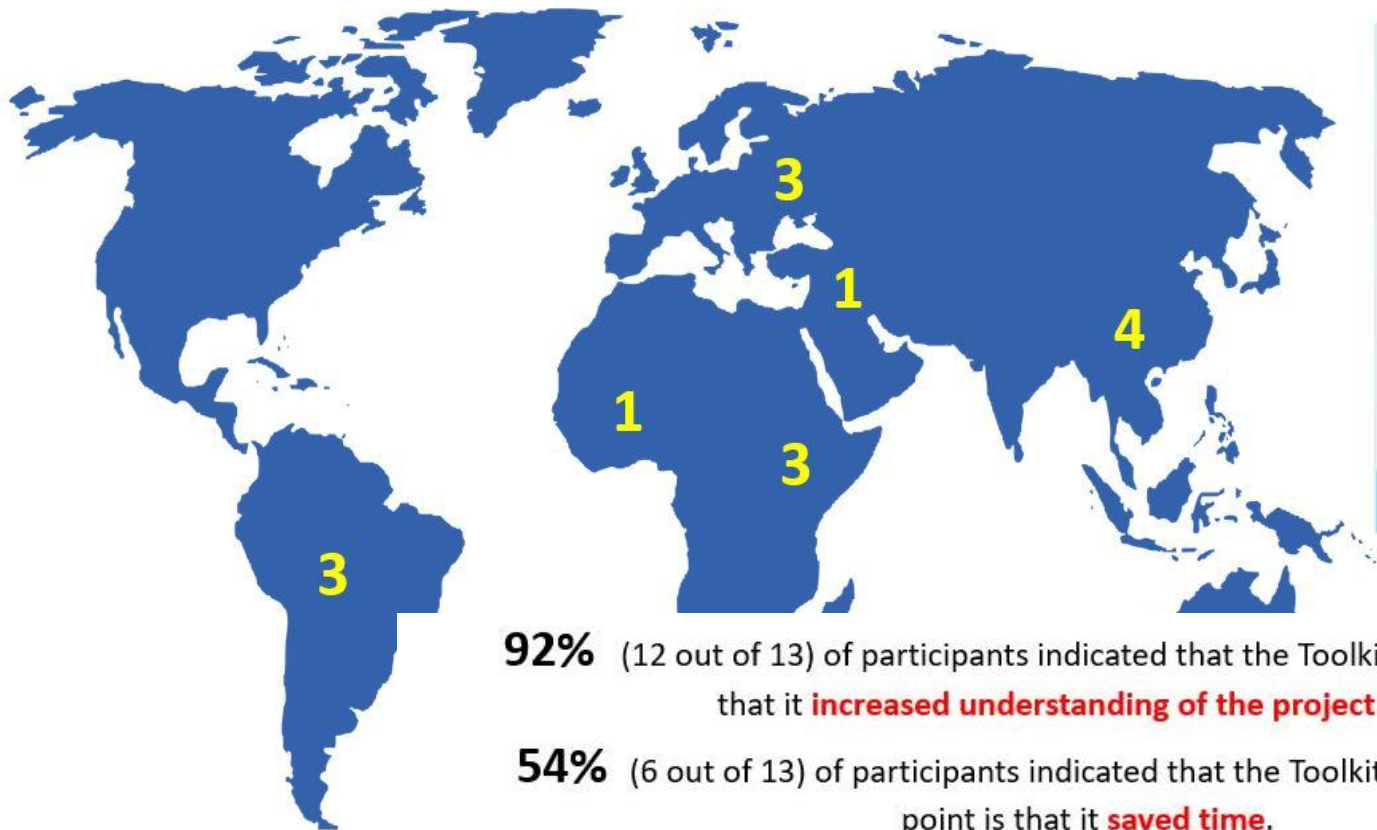
### ex. ESS6 - Biodiversity Conservation and sustainable Management of Living natural resources

- Forest Cover / Deforestation (Source: Hansen/ UMD/ Google/ USGS/ NASA, accessed through Global Forest Watch)
- Protected areas (Source: World Database on Protected Areas - International Union for Conservation of Nature (IUCN))
- Biodiversity hotspots (Source: Conservation International. "Biodiversity hotspots." Accessed through Global Forest Watch)
- Key Biodiversity Area (Source: Conservation International. "Biodiversity hotspots." Accessed through Global Forest Watch.)
- Key Biodiversity Area (Source: BirdLife International (2019). World Database of Key Biodiversity Areas. Developed by the KBA Partnership)
- Endangered and Threatened Species in AOI (Source: IUCN, BirdLife International, World Bank Group, Detailed discussions of the methodology are in the following reports: ~~)
- And more...



# AI-GPT Applied ESF Report Toolkit Pilot Overview

| GP    | Number of Pilot Teams |
|-------|-----------------------|
| ENB   | 13                    |
| SSI   | 2                     |
| Total | 15                    |



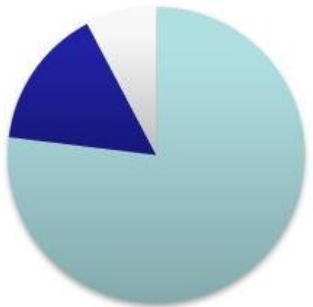
| Region | # of pilots |
|--------|-------------|
| AFE    | 3           |
| AFW    | 1           |
| EAP    | 4           |
| ECA    | 3           |
| LAC    | 3           |
| MENA   | 1           |
| Total  | 15          |

**92%** (12 out of 13) of participants indicated that the Toolkit’s **strongest point** is that it **increased understanding of the project sites**.

**54%** (6 out of 13) of participants indicated that the Toolkit’s **second strongest point** is that it **saved time**.



**85%** (11 out of 13) said the AI-GPT applied ESF Report Toolkit **helped enhance their ESF work**




Well Neutral Not Well

**77%** (10 out of 13) of participants stated that the **AI-GPT ESF Report provided information very well**, while 2 out 13 said neutral and 1 out 13 said it didn’t.

# What's next?

1. **ESF Chatbot:** An internal AI LLM-based query instrument that draws specifically from the internal WBG ESF library.
2. **ESIA Document Review Tool by IFC MALENA:** An AI tool which can review draft ESIAs/ESMPs for structural completeness against a review checklist. Its primary audience is the regional safeguards quality assurance teams, and will also be useful for ESF specialists and ESF external clients/PIU specialists. **The tool is a product of an IFC MALENA** – The World Bank is in close contact with the IFC team working on AI and Performance Standards, piloting the tool to the WB E&S teams in Europe and Central Asia Region.

# World Bank ITS Geospatial Platform

WORLD BANK INTRANET | Maps


PROJECTS

DATASETS

ANALYSES

SATELLITE


DRONE

GEOAI

TOOLKITS

HELP

PROFILE

Geospatial AI BETA

Create New

Recent Projects

New Project | Choose Model Type

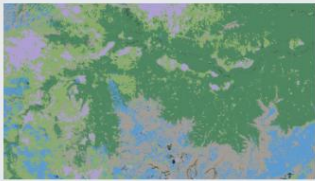


Image Clustering  
(Unsupervised)

Analyze images by grouping objects based on similar patterns without needing assigned labels. This unsupervised learning can help classify unlabeled data, saving time.

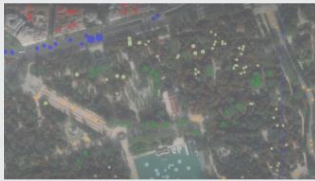




Image Classification  
(Supervised)

Assign categories or labels to images efficiently. Algorithms and machine learning models recognize patterns and features in new images, making classification more accurate and efficient.

BETA

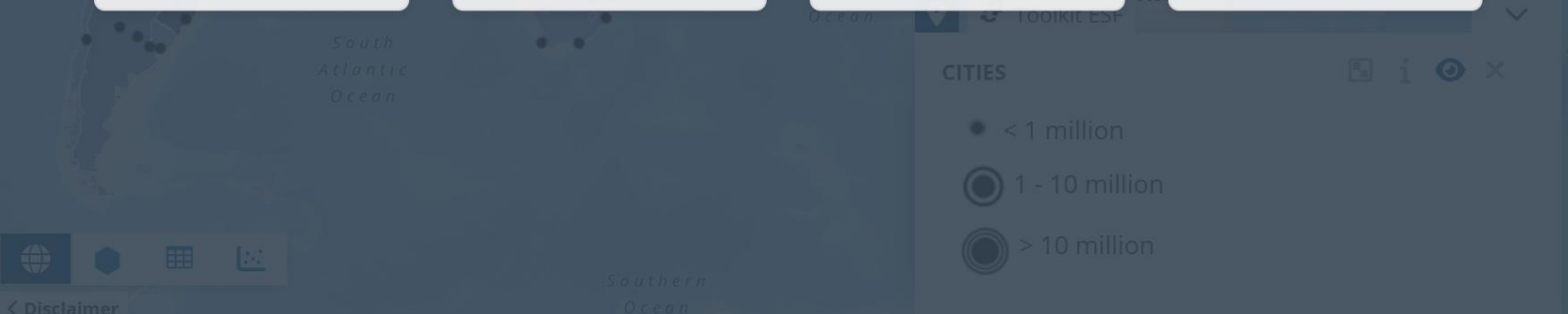
Change Detection

Analyzes satellite images of an area over time to identify surface changes like urbanization, deforestation, and natural disasters.

BETA

Object Detection

Identify and locate objects in an image. With advancements in computer vision, we can now detect objects more accurately and efficiently.



CITIES

< 1 million

1 - 10 million

> 10 million

Leaflet | Powered by Esri | Sources: Esri, Maxar, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodastystyrelsen, ...

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A composite image featuring a view of Earth from space on the right, showing the African continent and surrounding oceans. On the left, against a black background, is a small, detailed image of the Moon. The title text is centered between these two celestial bodies.

# Satellite Imagery & Drone Services



# Satellite Imagery Services by WB ITS Geospatial

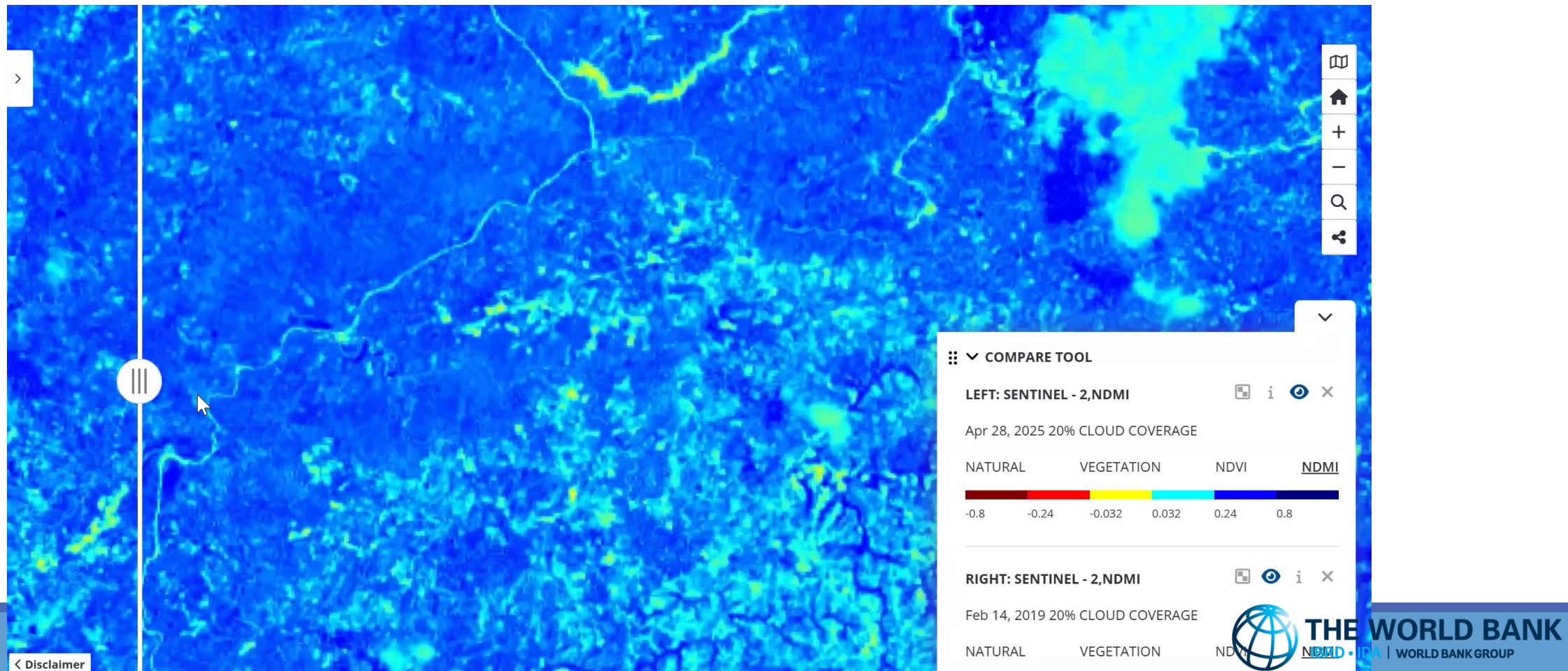
The World Bank's ITS Geospatial offers both:

1. **Free-publicly available satellite imageries and basic analytic services** (powered by Google Earth Engine) including **change detection (satellite image over time)** and simple **GIS mapping**, and
2. **Access to High-resolution satellite imagery via WB Geospatial Platform API**, connecting to the good external service providers (e.g., Planet, Maxar, Airbus) upon the requests from the Bank staff



# Free-publicly available satellite imageries

1. WB teams **and also external users** (clients) can access to this WB's free-publicly available satellite imageries (i.e., **Sentinel-2 that has 10m-60m resolution**) and basic analytic services (powered by Google Earth Engine) by just using this external link: <https://maps.worldbank.org/imagery/Satellite>
2. Anyone can do simple change detection analysis (satellite image over time) using this Bank's free platform **without paying additional cost.**





# High-resolution satellite imagery services via WB Geospatial Platform

## 1. Maxar

- Resolution: **30-40 cm**
- Near Real-Time ( +/-2 Days Latency – 90 Days)
- Approx Cost: 11000 USD for 12 shots/imageries for one year (Minimum order quantity is 100 km<sup>2</sup>) or 2750 USD for 4 shots/imageries of 25 km<sup>2</sup> for one year
- Specific cost shall be determined upon the request and discussion with the team
- Below are some example images taken from Maxar near project area (it's good enough for forest clearance monitoring purpose)

## 2. PlanetScope

- Resolution: **2-3 m**
- Near Real-Time (Daily)



# Drone Operation Services

## via WB Geospatial Platform

- **WB ITS provides access to global/region-specific drone services** to get drone images that can be commissioned for key areas.
- **Master Agreement with Drone Service Providers**
  - Top 3 ~ 5 in the region, who can operate globally
  - E.g. Globhe, WeRobotics, Flying Labs Malawi
- **Integration of Cloud-based Drone Data Management Platforms**
  - SiteScan, Pix4DCloud
  - Delivery Through WB Geospatial Platform





# Sharing Best Practices

A world map with a dark blue background and glowing yellow city lights. Five yellow arrows point downwards to specific regions: South America, West Africa, Central Africa, Europe, India, and East Asia.

Organized **MFIs Tech-for-ESF Working Group** with ADB, IDB, FAO, EBRD, AfDB, AIIB, IFC, MIGA, and WB since 2023 (Co-led by WB & ADB).

Rolling out as a **Global Engagement Program**, and aim to work with three levels of stakeholders

- E&S Specialists
- Country Clients
- Task Team Leaders of the WB Projects
- Collaborating with internal & external partners



# Let's continue the conversation!

Message me your questions or comments in the IAIA25 app.

**Hak Joo Song**

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*USA / South Korea*

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**#iaia25**