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INTRODUCING GEOSPATIAL FOOTPRINT OF THE GCF'S PORTFOLIO: PROJECT LOCATION GEOCODING METHODOLOGY

Laurene Torterat, Galyna Uvarova

Introducing geospatial footprint of the GCF's portfolio: Project location geocoding methodology

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First Edition

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About this Working Paper

This paper summarizes how the IEU DataLab identifies the sub-national geographical location of GCF projects by reviewing their approved funding proposals. The methodology described in this paper marks the first time the GCF's climate finance flows and distribution have been tracked at the sub-national level.

About the authors

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ABSTRACT

As the GCF continues its efforts to channel climate finance to the most vulnerable communities, the international evaluation community realizes the importance of geospatial components in assessing intervention impact and targeting for maximum impact. Using geospatial data can improve targeting, planning, policymaking and managing risk. Yet the uptake of geospatial methods is limited in the climate finance domain.

This paper summarizes how the IEU DataLab identifies the sub-national geographical location of GCF projects by reviewing their approved funding proposals. The methodology described in this paper marks the first time the GCF's climate finance flows and distribution have been tracked at the sub-national level.

The paper introduces possible approaches to identifying the location of GCF-funded activities and explains the main pathways of obtaining sub-national location data for Board-approved projects. It indicates that only 47 per cent of GCF projects disclose the sub-national location of the project. It also reviews various possible sources for project location information. The paper underlines the need for a standardized unit of measurement, approaches for harmonizing geodatabase inputs and the geocoding process's main steps. It concludes by outlining the geocoding challenges that remain. The paper cautions that these challenges will persist if we continue relying on funding proposal documentation that is developed without a spatial approach.

ABBREVIATIONS

AE	Accredited entity
EBRD	European Bank for Reconstruction and Development
IEU	Independent Evaluation Unit
FP	Funding proposal
GADM	Global administrative areas
GCF	Green Climate Fund
GIS	Geographic information system
IFAD	International Fund for Agricultural Development
M&E	Monitoring and Evaluation
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
SIDS	Small island developing states
TRHDP	Tina River Hydropower Development Project

A. INTRODUCTION

The current paper describes a methodology for geocoding beneficiary area locations within Green Climate Fund's (GCF) projects based on the information made available in the approved Funding Proposal (FP) package. The Independent Evaluation Unit (IEU) chose this methodology to support assigning spatial information to expected beneficiary areas. **Geocoding** is the process of assigning a spatial footprint based on textual information about an object for use in geospatial analysis or visualization on a map. This is the first study that captures the GCF's approach to geocoding project locations and establishes a baseline methodology for the relevant stakeholders. Additionally, the methodology captures the best practices and lessons learned in identifying project locations based on the information in the FP package prepared according to GCF's requirements (for projects approved 2015–2021).

The current geocoding exercise originated from the need to fill the location gap in the GCF FPs. Project location information is a helpful tool for assessing the alignment of GCF financial flows with pathways towards low greenhouse emissions and climate-resilient development (per Paris Agreement article 2.1.c). Geocoding provides more clarity on the precise geographic location of GCF projects and can be used for:

- Determining if GCF projects are targeting the most vulnerable communities at the sub-national level.

- Establishing whether GCF interventions within the same country are complementary and coherent.

- Quantifying the impact of GCF's project on the communities and ecosystems in beneficiary areas.

The IEU has reviewed FPs to identify the most granular information concerning the location of GCF-financed project activities. The driver behind this engagement was the absence of a specific section in the FP identifying the project's geographical location. The geocoding process delivered a uniform and standardized geodatabase of GCF project locations.

The first part of the paper defines the methodological approach, unit of measurement and geocoding information sources.

The second part of the paper focuses on the geodatabase structure and defines the captured variables.

The third part describes the geocoding workflow and the necessary identifying steps to populate the geodatabase.

The last part of the paper illustrates examples of simple and complex cases for GCF project location geocoding and how these should be resolved.

B. GEOCODED DATA

The **geodatabase**[1] of the GCF projects' locations provides a spatial reference for the project's beneficiary area. The geocoding methodology aims to be flexible enough to capture beneficiary areas across project themes, sectors and result areas. Such consistency is key for addressing the modifiable areal unit problem and ensuring robust results in portfolio-level spatial analysis. Geocoding was done using a top-down approach based on the information in the FP document package or a bottom-up approach based on information provided by the project team and Accredited

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[1] A geodatabase stores GIS information in one large file, which can contain multiple points, polygons, and/or polyline layers (see more on *helpwiki.evergreen.edu*).

Entity (AE). Varying quality and the extent of location information available within project documentation packages across the project cycle impact the precision in identifying project location. This geocoding methodology adopts a variable that reflects the confidence level and captures the accuracy of the defined beneficiary area at the sub-national level in the project approval stage.

C. BACKGROUND

Upon commencement of the FP review and project beneficiary location geocoding, it became clear there is no consistent approach to capturing the location of a suggested intervention during project origination. Having country-level information of a project's location might be sufficient in terms of GCF's mandate to support climate-challenged developing countries limit their greenhouse gas emissions and adapt to climate change. However, given the limitations in GCF's funding, having information about a project's location on a sub-national level is critical for measuring impact, managing the concentration of GCF's portfolio, targeting for impact and reaching the most vulnerable communities within the country.

The review found that only 47 per cent of FPs identify the GCF project's sub-national location (as of B.30). Further, 44 per cent of FPs identify the project's location in documents annexed to the FP package. In several cases, the location geocoding team had to collect project location information from other sources (e.g. feasibility studies) or the relevant stakeholders in GCF divisions. In three cases, to obtain information on the location of GCF-funded activities, it was necessary to liaise with the AE, as it was not available within the Fund.

The observations above indicate that the approach to capturing GCF project location remains inconsistent. There is no specific section in the FP where the AE discloses information on the geographic coverage of the project. Nor is there a requirement to submit a shapefile[2] of the estimated project location. While about half of the FPs include a map, these often vary in quality and are rarely useful for capturing a project's precise location. The review has also identified that the approach to disclosing project location varies across FPs and AEs. The project location review identified two main inconsistencies:

- The lack of a standardized approach to project location disclosure in the project development stage.
- Heterogeneity of project location understanding across FPs leading to varying levels of ambiguity in the descriptions of project location.

The absence of project location disclosure requirements at the FP development stage results in ambiguity regarding the ability to find project information in the FP package. If it can be found, there remains uncertainty about which document or source contains the information. Some AEs demonstrate technical proficiency and share shapefiles with project location, and such approach ensures transparency in terms of GCF-funded activity location. The location information concerning project intervention and beneficiaries is a prerequisite for ensuring relevance and feasibility in the GCF's monitoring and evaluation (M&E) and the GCF portfolio's targeting and impact assessment.

A Geographic Information System (GIS) manages and analyses all data types and is critical for normal M&E processes. GIS make it possible to ensure planned activities are happening and provide possibilities for improving the activities' effectiveness at all stages of the project cycle. GIS tools and data can support M&E functions. For example, local beneficiaries can learn how interventions may support them and map participation in project planning and implementation. Similarly, project staff can record new information to feed into the management and M&E system. Another example is

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[2] The shapefile format is a geospatial vector data format for geographic information system (GIS) software.

project managers using maps as tools for visualizing and identifying problems and opportunities and providing a basis for discussions with decision makers. Or, national and sub-national governmental bodies seeing value-for-money and results from national operations, while evaluators can obtain data to assess current and future interventions and their impacts. As mentioned in the International Fund for Agricultural Development's (IFAD) "Mapping rural development" manual, geospatial data helps enhance accountability and increase participation and buy-in across the range of stakeholders, from beneficiaries and implementors to donors and policymakers. The manual also notes that geospatial information is crucial for improving monitoring and reporting, enhancing project effectiveness and assessing impact.[3]

Heterogeneity in the definition of project location leads to multiple interpretations of the term "project location". One widely used interpretation is linked to intervention location. This could be used to geocode and identify the location of a project. Such an approach has a limited geographic footprint for projects that entail infrastructure development or foresee the establishment of a finance facility. Another approach for disclosing project location across FPs identifies the location of the project's beneficiaries, defined as a geographic area that will benefit from the project's implementation.

To illustrate the difference between these two approaches, a brief review of one example can be helpful. FP044, "Tina River Hydropower Development Project (TRHDP)," mentions that "The combined share of renewable energy generation sources (hydro and solar) on the Honiara grid is expected to shift from 3% in 2017 to 67% at the time of expected TRHDP commissioning in 2022". From this and other quotations, it is possible to identify that the city of Honiara is the beneficiary area of this project, while the intervention and implementation site is located at the Tina River.

Table 1.   Approaches to project location geociding

APPROACH	LIMITATIONS	ADVANTAGES
Beneficiary area of the project	The beneficiary area of the project may be different from the project implementation location and, at times, can be challenging to define with a high level of precision. Ex: FP044 (Tina River Hydropower Development Project) Beneficiary area: city of Honiara (polygon) Implementation site: Tina River (point)	Comparability across the project in GCF's portfolio Ability to conduct portfolio-level analysis and aggregation
Project implementation site	The project implementation site implies the precise location of intervention. This poses challenges for identifying the intervention location for non-infrastructure components or components not linked to the real sector: Example FP025: GCF –EBRD Sustainable Energy Financing Facilities include: • Climate financing: investments in high-performance climate technologies and supply chains / local manufacturing • Capacity building: investment assistance, training and marketing activities	More precise Works well for project-level analysis or intra-country analysis

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[3] IFAD, *Mapping Rural Development: How to use GIS to monitor and evaluate projects* (Rome, 2022. Available at https://www.ifad.org/documents/38714170/45948858/GeoMapManual-Final_WEB.pdf/05a555cc-65d8-2367-c7ce-3775f52d3101?t=1658502655336.

As of 2022, IEU's DataLab has finalized, cross-checked, and continued to maintain the project location beneficiary dataset. This continues to inform the following types of analyses within evaluations:

- Portfolio analysis (e.g. estimating the transaction costs across SIDS by using project location data in combination with travel time to cities data)

- Vulnerability analysis (e.g. the percentage of low-lying land in SIDS)

- Intervention targeting assessment (e.g. project location, population, and photovoltaic electricity potential for Kiribati)

- Deriving insights for country case study (e.g. land use pattern analysis in Belize)

1. GEOCODING PROCESS

The method for geocoding involves the following six steps:

- Review the project

- Strengthen project information with additional sources

- Identify the geographical scope of the beneficiary area

- Convert the project footprint into standardized units of measurement

- Geocode identified beneficiary area locations

- Geocode intervention location

All the steps of the geocoding process are captured in the project location tracking tool, making it easy to track the progress in the geocoding of the project locations.

2. GEOGRAPHIC UNIT

During the review of the FP, we identified different types of measurement units used to define the geographical cover in a number of projects, including:

- Administrative unit (e.g. FP034: 16 districts across two regions of Uganda are identified as project beneficiaries)

- Physio-geographical regions (e.g. FP136: the beneficiary area is identified as a watershed)

- Socioeconomic profiling (e.g. FP149: beneficiaries are identified as small and medium-sized enterprises across the country)

After screening the FP for the unit of measurement referred to by AEs, the conclusion is that the administrative unit is the most referenced (used in 64 per cent of projects to identify the location), followed by physio-geographic regions (used in 12 per cent of FPs to identify GCF project location).

Making necessary considerations while identifying the unit of measurement during project location geocoding is critical, especially in the case of further aggregation and rezoning of project locations for portfolio-level analysis. The effects of changes in the measurement unit have been widely documented. Hence consistency, standardization, and reproducibility take a central role in project location methodology.

For the sake of consistency and standardization, the geocoding team used administrative boundaries as the unit of measurement, as the unit overlaps with the footprint of the project location. In cases where the overlap is not full, we used a cutoff value of 80 per cent in considering the administrative unit as the GCF beneficiary project location. This means that where, for example, the project is

declared to benefit communities in a certain river basin, administrative divisions that have at least 80 per cent overlap with the river basin area will be regarded as a beneficiary area location.

The team has compiled a short list of credible open-access data sources for an administrative boundary, listed in the order of preference:

- Global Administrative Areas (GADM)
- United Nations Office for the Coordination of Humanitarian Affairs
- Open Street Map
- State Statistics

3. DATA SOURCES

The geocoding team conducted a systematic review of FPs to understand the state of the project locations in the documentation of approved GCF projects. The review started with the approved FPs. When the information in the FP itself was incomplete, the scope of the search was extended to include other possible sources of project location information. One output of the review is a list of other GCF documents that may contain information about the geographical coverage of GCF projects. A possible source of GCF project location information (as of B.30) includes:

- Funding proposal: the description of the project/programme component
- Funding proposal: annexes (map annex, feasibility study)
- Funded activity agreement
- Relevant stakeholders in GCF's Secretariat
- Accredited entities
    - FP019 Priming Financial and Land-Use Planning Instruments to Reduce Emissions from Deforestation – Shapefile provided by United Nations Development Programme
    - FP026 Sustainable Landscapes in Eastern Madagascar – Shapefile provided by CI
    - FP086 Green Cities Facility – Table sent by EBRD

Due to the lack of a standardized approach to project location disclosure, as well as the heterogeneity of project location interpretation across FPs documents mentioned above, location information was provided in various formats, including:

- Maps
- Shapefiles
- Schemes or diagrams
- Text description of project location, for example:
    - A list of confirmed project locations
    - A list of tentative project locations
    - Targeting criteria
    - A list of locations for the overall project – not specifying GCF-funded activity locations

D. THE WORKFLOW OF GEOCODING PROCESS

1. REVIEW PROJECT INFORMATION AND DOCUMENTATION

Geocoder's review covered documentation in the approved FP package, including the FP, feasibility study and other annexes. This initial review provides information about the project title, theme,

division, activities description, and preliminary beneficiary area location. In cases when the FP package includes sufficient information about the beneficiary area for the project and its components, the coder can move to step 3 directly and convert the geographic scope of the project beneficiary area to the standard unit of measurement. In cases when documents in the FP package mention a project is happening at the sub-national level, but no details are provided, the coder should move to step 2 and strengthen project location information with additional sources. Reviewing the project documentation at the approval stage provides an overview of varying levels of sub-national targeting across projects at the time of the Board's approval.

2.   STRENGTHEN PROJECT LOCATION INFORMATION WITH ADDITIONAL SOURCES

There are cases when FP documentation does not provide sufficient information on the planned project location. To address this data gap, additional information can be requested from stakeholders. If, at the time of geocoding, the project has advanced in implementation, additional information regarding project targeting can be requested from the Division of Portfolio Management or the project's AE. In the absence of more detailed information, geocoding is performed using FP data with the corresponding adjustment of geocoding confidence level.

3.   CONVERT THE GEOGRAPHICAL SCOPE OF THE PROJECT BENEFICIARY AREA TO THE STANDARD UNIT OF MEASUREMENT

When the scope of the beneficiary area is identified, the geocoder should convert the corresponding geographical area into the standardized unit of measurement. Standardizing the unit of measurement helps address inconsistencies in the results of geospatial analysis related to vast differences in the size of spatial features.

Currently, estimated climate finance flows are usually reported at the level of sovereign states, while information regarding the allocation of GCF finance to districts and provinces within a country is usually missing. IEU uses a granular approach to geocoding sub-national project activities so it can build a foundation for assessing sub-national equality. At this step, the geocoder identifies the administrative units that correspond to the geographical scope of the project beneficiary area (the project might mention natural region, riven basin, administrative region, etc.).

## 4.   GEOCODE BENEFICIARY AREA

The administrative units corresponding to the beneficiary area of a project are extracted and appended to the geodatabase of the project beneficiary areas across GCF's portfolio. Attributes of the shapefile are populated accordingly, and the geocoding tracking tool is updated with the information regarding standardized project scope (administrative units) and geocoding status. In terms of administrative level, the higher the administrative level at the project activity site, the more granular the location reporting. To illustrate, Admin Level 0 corresponds to a country-level project, Admin Level 1 to a provincial-level or regional project and Level 4 to a settlement-based project.

5.   QUALITY ASSURANCE OF BENEFICIARY AREA GEOCODING

Upon completion of the geocoding project, the reviser (another geocoder from the DataLab) independently goes through step 1 (review project information) to step 4 (geocode beneficiary area) to verify the geographical scope and location of the project beneficiary area. Upon determining the project beneficiary area, the reviser verified their decision against information captured in geocoding tracker after step 4. All differences in judgment were resolved through discussion, and the final geocoding was made upon reaching a consensus. If some cases, when information gaps were

identified, the geocoding team reverted to step 2 (strengthen project location information with additional sources) and requested required information from the relevant stakeholders.

The overview of the project location geocoding workflow is presented in Figure 1.

Figure 1.   *Workflow of project location geocoding*

Project location geocoding workflow

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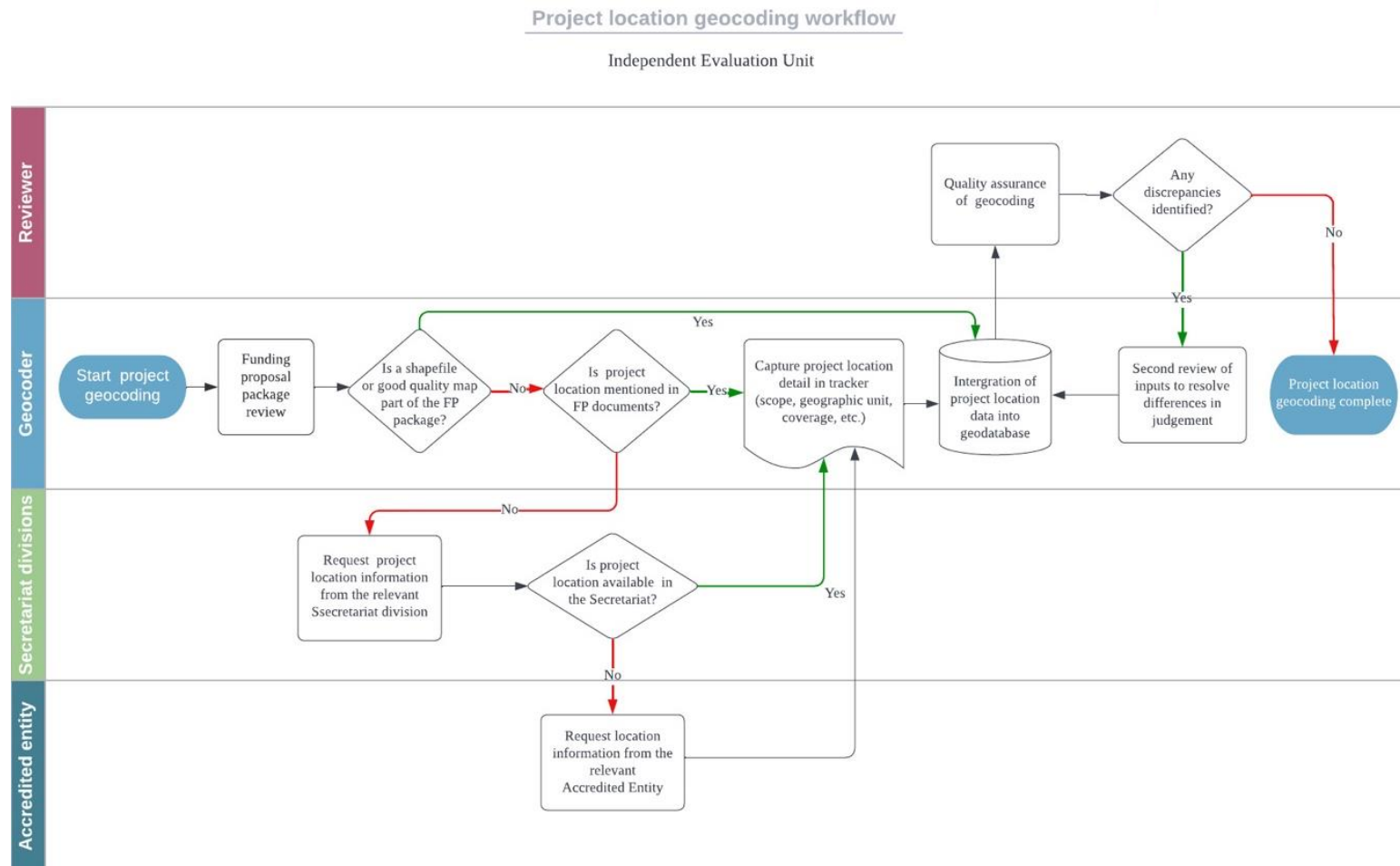
Source: IEU DataLab's own work

E. REMAINING CHALLENGES

1. CHALLENGES

The geocoding team still faces several challenges that impact the accuracy of its project location identification, including:

- Some projects finance sub-projects. The approach to project location disclosure in such instances is inconsistent across FPs. For example:
    - Pre-selected sub-projects (e.g. FP105 mentions that "Indicative pipeline of projects to be funded under the program")
    - "To be determined" sub-projects (e.g. SAP003 indicates that "These selection criteria will be further articulated in a grant operation manual during project implementation"; FP039 states that "The Framework envisages providing debt financing for 8–12 individual subprojects."). Following is an example of SAP003 package which indicates further criteria will be determined later.

    Activity 2.1.1. Scale up the use of water-saving and efficiency devices and techniques in municipal and agriculture sector.

    To actively reduce water demand in the municipal and agricultural sectors, water-saving devices will be distributed under the project at the household and farm levels. This will include the scaling up of existing water conservation initiatives currently being run by the Electricity and Water Authority (EWA), which will be facilitated through biannual national workshops on water conservation. Initial inputs will assess the effectiveness of the existing initiatives and current water-use patterns to identify the most effective technologies in Bahrain context. The project will target 5,000 households and 50 farms across three years, that will be selected on the basis of water consumption and income status, targeting households and farmers without the financial means to adopt water saving devices and efficient irrigation without external support. Water saving devices will be distributed too women and men equally and will consider the specific needs of women where appropriate.

- Some projects will use GCF funding to set up a finance facility but do not clarify the sub-national areas that will receive funding (e.g. FP005: "The Fund will invest approximately $80M in 10-15 companies, within [an] investment range of approximately $2–$10M per portfolio company.")

    The Fund intends to target solutions that provide access to clean, safe and affordable energy for those living at the BoP. The Fund will invest approximately $80M in 10-15 companies, within investment range of approximately $2M to $10M per portfolio company. in accordance with Acumen's accreditation, the Fund will not invest greater than $10 million in one portfolio company and will ensure that investments fall within ESS Category C of companies that have minimal or no adverse environmental and/or social risk and/or impacts. We estimate that approximately 60-70% of investments will be in businesses that have proven solutions to bring energy access to the masses such as solar lanterns, solar home systems and solar mini-grids, while 30-40% will be invested to build-out parts of the eco-system, which are weak or missing. Examples of investments in the latter category include consumer financing vehicles, mobile payment and remote monitoring / meter technologies, and working capital facilities.

- Finally, there is the question of multi-country projects. Geocoding occurs during the project approval stage. Therefore, projects where some target countries do not receive funding from GCF are a challenge to the methodology's accuracy and need amending at the project implementation stage. An example of FP140 is extracted as follows.

> The Programme targets energy-intensive industries, (non-fossil energy) mining companies, agribusinesses and agribusiness value chains (and related logistics) in the following participating countries: Armenia, Jordan, Kazakhstan, Morocco, Serbia, Tunisia and Uzbekistan. In these sectors and countries, key barriers need to be overcome to unlock potentials to deliver climate benefits. Critical financial barriers to the uptake of climate technologies across industrial, agribusiness and mining sectors contribute to the higher costs that early adopters of technologies face due to a lack of access to suitable financial products with adequate pricing. In addition, companies face a range of capacity barriers related to identifying, prioritizing, developing, implementing and monitoring low-carbon projects and the respective climate governance procedures.

2. THE WAY AHEAD: COMPONENT-LEVEL GEOCODING

To get insights into project activities at a more granular level and increase the expected spatial resolution of analysis, the team geocoded and categorized project components by activity type. This improvement allowed us to capture the project's geographical coverage, gain component-level insights, and simultaneously conduct comparative analysis across components. Concerning their spatial footprint, the identified types of project components consist of the following:

- Real sector's activity
- Enabling environment and capacity building
- Climate finance facility

Figure 2.   *Typology of project components*
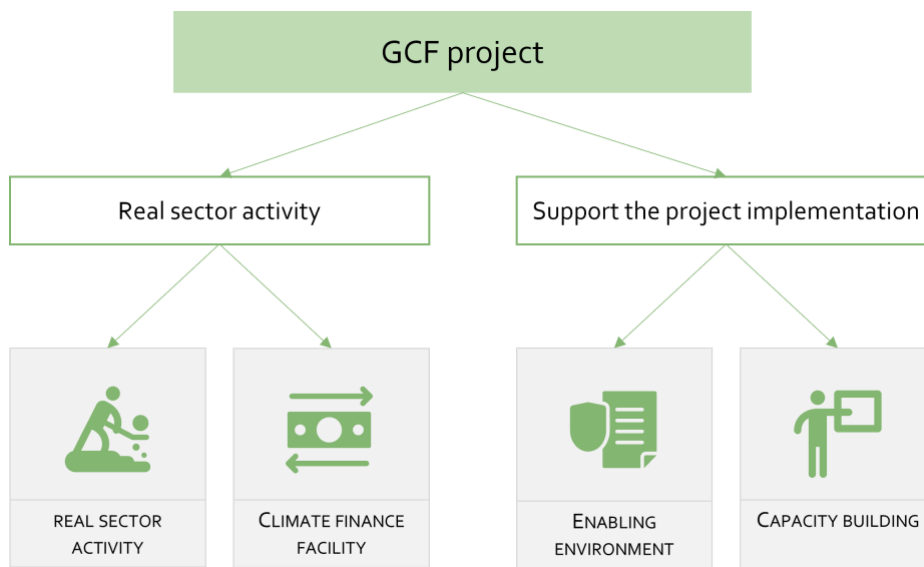
Source: IEU DataLab's own work

Within this category, the components of the real sector are separated from project implementation support activities. Under the umbrella of project implementation support, capacity building is defined as a training activity that increases organizational capability and the individual's knowledge and skills. The enabling environment is defined as an activity related to legal implementation, policy

or legal framework. The category of climate finance encompasses all the activities associated with financial operations, such as setting up a climate funding facility and disbursing finance. In most cases, the spatial footprint of climate finance facilities is not defined in terms of an administrative unit or natural region but primarily through socioeconomic profiling (e.g. targeting small and medium-sized enterprises across the country). The category of real sector activity includes all activities in the real sector economy, excluding financial operations (e.g. installation of solar panels, mini-grid, or biodiversity restoration).

a. Basic rules for geocoding

For each FP, the documentation and relevant sources were reviewed to capture the extent of different project outputs. To ensure consistency throughout the geocoding process and across GCF's portfolio, the following rules were applied during each project's review:

- The geographic scope of geocoded location is equal to the total beneficiary area for the projects' combined geographical coverage.

- When the FP design foresees several components being executed in the same location, the geodatabase captures which type of activity is carried out within the administrative unit.

- Three main sources of boundary geometry were used to define the most precise administration border. Due to the high level of standardization and high spatial coverage, the preferred source was GADM. OCHA boundary data was used for countries where the required resolution's administrative boundaries were unavailable. In cases where both OCHA and GADM did not provide the necessary data, the country's own statistics served as a backup option.

b. Geocoding methodology for complex cases

Throughout its location geocoding project, the team has developed a set of advanced rules that help guide cases where project location information is vague, provided in an unconventional format or the standard rules and workflow do not apply.

- If a project targets areas outside a country's administrative boundaries (e.g. coastal zones in FP122), then adjacent administrative units of the most granular size are considered beneficiary areas.

  - Example: in FP122, the project location is indicated through the phrase "protection and sustainable management of coastal resources relevant for ecosystems-based adaptation (mangroves, coral reefs, seagrass)".

- A multi-country project/programme may imply the establishment of a fund and specify a country or countries as definite project/programme location(s) while some countries may be mentioned as indicative locations for project scale-up. In such cases, project locations indicated as "definite" are used for geocoding.

  - Example: FP005 indicated that "The Fund will initially focus on Rwanda and Kenya but may also expand to other East African countries such as Uganda throughout the life of the Fund".

- If a disclosed project location partially overlaps with the corresponding administrative unit, then an administrative unit with >80 per cent overlap is indicated as the project beneficiary location.

  - Example: FP136 "The targeted watersheds for this project were selected with inter-regional equity in mind. A total of 210 major watersheds are included". For this project (for which there is a map in the FP's annex), the scope will correspond to the selected administrative units, of which at least 80 per cent falls under the watershed area.

- If the project implies the construction of a power plant, the beneficiary area is considered an overlap of administrative units and the corresponding energy grid connected to the energy generation facility.
    - Example: FP017 mentions: "The project activity of the Atacama Solar Photovoltaic Power Plant Project consists of the construction of a greenfield solar photovoltaic power plant to generate electricity and supply it to the Grand North Interconnected System (*Sistema Interconectado del Norte Grande - SING*) of Chile".

Appendix 1.   FEATURE TYPE

VARIABLE NAME	VARIABLE CODE	VARIABLE DESCRIPTION
Project ID	FPXXX; SAPXXX	FP number
Location name	XXX	Name of the location that contains the geocoded area
Location level	"ADM0"; "ADM1"	Project scope
Geocoded level	"ADM0"; "ADM1"	Final resolution of geocoding
p_site_id	"Potential Area Beneficiaries"	
imple_site	"0"; "1"	Whether the geocoded area is the beneficiary area or implementation site: 0: beneficiary area; 1: implementation site
checks	"0"; "1"; "2"; "3"	whether it has been validated: 0: not checked, 1: checked and validated, 2: checked but need to be revised, 3: need further documents from the secretariate
Source	"AnnexMAP"; "FundingProposal"; "AccreditedEntity"	Source of the document used for geocoding
NAME	XXX	Name of the country
GID_0	XXX	ISO code 3 of the country
BA	"0"; "1"	Result area: Building, cities, industries and appliances, 0: No, 1: Yes
EE	"0"; "1"	Result area: Ecosystems and ecosystem services, 0: No, 1: Yes
EP	"0"; "1"	Result area: Energy access and power generation, 0: No, 1: Yes
FL	"0"; "1"	Result area: Forestry and land use, 0: No, 1: Yes
HW	"0"; "1"	Result area: Health and well-being, and food and water security, 0: No, 1: Yes
IB	"0"; "1"	Result area: Infrastructure built environment, 0: No, 1: Yes
LT	"0"; "1"	Result area: Low Emission Transport, 0: No, 1: Yes
VC	"0"; "1"	Result area: Livelihoods of Most Vulnerable People and Communities, 0: No, 1: Yes
FP_WITH_ON	"0"; "1"	Whether given FP only has country-level boundaries as no other geographical location is given at the time of geocoding
GCF_Region	"Latin America and the Caribbean"; "Africa"; "Asia-Pacific"; "Eastern Europe"	Region GCF identifies for its projects
Least developed countries	"Yes"; "No"	Least developed countries
SIDs	"Yes"; "No"	Small island developing
Internatio	"South America";	Regions that are identified internationally

VARIABLE NAME	VARIABLE CODE	VARIABLE DESCRIPTION
	"Africa"; "Asia"; "Oceania"; "Central America"; "Europe"; "Middle East"; "Oceania"; "The Caribbean"	
id_loca	!project_id! +"_"+!Geocoded_L! +"_"+!p_site_id! +"_"+!NAME!	ID number for each row
Theme	"Cross-cutting"; "Adaptation"; "Mitigation"	The theme of the project
Multi_Coun	"Yes"; "No"	If the project is a multi-country project
Division	"DMA"; "PSF"	In which division the project is belonging
CapacityBuilding	"Yes"; "No"; "NA"; "No"	Yes= Administrative unit covered by this type of activity No=Administrative unit does not cover by this type of activity, but this type of activity is still happening in other units NA = This type of activity is not happening in this project
FinanceFacility	"Yes"; "No"; "NA"; "No"	Yes= Administrative unit covered by this type of activity No=Administrative unit does not cover by this type of activity, but this type of activity is still happening in other units NA = This type of activity is not happening in this project
RealSector	"Yes"; "No"; "NA"; "No"	Yes= Administrative unit covered by this type of activity No=Administrative unit does not cover by this type of activity, but this type of activity is still happening in other units NA = This type of activity is not happening in this project
EnablingEnvironment	"Yes"; "No"; "NA"; "No"	Yes= Administrative unit covered by this type of activity No=Administrative unit not covered by this type of activity, but this type of activity is still happening in other units NA = This type of activity is not happening in this project
REDDPLUS	"Yes"; "NA"	If the project is a REDD[4]+ project

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[4] REDD+ stands for reducing emissions from deforestation and forest degradation.

Appendix 2. TECHNICAL SPECIFICATIONS FOR THE GIS TASKFORCE EQUIPMENT

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HARDWARE/SOFTWARE CATEGORY	MINIMUM SPECIFICATION
Preload OS	Windows 10 +
Graphics	NVIDIA® RTX™ A2000 Max-Q 4GB GDDR6 128bit
Processor	11th Generation Intel® Xeon® W-11855M vPro™ Processor (3.20 GHz, Up to 4.90 GHz with Turbo Boost, 6 Cores, 12 Threads, 18 MB Cache)
DIMM Memory	32 GB DDR4-3200MHz (SoDIMM)
HDD Total Capacity	512 GB
GIS software	QGIS, ArcGIS 10.x or ArcPro
Spreadsheet software	MS Excel, OpenOffice or similar