

# The UCDP and AidData codebook on georeferencing aid

Version 1.1

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## **The UCDP and AidData codebook on geo-referencing aid Version 1.1<sup>12</sup>**

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AidData: Tracking Development Finance

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# 1 Introduction

This codebook details how aid events that are available from Aid-Data and other donor sources can be assigned latitude and longitude coordinates, i.e. be geo-referenced, under the UCDP/AidData coding rules. The rules are derived from the UCDP Geo-referenced Event Dataset (GED) Codebook version 1.0 (Sundberg et al., 2010) which covers the geo-referencing of violent events. The system has been adapted and complemented by additional rules to enable the coding of aid projects rather than battles. The UCDP GED is used as a starting point as it permits us to identify and record a hierarchy of locations differentiated by various precision scores.

Sources vary in the precision that locations are reported; sometimes the exact location is named and in other instances the general area is reported. Following UCDP, the system of geo-referencing used by UCDP/AidData can therefore cope with coordinates at four main levels, ranging from point locations, through two administrative divisions, to the country level. Eight precision categories are connected to the coordinates in order for researchers to select subsets of the data set that contain different levels of precision. The main objective is to record all locations to which aid dollars are committed or distributed. Locations that benefit indirectly are not coded, unless the geographic locations of the indirect areas are significant enough to be clearly spelled out in project documents.

## **2 The Benefits of Geo-Referencing Aid Locations**

The availability of aid locations at a sub-national level provides four main benefits to donor organizations: ease of management, dialogue with recipients, coordination with other donors, and increased transparency.

### **Ease of Management**

Localized data can provide donors with a better understanding of the allocation of aid within the country, highlighting any potential financing gaps, displaying inequities of aid distribution, and ensuring that aid flows to those who need it most. Once mapped, city-level data presents management with a simple platform to assess its current performance and to plan its future projects.

### **Dialogue with Recipients**

If made public, mapped sub-national data can provide recipients with a better understanding of how and where aid should be working for their benefit. Recipients will be better able to carry on a dialogue with donors to direct aid to areas which may have been otherwise neglected, and which need the aid the most.

### **Coordination with Other Donors**

Once multiple donors have made their mapped data available to the public, donor organizations will have a clearer picture of the aggregate distribution of aid within a country. Donors will be able to co-

ordinate their efforts to specialize in certain regions, or to co-finance projects, eliminating potentially wasteful project duplication.

## **Increased Transparency**

Mapped data will also hold both donors and recipient governments accountable to their intended beneficiaries. Researchers, auditors, and recipient citizens will be able to verify that projects are being implemented in their intended locations, reducing waste and fungibility and increasing aid effectiveness.

### **3 Roadmap for Georeferencing Projects across Donors**

The UCDP/AidData georeferencing scheme is flexible enough to code projects across multiple databases and donors. Our standard procedures for georeferencing include the following steps in this order.

1. AidData - Titles and Descriptions
2. Donor Documents
  - A. A specific document that provides official location for all of that donors' projects
  - B. Project info doc or project planning doc.
  - C. Project implementation doc.
  - D. Project evaluation document
  - E. Phone call or email to project manager
3. Recipient Database - development project management information system
4. Recipient Documents - on websites for the recipient development coordination agency.
5. Implementing Agency Documents - often the implementing agency maintains its own project website; these can be NGOs or private contractors

For any donor, we can begin with existing information in the AidData database. Following this, we consider a variety of documents from the donor, including those listed in A-E above. The prioritization of documents will change between donors as location information may appear in different documents, depending upon the reporting procedures of the organization (for instance, World Bank Project Appraisal Documents tend to give particularly rich geographic information, while the Project Information Documents tend to be more sparse in providing geographic locations). However, in all cases, multiple project documents should be reviewed to ensure that all locations receive a geographic reference. Following a consideration of the do-

nor's documents, the recipient database, recipient documents, and implementing agency documents can be consulted for further information. These steps enable us to be flexible in coding any particular donor.

## 4 Locating aid events in time and space

The geo-referenced data set that has so far resulted from this coding scheme is compatible with the original version of AidData as well as a variety of donor sources and GIS systems. This means that UCDP/AidData's unit of analysis is primarily funding commitments as opposed to distributed aid or calendar days (PLAID, 2010). Since data on the exact dates of funding commitments are sparse most geo-referenced locations can only be related to the year that a specific commitment was made.

When there are aid projects intended for several locations we include an additional row of data with the same project information, but separate sets of coordinates for every additional location. This means that each event is defined as a project-location.

## 5 About the geo-referencing of locations

Each aid project may have location information on several levels. First, the project abstract often contains some location information, but may not reflect all of a project's intended targets. After searching through the abstract for location information, the most recent updates of all project documentation are reviewed (this can include Project Appraisal Documents, Project Papers, etc.). In geo-referencing the AidData data set, titles and descriptions are also reviewed for relevant geographic information. Location information is frequently contained in more than one project document, necessitating a review of all possible sources of information. For this reason, unless a document definitively states that all locations are contained therein, the most recent of each document type is reviewed.

In the data set, the first column contains the number of locations that the project reaches (`numbloc`). The second and third columns in each set of coordinates contain the latitude (`lat`) and longitude (`long`) of the location. The fourth column in a set specifies the first-order administrative division (`ADM1`) and the fifth a second order division (`ADM2`) as a string variable. In addition, the official Geoname and Geoname ID (from [geonames.org](http://geonames.org)) are included in the sixth and seventh columns. If events only have information on the administrative division, and not the exact location, then the centroid point of the administrative division is entered into the latitude and longitude columns. Lastly, in each set of coordinates, the precision of the coordinates is specified (`Precision`), which we discuss in greater depth below. For additional locations, the project information is replicated in the following row, then the next set of coordinates and Geonames is entered.

Table 1 (see appendix) illustrates how the coding sheet looks for a project in which the recipient locations are clear and straightforward to geo-reference. The example references part of a World Bank transport improvement project with eleven locations, including Miritini and Kisumu, Kenya.

In table 1, the coordinates of the first location are recorded in the second and third column. The fourth and fifth columns display the

province and district in which the points are located. The sixth column is the Geoname of the point location, while the seventh column is the unique Geoname ID for the point. Finally, the precision code of 1 indicates that the points correspond to a specific place, in this case a town.

If there is no direct mention of any location in the sources, and the title and abstract do not indicate that aid is granted to the central government or national in nature, aid is assumed to go to the country in general. The country coordinates are coded with precision 7 which indicates that the location is unknown. This means that it is up to the researchers using the data to decide if unclear aid locations should, by default, be excluded, or be assumed to go to the entire country. See the advanced rules in section 8.

The coordinates are determined through Geonames, and the American National Geospatial Intelligence Service (NGA) is used as a complementary data source. Geonames and NGA both provide online services, namely [www.geonames.org](http://www.geonames.org) and the GEOnet Names Server (GNS), which contains names and coordinates of various administrative divisions, populated places, waterways, and objects. (<http://geonames.nga.mil/ggmagaz/geonames4.asp>) The latitude and longitude coordinates are recorded with a six decimal precision. The map projection used is the standard World Geodetic System 1984 (WGS 84) (Sundberg et al, 2010). Google Earth is also used in order to complement the primary and secondary sources.

## 6 About the precision categories

For the data to be useful for a wide range of applications it is crucial to make it possible to select sub-sets of the data based on varying criteria of precision. The first six categories detailed by the UCDP's Georeferencing Project Codebook (Sundberg et al. 2010) are used here, with minor modifications. The seventh and eight precision categories are unique for the UCDP/AidData codebook.

1 = The coordinates corresponds to an exact location, such as a populated place or a hill.

- The code is also used for locations that join a location which is a line (such as a road or railroad). Lines are not coded only the points that connect lines. All points that are mentioned in the source are coded. See section 7 for more information on coding lines.

2 = The location is mentioned in the source as being “near”, in the “area” of, or up to 25 km away from an exact location. The coordinates refer to that adjacent, exact, location.

3 = The location is, or is analogous to, a second order administrative division (ADM2), such as a district, municipality or commune.

4 = The location is, or is analogous to, a first order administrative division (ADM1), such as a province, state or governorate.

5 = The location can only be related to estimated coordinates, such as when a location lies between populated places; along rivers, roads and borders; more than 25 km away from a specific location; or when sources refer to parts of a country greater than ADM1 such as a National Park which spans across several provinces (e.g. Foret Classee de Gongon in Benin)

6 = The location can only be related to an independent political entity, meaning the pair of coordinates that represent a country. This in-

cludes aid that is intended for country-wide projects as well as larger areas that cannot be geo-referenced at a more precise level

7 = Unclear. The country coordinates are entered to reflect that sub-country information is unavailable.

8 = The location is estimated to be a seat of an administrative division (local capital) or the national capital.

- If aid goes to Luanda, for example, without further specification on the location, and there is an ADM1 as well as a capital called Luanda, then code the coordinates of the capital with precision 8.
- If it is not spelled out that aid goes to the capital; but if it is clear that it goes to a government ministry or to government financial institutions; and if those institutions are most likely located in the capital; then the coordinates of the capital are coded with precision 8. (However, if it can be verified that the recipient institution is located in the capital then the coordinates of the capital with precision 1 are used.)

## 7 Basic rules for geo-referencing

### Geonames

Enter the location name into the Geonames search engine, selecting the desired country. If there is no hit, try an advanced search of feature classes or use the “fuzzy search” feature. If there are still no results, search again using NGA GNS. GNS often contains more alternate spellings than Geonames, and those alternate spellings can be re-entered into Geonames to obtain the Geoname and Geoname ID.

### NGA GNS

Enter the location into the NGA GNS using the category “start with” and input search string “without diacritics”. If there is no hit in the GNS, search again using the category “fuzzy search” (Sundberg et al. 2010). If there are still no results, search again using Google Earth or Google Maps. Sometimes Google is better in suggesting options for spelling names that are misspelled in the sources. Use the coordinates of the location with the modified spelling, if it appears to be the place intended in the source. Left click on the pair of coordinates suggested in the gazetteer in order to obtain the location in decimal form rather than degrees, minutes, and seconds.

### Area locations

Administrative divisions (ADM1 and ADM2) and countries are areas. The latitude and longitude representation of areas are estimated as the coordinates of the centroid point and the Geoname ID provides a boundary file for the administrative divisions relating to the point. The names of first order administrative divisions (ADM1) and second order administrative divisions (ADM2) are saved in the data as text/strings in the “ADM1” and “ADM2” columns. The precision

code depends on the level of the area (3, 4, 6/7). Note that some cases have no second order administrative divisions connected to the first order administrative divisions in GNS. Geonames contains this information more often, and second order divisions are included whenever they can be located.

A particular problem when working with longer time series is that there are states that have revised the boundaries of their administrative divisions at some occasion during the years that are being coded. The priority in such instances is to best approximate the area that is intended in the source. Thus, if a province is divided into several new provinces, each of the new provinces within the boundaries of the defunct province is coded. A more difficult case occurs when countries decrease the number of provinces. In this case, the current province which contains the territory of the defunct province is coded and a note is made of the defunct province as the intended recipient.

## **Point locations**

Locations that are discrete points are for instance towns, cities, suburbs, hills, farms, and various installations. Occasionally the source will mention a location within a location, for instance a hospital in a capital. Since that does not happen often, and since the coordinates of the main location are the only ones available in most cases, record only the coordinates of the main location. For instance if there are funds going to farms somewhere in the location Bengo, as well as aid to hospitals somewhere in the same location, then Bengo is coded only once. Suburbs are borderline cases. Suburbs to cities should be considered to be locations in their own right and are coded if the coordinates are available (with precision 1). If the coordinates of a major suburb are not available use the coordinates of the main city and precision 2.

If a location cannot be pinpointed via the search functions in Geonames, the GNS, or Google Earth, for instance a dam, then use the coordinates of the closest populated place rather than for instance estimating a point in the lake through Google Earth. In that case use the appropriate precision code (2 or 5). However, if the dam itself can

be visually located via Google Earth, then estimate the coordinates of the centre of that exact location.

While coding point and line locations, also record the names of the related administrative divisions, if possible. Sometimes those names are not available from the gazetteer. If that is the case, use alternate sources such as [fallingrain.com](http://fallingrain.com) or [statoids.com](http://statoids.com) (Law, 2010) to determine the relevant administrative division. First order administrative divisions must be coded when a coordinate represents a sub-provincial feature, while second order administrative divisions may be left vacant if a brief search does not return reliable results.

## **Line locations**

If the location is a road, or a power line or similar connection between points, then code the point locations that are mentioned in the source as linking the road. Sometimes the name of the road (for instance Beira-Machipanda) is not the stretch of the road that receives the funding (for instance the Inchope-Machipanda section). If the source specifies the stretch of road which receives the funding, then record all towns that are explicitly mentioned in the source and that connect the road as well as any provinces through which the road passes.

If connecting towns are not indicated, simply record the provinces through which the road passes. For instance, a road running from Nairobi, Kenya to Mombassa, Kenya would necessitate five codes: (1) Nairobi, with Nairobi Area listed as the ADM1 and precision code 1; (2) Mombassa, with Coast Province listed as ADM1 and precision code 1; (3) Nairobi Area Province with precision code 4; (4) Eastern Province (through which the road passes) with precision code 4; and (5) Coast Province with precision code 4. This is done to reflect the fact that funding is allocated across the entire road through each af-

fected province, rather than simply to the point locations of the road ends.

## **Islands, peninsulas and parks**

When encountering islands, peninsulas or parks the proper precision code might be unclear. Do not code the island, peninsula or park separately if it is clearly a part of another location. For instance, Manhattan is a part of New York City and would not be counted as an island or a suburb. For other situations use the available codes:

1= The island, peninsula or park is very small, or a particular point on an island is named and can be coded;

2= If a very small island, peninsula or park, or a point on a big area, is not specified more than near a point;

3=The island, peninsula or park is, or is similar to, an ADM2, or more than one ADM2 clearly fit within the area and can be coded separately;

4=The island, peninsula or park is, or is similar to, an ADM1, or more than one ADM1 clearly fit within the area and can be coded separately;<sup>1</sup>

5=The island, peninsula or park is a bigger region that contains several ADM1 that do not clearly fit within the area; or if the area's location is unclear and further than 25 km from a named location; or if the coordinates can only be estimated between two named locations;

6=The island, peninsula or park is an independent political entity.

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<sup>1</sup> "Similar to" means that the area has a similar size as a typical ADM1 or ADM2 in that particular country. If in doubt, always use the less precise option.

## 8 Advanced rules for geo-referencing

The advanced rules are designed to support the coder when sources are vague or unclear about which locations receive funding. The best option is always to try and find better sources with information on the location. When that is not possible, due to time or other constraints, advanced rules are used to code vague, unclear, and ambiguous locations. The advanced rules are the result of trade-offs between two guiding criteria:

- Be conservative in the coding and assign aid to larger or otherwise more significant locations rather than smaller and insignificant locations.
- Strive to locate coordinates that as much as possible reflect real locations (like towns) rather than artificial (like the centroids of administrative divisions).

### Locations with ambiguous names

The sources often include the name of a location but are very sparse in specifying what type of location it is. In some cases that scarcity in specifying whether a location is an object, a town, or an administrative division, is combined with a wide selection of places that are named the same. In this case, after obtaining the options from Geonames, perform a search with the GNS and select the location that can be verified (i.e., has the same latitude and longitude). If an identical point cannot be located by cross-referencing the gazetteers, use an additional source such as Google Earth or fallingrain.com.

When feasible, the best option in ambiguous cases is to consult area experts who know which place is most likely intended. In Mozambique there are, for instance, a number of places called Pemba. For someone who has lived in Mozambique the most likely location is the Pemba which is the seat of the administrative division Cabo Delgado.

Until area experts can be consulted coders will however need to use the rules listed in the rest of this section.

One form of ambiguity is when there are several options in Geonames or the GNS, but neither is spelled the same as the location mentioned in the project's source documents. The source can for instance mention the location "Lang port" and the options in the gazetteer that is closest to that spelling may be "Lange" and "Langa". In this case, if Langa is closer to water than Lange, then go with Langa (since Lang has got a port according to the source). When all options fail to provide the location in the source, there are other rules to follow, which are listed in Table 2 (see appendix). Those instructions provide rules for arbitrating between two possibilities based on a prioritization of feature classes and are based on the two balancing criteria that are mentioned in the section above. However, when both potential points have identical feature classes, alternative sources should be used to corroborate one of the points.

If the alternative sources match both points, or none of the points, other factors should be considered such as the location of other points for the same project. For instance, there are three towns named Sabon Birnin in Nigeria, one each in the provinces of Kaduna, Sokoto, and Kebbi. If all of the other locations in the project documents are found in Kaduna province, the Sabon Birnin in Kaduna would be the most likely target, and should be selected. Once the location has been arbitrated satisfactorily, use a slightly more conservative precision code for the selected geographic feature (i.e. 2 for populated place and 5 for a district or province).

If it is difficult to determine whether a town, for instance Lang, is just misspelled in the source or if it is a place which is just not available in the gazetteer or Google Earth, the precision category will be a 5 or 7. The location is therefore either treated as being somewhere within a larger area that can be estimated, for instance a coast-line when the location has a sea port. Or it is treated as other unclear locations

with the exception that the possible location name can be noted in the spreadsheet.<sup>2</sup>

## Vague area locations

In some instances the source will mention “most provinces” or similar vague locations. It is precise enough that the coder knows the general region that has aid committed to it, but unclear enough that the exact areas are hard to pinpoint – hence the term vague. When feasible, this project should be flagged by the coder (and temporarily left uncoded) for a supervisor to contact the implementing agency for clarification. If resources do not allow for specific inquiries when some vague geographic information is available, like “northern provinces”, then code all provinces along the northern border (with precision 4). The principle is to ensure that the correct provinces receive a geographic reference.

When it is possible to locate a centroid point for a vague/large region through Geonames or the GNS, or by estimating it, precision code 5 is used. The reason is that a centroid of a large region is less precise than for instance two centroids of two provinces. An example is in Guinea where Haute Guinea refers to an “upper” region in Guinea. The GNS has a centroid point so the coordinates for that point is used along with precision code 5. When using precision code 5, the ADM1 field should be left blank and each province containing a portion of that geographic feature (such as a National Park or Ecological Reserve) should receive a separate code (similar to the rules for coding roads through multiple provinces). In many instances it is impossible to estimate which areas are intended (for instance “most provinces”). In such cases, when it is known that the locations are areas that ap-

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<sup>2</sup> For using precision code 7 see “unclear locations” and “cases with at least one clear location and one unclear location”.

pear to cover a big unspecified swath of land, code the country level coordinates once and use precision code 6.<sup>3</sup>

## **Cases with at least one clear location and one vague area location**

If the source specifies one location and then notes that other locations will also receive aid, for instance “most provinces”, then do not forget to code those vague cases. In that case there will thus be two sets of coordinates, one for the explicitly mentioned source, and one for the country that collects the unspecified locations.

## **Unclear locations**

A location is unclear if it is not certain that it is an area and if the exact location cannot be determined. Even if there is no direct mention of any location in the source material, a project is still geo-referenced. Users of the data set can therefore decide whether or not, or how, to include unclear locations in analyses. An example of a project with an unclear location is a World Bank local government support project in Tanzania which requires that local governments apply and be approved for support. Without contacting the project manager, it is impossible to determine which local governments actually received funding through the project. The solution is just to code the entire

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<sup>3</sup> If the source mentions locations that are unspecified *points* then see the rules for “unclear locations” and “cases with at least one clear location and one unclear location”.

country as the recipient whenever a case is unclear, using precision code 7 (see table 3, appendix).

On the other hand, if the source makes it clear that a central government institution receives the funding then the capital is coded, albeit with precision 8 (see table 4, appendix).<sup>4</sup>

Finally, if the source makes it clear that funding will take place throughout the country, the country coordinates are used with precision 6 (see table 5, appendix).

## **Cases with at least one clear location and one unclear location**

If the coordinates of one location of a project (a row in the data set) are known and if there is one additional location in that event which is unclear (like “some towns”) then, unlike when areas are merely vague, that unclear place is just not coded. No assumed country level or capital coordinates or anything similar are added in the way that is done when the entire event is unclear.<sup>5</sup>

However if it is entirely clear that one part of the funding goes to unnamed populated places *throughout* the country, then the country level is also coded (with precision 6). In those cases it must however

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4 One could assume that precision code 7 should be used rather than 8 in this case. It is however more convenient for users to easily locate the most unclear cases by just selecting all observations where column “Precision” is 7. Furthermore, assuming that the capital is the recipient if a government institution receives the funding, is a much clearer decision than assigning the national level only, when rural locations are recipients.

5 The clear location is considered to provide enough location information. If a set of unclear coordinates for the national level (with precision 7) would be added every time there is a completely unclear location mentioned parallel with clear locations – such a rule would complicate the coding and the use of the data well beyond its benefits.

be clear that the locations cover most of the country to warrant inclusion alongside a clear location with precision code 6.

## A summary of coding rules for vague or unclear locations

Table 6 lists which coordinates and precision categories to choose in the main unclear or vague situations.

Table 6: Selecting a location when no geographic location is explicitly named

Precision code	Capital is assumed to be location if:	Country is assumed to be location if:
8	The project title or description makes it clear that the central government ministries or financial institutions are recipients	
7		The project title or description fields suggest that aid goes to a rural area (and most likely not to the capital)
7		If the capital has no access to waterways and if the project title or description indicates that the aid goes to harbour activities

Note that that “central government ministries or financial institutions” only include those that are fully controlled by the government. Government “programs” or similar cooperative arrangements or organisations, which are composed of a wide variety of NGO’s, central or local government agencies, and companies are not assumed to be located in the capital (with precision 8). Such recipients are considered unclear and coded as such (country coordinate with precision code 7).

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# Appendix

Table 1: Example of clear locations.

Numbloc	Lat	Long	ADM1	ADM2	Geoname	GeonameID	Precision
11	-4	39.56667	Coast	Mombasa	Miritini	177896	1
11	-0.1	34.75	Nyanza	Kisumu	Kisumu	191245	1

Table 2: Selecting a location when several alternatives have the same name

	<b>Object</b>	<b>Populated place, unofficial name</b>	<b>Populated place, official (BGN) name</b>	<b>Seat of administrative division</b>	<b>Capital</b>	<b>ADM2</b>	<b>ADM1</b>
<b>Object</b>	Use alternate sources and consider locations of other project components	Choose the populated place. Precision code = 1	Choose the populated place. Precision code = 1	Choose the seat of the administrative division. Precision code = 1	Choose the capital. Precision code = 1	Choose the centroid of ADM2. Precision code = 3	Choose the centroid of ADM1. Precision code = 4
<b>Populated place, unofficial name</b>	..	Use alternate sources and consider locations of other project components	Choose the populated place, official (BGN) name. Precision code = 1	Choose the seat of the administrative division. Precision code = 1	Choose the capital. Precision code = 1	Choose the centroid of ADM2. Precision code = 3	Choose the centroid of ADM1. Precision code = 4
<b>Populated place, official (BGN) name</b>	..	..	Use alternate sources and consider locations of other project components	Choose the seat of the administrative division. Precision code = 8	Choose the capital. Precision code = 8	Choose the centroid of ADM2. Precision code = 3	Choose the centroid of ADM1. Precision code = 4

	<b>Object</b>	<b>Populated place, unofficial name</b>	<b>Populated place, official (BGN) name</b>	<b>Seat of administrative division</b>	<b>Capital</b>	<b>ADM2</b>	<b>ADM1</b>
<b>Seat of administrative division</b>	..	..	..	Use alternate sources and consider locations of other project components	Choose the capital. Precision code = 8	Choose the seat of the administrative division. Precision code = 8	Choose the seat of the administrative division. Precision code = 8
<b>Capital</b>	..	..	..	..	..	Choose the capital. Precision code = 8	Choose the capital. Precision code = 8
<b>ADM2</b>	..	..	..	..	..	The most likely is selected. Precision code = 4	ADM1 is selected over ADM2. Precision code = 4
<b>ADM1</b>	..	..	..	..	..	..	The most likely is selected. Precision code = 5 or 6

Table 3: Example of unclear location

Numbloc	Lat	Long	ADM1	ADM2	Geoname	GeonameID	Precision
1	-6	35			United Republic of Tansania	149590	7

Table 4: Example of when a central government institution receives funding

Numbloc	Lat	Long	ADM1	ADM2	Geoname	GeonameID	Precision
1	-4.2669	15.28327	Brazzaville		Brazzaville	2260494	8

Table 5: Example of when a project is national in scope

Numbloc	Lat	Long	ADM1	ADM2	Geoname	GeonameID	Precision
1	8	-5			Republice of Côte d'Ivoire	2287781	6