BEST PRACTICES FOR GEOLOCATION DATA COLLECTION AND PREPARATION

i WHAT IS THIS GUIDE FOR?

Support SPOs in collecting and preparing geolocation data to:

1. Ensure geolocation data meets Fairtrade standards.
2. Check for deforestation risks in mapped areas.
3. Format geolocation data to comply with EUDR rules.
4. Facilitate easy sharing of geolocation data with commercial partners.
5. Support transparency and trust in supply chains.

Important Note

While Fairtrade accepts remotely collected data, we recommend field data collection, especially for polygon mapping of plots over 4 hectares or in high-risk areas. This guide outlines best practices for accurate field data collection and submission to Fairtrade International.

SOME EXAMPLES OF GPS DEVICES FOR DATA COLLECTION

GPS Device   **Smartphone**   **Tablet**

HOW THIS GUIDE IS STRUCTURED

This guide provides instructions on how to collect, prepare, and submit geolocation data in either point or polygon format.

GPS Points   **GPS Polygons**

PLAN YOUR DATA COLLECTION IN THE FIELD

1. DEFINE CLEAR OBJECTIVES

- Define whether plots will be mapped as points or polygons; for plots of more than 4 hectares and in high-risk areas, polygon mapping is required.
- Assign unique and permanent identification codes to each farmer (farmer ID).
- Make sure your team is prepared and understands how and what data should be collected.
- Plan each collection visit by identifying how many farms and plots will be visited or how many hectares need to be covered.

2. SELECT DEVICES AND TOOLS

Select GPS and GIS tools that meet data requirements and suit your resources.

1. GPS (Global Positioning System): A GPS device determines your position on Earth, allowing you to collect precise location data. Smartphones and tablets with GPS functionality can also be used for field data collection.
2. GIS (Geographic Information System) software: Unlike GPS, a GIS is used to analyze and visualize spatial data. GIS software enables the combination of different data types, examination of locations, and organization of information into maps.

3. ASSIGN RESPONSIBILITIES

- Clearly identify who will be responsible for data collection.
- Ensure that the staff tasked with data collection is qualified and trained.
- It's ideal to include at least one person with GIS experience.

4. GENERATE FIELD LOGS

We recommend to generate Field logs to document the data collection process:
1. Names of responsible individuals,
2. Dates and hour,
3. Locations (city or town)
4. Tools and equipment used
5. Observations during each field visit.

This approach allows for tracking the origin of the data and verifying its accuracy. It ensures that all parties involved in the data collection process can be identified, making it easier to assign responsibility and verify the process.

5. ENSURE FAVORABLE CONDITIONS FOR DATA CAPTURE

For accurate data collection, ensure that conditions are optimal.
Key factors to consider include:
- Weather conditions: as heavy rain or fog can interfere with GPS accuracy.
- Physical obstructions: such as trees or steep slopes can block GPS signals.
- Plot accessibility: data collection may not be possible in hard-to-reach areas.

Whenever possible, avoid collecting data under unfavorable conditions to maintain accuracy and reliability.

6. CHECK EQUIPMENT BEFORE EACH VISIT

Ensure that all devices are configured correctly and fully charged before each field visit to avoid interruptions during data collection. Verify that the GPS is set to WGS84 coordinates and configured to collect 6 decimal places.

GPS POINT DATA COLLECTION

- For plots under 4 hectares, point or polygon data can be collected for every cultivated plot.
- If you choose to collect point data for plots under 4ha that are not in a high-risk areas, accepted formats include: Excel, .csv, .kml, .shp, or GeoJSON.

Required data includes:
- FLOID,
- Farmer ID,
- unique Farm unit ID,
- Plot Area,
- Latitude,
- Longitude,
- (Optional for 2nd or 3rd Grade SPOs) Name of 1st Grade SPO.

GOOD PRACTICES FOR POINT DATA COLLECTION

For each plot, a geolocation point should be collected at the center.

If a farm is large but the cultivated area (the plot) is less than 4 hectares, do not collect data for the entire farm. Instead, record a single point at the center of the cultivated area.

A farm can consist of several plots. A point should be collected for each plot individually, rather than for the entire property. Each of these plots must be assigned with unique Farm Unit ID.

If there are barriers, such as rivers or roads, dividing the farm, these should not be considered as part of a continuous plot but as separate plots.

If two plots are next to each other, avoid collecting points that are too close to the edge.

HOW TO COLLECT POINT DATA

Go to the center of the plot

Go to the center of the plot and find a location free from obstacles, such as trees, clouds, or any physical barriers that might interfere with accurate data capture.

Wait for a good GPS signal

Wait some minutes until your device has a strong GPS signal before proceeding to take the point.

Add attributes

- Use the Farm Unit ID as the primary key to identify each plot. While multiple plots can belong to the same farm, each Farm Unit ID must be unique to a specific plot.
- If your device allows it, also include the Farmer ID and plot area (in hectares).
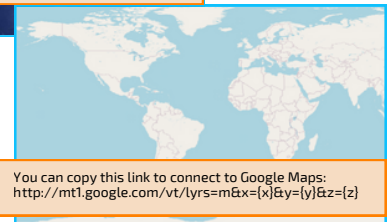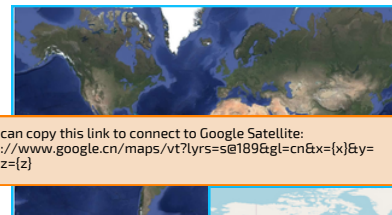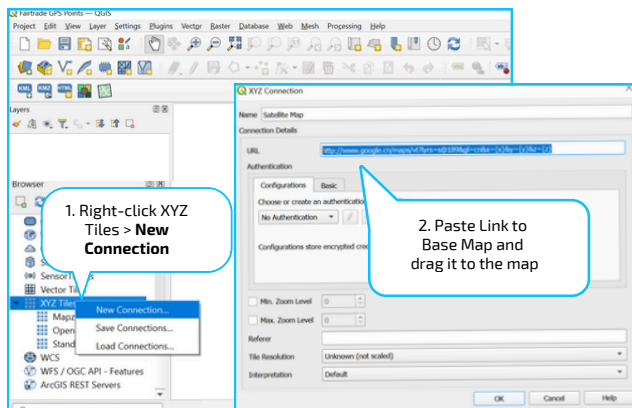
4

GPS POINT DATA PREPARATION

Once your point data has been collected, you will likely need to complete the required information attached to each point, such as latitude and longitude, using a GIS tool. GIS software also helps verify and manipulate data points. There are many GIS options available, and you can choose the one most suitable for your SPO. For the examples in this guide, QGIS is used as a free option.
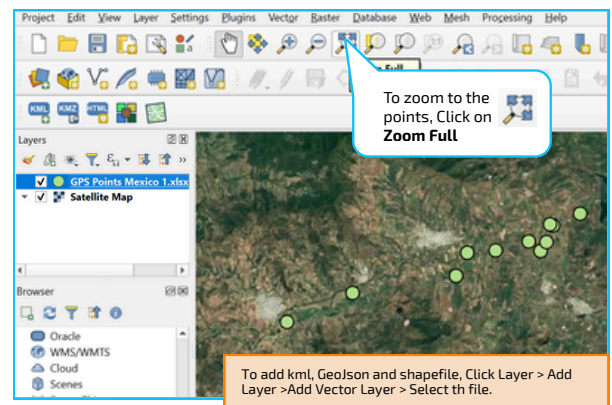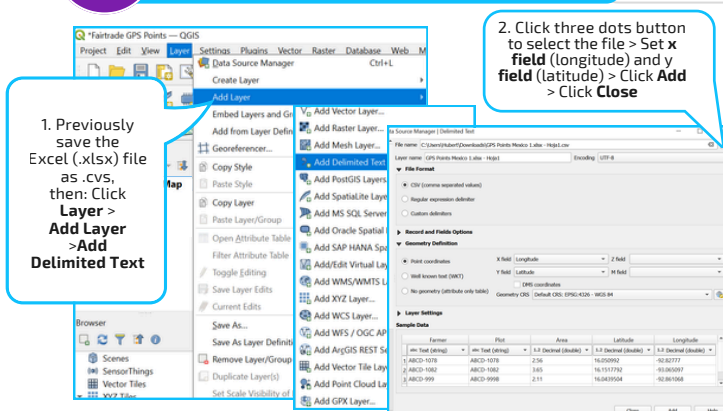
1. GENERAL CONFIGURATION

Set up your project to be **in WGS84**, and import a **base map.**

1. Right-click XYZ Tiles > **New Connection**

2. Paste Link to Base Map and drag it to the map

You can copy this link to connect to Google Satellite:
http://www.google.cn/maps/vt?lyrs=s@189&gl=cn&x={x}&y={y}&z={z}

You can copy this link to connect to Google Maps:
http://mt1.google.com/vt/lyrs=m&x={x}&y={y}&z={z}

2. IMPORT YOUR FILE

Import your point data file (e.g., KML, SHP, Excel).

1. Previously save the Excel (.xlsx) file as .cvs, then: Click **Layer** > Add Layer >**Add Delimited Text**

2. Click three dots button to select the file > Set **x field** (longitude) and y **field** (latitude) > Click **Add** > Click **Close**

To zoom to the points, Click on **Zoom Full**

To add kml, GeoJson and shapefile, Click Layer > Add Layer >Add Vector Layer > Select th file.

3. GENERAL CHECK OF THE FILE

Check the Attribute Table, here you can identify which information can be used.

1. Right-click in the file > **Open attribute table**
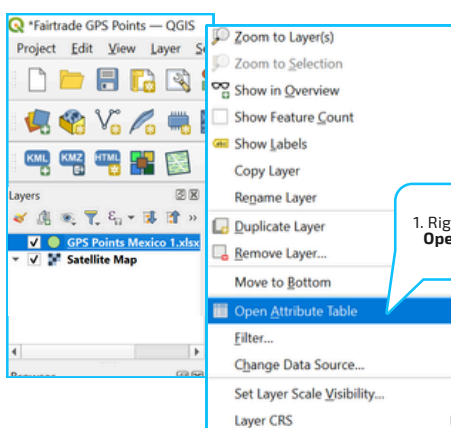
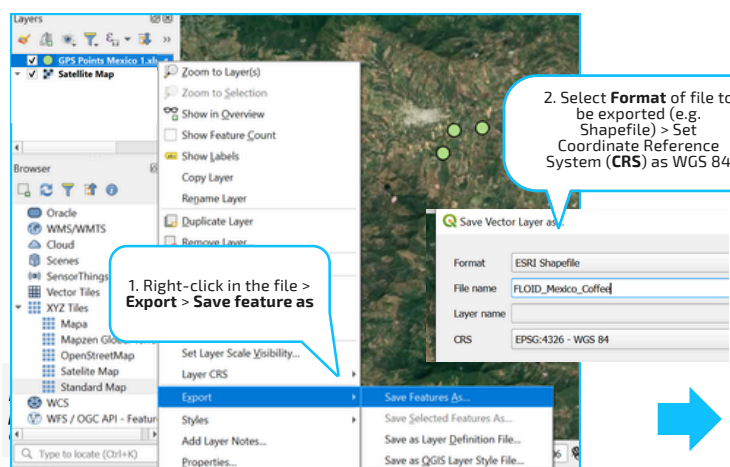|	Farmer	Plot	Area	Latitude	Longitude
1	ABCD-1078	ABCD-1078	2.56	16.050992	-92.8277701
2	ABCD-1082	ABCD-1082	3.65	16.1517792	-93.065097
3	ABCD-999	ABCD-999B	2.11	16.0439504	-92.8610676
4	ABCD-440	ABCD-440	1.41	16.1279564	-93.1554987
5	ABCD-852	ABCD-852C	2.99	16.0827218	-92.811092
6	ABCD-1222	ABCD-1222	0.5	16.1694622	-93.0263912

An Attribute table contains information about each point or polygon. Each row represents a point, line, or polygon, and each column holds details like name, size, or type.

4. PREPARE THE FILE FOR EDITING

4.1 MAKE SURE THE FILE IS IN SHAPEFILE FORMAT FOR EDITING

If you have all your points in one file, you may need to export it as a shapefile if it is not already in order to edit the points later.
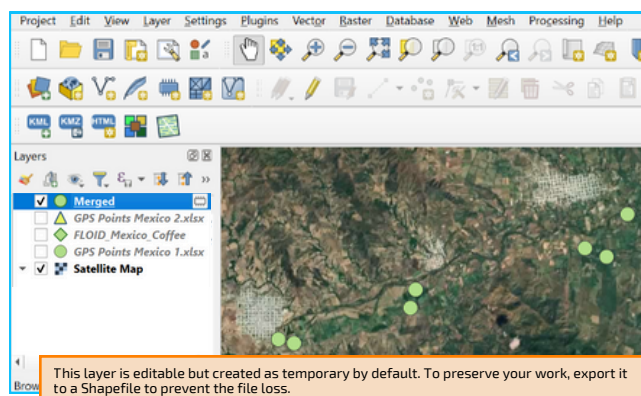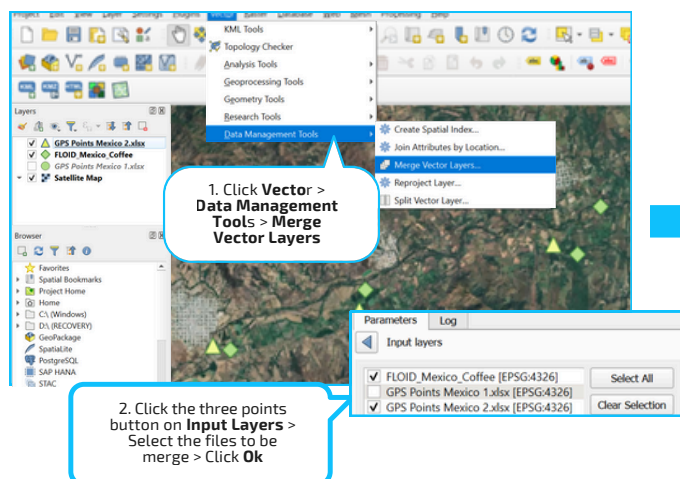

2. Select **Format** of file to be exported (e.g. Shapefile) > Set Coordinate Reference System (**CRS**) as WGS 84

1. Right-click in the file > **Export** > **Save feature as**

Example of a shapefile document

Name	Type
FLOID_Mexico_Coffee.cpg	CPG File
FLOID_Mexico_Coffee.dbf	DBF File
FLOID_Mexico_Coffee.prj	PRJ File
FLOID_Mexico_Coffee.qix	QIX File
FLOID_Mexico_Coffee.qmd	QMD File
FLOID_Mexico_Coffee.shp	SHP File
FLOID_Mexico_Coffee.shx	SHX File

In GIS, a layer is a collection of information shown on a map, such as points, lines, or areas like roads, cities, or rivers.
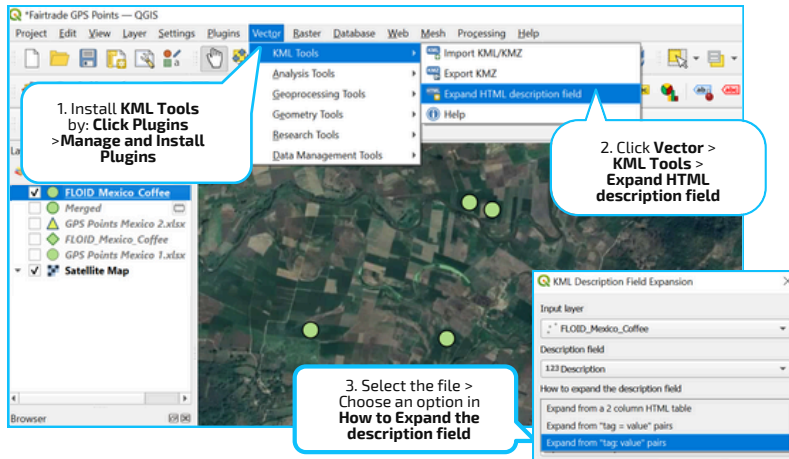
4. 2 MERGE FILES

If you have several files like several KMLs, use a tool in the GIS to merge them into a single file.

1. Click **Vecto**r > **Data Management Tool**s > **Merge Vector Layers**

2. Click the three points button on **Input Layers** > Select the files to be merge > Click **Ok**

This layer is editable but created as temporary by default. To preserve your work, export it to a Shapefile to prevent the file loss.

4. 3 SEPARATE FIELDS

If you have one field in your attribute table that contains multiple useful data (e.g., farmer ID and plot area) in the same field, you should use tools to separate them.

1. Install **KML Tools** by: **Click Plugins >Manage and Install Plugins**

2. Click **Vector** > **KML Tools** > **Expand HTML description field**

3. Select the file > Choose an option in **How to Expand the description field**

For this example, "expand from tag: value pairs" was chosen due a colon (:) is separating the title and the value (e.gPlotArea: 0.9 and not PlotArea=0.9).

This layer is editable but created as temporary by default. To preserve your work, export it to a Shapefile to prevent the file loss.

4. 4 RENAME FIELDS

Once you have your file ready to edit it, rename the fields and correct any names if necessary.


2. Click **Fields**> Change field names

1. Right-click on the file > Click **Properties**

Delete unnecessary columns by clicking on Editing tool and click on delete fields.
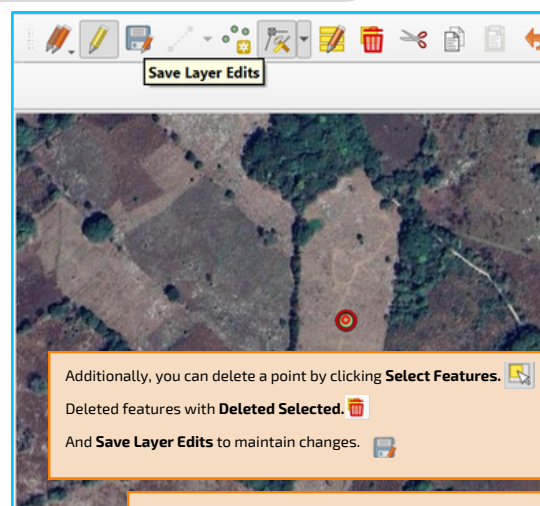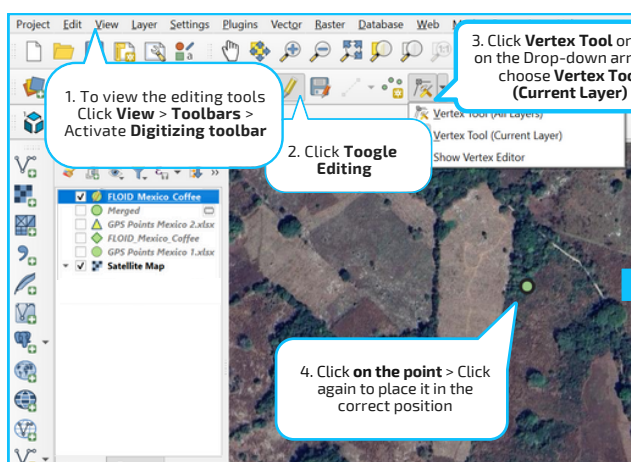
5. IDENTIFY INCORRECTS POINTS

Zoom to the file to verify the location of the points. Ensure they are correctly placed, especially within the same country or corresponding city.
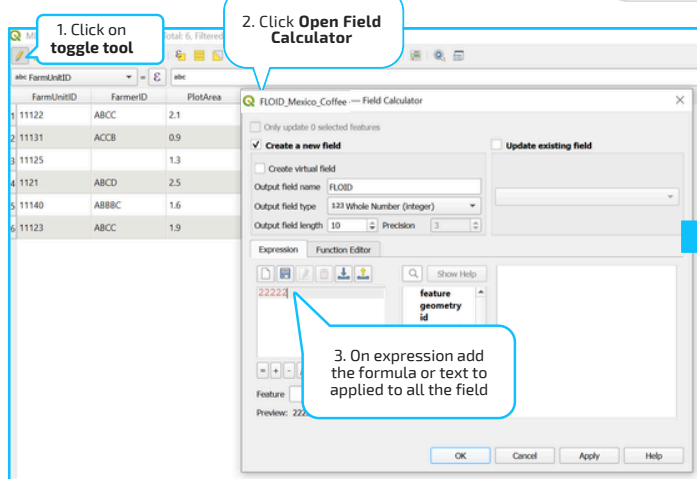

1. Right-click on the file > Click **Zoom to Layer**
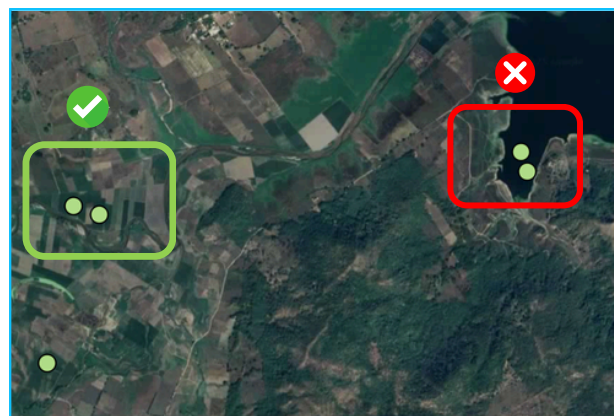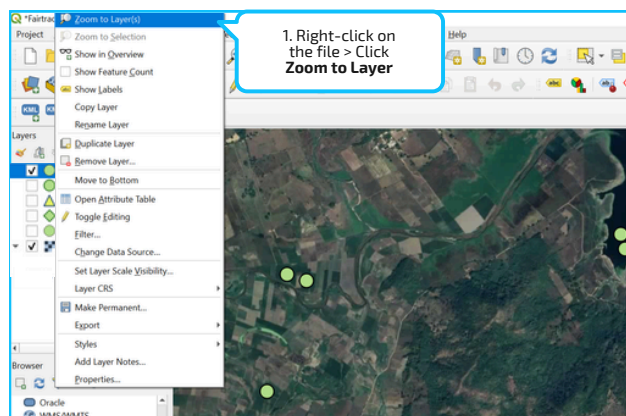
6. EDIT POINTS

Edit points that are not correctly located, or delete them if they do not correspond to any farm.

1. To view the editing tools Click **View** > **Toolbars** > Activate **Digitizing toolbar**

2. Click **Toogle Editing**

3. Click **Vertex Tool** or Click on the Drop-down arrow > choose **Vertex Tool (Current Layer)**

4. Click **on the point** > Click again to place it in the correct position

Save Layer Edits

Additionally, you can delete a point by clicking **Select Features**. Deleted features with **Deleted Selected**. And **Save Layer Edits** to maintain changes.

e.g. editing tool for crossed borders and to overlapped plots.

7. ADD MISSING FIELDS

- If you missed any fields during data collection, you can add new fields manually for FLOID, plot area, farmer ID.
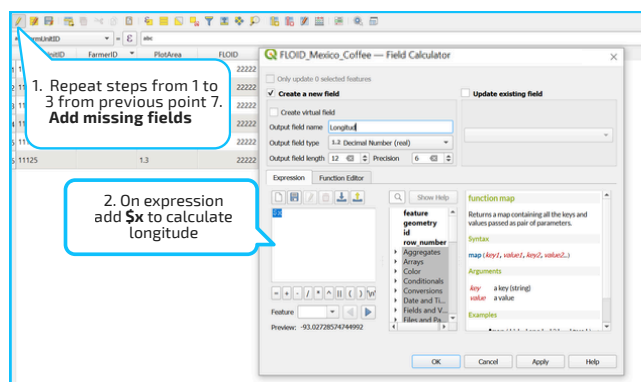- Check for duplicates in your Farm_IDs, as these should be unique and not repeated.

1. Click on **toggle tool**

2. Click **Open Field Calculator**

3. On expression add the formula or text to applied to all the field

FarmUnitID	FarmerID	PlotArea	FLOID
11131	ACCB	0.9	22222
1121	ABCD	2.5	22222
11123	ABCC	1.9	22222
11122	ABCC	2.1	22222
11140	ABBBC	1.6	22222

8. ADD LATITUDE AND LONGITUDE

In attributes, add a calculated field for Latitude and Longitude:
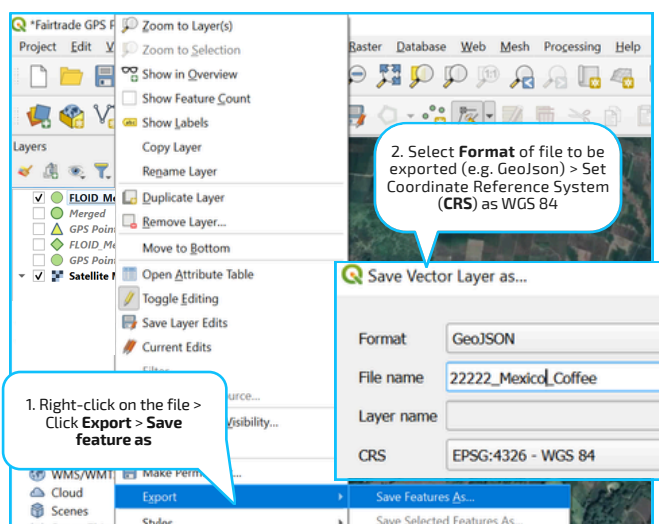- $x for latitude,
- $y for longitude.

1. Repeat steps from 1 to 3 from previous point 7. **Add missing fields**

2. On expression add **$x** to calculate longitude

Repeat all the steps to add a new field for Latitude with the expression $y.

9. EXPORT DATA

Export the data in a format accepted by Fairtrade International for deforestation analysis. Make sure the format is compatible with Fairtrade International requirements. The name should include:
- organisation's FLOID,
- country,
- product (cocoa or coffee) for which you are submitting data.

2. Select **Format** of file to be exported (e.g. GeoJson) > Set Coordinate Reference System (**CRS**) as WGS 84

1. Right-click on the file > Click **Export** > **Save feature as**

Name	Type
☑ 22222_Mexico_Coffee.geojson	GEOJSON File
22222_Mexico_Coffee.dbf	DBF File
22222_Mexico_Coffee.qix	QIX File
22222_Mexico_Coffee.cpg	CPG File
22222_Mexico_Coffee.prj	PRJ File
22222_Mexico_Coffee.qmd	QMD File
22222_Mexico_Coffee.shp	SHP File
22222_Mexico_Coffee.shx	SHX File

(file name should specify [FLOID]_[Country]_[Product].

POLYGON DATA COLLECTION

- Required for plots where the cultivated area is 4 hectares or more or the plot is in a known high-risk area.

Polygon data should include:
- FLOID,
- Farmer ID,
- unique farm unit ID,
- (Optional for 2nd or 3rd Grade SPOs) Name of 1st Grade SPO attached to each polygon.

GOOD PRACTICES FOR POLYGONS

- You can walk around the boundaries of the plot to collect the data by activating tracking.
- When doing this, it is recommended to use a handheld GPS unit or specialized field equipment, rather than a cell tower devices like smartphones or tablets.
- Once you've completed the polygon, save the polygon and insert the Farm Unit ID in the polygon name.

- If the plot is too large and difficult to walk around, ideally, collect a point at each vertex. Later, you can draw the polygon on the desktop using a GIS.
- You must stand in the first corner, save the point, continue to each corner and collect points in sequence.
- Save each point with Farm Unit ID as the main identifier. If your device does not automatically assign an order, add an identifier with the point's order (e.g., "1", "2", "3").
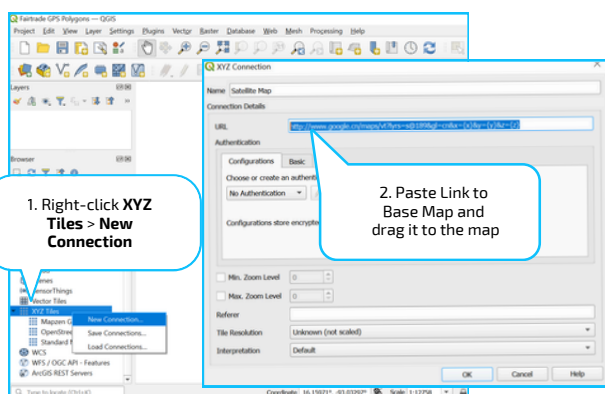- It is recommended to follow a clockwise direction.

GPS POLYGON DATA PREPARATION

Once your polygon or corner points have been collected, you will likely need to complete the required information attached to each plot, such as corner points coordinates and total area, using a GIS tool. GIS software also helps verify and refine polygon shapes or estimated boundaries for accuracy. There are many GIS options available, and you can choose the one most suitable for your SPO. For the examples in this guide, QGIS is used as a free option.

1.GENERAL CONFIGURATION

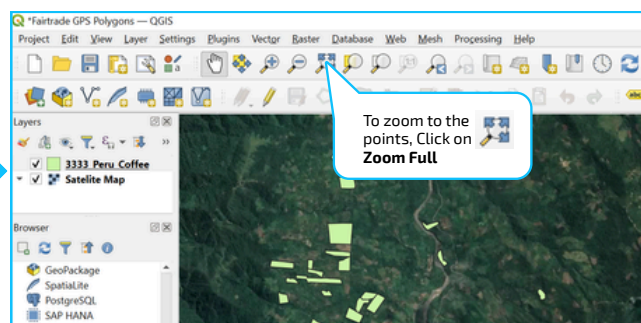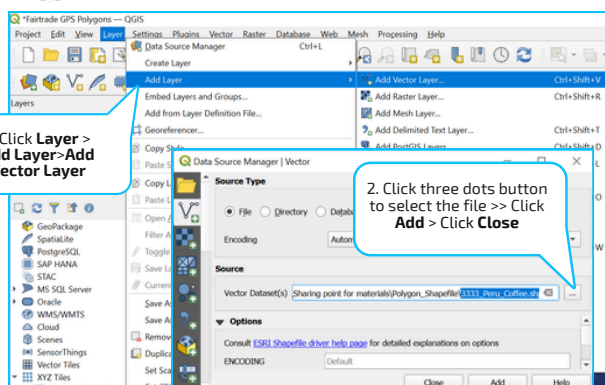Set up your project to be **in WGS84**, and import a **base map.**

1. Right-click **XYZ Tiles** > **New Connection**

2. Paste Link to Base Map and drag it to the map

You can copy this link to connect to Google Satellite:
http://www.google.cn/maps/vt?lyrs=s@189&gl=cn&x={x}&y={y}&z={z}

You can copy this link to connect to Google Maps:
http://mt1.google.com/vt/lyrs=m&x={x}&y={y}&z={z}

2. IMPORT YOUR FILE

Import the polygon/corner points file (e.g., KML, SHP, Excel).

1. Click **Layer** > **Add Layer**>**Add Vector Layer**

2. Click three dots button to select the file >> Click **Add** > Click **Close**

To zoom to the points, Click on **Zoom Full**

3. GENERAL CHECK OF THE FILE

Check the Attribute Table, here you can identify which information can be used.

1. Right-click in the file > **Open attribute table**
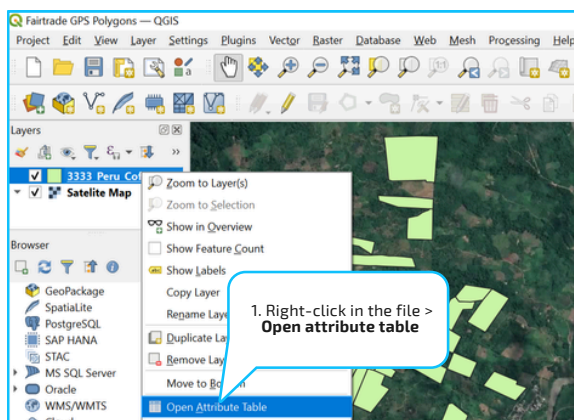
	FarmUnitID	FarmerID
1	ABC-007-01	ABC-007
2	ABC-013-01	ABC-013
3	ABC-032-01	ABC-032
4	ABC-035-01	ABC-035
5	ABC-038-01	ABC-038

An Attribute table contains information about each point or polygon. Each row represents a point, line, or polygon, and each column holds details like name, size, or type.
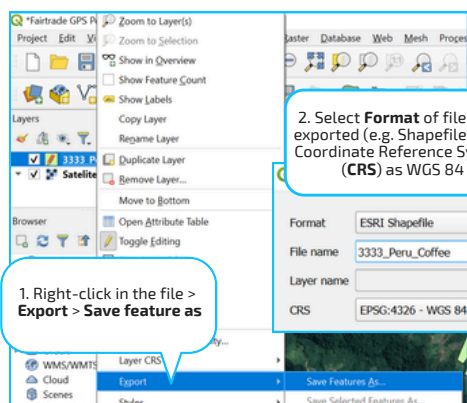
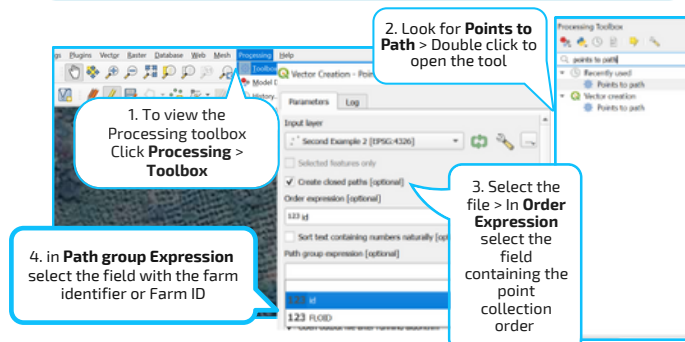# 4. PREPARE THE FILE FOR EDITING

4. 1 CHANGE THE FILE FORMAT

If you have all your points in one file, you may need to export it as a shapefile if it is not already in order to edit the points later.

2. Select **Format** of file to be exported (e.g. Shapefile) > Set Coordinate Reference System (**CRS**) as WGS 84

1. Right-click in the file > **Export** > **Save feature as**

| Name	Type
3333_Peru_Coffee.cpg	CPG File
3333_Peru_Coffee.dbf	DBF File
3333_Peru_Coffee.prj	PRJ File
3333_Peru_Coffee.qmd	QMD File
3333_Peru_Coffee.shp	SHP File
3333_Peru_Coffee.shx	SHX File

4. 2 CONNECT POINTS AND CREATE POLYGONS

If you have points at every corner of your plot, you can connect them to form polygons.

1. To view the Processing toolbox Click **Processing** > **Toolbox**

2. Look for **Points to Path** > Double click to open the tool

3. Select the file > In **Order Expression** select the field containing the point collection order

4. in **Path group Expression** select the field with the farm identifier or Farm ID

4. 3 CONNECT LINES AND CREATE POLYGONS

If you have lines that form the boundaries but are not complete polygons, use a tool to convert them into polygons.
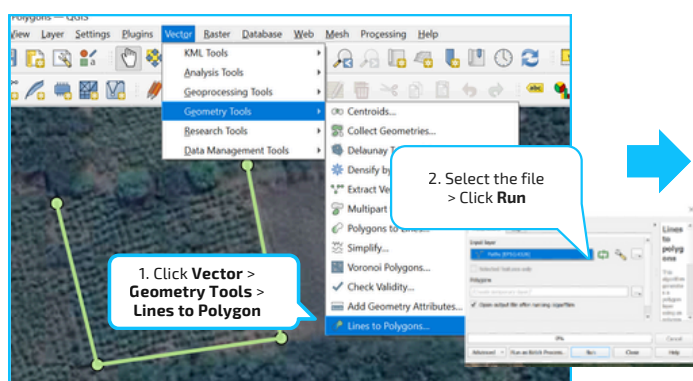
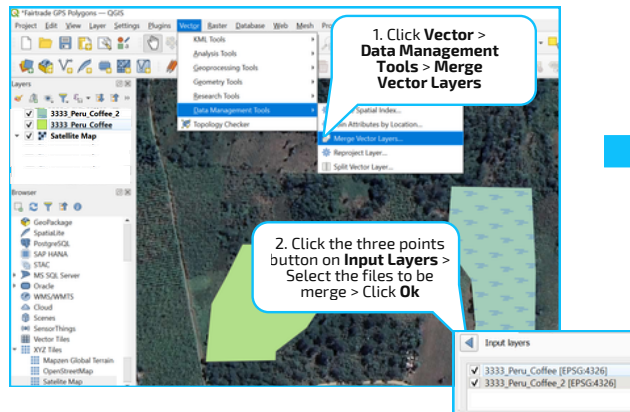1. Click **Vector** > **Geometry Tools** > **Lines to Polygon**

2. Select the file > Click **Run**

This layer is editable but created as temporary by default. To preserve your work, export it to a Shapefile to prevent the file loss.

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4. 4 MERGE FILES

If you have several files like several KMLs, use a tool in the GIS to merge them into a single file.

1. Click **Vector** > **Data Management Tools** > **Merge Vector Layers**

2. Click the three points button on **Input Layers** > Select the files to be merge > Click **Ok**

Input layers
✓ 3333_Peru_Coffee [EPSG:4326]
✓ 3333_Peru_Coffee_2 [EPSG:4326]

This layer is editable but created as temporary by default. To preserve your work, export it to a Shapefile to prevent the file loss.

4. 5 RENAME FIELDS

Once you have your file ready to edit it, rename fields and correct any names if necessary.
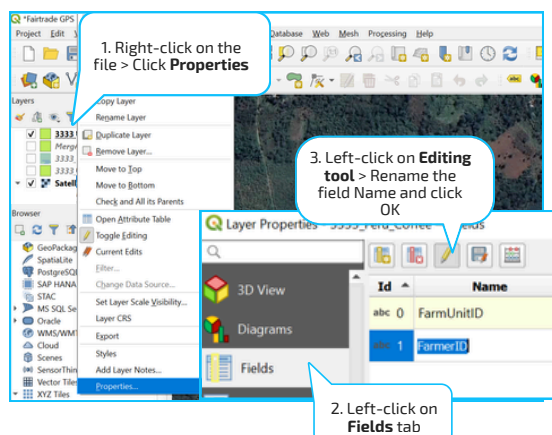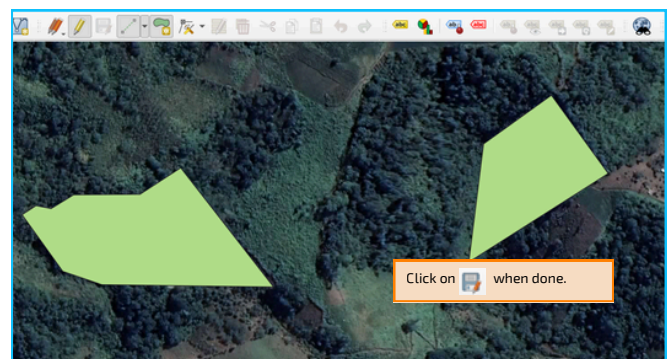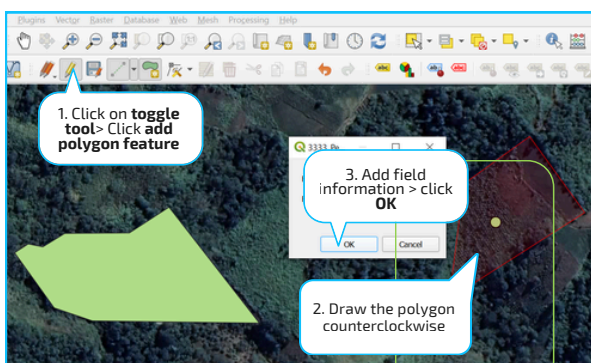

1. Right-click on the file > Click **Properties**

2. Left-click on **Fields** tab

3. Left-click on **Editing tool** > Rename the field Name and click OK

	FarmUnitID	FarmerID
1	ABC-007-01	ABC-007
2	ABC-013-01	ABC-013
3	ABC-032-01	ABC-032
4	ABC-035-01	ABC-035
5	ABC-038-01	ABC-038
6	ABC-041-01	ABC-041

Delete unnecessary columns by clicking on Editing tool and click on delete fields.

5. DRAW POLYGON

If you cannot create polygons automatically, you can manually draw the polygons by connecting the points you've collected and using images or maps as a reference.
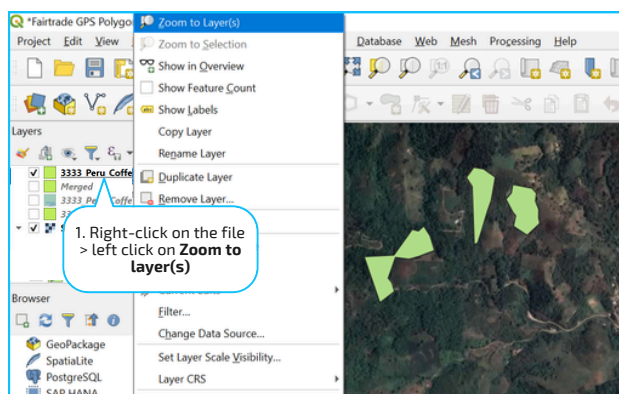

1. Click on **toggle tool** > Click **add polygon feature**

2. Draw the polygon counterclockwise

3. Add field information > click **OK**

Click on [icon] when done.
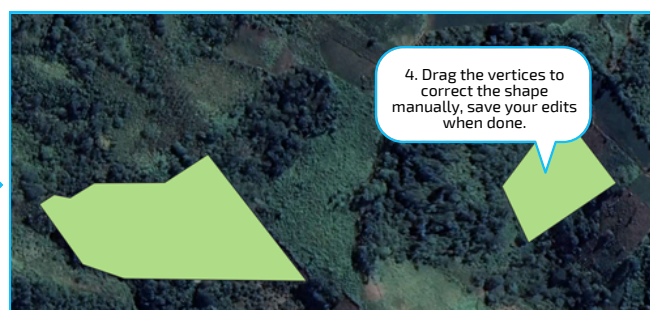
6. IDENTIFY AND EDIT INCORRECT POLYGONS

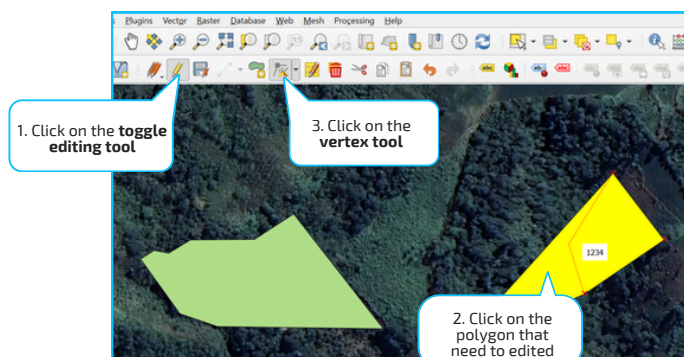## 6.1 VERIFY THE LOCATION

Edit the polygons that are incorrectly located or eliminate them if they do not correspond to any farm.
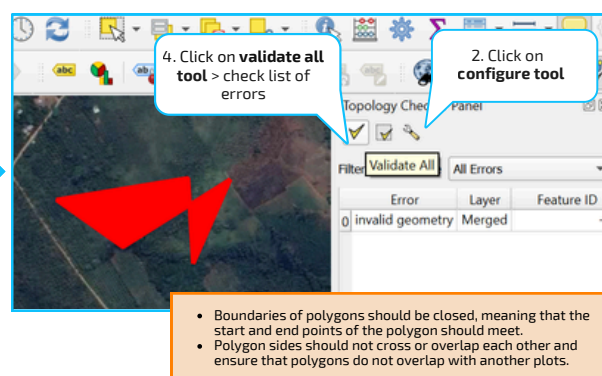
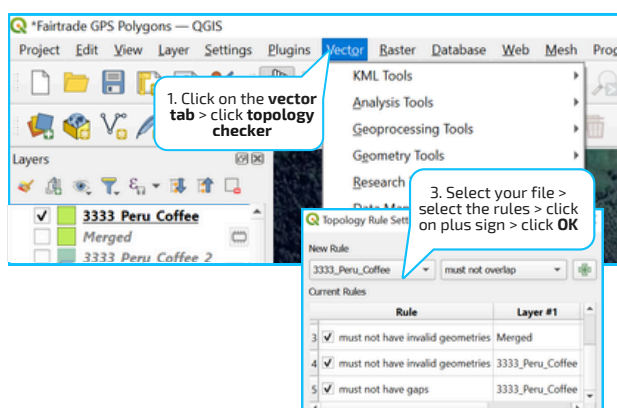

1. Right-click on the file > left click on **Zoom to layer(s)**

6.2 EDIT POLYGONS

Edit the polygons that are incorrectly located or eliminate them if they do not correspond to any farm.

1. Click on the **toggle editing tool**

3. Click on the **vertex tool**

2. Click on the polygon that need to edited

4. Drag the vertices to correct the shape manually, save your edits when done.
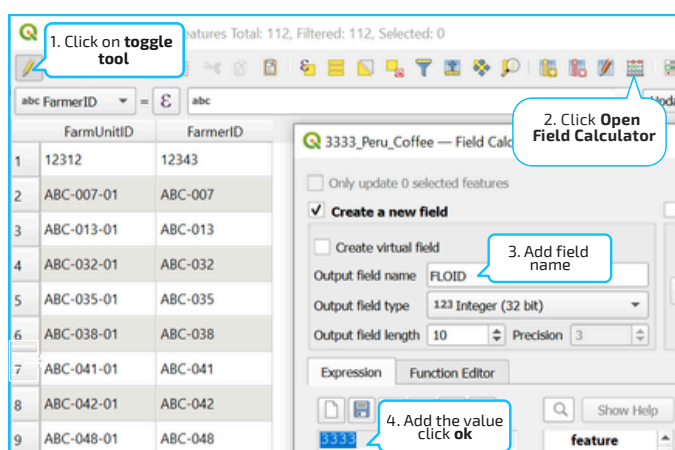
6.3 CHECK POLYGON VALIDITY

Check and modify polygons with errors in their shape, fix boundaries that don't align, delete unnecessary vertices, or correct irregular shapes.

1. Click on the **vector tab** > click **topology checker**

3. Select your file > select the rules > click on plus sign > click **OK**

4. Click on **validate all tool** > check list of errors

2. Click on **configure tool**

- Boundaries of polygons should be closed, meaning that the start and end points of the polygon should meet.
- Polygon sides should not cross or overlap each other and ensure that polygons do not overlap with another plots.

7. ADD MISSING FIELDS

- If you missed to collect any fields during field collection, you can add new fields manually for FLOID, and Farmer lD.
- Check for duplicates in your Farm IDs, as these should be unique and not repeated.
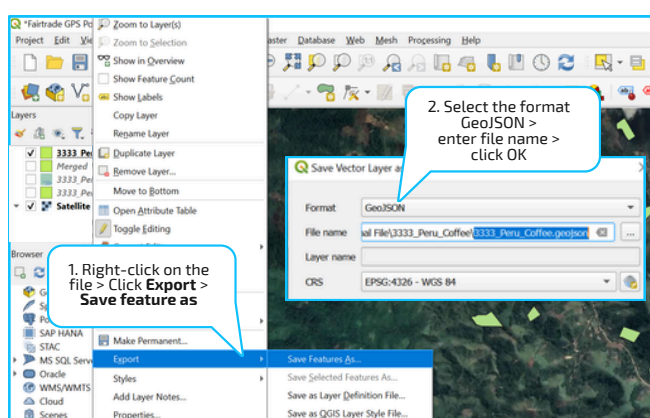

1. Click on **toggle tool**

2. Click **Open Field Calculator**

3. Add field name

4. Add the value click **ok**

8. EXPORT DATA

Export the data in a format accepted by Fairtrade International for deforestation analysis. Make sure the format is compatible with Fairtrade International requirements. The name should include:
- organisation's FLOID,
- country,
- product (cocoa or coffee) for which you are submitting data.

1. Right-click on the file > Click **Export** > **Save feature as**

2. Select the format GeoJSON > enter file name > click OK

(file name should specify [FLOID]_[Country]_[Product])

DATA VALIDATION

While many steps have been covered throughout the data collection and editing process for points and polygons, it's important to perform a final check to ensure that everything is in order. Before submitting, make sure to follow the Data Quality Check to verify that you have met all requirements for submission.

KNOW MORE

https://www.fairtrade.net/en/why-fairtrade/why-we-do-it/deforestation/resources-for-producers-on-the-eu-deforestation-regulation.html