



World Bank Gender Indicator Tool

User Manual

September 2023

TABLE OF CONTENTS

1	Install QGIS.....	4
2	Install Open Route Service (ORS) plugin	5
3	Installing Plugin on local device	8
4	Using the Plugin.....	13
4.1	SETUP TAB.....	13
4.2	INDIVIDUAL TAB	15
4.2.1	Education.....	15
4.2.2	Care Responsibilities	16
4.2.3	Domestic Violence.....	17
4.2.4	Aggregate.....	18
4.3	CONTEXTUAL TAB	19
4.3.1	Policy and Legal Protection.....	19
4.3.2	Access to Finance	20
4.3.3	Aggregate.....	21
4.4	ACCESSIBILITY TAB	22
4.4.1	Women's Travel Patterns	22
4.4.2	Access to Public Transport.....	23
4.4.3	Access to Education and Training Facilities	24
4.4.4	Access to Jobs in the RE sector	25
4.4.5	Access to Health Facilities	26
4.4.6	Access to Financial Facilities	27
4.4.7	Aggregate.....	28
4.5	PLACE CHARACTERIZATION TAB.....	29
4.5.1	Active Transport	29
4.5.2	Availability of Public Transport	30
4.5.3	Safety	31
4.5.4	Security.....	32
4.5.5	Income Level.....	33

4.5.6	Electricity Access.....	34
4.5.7	Urbanization.....	35
4.5.8	Size of Housing.....	36
4.5.9	Digital Inclusion	37
4.5.10	Natural Environment and Climatic Factors.....	38
4.5.11	Aggregate.....	39
4.6	DIMENSION AGGREGATION TAB.....	40
4.7	INSIGHTS TAB.....	41
APPENDIX A	SIDS CRS	47

1 Install QGIS

1. The link below will take you to the QGIS website where you will be able to download the installation file. Note that it is possible to use older versions of QGIS, e.g. Version 3.28.

QGIS website: <https://www.qgis.org/en/site/>

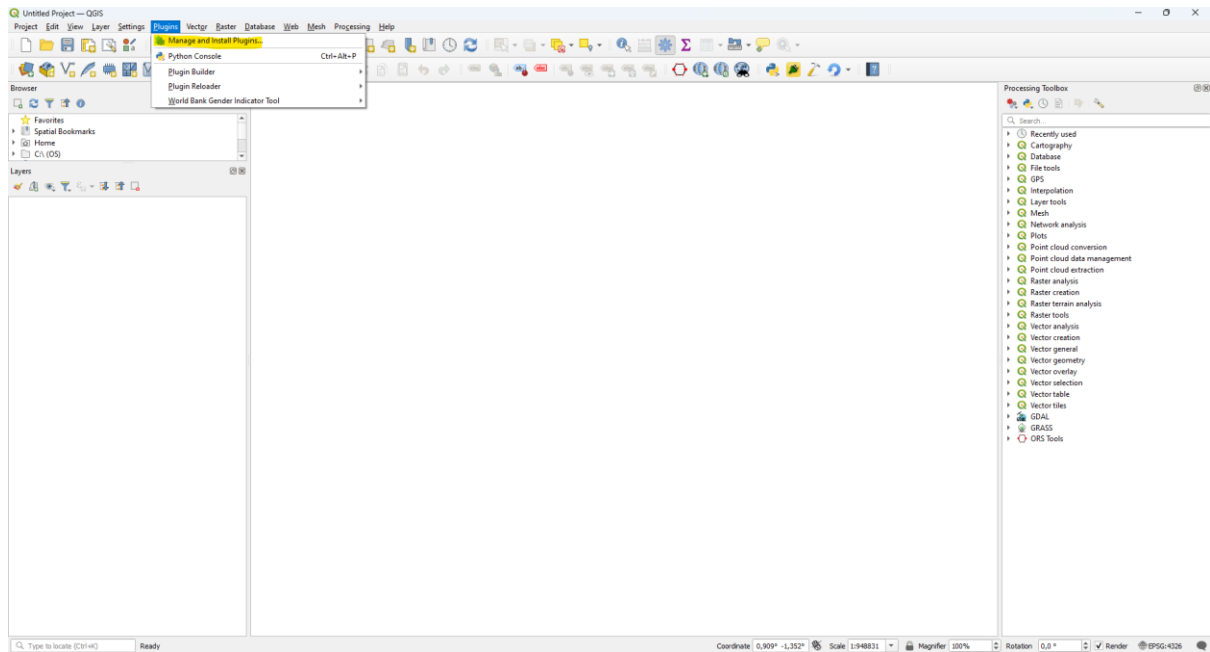


2. Once the installation file is downloaded run the installation file.
3. A pop up window as seen in image below should show up. Follow the prompts and leave all settings on default.

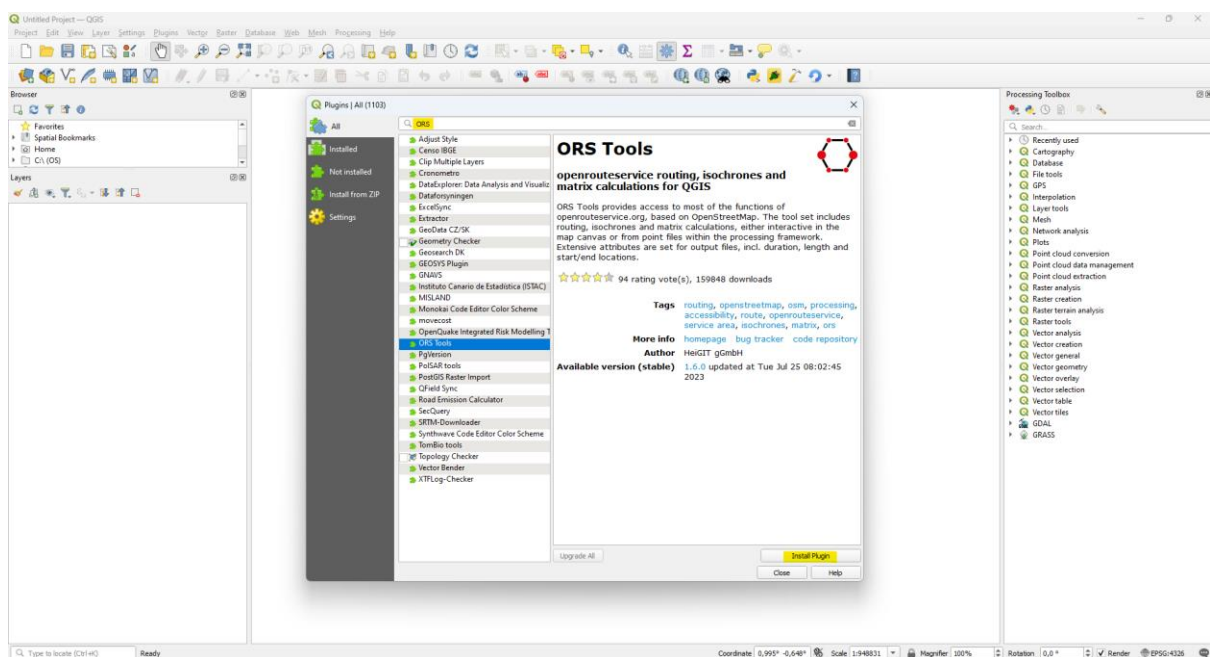


2 Install Open Route Service (ORS) plugin

1. Open QGIS, navigate to the “Plugins” tab and select “Manage and Install Plugins...” option from the drop-down menu.



2. The “Plugins” pop up window should appear as seen in image below.
3. In the search bar type “ORS”, select the “ORS Tool” from the list of plugins, and select the install button to install the plugin.



- You will now have to setup an account on the Open Route Service website which can be accessed by clicking the link below.

ORS website: <https://openrouteservice.org/>

ORS Sign up: <https://openrouteservice.org/dev/#/signup>

The screenshot shows the 'CREATE AN ACCOUNT' page on the Open Route Service website. The page has a navigation bar with links: Donate, Services, Tools, Examples, Ask Us!, Plans, Jobs, API Playground, and Log In. The main form is titled 'CREATE AN ACCOUNT' and includes a 'SIGN UP WITH GITHUB' button. Below this, there are input fields for 'Username' (0/20), 'Email*', 'First name*', and 'Last name*'. There is also a 'Sector' dropdown menu and a 'Website' input field. A 'Define your password' section contains 'New password*' (0/25) and 'Confirm new password*' (0/25) fields. Below the password fields are two checkboxes: 'Subscribe to newsletter' and 'I accept the terms of service and was informed about the privacy policy'. A 'Please note:' section is at the bottom.

- Fill in all the necessary fields to sign up and then log into your account.
- Requesting a standard token and provide a name for Token.

The screenshot shows the 'Dev dashboard' on the Open Route Service website. The navigation bar includes links: Donate, Services, Tools, Examples, Ask Us!, Plans, Jobs, API Playground, and Dashboard. The user is logged in as 'Hi Yusuf'. The 'Dev dashboard' section has two tabs: 'TOKENS' and 'PROFILE'. The 'TOKENS' tab is active, showing a table with columns: Name, Key, Is valid, Remaining Quota, and Actions. A message states: 'You don't have a token. To create one you have to select a token type below and give it a name.' Below this is the 'Request a token' section. It has a dropdown menu for 'Token name*' with 'Standard' selected. A text input field contains 'Test'. A red 'CREATE TOKEN' button with a right arrow is at the bottom right.

- Once token has been created, navigate to the Dashboard tab and click on the API key as seen in the image below. The API key should now be copied to clipboard.

openroute service

Dev dashboard

TOKENS PROFILE

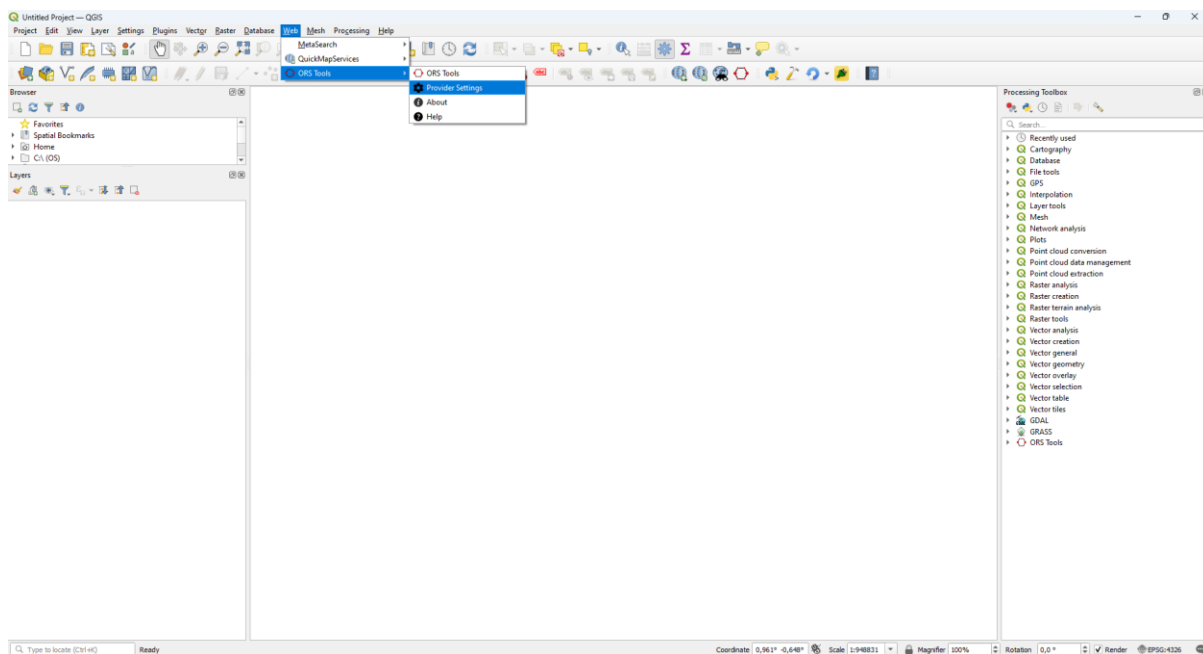
Your request for upgrading to the collaborative plan has been accepted.

Name	Key	Is valid	Remaining Quota	Actions
WBGIT	5b3ca35379511100017f52433339b2092fe4d13e99e78f05948c2b	Expires in 2 months		

Token quota

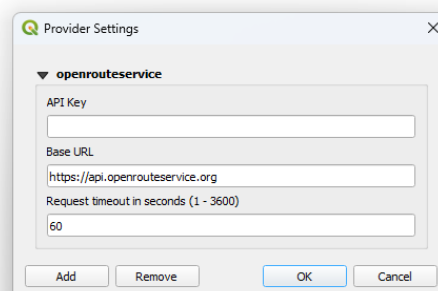
Main Endpoints			Microservice Endpoints		
	Quota left (renews in)	Per Min		Quota left (renews in)	Per Min
Directions V2	10000/10000	40	ElevationLine	1000/1000	38
Isochrones V2	2500/2500	20	ElevationPoint	10000/10000	100
Matrix V2	2500/2500	40	GeocodeAutoComplete	5000/5000	100
			GeocodeReverse	5000/5000	100

8. In the QGIS window navigate the ORS tool and select “Provider Settings”.



9. The provider settings pop up window should now appear as seen in the image below.

10. Past the API key that has been copied to the clipboard into the API Key field and press “OK”.



N.B. Additional Credits can be requested on the ORS site by applying for the collaborative plan as described [here](#). You will have to provide a brief motivation, however, If your application is in a humanitarian, academic, governmental, or non-for-profit organization, you may be eligible for the collaborative plan.

This email address can also be used for further assistance:

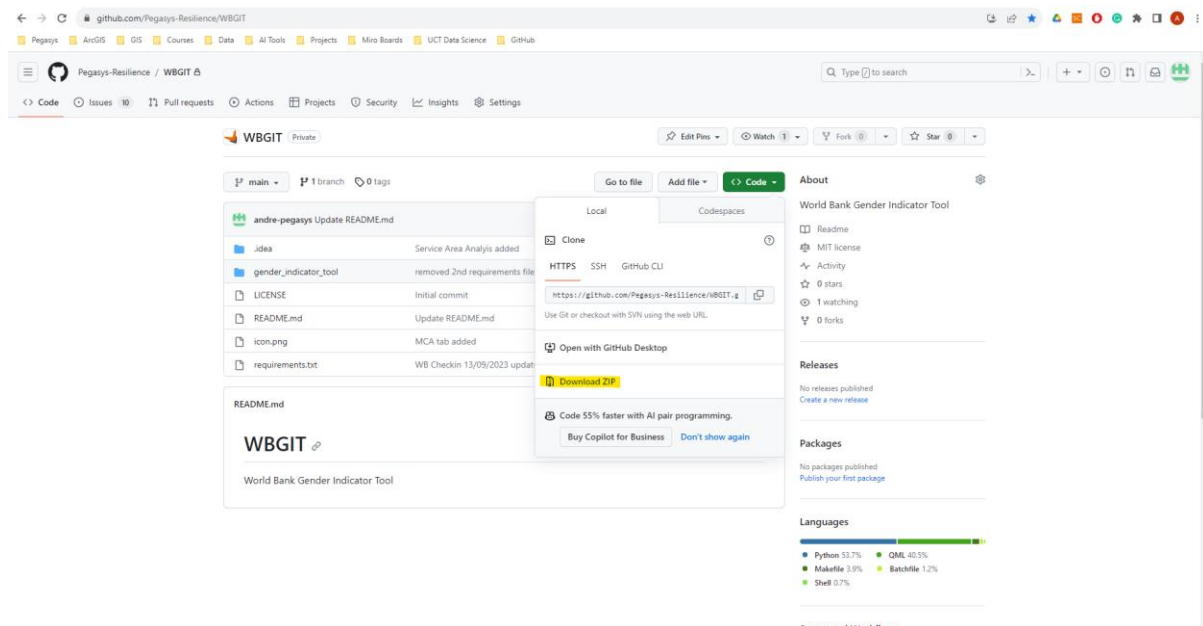
support@openrouteservice.heigit.org

3 Installing Plugin on local device

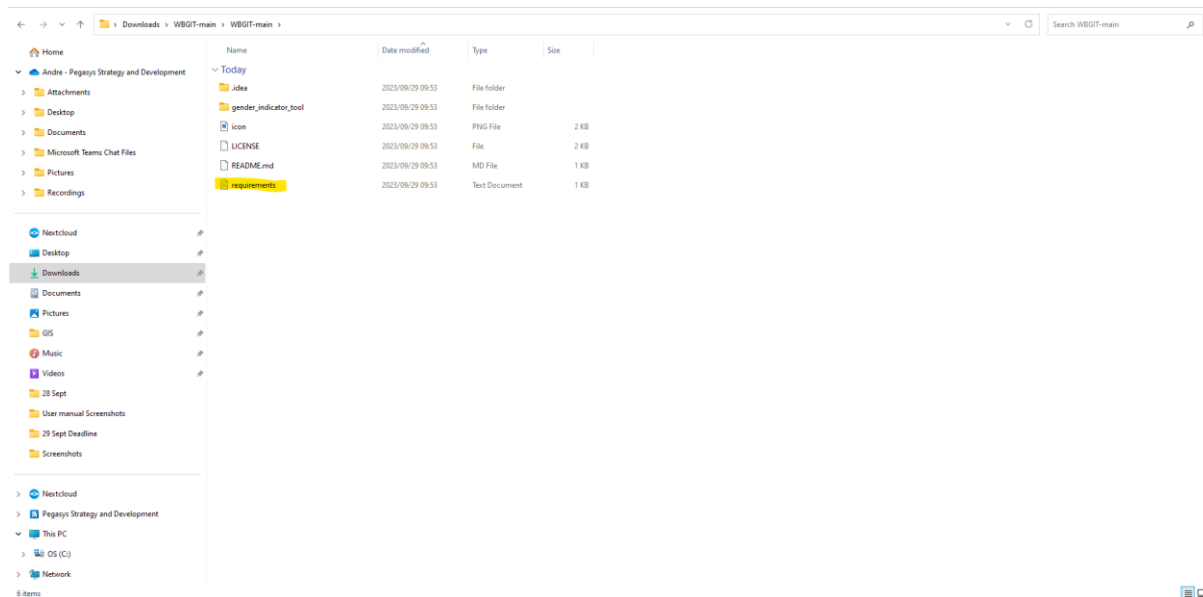
1. The link below will take you to the GitHub repository where the “World Bank Gender Indicator Tool” is maintained.

GitHub Repository: <https://github.com/Pegasys-Resilience/WBGIT>

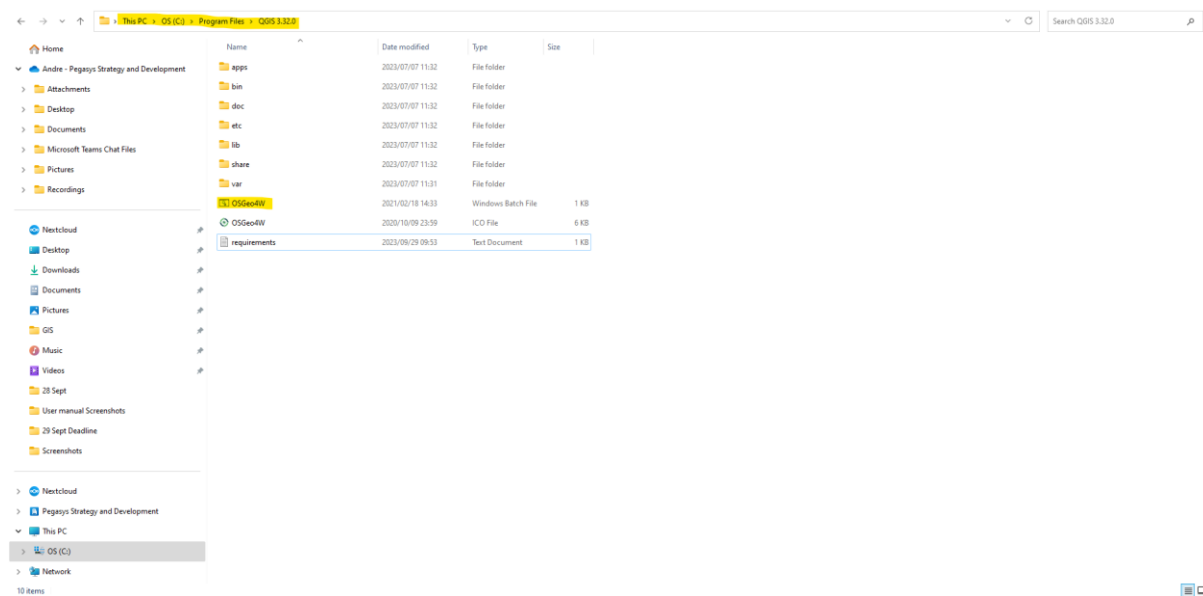
2. Click on the green “Code” button and select the “Download ZIP” option.



3. Once the download has been completed extract the contents of the ZIP file.
4. Navigate to your extracted ZIP folder and copy the *requirements.txt* file.

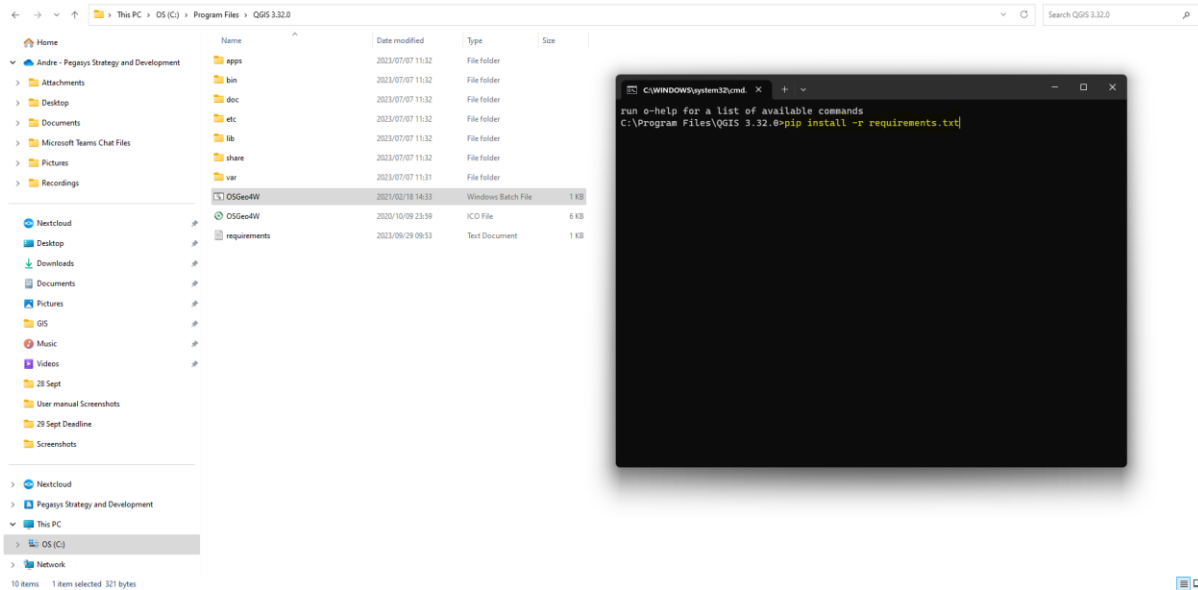


5. Navigate to the QGIS program folder and paste the *requirements.txt* file into it. The file path would be similar to this: *C:\Program Files\QGIS 3.32.0* as seen in the image under **step 10**.
6. Run the *OSGeo4W* batch file.

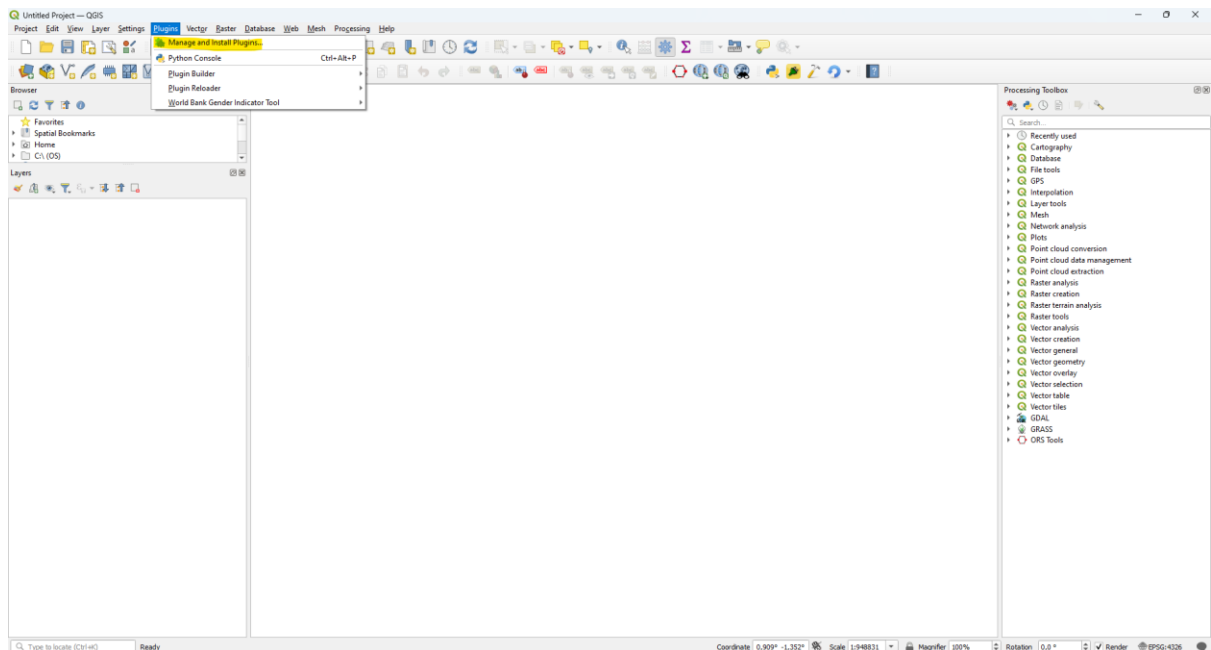


7. A command line pop-up window will appear as seen in the image below.
8. Type the following into it and press Enter.

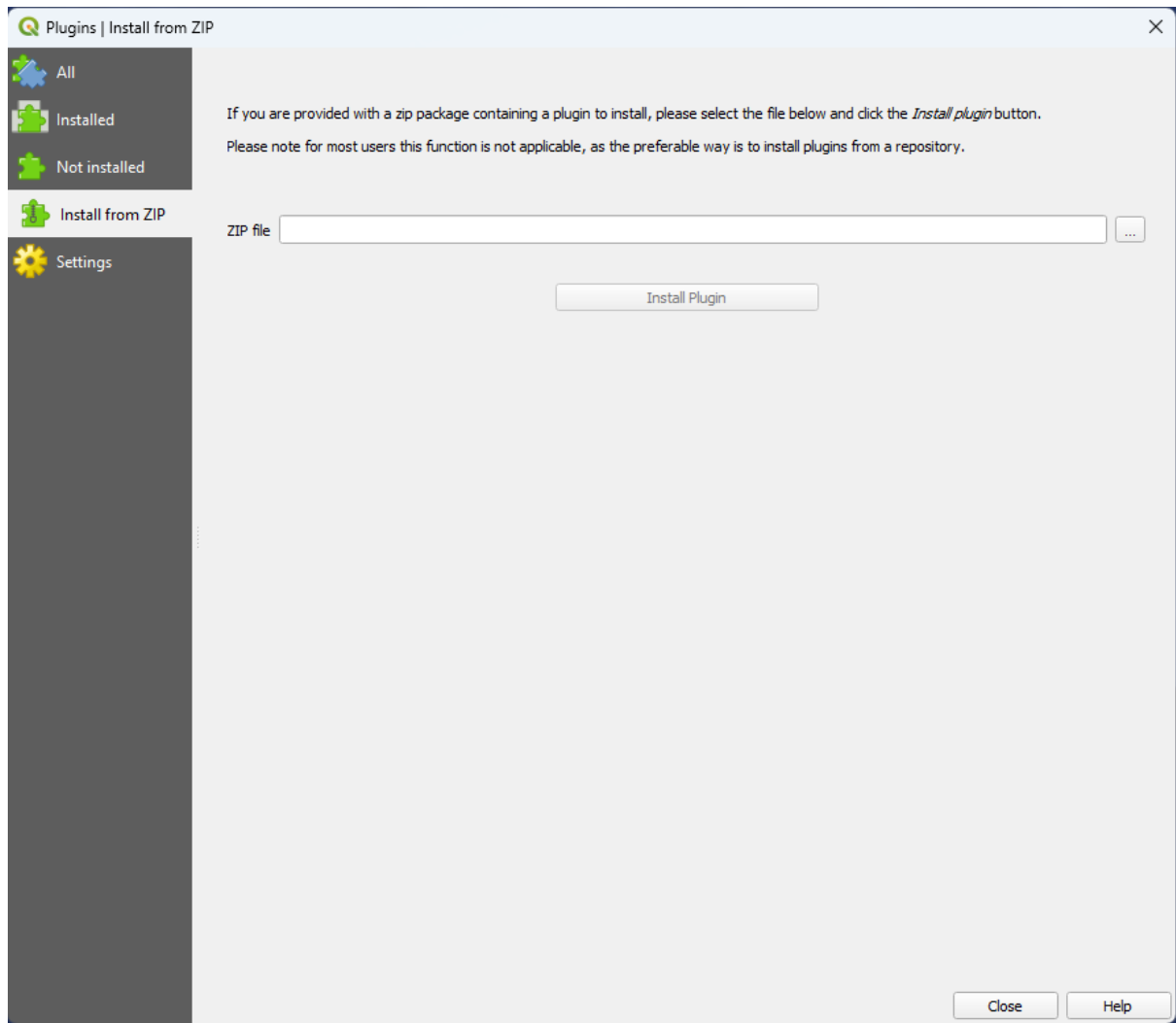
```
pip install -r requirements.txt
```



9. All the Python libraries that the Plugin is dependent on will now be installed. This can take a few minutes to install.
10. Once the installations are complete you can close command line pop-up window.
11. Open QGIS, navigate to the “Plugins” tab and select “Manage and Install Plugins...” option from the drop-down menu.



12. In the plugin pop up window navigate to the “Install from ZIP” tab.

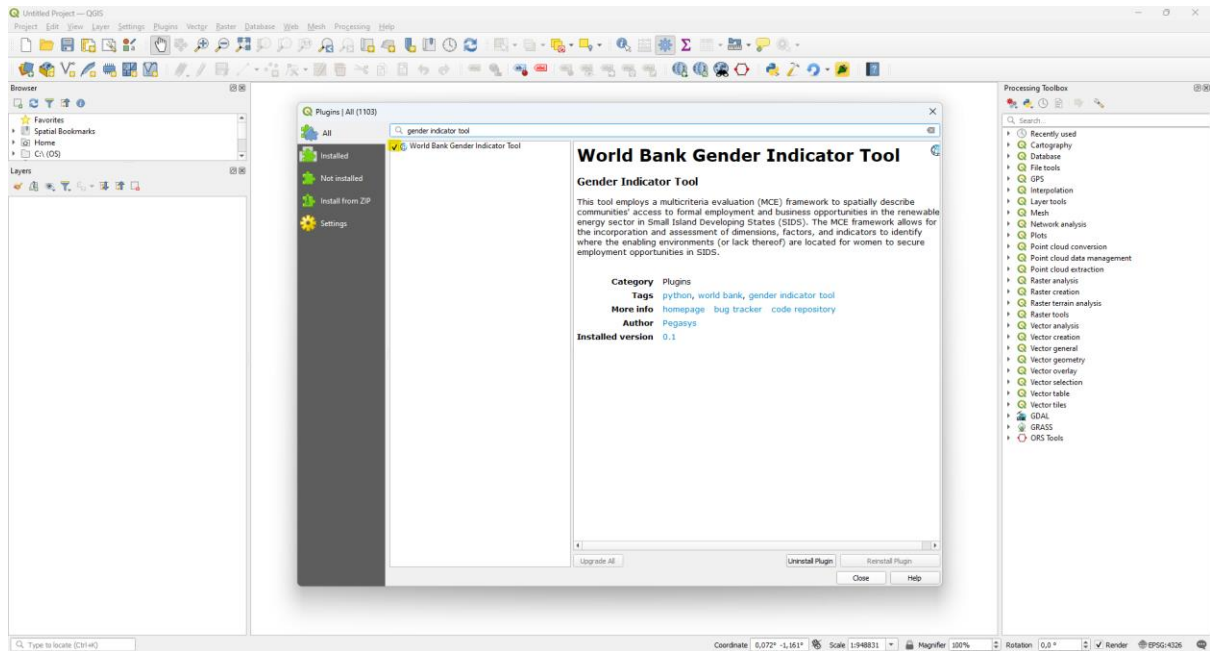


13. From the “Install from ZIP” tab navigate back to your extracted ZIP folder and select the “gender_indicator_tool” compressed (zipped) folder as seen in the image bellow.

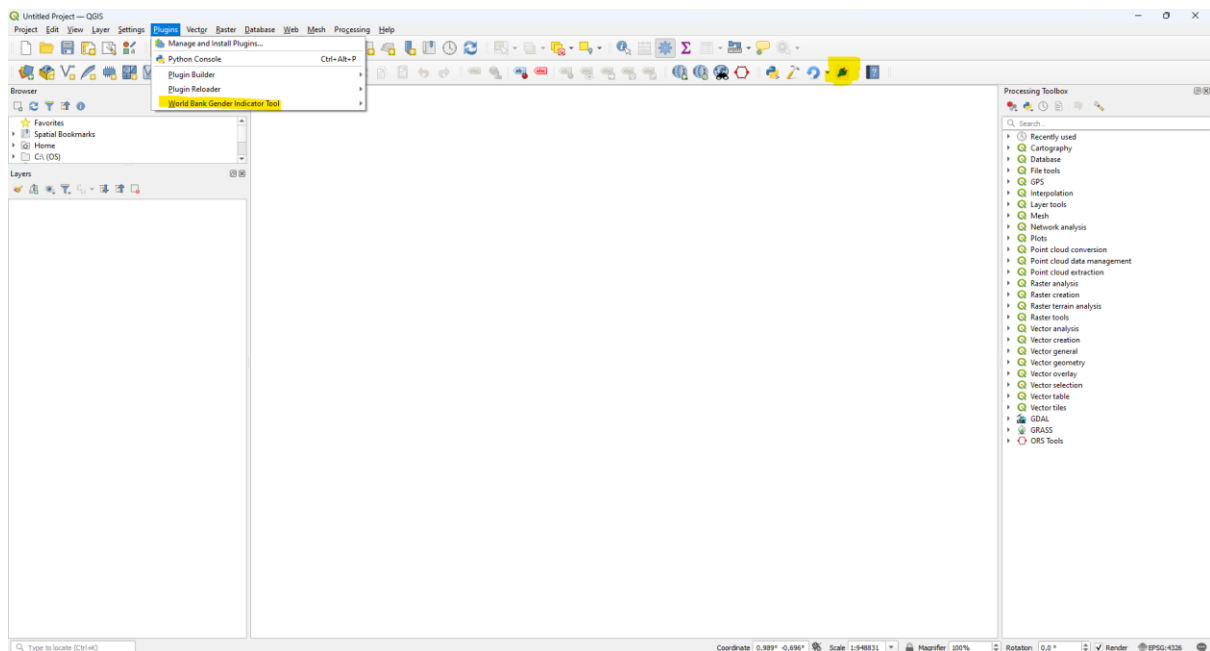
Name	Status	Date modified	Type	Size
.idea	✓ ↩	2023/09/20 14:34	File folder	
gender_indicator_tool	✓ ↩	2023/11/21 09:29	File folder	
gender_indicator_tool	✓ ↩	2023/11/21 09:26	Compressed (zipp...	256 KB
icon	✓ ↩	2023/07/07 14:11	PNG File	2 KB
LICENSE	✓ ↩	2023/07/15 22:15	File	2 KB
README.md	✓ ↩	2023/10/02 23:23	MD File	1 KB
requirements	✓ ↩	2023/11/08 15:52	Text Document	1 KB
WBGIT - Tool User Manual	✓ ↩	2023/11/20 10:10	Adobe Acrobat D...	2 936 KB

14. Once ZIP file has been selected click on “Install Plugin”.
15. Once plugin has been installed navigate to the “All” tab.

16. In the search bar type “gender indicator tool” and click the check box next to the “World Bank Gender Indicator Tool” to install the plugin.

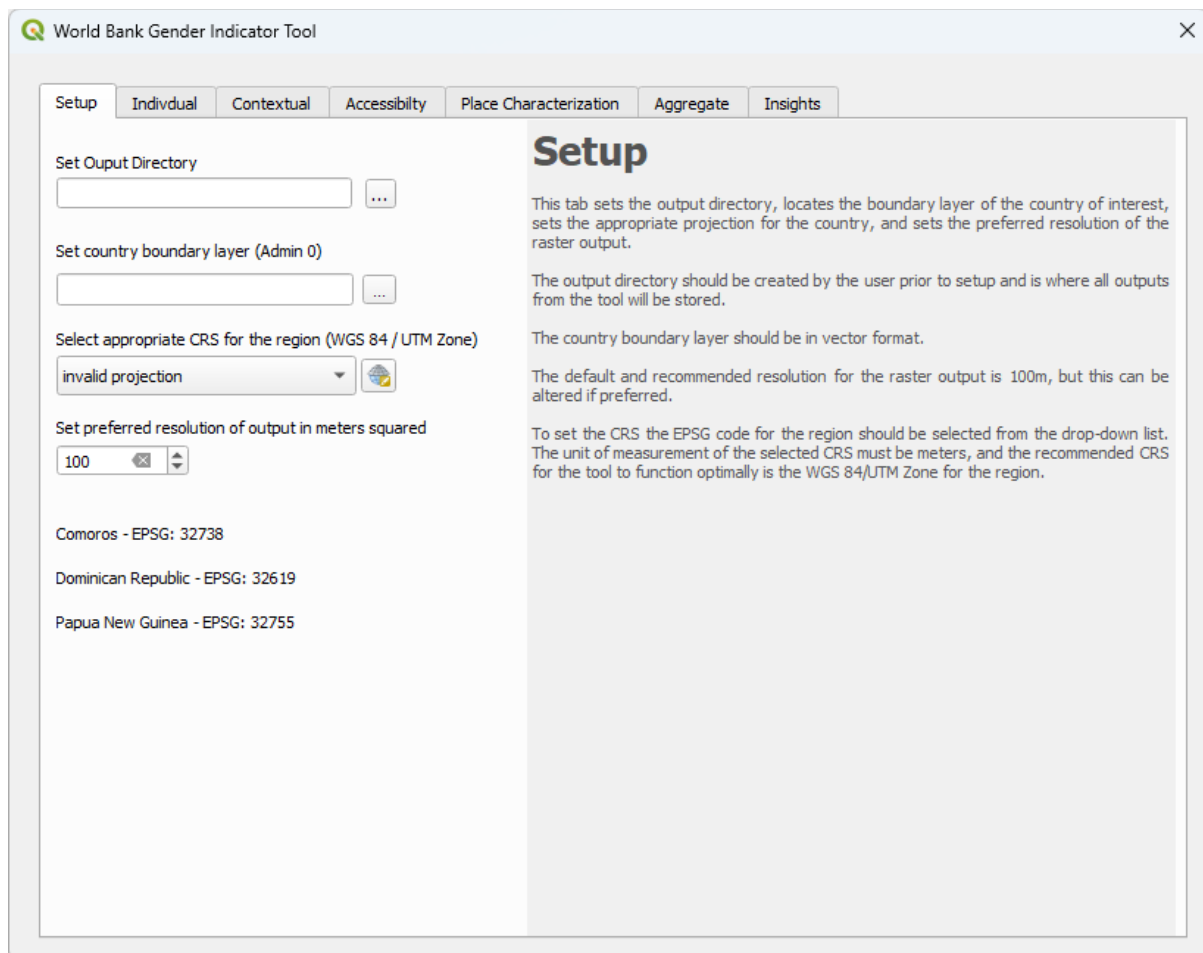


17. The plugin is now installed and you should now be able to access it in you tool bar or under the Plugin’s tab as seen in the image below.



4 Using the Plugin

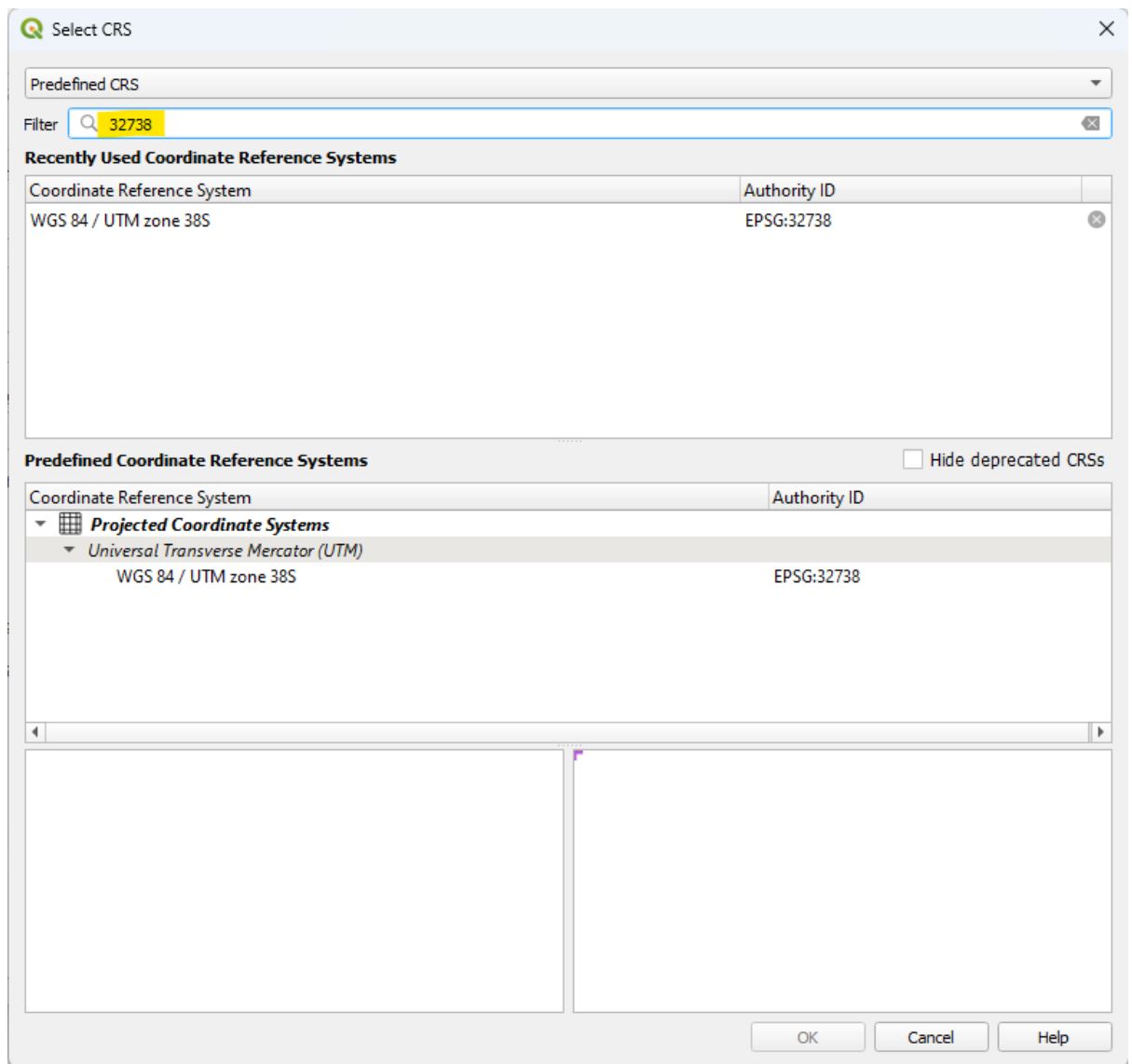
4.1 SETUP TAB



1. Create a project folder that will be used to store all tool outputs
2. Set the output directory to project folder created in the previous step
3. Set the country boundary layer by navigating to and selecting the **Admin 0** country boundary polygon shapefile for the country you want to analyze.
4. Select the appropriate coordinate reference system (CRS) from the QGIS CRS database.

Appendix A lists the all the CRS to be used for the SIDS countries.

5. Copy and paste the EPSG code for your specific country and paste it in the Filter bar as seen in the image below.



6. Select the CRS from the list and click “OK”
7. Set your preferred out raster output resolution in meters squared.

4.2 INDIVIDUAL TAB

4.2.1 Education

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Individual' tab is selected, and within it, the 'Education' sub-tab is active. The interface includes a 'Polygon Input Layer' section with a text box, a 'Set' button, and an ellipsis button. Below this is a 'Field of interest in the polygon layer' dropdown menu. The 'Raster Output Filename' section shows 'EDU_.tif' with a file icon button. An 'Execute' button is at the bottom left. On the right, a large text area titled 'Education' contains explanatory text about the algorithm and data requirements.

World Bank Gender Indicator Tool

Setup Individual Contextual Accessibility Place Characterization Aggregate

Education Care Responsibilities Domestic Violence Aggregate

Polygon Input Layer

Field of interest in the polygon layer

Raster Output Filename

EDU_.tif

Execute

Education

This algorithm creates a raster output representing a standardized measure of the percentage of women who have achieved a post-secondary education in the country of interest. The input is standardized using a linear scaling process to output values between 0 and 5, where 5 indicates areas where all women have a post-secondary education, while 0 indicates areas where no women have a post-secondary education.

Polygon Input Layer should be a polygon layer containing a field reporting the percentage of women who have achieved a post-secondary education. This layer is generally only available at the country level but spatially disaggregated data can be used if available.

Once the polygon input layer is set, select the field containing the percentage from the drop down list.

If desired, the raster output filename can be altered to suit requirements.

1. Navigate to and select polygon input shapefile containing a field reporting the percentage of women who have achieved a post-secondary education.
2. Click the “Set” button to extract all the fields from the polygon input layer.
3. Select the field containing the numeric value representing the percentage of women who have achieved a post-secondary education.
4. Enter an alternate raster output file name if desired.
5. Click “Execute” button to run the algorithm.
6. Status text next to the “Execute” button will appear and let you know once processing is complete.
7. The aggregated output raster file will be store in the project folder specified in the “Setup” tab, under the “Individual” folder. (*Project_Folder/Individual/Raster_output.tif*)

4.2.2 Care Responsibilities

World Bank Gender Indicator Tool

Setup Individual Contextual Accessibility Place Characterization Aggregate

Education Care Responsibilities Domestic Violence Aggregate

Care Responsibilities

This algorithm creates a raster output representing a standardized measure of the percentage of time that women spend on household provision of services. The input is standardized using a linear scaling process to output values between 0 and 5, where 5 indicates areas where women spend less than 5% of their time on household activities, while 0 indicates areas where women spend all their time on unpaid household activities.

Polygon Input Layer should be a polygon layer containing a field reporting the percentage of time spent on household activities. This layer is generally only available at the country level but spatially disaggregated data can be used if available.

Once the polygon input layer is set, select the field containing the percentage from the drop down list.

If desired, the raster output filename can be altered to suit requirements.

Polygon Input Layer: [Text Field] ... Set

Field of interest in the polygon layer: [Dropdown Menu]

Raster Output Filename: CRE_.tif [Icon] Execute

1. Navigate to and select polygon input shapefile containing a field reporting the percentage of time women spend on care responsibilities or household activities.
2. Click the “Set” button to extract all the fields from the polygon input layer.
3. Select the field containing the numeric value representing percentage of time women spend on care responsibilities or household activities.
4. Enter an alternate raster output file name if desired.
5. Click “Execute” button to run the algorithm.
6. Status text next to the “Execute” button will appear and let you know once processing is complete.
7. The aggregated output raster file will be store in the project folder specified in the “Setup” tab, under the “Individual” folder. (*Project_Folder/Individual/Raster_output.tif*)

4.2.3 Domestic Violence

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Individual' tab is selected, and within it, the 'Domestic Violence' sub-tab is active. The interface includes a 'Polygon Input Layer' section with a text box, a browse button (...), and a 'Set' button. Below this is a 'Field of interest in the polygon layer' dropdown menu. The 'Raster Output Filename' section contains a text box with 'DOV_.tif' and an 'Execute' button. To the right, a large text area titled 'Domestic Violence' provides detailed instructions: 'This algorithm creates a raster output representing a standardized measure of the percentage of women who have suffered some form of domestic violence. The input is standardized using a linear scaling process to output values between 0 and 5, where 5 indicates areas where no women have experienced domestic violence, while 0 indicates areas where all women have experienced domestic violence.' It further explains that the 'Polygon Input Layer' should be a polygon layer with a field for the percentage of women who have suffered domestic violence, and that the 'Field of interest' should be selected from the dropdown. It also notes that the 'Raster Output Filename' can be altered if needed.

1. Navigate to and select polygon input shapefile containing a field reporting the percentage of women who have suffered domestic violence.
2. Click the “Set” button to extract all the fields from the polygon input layer.
3. Select the field containing the numeric value representing the percentage of women who have suffered domestic violence.
4. Enter an alternate raster output file name if desired.
5. Click “Execute” button to run the algorithm.
6. Status text next to the “Execute” button will appear and let you know once processing is complete.
7. The aggregated output raster file will be store in the project folder specified in the “Setup” tab, under the “Individual” folder. (*Project_Folder/Individual/Raster_output.tif*)

4.2.4 Aggregate

World Bank Gender Indicator Tool

Setup Individual Contextual Accessibility Place Characterization **Aggregate**

Education Care Responsibilities Domestic Violence **Aggregate**

Factors	Weight %
Education (EDU)	33,33
Care Responsibilities (CRE)	33,33
Domestic Violence (DOV)	33,33

Output Aggregate Raster Filename
ID_AGG.tif

Execute

Factor Aggregation

This algorithm aggregates the raster outputs of all available factors within the individual dimension by assuming equal weighting of all factors within the dimension.

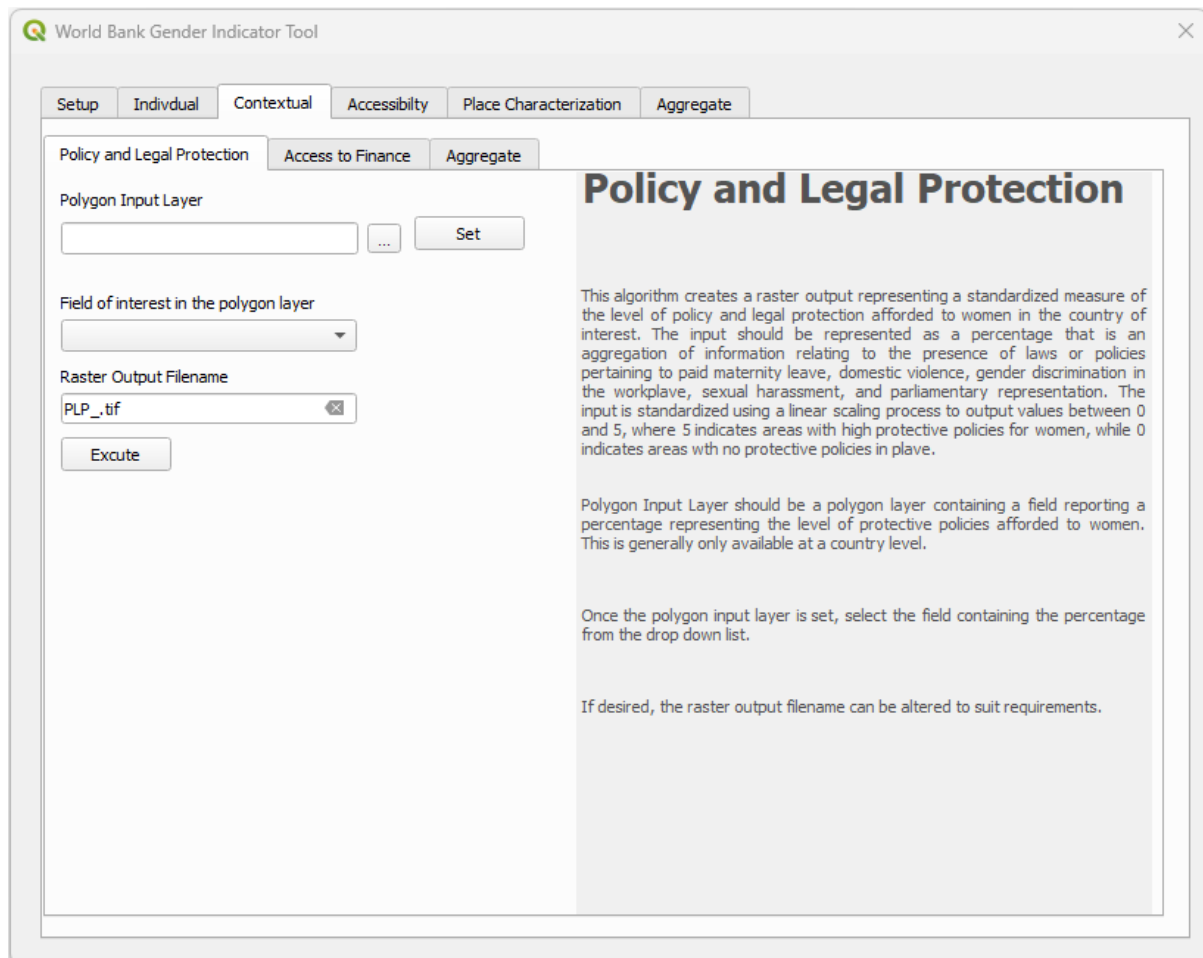
If desired, the user can load previously created factor outputs by navigating to their location.

If data for a factor is not available, the weighting of the available factors should be adjusted such that they remain equal and add up to 100%.

1. Load the raster outputs generated in each of the previous factor tabs for the Individual Dimension.
If a factor was executed in the same work session, it's file path will automatically be populated after execution.
2. If factors are missing adjust weighting percentage accordingly and ensure it totals to 100%.
If a factor is missing it needs to be given a weighting of 0%. All factors should have equal weighting within a dimension.
3. Enter an alternate aggregated raster output file name if desired.
4. Click "Execute" button to run the algorithm.
5. Status text next to the "Execute" button will appear and let you know once processing is complete.
6. The aggregated layer will be loaded to the QGIS and appear in the table of content.
7. The aggregated output raster file will be store in the project folder specified in the "Setup" tab, under the "Individual" folder. (*Project_Folder/Individual/Raster_output.tif*)

4.3 CONTEXTUAL TAB

4.3.1 Policy and Legal Protection



The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Contextual' tab is selected, and within it, the 'Policy and Legal Protection' sub-tab is active. The interface includes a 'Polygon Input Layer' section with a text box, a browse button (...), and a 'Set' button. Below this is a 'Field of interest in the polygon layer' dropdown menu. The 'Raster Output Filename' section shows 'PLP_.tif' with a clear button (X). An 'Execute' button is at the bottom left. On the right, a large text area titled 'Policy and Legal Protection' contains explanatory text about the algorithm and input requirements.

World Bank Gender Indicator Tool

Setup Individual **Contextual** Accessibility Place Characterization Aggregate

Policy and Legal Protection Access to Finance Aggregate

Polygon Input Layer

... **Set**

Field of interest in the polygon layer

Raster Output Filename

PLP_.tif X

Execute

Policy and Legal Protection

This algorithm creates a raster output representing a standardized measure of the level of policy and legal protection afforded to women in the country of interest. The input should be represented as a percentage that is an aggregation of information relating to the presence of laws or policies pertaining to paid maternity leave, domestic violence, gender discrimination in the workplace, sexual harassment, and parliamentary representation. The input is standardized using a linear scaling process to output values between 0 and 5, where 5 indicates areas with high protective policies for women, while 0 indicates areas with no protective policies in place.

Polygon Input Layer should be a polygon layer containing a field reporting a percentage representing the level of protective policies afforded to women. This is generally only available at a country level.

Once the polygon input layer is set, select the field containing the percentage from the drop down list.

If desired, the raster output filename can be altered to suit requirements.

1. Navigate to and select polygon input shapefile containing a field reporting a percentage representing the level of protective policies afforded to women.
2. Click the “Set” button to extract all the fields from the polygon input layer.
3. Select the field containing the numeric value representing a percentage representing the level of protective policies afforded to women.
4. Enter an alternate raster output file name if desired.
5. Click “Execute” button to run the algorithm.
6. Status text next to the “Execute” button will appear and let you know once processing is complete.
7. The aggregated output raster file will be store in the project folder specified in the “Setup” tab, under the “Contextual” folder. (*Project_ Folder/Contextual/Raster_output.tif*)

4.3.2 Access to Finance

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Contextual' tab is selected, and within it, the 'Access to Finance' sub-tab is active. The interface includes a 'Polygon Input Layer' section with a text box, a browse button (...), and a 'Set' button. Below this is a 'Field of interest in the polygon layer' dropdown menu. The 'Raster Output Filename' section shows 'FIN_.tif' in a text box with a file icon. An 'Execute' button is at the bottom left. On the right, a large text area titled 'Access to Finance' contains explanatory text about the algorithm and instructions for using the tool.

World Bank Gender Indicator Tool

Setup Individual Contextual Accessibility Place Characterization Aggregate

Policy and Legal Protection Access to Finance Aggregate

Polygon Input Layer

Field of interest in the polygon layer

Raster Output Filename

FIN_.tif

Execute

Access to Finance

This algorithm creates a raster output representing a standardized measure of the percentage of women who have a bank account or have borrowed from a formal financial institution. The input is standardized using a linear scaling process to output values between 0 and 5, where 5 indicates areas where all women have a bank account or have borrowed from a formal financial institution, while 0 indicates areas where no women have a bank account or have borrowed from a formal institution.

Polygon Input Layer should be a polygon layer containing a field reporting the percentage of women who have a bank account. This layer is generally only available at the country level but spatially disaggregated data can be used if available.

Once the polygon input layer is set, select the field containing the percentage from the drop down list.

If desired, the raster output filename can be altered to suit requirements.

1. Navigate to and select polygon input shapefile containing a field reporting the percentage of women who have a bank account.
2. Click the “Set” button to extract all the fields from the polygon input layer.
3. Select the field containing the numeric value representing the percentage of women who have a bank account.
4. Enter an alternate raster output file name if desired.
5. Click “Execute” button to run the algorithm.
6. Status text next to the “Execute” button will appear and let you know once processing is complete.
7. The aggregated output raster file will be store in the project folder specified in the “Setup” tab, under the “Contextual” folder. (*Project_Folder/Contextual/Raster_output.tif*)

4.3.3 Aggregate

World Bank Gender Indicator Tool

Setup Individual Contextual Accessibility Place Characterization Aggregate

Policy and Legal Protection Access to Finance Aggregate

Factors	Weight %
Policy and Legal Protection (PLP)	50,00
Access to Finance (FIN)	50,00

Output Aggregate Raster Filename
CD_AGG.tif

Execute

Factor Aggregation

This algorithm aggregates the raster outputs of all available factors within the contextual dimension by assuming equal weighting of all factors within the dimension.

If desired, the user can load previously created factor outputs by navigating to their location.

If data for a factor is not available, the weighting of the available factors should be adjusted such that they remain equal and add up to 100%.

1. Load the raster outputs generated in each of the previous factor tabs for the Contextual Dimension.
If a factor was executed in the same work session, it's file path will automatically be populated after execution.
2. If factors are missing adjust weighting percentage accordingly and ensure it totals to 100%.
If a factor is missing it needs to be given a weighting of 0%. All factors should have equal weighting within a dimension.
3. Enter an alternate aggregated raster output file name if desired.
4. Click "Execute" button to run the algorithm.
5. Status text next to the "Execute" button will appear and let you know once processing is complete.
6. The aggregated layer will be loaded to the QGIS and appear in the table of content.
7. The aggregated output raster file will be store in the project folder specified in the "Setup" tab, under the "Contextual" folder. (*Project_ Folder/Contextual/Raster_output.tif*)

4.4 ACCESSIBILITY TAB

4.4.1 Women's Travel Patterns

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Accessibility' tab is selected, and within it, the 'Women's Travel Patterns' sub-tab is active. The interface is divided into two main sections: a left sidebar with input fields and a right main panel with explanatory text.

Left Sidebar (Input Fields):

- Step 1: Repeat for all facility types**
- Facility Point Layer Input:** A text box with a browse button (...).
- Select mode of travel:** A dropdown menu currently set to 'Walking'.
- Select measurement:** A dropdown menu currently set to 'Distance'.
- Travel distance or time increments [meters OR min]:** A text box containing '300, 600, 800, 1200, 1500'.
- Facility Output Raster Filename:** A text box containing 'Facility_.tif'.
- Execute:** A button.
- Step 2: Aggregate Facility Outputs**
- WTP Raster Output Filename:** A text box containing 'WTP_.tif'.
- Aggregate:** A button.

Right Main Panel (Explanatory Text):

Women's Travel Patterns

This algorithm estimates the ease with which women can access facilities related to their role as caregivers. The input is point locations of facilities related to women's role as caregivers, including childcare, primary and secondary schools, markets, grocery stores and recreational areas.

The algorithm uses the road network and travel distances or times to estimate ease of access to the input locations at five incrementally increasing measurement intervals, with the largest being the maximum distance or time women would travel to reach these locations.

Step 1: This step uses point locations of each facility type deemed important and is repeated for each facility type.

The user can select walking or driving as a travel mode and it is recommended that the same travel mode should be selected for all accessibility factors. The default travel mode is walking and the measurement for this is distance in metres. The travel increments for walking are already loaded and if using this mode the user should not alter these values without good reason.

If time is selected, the equal measurement increments should be in minutes, and the maximum increment should be the maximum time women would spend driving to reach these facilities (for example, if the maximum time spent driving is 30 minutes, the increment input would be 6, 12, 18, 24, 30).

The algorithm runs a service area network analysis and the result is five catchment areas, based on the road network, of increasing size and decreasing accessibility. These catchment area polygons are assigned decreasing scores ranging from 5 to 1, with areas outside of the catchment areas assigned a score of zero, and the output is rasterized.

Step 2: The algorithm identifies all raster layers created in step 1 and aggregates them by calculating the mean score for each pixel. The default raster output filename does not need to be altered unless the user wishes.

1. Navigate to and select point shapefile input of facilities related to women's role as caregivers. This includes:
 - Childcare facilities
 - Primary and secondary schools
 - Markets
 - Grocery stores
 - Recreational areas
2. Select the mode of travel (Walking OR Driving).
3. Select method of measurement (Distance OR Time).
4. Specify travel distance or time increments in meters or time respectively using comma delimitation.
5. Edit the facility raster output file name for each unique type of facility.
6. Click "Execute" button to run the algorithm.

7. Status text next to the “Execute” button will appear and let you know once processing is complete.
8. The output raster file will be store in the project folder specified in the “Setup” tab, in the “WTP” folder under the “Accessibility” folder. (*Project_Folder/Accessibility/WTP/Raster_output.tif*)

Steps 1 – 8 will have to be repeated for all facility types.

9. Once all facilities have completed the processing, Enter aggregated raster output file name.
10. Click “Aggregate” button to run the algorithm.
11. Status text next to the “Execute” button will appear and let you know once processing is complete.
12. The aggregated output raster file will be stored in the project folder specified in the “Setup” tab, under the “Contextual” folder. (*Project_Foldser/Accessibility/Raster_output.tif*)

4.4.2 Access to Public Transport

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Accessibility' tab is selected, and within it, the 'Public Transport' sub-tab is active. The interface includes a left sidebar with navigation options: 'Setup', 'Individual', 'Contextual', 'Accessibility', 'Place Characterization', and 'Aggregate'. The 'Public Transport' sub-tab has its own set of options: 'Women's Travel Patterns', 'Public Transport', 'Education and Training', 'Jobs', 'Health Facilities', 'Finance Facilities', and 'Aggregate'. The main content area is titled 'Public Transport' and contains the following fields and instructions:

- Transport Stops Input Layer (Point):** A text input field with a browse button (...).
- Select mode of travel:** A dropdown menu currently set to 'Walking'.
- Select measurement:** A dropdown menu currently set to 'Distance'.
- Travel distance or time increments [meters OR min]:** A text input field with the value '200, 400, 600, 800, 1000' and a browse button (...).
- Raster Output Filename:** A text input field with the value 'PBT_.tif' and a browse button (...).
- Execute:** A button to run the algorithm.

The right side of the 'Public Transport' panel contains explanatory text:

Public Transport

This algorithm estimates the ease with which women can access public transport stops.

The algorithm uses the road network and travel distances or times to estimate ease of access to the input locations at five incrementally increasing measurement intervals, with the largest being the maximum distance or time women would travel to reach these locations.

The user can select walking or driving as a travel mode and it is recommended that the same travel mode should be selected for all accessibility factors. The default travel mode is walking and the measurement for this is distance in metres. The travel increments for walking are already loaded and if using this mode the user should not alter these values without good reason.

If time is selected, the equal measurement increments should be in minutes, and the maximum increment should be the maximum time women would spend driving to reach a public transport stop (for example, if the maximum time spent driving is 30 minutes, the increment input would be 6, 12, 18, 24, 30).

The algorithm runs a service area network analysis and the result is five catchment areas, based on the road network, of increasing size and decreasing accessibility. These catchment area polygons are assigned decreasing scores ranging from 5 to 1, with areas outside of the catchment areas assigned a score of zero, and the output is rasterized.

The default raster output filename does not need to be altered unless the user wishes.

1. Navigate to and select point shapefile input for public transport stops.
2. Select the mode of travel (Walking OR Driving).

3. Select method of measurement (Distance OR Time).
4. Specify travel distance or time increments in meters or time respectively using comma delimitation.
5. Enter an alternate raster output file name if desired.
6. Click “Execute” button to run the algorithm.
7. Status text next to the “Execute” button will appear and let you know once processing is complete.
8. The aggregated output raster file will be stored in the project folder set in the “Setup” tab, under the “Accessibility” folder (*Project_Folder/Accessibility/Raster_output.tif*).

4.4.3 Access to Education and Training Facilities

World Bank Gender Indicator Tool

Setup Individual Contextual **Accessibility** Place Characterization Aggregate

Women's Travel Patterns Public Transport **Education and Training** Jobs Health Facilities Finance Facilities Aggregate

Education and Training Facilities

Education Facilities Input Layer (Point)

Select mode of travel: **Walking**

Select measurement: **Distance**

Travel distance or time increments [meters OR min]: 1000, 2000, 3000, 4000, 5000

Raster Output Filename: ETF_.tif

Execute

Full path to the file(s), including name and extension

The ease with which women can access universities and technical training facilities.

The algorithm uses the road network and travel distances or times to estimate ease of access to the input locations at five incrementally increasing measurement intervals, with the largest being the maximum distance or time women would travel to reach these locations.

The user can select walking or driving as a travel mode and it is recommended that the same travel mode should be selected for all accessibility factors. The default travel mode is walking and the measurement for this is distance in metres. The travel increments for walking are already loaded and if using this mode the user should not alter these values without good reason.

If time is selected, the equal measurement increments should be in minutes, and the maximum increment should be the maximum time women would spend driving to reach a public transport stop (for example, if the maximum time spent driving is 30 minutes, the increment input would be 6, 12, 18, 24, 30).

The algorithm runs a service area network analysis and the result is five catchment areas, based on the road network, of increasing size and decreasing accessibility. These catchment area polygons are assigned decreasing scores ranging from 5 to 1, with areas outside of the catchment areas assigned a score of zero, and the output is rasterized.

The default raster output filename does not need to be altered unless the user wishes.

1. Navigate to and select point shapefile input of education and training facilities.
2. Select the mode of travel (Walking OR Driving).
3. Select method of measurement (Distance OR Time).
4. Specify travel distance or time increments in meters or time respectively using comma delimitation.

5. Enter alternate raster output file name if desired.
6. Click “Execute” button to run the algorithm.
7. Status text next to the “Execute” button will appear and let you know once processing is complete.
8. The aggregated output raster file will be stored in the project folder specified in the “Setup” tab, under the “Accessibility” folder (*Project_Folder/Accessibility/Raster_output.tif*).

4.4.4 Access to Jobs in the RE sector

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Accessibility' tab is selected, and within it, the 'Jobs' sub-tab is active. The main heading is 'Renewable Energy Jobs'. The interface includes a left sidebar with input fields and a right sidebar with explanatory text.

Left Sidebar Inputs:

- Renewable Energy Facilities Input Layer (Point):** A text box with a browse button (...).
- Select mode of travel:** A dropdown menu currently set to 'Walking'.
- Select measurement:** A dropdown menu currently set to 'Distance'.
- Travel distance or time increments [meters OR min]:** A text box containing '1400, 2800, 4200, 5600, 7000' and a browse button (...).
- Raster Output Filename:** A text box containing 'JOB_.tif' and a browse button (...).
- Execute:** A button to run the algorithm.

Right Sidebar Text:

Renewable Energy Jobs

This algorithm estimates the ease with which women can access existing renewable energy project locations.

The algorithm uses the road network and travel distances or times to estimate ease of access to the input locations at five incrementally increasing measurement intervals, with the largest being the maximum distance or time women would travel to reach these locations.

The user can select walking or driving as a travel mode and it is recommended that the same travel mode should be selected for all accessibility factors. The default travel mode is walking and the measurement for this is distance in metres. The travel increments for walking are already loaded and if using this mode the user should not alter these values without good reason.

If time is selected, the equal measurement increments should be in minutes, and the maximum increment should be the maximum time women would spend driving to reach a public transport stop (for example, if the maximum time spent driving is 30 minutes, the increment input would be 6, 12, 18, 24, 30).

The algorithm runs a service area network analysis and the result is five catchment areas, based on the road network, of increasing size and decreasing accessibility. These catchment area polygons are assigned decreasing scores ranging from 5 to 1, with areas outside of the catchment areas assigned a score of zero, and the output is rasterized.

The default raster output filename does not need to be altered unless the user wishes.

1. Navigate to and select point shapefile input of jobs or job facilities.
2. Select the mode of travel (Walking OR Driving).
3. Select method of measurement (Distance OR Time).
4. Specify travel distance or time increments in meters or time respectively using comma delamination.
5. Enter alternate raster output file name if desired.
6. Click “Execute” button to run the algorithm.

7. Status text next to the “Execute” button will appear and let you know once processing is complete.
8. The aggregated output raster file will be stored in the project folder specified in the “Setup” tab, under the “Accessibility” folder (*Project_Folder/Accessibility/Raster_output.tif*).

4.4.5 Access to Health Facilities

World Bank Gender Indicator Tool

Setup Individual Contextual **Accessibility** Place Characterization Aggregate

Women's Travel Patterns Public Transport Education and Training Jobs **Health Facilities** Finance Facilities Aggregate

Health Facilities

Health Facilities Input Layer (Point)

Select mode of travel: Walking

Select measurement: Distance

Travel distance or time increments [meters OR minutes]: 2000, 4000, 6000, 8000, 10000

Raster Output Filename: HEA_.tif

Execute

This algorithm estimates the ease with which women can access health facilities such as hospitals and women's health clinics.

The algorithm uses the road network and travel distances or times to estimate ease of access to the input locations at five incrementally increasing measurement intervals, with the largest being the maximum distance or time women would travel to reach these locations.

The user can select walking or driving as a travel mode and it is recommended that the same travel mode should be selected for all accessibility factors. The default travel mode is walking and the measurement for this is distance in metres. The travel increments for walking are already loaded and if using this mode the user should not alter these values without good reason.

If time is selected, the equal measurement increments should be in minutes, and the maximum increment should be the maximum time women would spend driving to reach a public transport stop (for example, if the maximum time spent driving is 30 minutes, the increment input would be 6, 12, 18, 24, 30).

The algorithm runs a service area network analysis and the result is five catchment areas, based on the road network, of increasing size and decreasing accessibility. These catchment area polygons are assigned decreasing scores ranging from 5 to 1, with areas outside of the catchment areas assigned a score of zero, and the output is rasterized.

The default raster output filename does not need to be altered unless the user wishes.

1. Navigate to and select point shapefile input of health care facilities.
2. Select the mode of travel (Walking OR Driving).
3. Select method of measurement (Distance OR Time).
4. Specify travel distance or time increments in meters or time respectively using comma delimitation.
5. Enter alternate raster output file name if desired.
6. Click “Execute” button to run the algorithm.
7. Status text next to the “Execute” button will appear and let you know once processing is complete.

- The aggregated output raster file will be stored in the project folder specified in the “Setup” tab, under the “Accessibility” folder. (*Project_Folder/Accessibility/Raster_output.tif*)

4.4.6 Access to Financial Facilities

World Bank Gender Indicator Tool

Setup Individual Contextual **Accessibility** Place Characterization Aggregate

Women's Travel Patterns Public Transport Education and Training Jobs Health Facilities **Finance Facilities** Aggregate

Financial Facilities

Financial Facilities Input Layer (Point)

Select mode of travel

Walking

Select measurement

Distance

Travel distance or time increments [meters OR min]

1000, 2000, 3000, 4000, 5000

Raster Output Filename

FIF_.tif

Execute

This algorithm estimates the ease with which women can access financial facilities such as banks and ATMs.

The algorithm uses the road network and travel distances or times to estimate ease of access to the input locations at five incrementally increasing measurement intervals, with the largest being the maximum distance or time women would travel to reach these locations.

The user can select walking or driving as a travel mode and it is recommended that the same travel mode should be selected for all accessibility factors. The default travel mode is walking and the measurement for this is distance in metres. The travel increments for walking are already loaded and if using this mode the user should not alter these values without good reason.

If time is selected, the equal measurement increments should be in minutes, and the maximum increment should be the maximum time women would spend driving to reach a public transport stop (for example, if the maximum time spent driving is 30 minutes, the increment input would be 6, 12, 18, 24, 30).

The algorithm runs a service area network analysis and the result is five catchment areas, based on the road network, of increasing size and decreasing accessibility. These catchment area polygons are assigned decreasing scores ranging from 5 to 1, with areas outside of the catchment areas assigned a score of zero, and the output is rasterized.

The default raster output filename does not need to be altered unless the user wishes.

- Navigate to and select point shapefile input of financial facilities.
- Select the mode of travel (Walking OR Driving).
- Select method of measurement (Distance OR Time).
- Specify travel distance or time increments in meters or time respectively using comma delamination.
- Enter alternate raster output file name if desired.
- Click “Execute” button to run the algorithm.
- Status text next to the “Execute” button will appear and let you know once processing is complete.
- The aggregated output raster file will be stored in the project folder specified in the “Setup” tab, under the “Accessibility” folder (*Project_Folder/Accessibility/Raster_output.tif*).

4.4.7 Aggregate

The screenshot shows the 'World Bank Gender Indicator Tool' window with the 'Aggregate' tab selected. The 'Accessibility' sub-tab is also active. The 'Factors' section lists six categories: Women's Travel Patterns (WTP), Public Transport (PBT), Education and Training (ETF), Jobs (JOB), Health Facilities (HEA), and Financial Facilities (FIF). Each category has a text input field and a 'Weight %' spinner set to 16.67. Below this, the 'Output Aggregate Raster Filename' is set to 'AD_AGG.tif'. An 'Execute' button is present. A 'Factor Aggregation' section contains explanatory text about the algorithm and how to adjust weights.

Factors	Weight %
Women's Travel Patterns (WTP)	16.67
Public Transport (PBT)	16.67
Education and Training (ETF)	16.67
Jobs (JOB)	16.67
Health Facilities (HEA)	16.67
Financial Facilities (FIF)	16.67

Output Aggregate Raster Filename: AD_AGG.tif

Factor Aggregation

This algorithm aggregates the raster outputs of all available factors within the accessibility dimension by assuming equal weighting of all factors within the dimension.

If desired, the user can load previously created factor outputs by navigating to their location. If data for a factor is not available, the weighting of the available factors should be adjusted such that they remain equal and add up to 100%.

1. Load the raster outputs generated in each of the previous factor tabs for the Accessibility Dimension.
If a factor was executed in the same work session, the file path will automatically be populated after execution.
2. If factors are missing, adjust weighting percentage accordingly and ensure it totals to 100%.
If a factor is missing it needs to be given a weighting of 0%. All factors should have equal weighting within a dimension.
3. Enter alternate aggregated raster output file name if desired.
4. Click "Execute" button to run the algorithm.
5. Status text next to the "Execute" button will appear and let you know once processing is complete.
6. The aggregated layer will be loaded to the QGIS and appear in the table of content.
7. The aggregated output raster file will be stored in the project folder specified in the "Setup" tab, under the "Contextual" folder (*Project_Folder/Accessibility/Raster_output.tif*).

4.5 PLACE CHARACTERIZATION TAB

4.5.1 Active Transport

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Place Characterization' tab is selected, and within it, the 'Active Transport' sub-tab is active. The interface includes several input fields and buttons for configuring the active transport algorithm. On the right, there is a detailed explanation of the algorithm's purpose and requirements.

World Bank Gender Indicator Tool

Setup Individual Contextual Accessibility **Place Characterization** Aggregate

Active Transport Public Transport Safety Security Income Level Electrical Access Urbanization Housing Digital Includ

Road Network Input Layer (Polyline)

... **Set**

Field representing road type in the input layer

Unique Values

Score extracted road types from (0-5)

E.g. [{"Trail", 4}, {"Tertiary", 3}, {"Motorway", 1}]

Raster Output Filename

WLK_.tif

Execute

Active Transport

This algorithm characterizes areas based on the degree to which they support safe and efficient walking active transport for women, through the classification of road type.

The algorithm requires the user to select the field containing road type classifications and extracts the unique road types in the field.

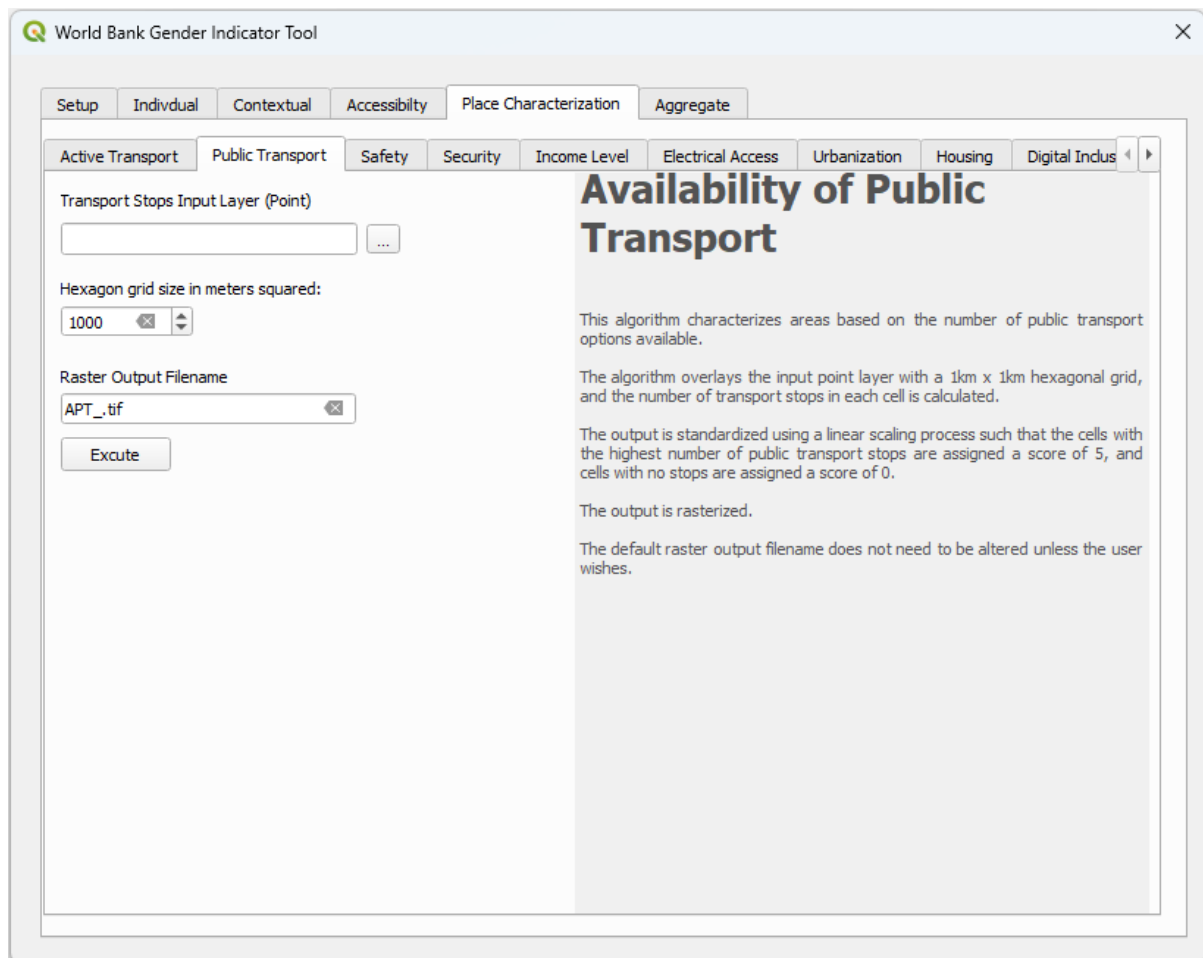
The user reclassifies the extracted road types to scores ranging from 1 to 5 based on local knowledge, where 5 is a highly walkable road type and 1 is a road type where walking is unsafe. The algorithm assigns a score of 0 to areas where there are no roads at all.

The reclassified roads are buffered to a distance of 250 m and the output is rasterized.

The default raster output filename does not need to be altered unless the user wishes.

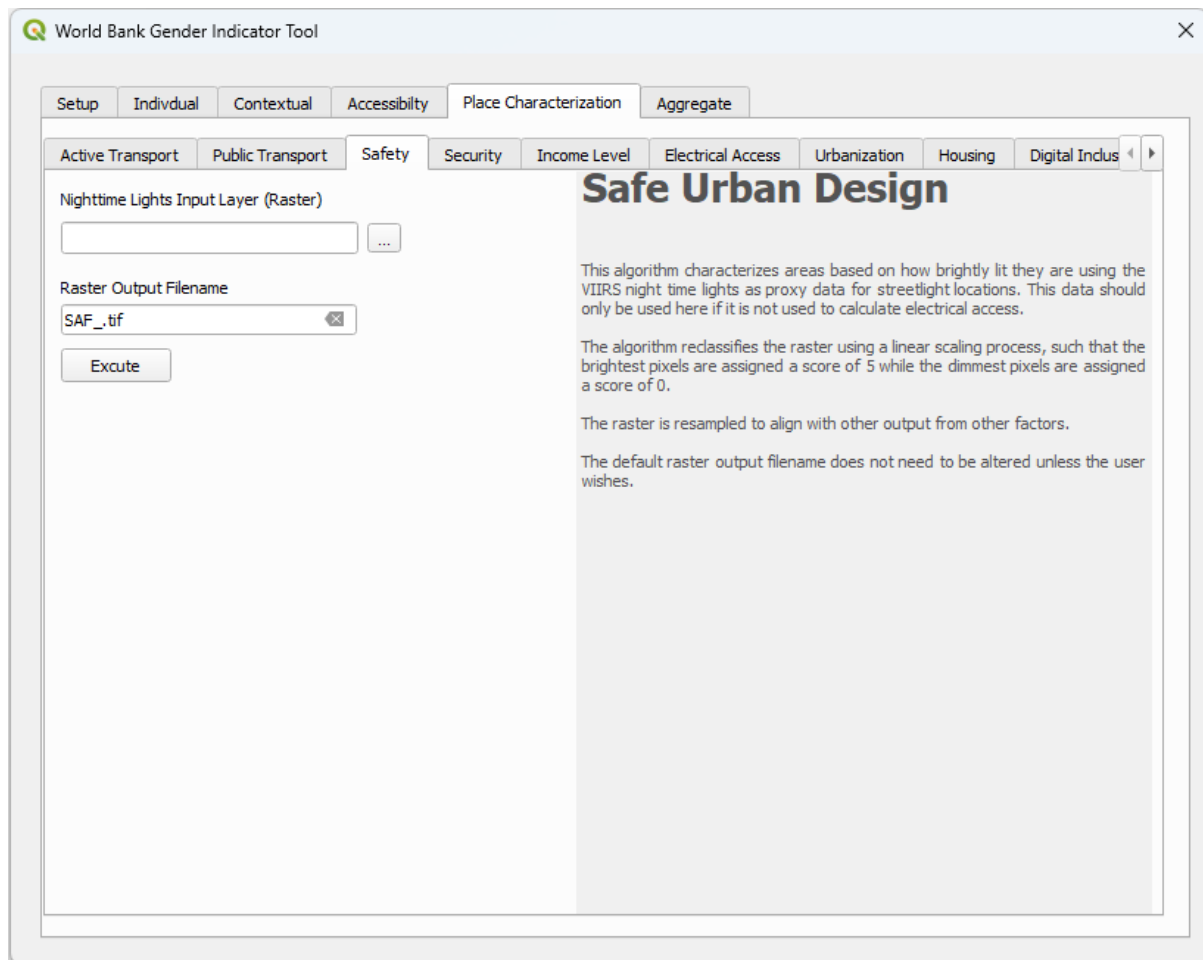
1. Navigate to and select polyline road network shapefile.
2. Click the "Set" button to extract all the fields from the polyline input layer.
3. Select the field containing the road type categorical values.
4. Click the "Unique Values" button to extract all the unique road type values.
5. Score each of the extracted road types from 1 to 5 based on local knowledge, where 5 is a road type that is very safe for walking and cycling and 1 is a road type that is unsafe.
6. Enter alternate raster output file name if desired.
7. Click "Execute" button to run the algorithm.
8. Status text next to the "Execute" button will appear and let you know once processing is complete.
9. The aggregated output raster file will be stored in the project folder specified in the "Setup" tab, under the "Place Characterization" folder (*Project_Folder/Place Characterization/Raster_output.tif*).

4.5.2 Availability of Public Transport



1. Navigate to and select point shapefile input for public transport stops.
2. Set hexagon grid size. The default is 1km.
The smaller size the more computationally intensive the algorithm will be.
3. Enter alternate raster output file name if desired.
4. Click "Execute" button to run the algorithm.
5. Status text next to the "Execute" button will appear and let you know once processing is complete.
6. The aggregated output raster file will be stored in the project folder specified in the "Setup" tab, under the "Place Characterization" folder (*Project_Folder/ Place Characterization/Raster_output.tif*).

4.5.3 Safety



1. Navigate to and select night time lights raster input.
2. Enter alternate raster output file name if desired.
3. Click "Execute" button to run the algorithm.
4. Status text next to the "Execute" button will appear and let you know once processing is complete.
5. The output raster file will be stored in the project folder set in the "Setup" tab, under the "Place Characterization" folder (*Project_Folder/Place Characterization/Raster_output.tif*).

4.5.4 Security

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Place Characterization' tab is selected, and within it, the 'Security' sub-tab is active. The interface is divided into two main sections: 'Step 1: Repeat for all available crime incident types' and 'Step 2: Aggregate Crime Rates'. In Step 1, there is a 'Crime Rate Input Layer (Polygon)' field with a file selection button and a 'Set' button. Below this is a 'Field of interest in the polygon layer' dropdown menu. The 'Crime Type Output Raster Filename' is set to 'Incidents_.tif', with an 'Execute' button below it. In Step 2, the 'Aggregated Crime Rates Raster Output Filename' is set to 'SEC_.tif', with an 'Aggregate' button below it. On the right side of the window, there is a 'Security' section with explanatory text and step-by-step instructions. The text explains that the algorithm characterizes areas based on crime incidents per 100,000 residents. Step 1 involves selecting a polygon layer and a field of interest. Step 2 involves reclassifying the input data using an inverse linear scaling process, where the highest crime rates are assigned a score of 0 and zero crime rates are assigned a score of 5. The final step involves aggregating all raster layers created in step 1 by calculating the mean score for each pixel.

1. Navigate to and select crime rate polygon input shapefile containing a field reporting crime rate for a specific incident.
2. Click the “Set” button to extract all the fields from the polygon input layer.
3. Select the field containing the numeric value representing crime rate.
4. Enter raster output file name for the crime type.
5. Click “Execute” button to run the algorithm.
6. Status text next to the “Execute” button will appear and let you know once processing is complete.
7. The output raster file will be stored in the project folder specified in the “Setup” tab, in the “SEC” folder under the “Accessibility” folder (*Project_Folder/Place Characterization/SEC/Raster_output.tif*).

Steps 1 – 8 will have to be repeated for all facility types.

8. Once all crime types have completed the processing, enter aggregated raster output file name.
9. Click “Aggregate” button to run the algorithm.

10. Status text next to the “Execute” button will appear and let you know once processing is complete.
11. The aggregated output raster file will be stored in the project folder specified in the “Setup” tab, under the “Contextual” folder. (*Project_Folder//Place Characterization/Raster_output.tif*)

4.5.5 Income Level

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Place Characterization' tab is active, and the 'Income Level' sub-tab is selected. The interface includes a 'Wealth Index Input Layer (Polygon)' section with a file selection button and a 'Set' button. Below this is a 'Field of interest in the polygon layer' dropdown menu. The 'Output Raster Filename' section shows 'INC_.tif' as the default name, with an 'Execute' button below it. On the right, a text box titled 'Income level' provides a description of the algorithm: it characterizes areas based on the wealth index, uses a linear scaling process where 5 indicates a wealth index of 100 and 0 indicates zero, and the resulting data is rasterized. The default output filename is noted as 'INC_.tif'.

1. Navigate to and select wealth index polygon input shapefile containing a field with the wealth index.
2. Click the “Set” button to extract all the fields from the polygon input layer.
3. Select the field containing the numeric value representing wealth index.
4. Enter alternate raster output file name if desired.
5. Click “Execute” button to run the algorithm.
6. Status text next to the “Execute” button will appear and let you know once processing is complete.
7. The output raster file will be stored in the project folder specified in the “Setup” tab, under the “Contextual” folder (*Project_Folder//Place Characterization/Raster_output.tif*).

4.5.6 Electricity Access

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Place Characterization' tab is selected, and within it, the 'Electrical Access' sub-tab is active. The interface is divided into two main sections: a left sidebar for input configuration and a right panel for the 'Electricity Access' algorithm details.

Left Sidebar (Input Configuration):

- Electrical Access Input Layer (Polygon):** Includes a file selection button (three dots), a 'Set' button, and a 'Field of interest in the polygon layer' dropdown menu.
- Output Raster Filename:** A text input field containing 'ELC_.tif' with a file icon button.
- Execute:** A button to run the algorithm.
- OR:** A separator between the two input methods.
- Nighttime Lights Raster Layer Input:** Includes a file selection button (three dots).
- Output Raster Filename:** A text input field containing 'ELC_.tif' with a file icon button.
- Execute:** A button to run the algorithm.

Right Panel (Electricity Access Details):

Electricity Access

This algorithm estimates electrical access for areas based on how brightly lit they are using the VIIRS nighttime lights as a proxy for spatially disaggregated electrical access data. This data should only be used here if it is not used to calculate the Safe Urban Design factor.

The algorithm reclassifies the nighttime lights raster using a linear scaling process, such that the brightest pixels are assigned a score of 5 while the dimmest pixels are assigned a score of 0.

The raster is resampled to align with other output from other factors.

The default raster output filename does not need to be altered unless the user wishes.

1. Navigate to and select electricity access polygon input shapefile containing a field indicating percentage individuals that have access to electricity.
2. Click the “Set” button to extract all the fields from the polygon input layer.
3. Select the field containing the numeric value representing percentage individuals that have access to electricity.
4. Enter an alternate raster output file name if desired.
5. Click “Execute” button to run the algorithm.
6. Status text next to the “Execute” button will appear and let you know once processing is complete.
7. The output raster file will be stored in the project folder specified in the “Setup” tab, under the “Contextual” folder (*Project_Folder//Place Characterization/Raster_output.tif*).

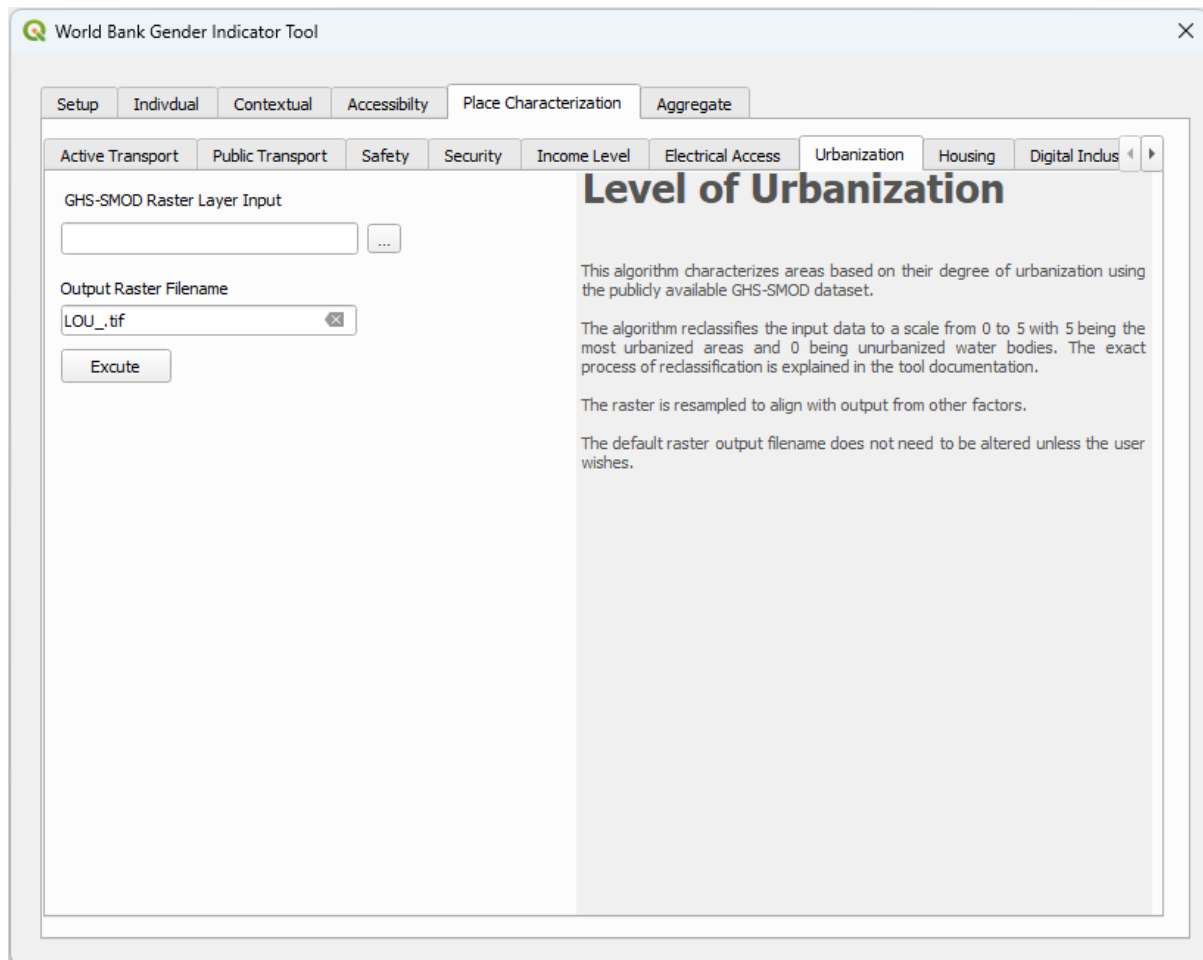
OR

1. Navigate to and select night time lights raster input.
2. Enter raster output file name.

3. Click “Execute” button to run the algorithm.
4. Status text next to the “Execute” button will appear and let you know once processing is complete.
5. The aggregated output raster file will be stored in the project folder specified in the “Setup” tab, under the “Place Characterization” folder (Project_Folder/Place Characterization/Raster_output.tif).

N.B. If night time lights raster data is used for the “Safe Urban Design” factor it should not be used in the “Electrical Access” factor and vice-versa

4.5.7 Urbanization



The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Place Characterization' tab is selected, and within it, the 'Urbanization' sub-tab is active. On the left, there are input fields for 'GHS-SMOD Raster Layer Input' (with a browse button) and 'Output Raster Filename' (containing 'LOU_.tif' and a file icon). An 'Execute' button is below these fields. On the right, the 'Level of Urbanization' section contains descriptive text about the algorithm's use of the GHS-SMOD dataset and its reclassification process.

World Bank Gender Indicator Tool

Setup Individual Contextual Accessibility **Place Characterization** Aggregate

Active Transport Public Transport Safety Security Income Level Electrical Access **Urbanization** Housing Digital Inclus

GHS-SMOD Raster Layer Input

Output Raster Filename

LOU_.tif

Execute

Level of Urbanization

This algorithm characterizes areas based on their degree of urbanization using the publicly available GHS-SMOD dataset.

The algorithm reclassifies the input data to a scale from 0 to 5 with 5 being the most urbanized areas and 0 being unurbanized water bodies. The exact process of reclassification is explained in the tool documentation.

The raster is resampled to align with output from other factors.

The default raster output filename does not need to be altered unless the user wishes.

1. Navigate to and select GHS-SMOD raster input.
2. Enter alternate raster output file name if desired.
3. Click “Execute” button to run the algorithm.
4. Status text next to the “Execute” button will appear and let you know once processing is complete.

- The output raster file will be stored in the project folder set in the “Setup” tab, under the “Place Characterization” folder (*Project_Folder/Place Characterization/Raster_output.tif*).

4.5.8 Size of Housing

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Place Characterization' tab is selected, and within it, the 'Housing' sub-tab is active. The interface includes a sidebar with various indicators like Active Transport, Public Transport, Safety, Security, Income Level, Electrical Access, Urbanization, Housing, and Digital Inclusion. The main panel is titled 'Size of Housing' and contains a description of the indicator, the algorithm used, and the data standardization process. On the left, there are input fields for 'Building Footprint Input Layer (Polygon)', 'Hexagon grid size in meters squared' (set to 1000), and 'Output Raster Filename' (set to QUH_.tif), along with an 'Execute' button.

Size of Housing

This indicator characterizes areas based on the size of housing based on the assumption that buildings with a footprint of less than 60m² are more likely to represent informal housing typologies. Evidence shows that informal settlements can be identified based on a threshold building size of 60 m².

This algorithm calculates the area of each building footprint in the input building footprint polygon layer. It then overlays the polygon layer with a 1km x 1km hexagonal grid, and calculates the percentage of buildings within each grid cell that have a footprint greater than 60 m².

Data are then standardized scale of 0 to 5 using a linear scaling process, such that 5 represents areas where 100% of buildings have a footprint larger than 60 m², and 0 represents areas where no buildings have a footprint larger than 60m².

The default raster output filename does not need to be altered unless the user wishes.

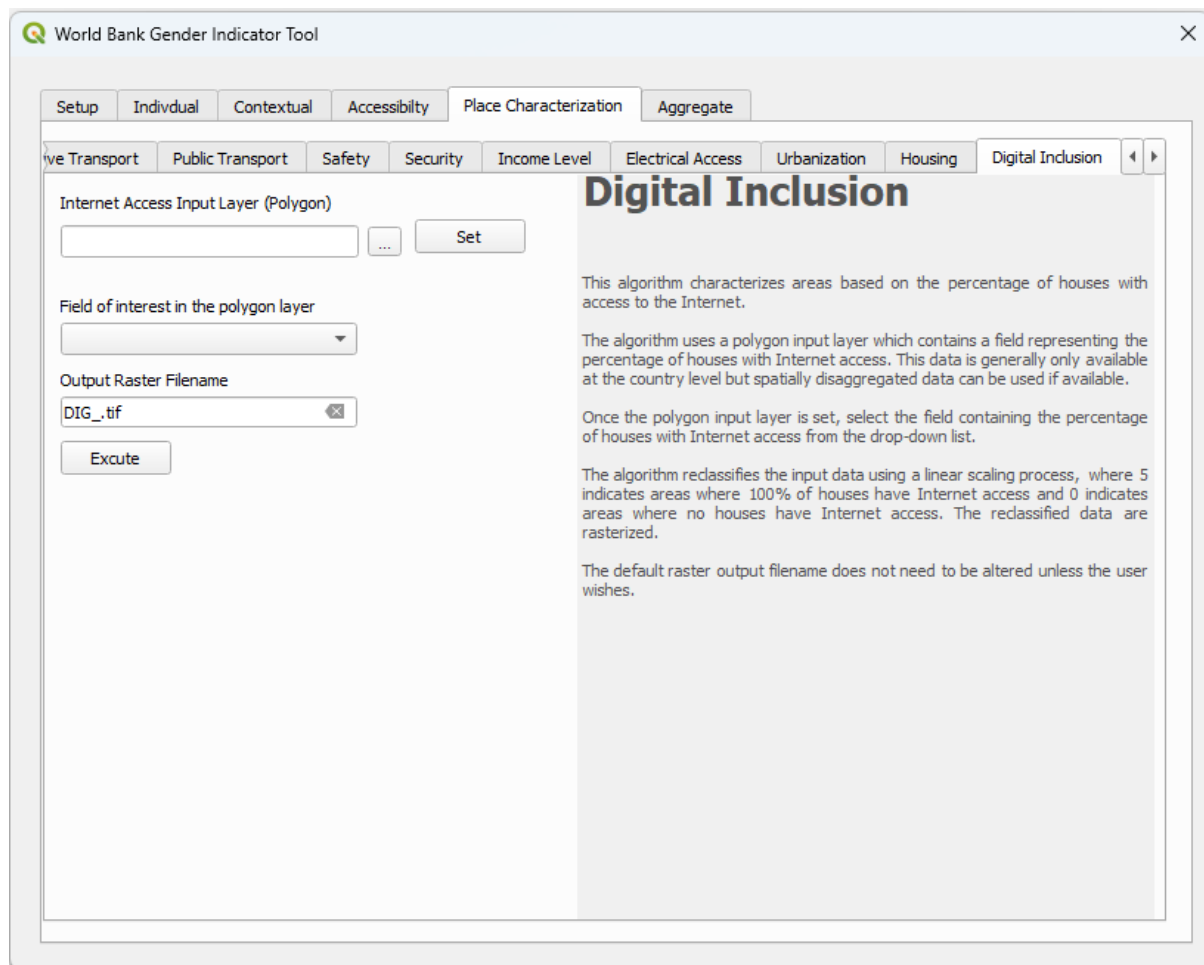
Building Footprint Input Layer (Polygon)
 ...

Hexagon grid size in meters squared:
 1000

Output Raster Filename

- Navigate to and select the building footprints polygon shapefile.
- Set hexagon grid size. The default is 1 km.
The smaller size the more computationally intensive the algorithm will be.
- Enter alternate raster output file name if desired.
- Click “Execute” button to run the algorithm.
- Status text next to the “Execute” button will appear and let you know once processing is complete.
- The aggregated output raster file will be stored in the project folder specified in the “Setup” tab, under the “Place Characterization” folder (*Project_Folder/ Place Characterization/Raster_output.tif*).

4.5.9 Digital Inclusion



1. Navigate to and select the polygon input shapefile containing a field indicating representing the percentage of houses with Internet access
2. Click the “Set” button to extract all the fields from the polygon input layer.
3. Select the field containing the numeric value representing the percentage of houses with Internet access
4. Enter alternate raster output file name if desired.
5. Click “Execute” button to run the algorithm.
6. Status text next to the “Execute” button will appear and let you know once processing is complete.
7. The output raster file will be stored in the project folder specified in the “Setup” tab, under the “Contextual” folder (*Project_Folder//Place Characterization/Raster_output.tif*).

4.5.10 Natural Environment and Climatic Factors

The screenshot shows the 'World Bank Gender Indicator Tool' window. The 'Place Characterization' tab is active, and the 'Natural Environment' sub-tab is selected. The interface is divided into two main sections: 'Step 1: Repeat for all available disaster risk types' and 'Step 2: Aggregate Natural Disaster Risk'.

Step 1: Repeat for all available disaster risk types

Hazard Input Layer (Polygon): [Text Box] ... [Set]

Field of interest in the polygon layer: [Dropdown Menu] [Unique Values]

Score extracted risk levels from (0-5): [Text Box]
E.g. [{"low", 4}, {"medium", 2}, {"high", 1}]

Hazard Type Output Raster Filename: [Text Box] [X]

[Execute]

Step 2: Aggregate Natural Disaster Risk

Aggregated Hazard Raster Output Filename: [Text Box] [X]

[Aggregate]

Natural Environment and Climatic factors

This algorithm characterizes areas based on their vulnerability to natural disasters.

Step 1

The algorithm uses polygon layers which contain the level of risk for natural disasters. These layers of information are often separated into different risk types, and so the first step is to rasterize the input data for each different class of disaster.

Once the polygon input layer is set, select the field containing the risk classification from the drop down list.

In the datasets, areas are classified as having either low, medium, or high risk. The algorithm reclassifies the input such that low-risk areas are assigned a score of 5, medium-risk areas are assigned a score of 2, and high-risk areas are assigned a score of 0. The reclassified data are rasterized.

Step 2

The algorithm identifies all raster layers created in step 1 and aggregates them by calculating the mean score for each pixel. The default raster output filename does not need to be altered unless the user wishes.

1. Navigate to and select polygon hazard shapefile.
2. Click the "Set" button to extract all the fields from the polyline input layer.
3. Select the field containing the descriptive risk level values.
4. Click the "Unique Values" button to extract all the unique risk level values.
5. Score each of the extracted risk levels from 1 to 5, where 5 is a lowest risk and 1 is highest risk.
6. Enter hazard type raster output file name.
7. Click "Execute" button to run the algorithm.
8. Status text next to the "Execute" button will appear and let you know once processing is complete.
9. The output raster file will be stored in the project folder specified in the "Setup" tab, under the "Place Characterization" folder. (*Project_Folder/Place Characterization/ENV/Raster_output.tif*)

Steps 1 – 9 will have to be repeated for all hazard types.

12. Once all hazard types have been processed, enter aggregated raster output file name.
13. Click "Aggregate" button to run the algorithm.

14. Status text next to the “Execute” button will appear and let you know once processing is complete.
15. The aggregated output raster file will be stored in the project folder specified in the “Setup” tab, under the “Contextual” folder (*Project_Folder//Place Characterization/Raster_output.tif*).

4.5.11 Aggregate

The screenshot shows the 'World Bank Gender Indicator Tool' window with the 'Aggregate' tab selected. The 'Place Characterization' sub-tab is active, showing a list of factors and their weights. The factors are: Active Transport (WLK), Public Transport (APT), Safe Urban Design (SAF), Security (SEC), Income Level (INC), Electrical Access (ELC), Level of Urbanization (LOU), Quality of Housing (QUH), Digital Inclusion (DIG), and Natural Environment (ENV). Each factor has a text input field and a weight of 10.00. The 'Output Aggregate Raster File' is set to 'PD_AGG.tif'. An 'Execute' button is located at the bottom left. On the right, a sidebar titled 'Factor Aggregation' provides a description of the algorithm.

Factor Aggregation

This algorithm aggregates the raster outputs of all available factors within the place characterization dimension by assuming equal weighting of all factors within the dimension.

If desired, the user can load previously created factor outputs by navigating to their location. If data for a factor is not available, the weighting of the available factors should be adjusted such that they remain equal and add up to 100%.

1. Load the raster outputs generated in each of the previous factor tabs for the Place Characterization Dimension.
If a factor was executed in the same work session, its file path will automatically be populated after execution.
2. If factors are missing, adjust weighting percentage accordingly and ensure it totals to 100%.
If a factor is missing it needs to be given a weighting of 0%. All factors should have equal weighting within a dimension.
3. Enter aggregated raster output file name.
4. Click “Execute” button to run the algorithm.
5. Status text next to the “Execute” button will appear and let you know once processing is complete.

6. The aggregated layer will be loaded to the QGIS and appear in the table of content.
7. The aggregated output raster file will be stored in the project folder specified in the “Setup” tab, under the “Contextual” folder (*Project_Folder/Place Characterization/Raster_output.tif*).

4.6 DIMENSION AGGREGATION TAB

World Bank Gender Indicator Tool

Setup Individual Contextual Accessibility Place Characterization **Aggregate**

Dimensions	Weighting
Individual	16,67 1/6 (16,67%)
Contextual	16,67 1/6 (16,67%)
Accessibility	33,33 1/3 (33,33%)
Place Characterization	33,33 1/3 (33,33%)

Output Aggregate Raster File
Final_AGG.tif

Excute

Dimension Aggregation

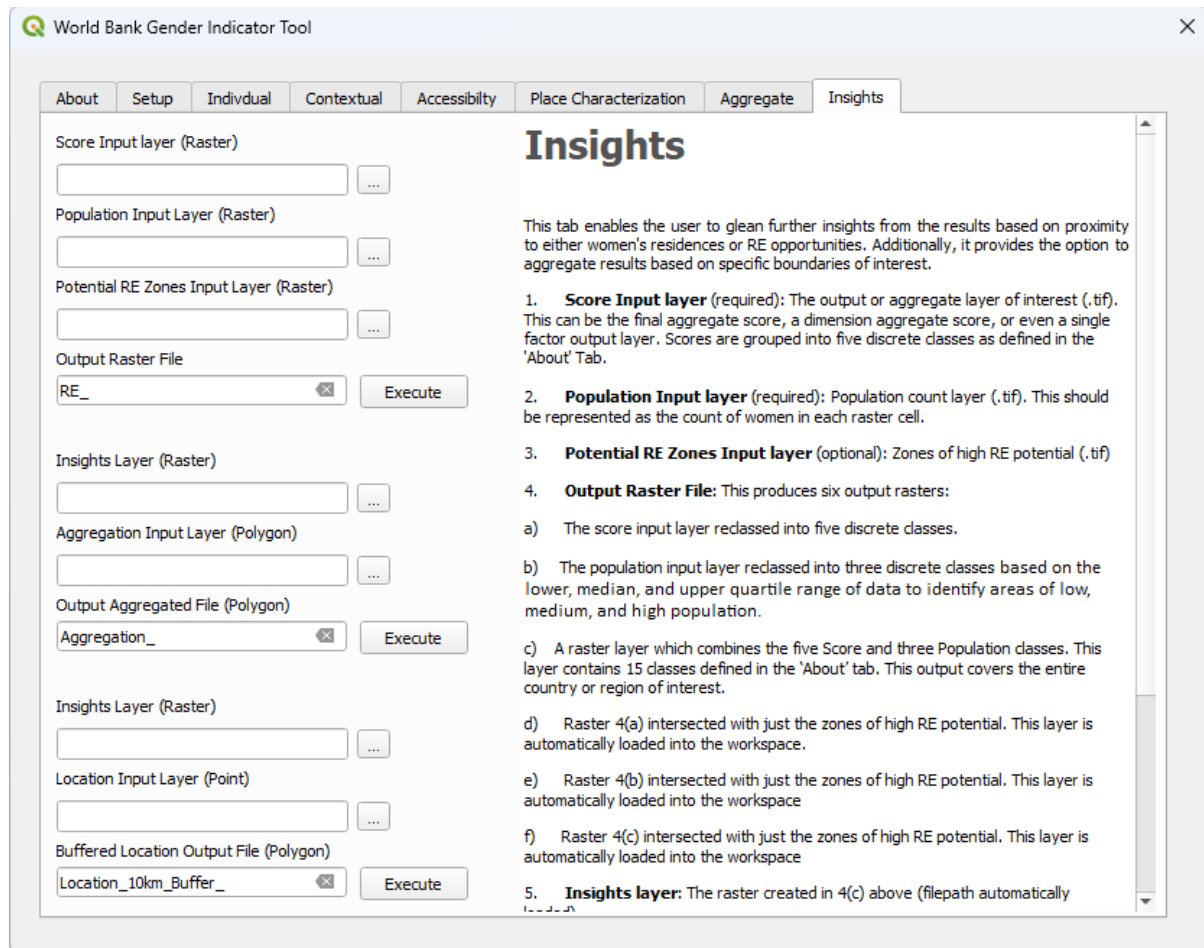
This algorithm aggregates the raster outputs of all available dimensions, by default assigning double the weight to Place Characterization and Accessibility dimensions as Contextual and Individual Dimensions (because of their more spatially disaggregated nature).

If data for a dimension is missing, the weighting of the remaining dimensions should be adjusted such that Place Characterization or Accessibility Dimensions are weighted double the Contextual or Individual Dimensions, and the weights still add up to 100%.

1. Load each dimensions aggregated raster outputs.
If a dimension's factor aggregation was executed in the same work session, it's file path will automatically be populated after execution.
2. If dimensions are missing, adjust weighting percentage accordingly and ensure it totals up to 100%.
If a dimension is missing it needs to be given a weighting of 0%.
3. Enter aggregated dimensions raster output file name.
4. Click “Execute” button to run the algorithm.
5. Status text next to the “Execute” button will appear and let you know once processing is complete.
6. The aggregated dimensional layer will be loaded to the QGIS and appear in the table of content.

7. The aggregated output raster file will be stored in the project folder specified in the “Setup” tab, under the “Final_output” folder (*Project_Folder/Final_Output/Raster_output.tif*).

4.7 INSIGHTS TAB



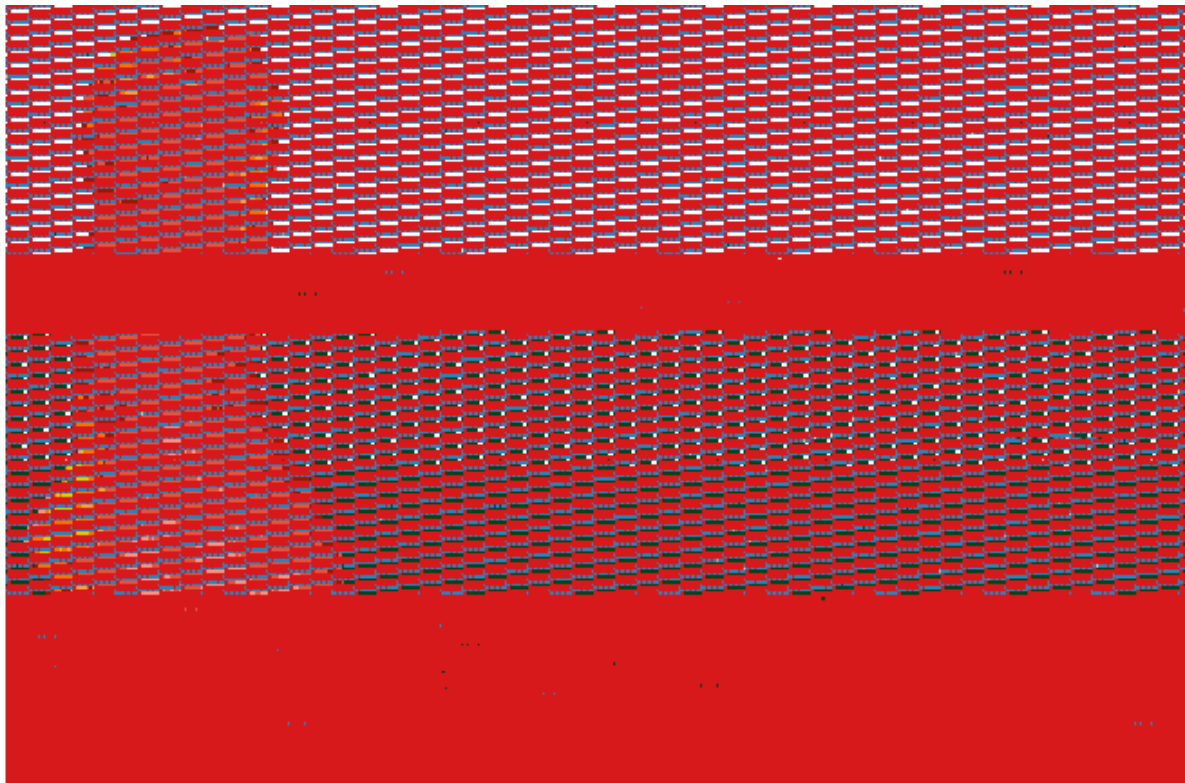
5 Troubleshooting

To be populated during the tool trial period as we identify common bugs or issues that aren't necessarily related to the back end programming of the tool.

5.1 ACCECCIBILTY TAB PROCESSING PERMISSION ERROR

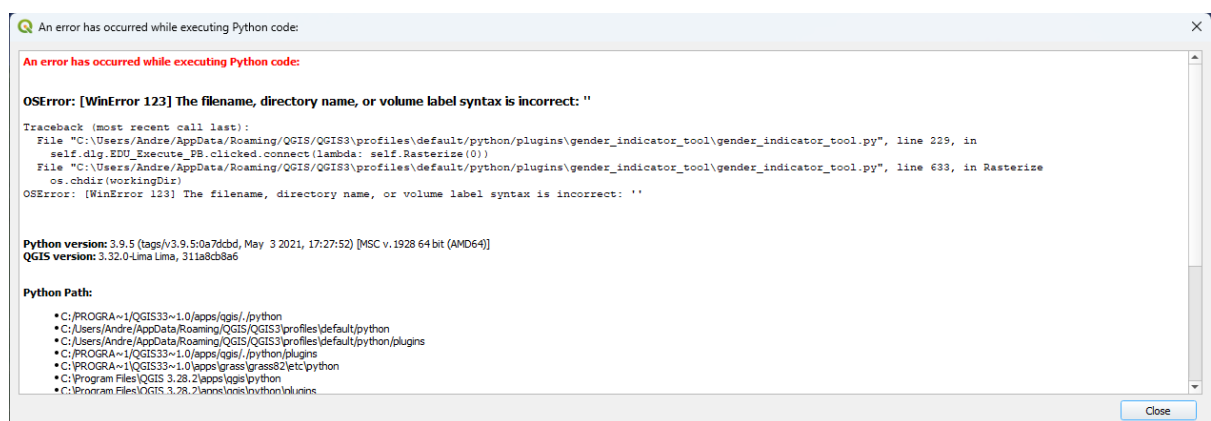
5.2 INTERFACE WIDGETS AND TEXT ARE DISTORTED

5.3 RASTER OUTPUTS NOT DISPALYING CORRECTLY



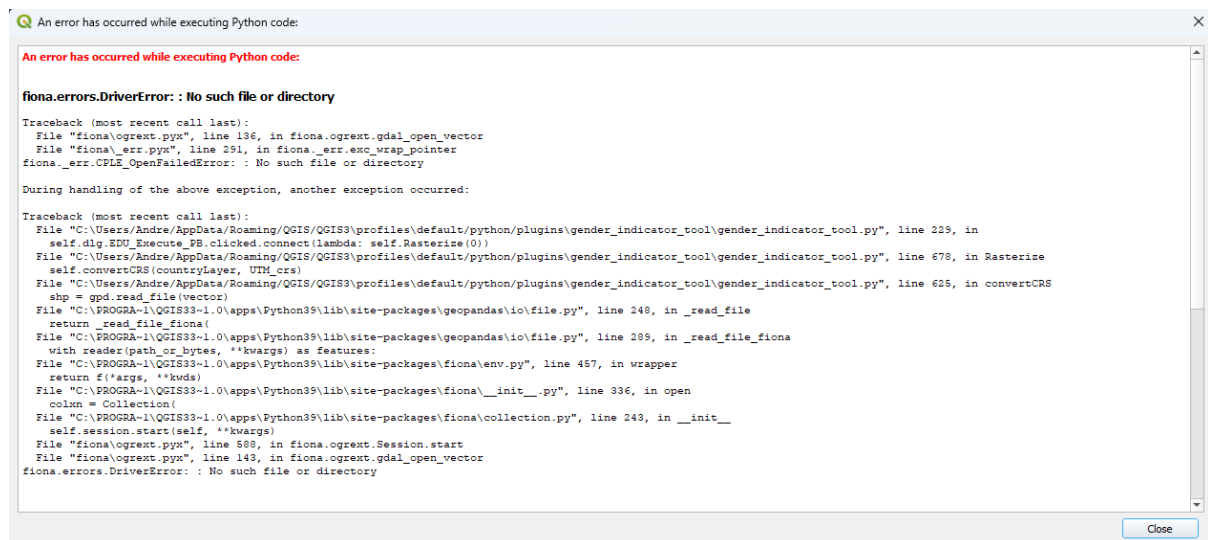
Occasionally, some of the outputs that are automatically loaded to the QGIS table of contents don't display correctly. To correct this, try and removing the layer that is displayed incorrectly and add it again to QGIS.

5.4 ERROR: OUTPUT DIRECTORY NOT SET



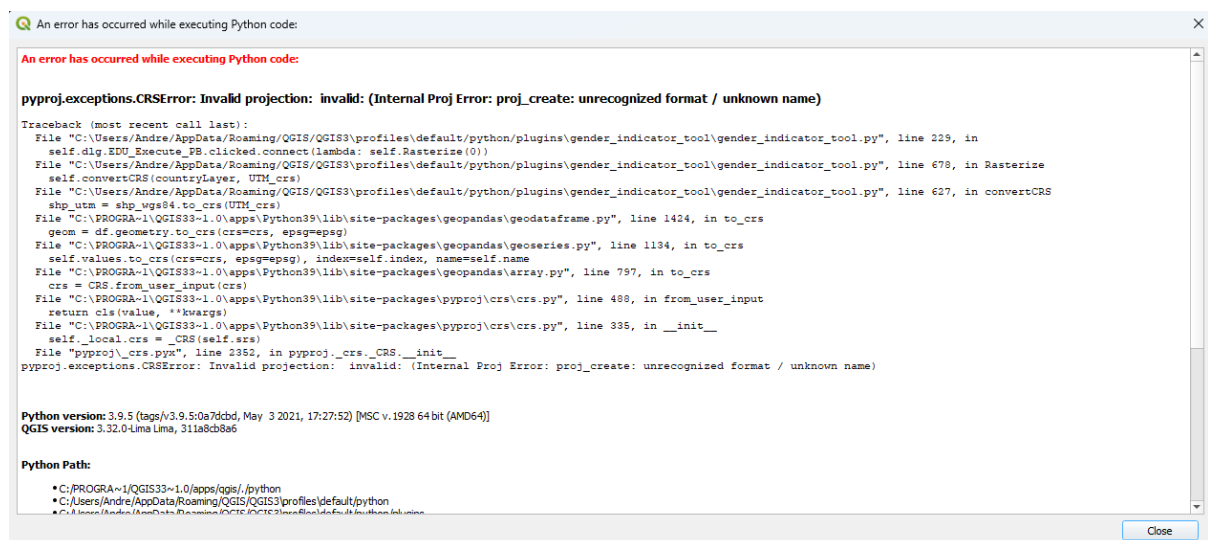
If you see the following error message, please check if you're output directory has been set in the "Setup" tab.

5.5 ERROR: COUNTRY BOUNDARY POLYGON NOT SET



If you see the following error message, please check if you're country boundary polygon layer has been set in the "Setup" tab.

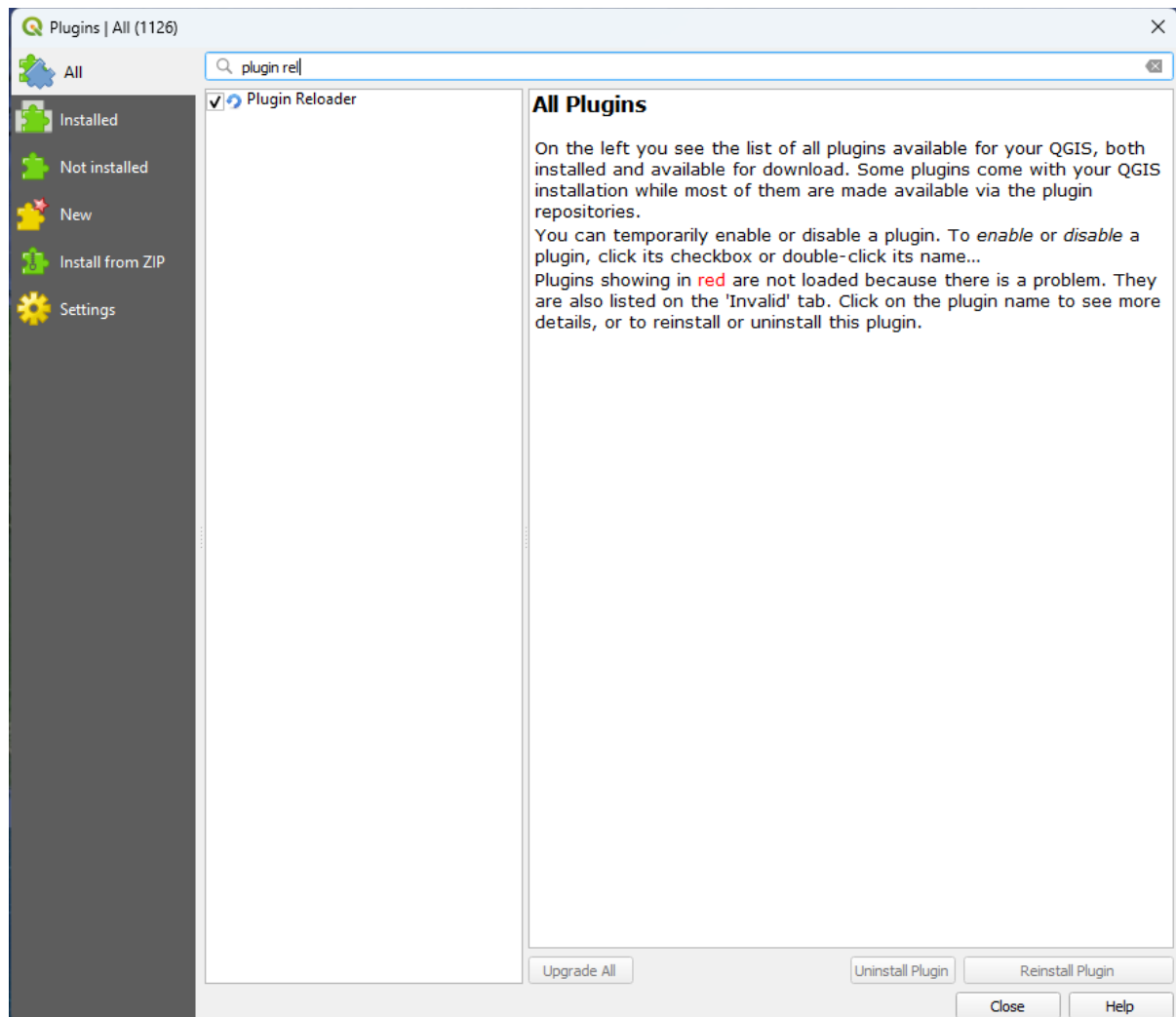
5.6 ERROR: CO-ORDINATE REFERENCE SYSTEM (CRS) NOT SET



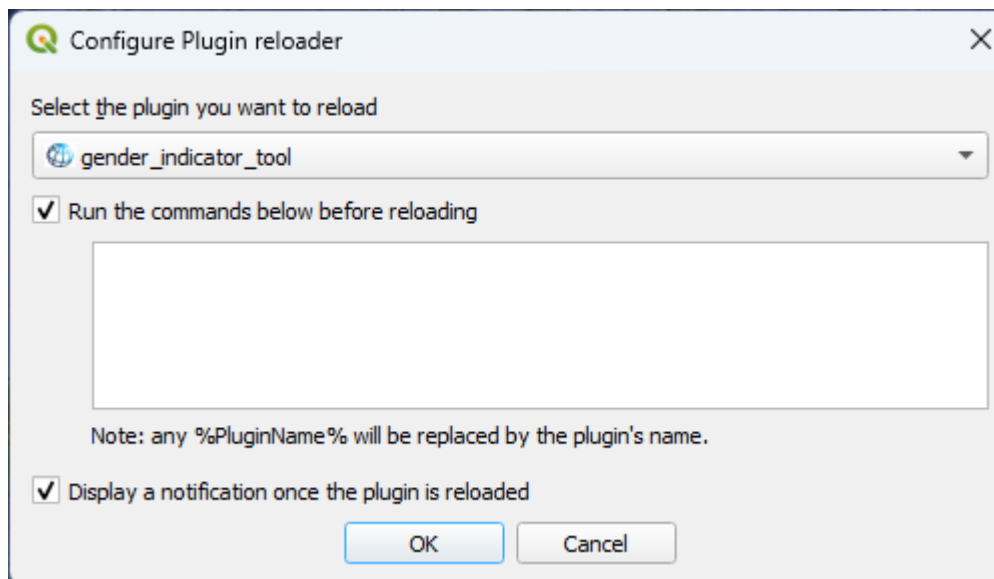
If you see the following error message, please check if you're CRS has been set in the "Setup" tab.

5.7 STEPS TO TAKE IF TOOL FREEZES OR DOES NOT RUN AS EXPECTED

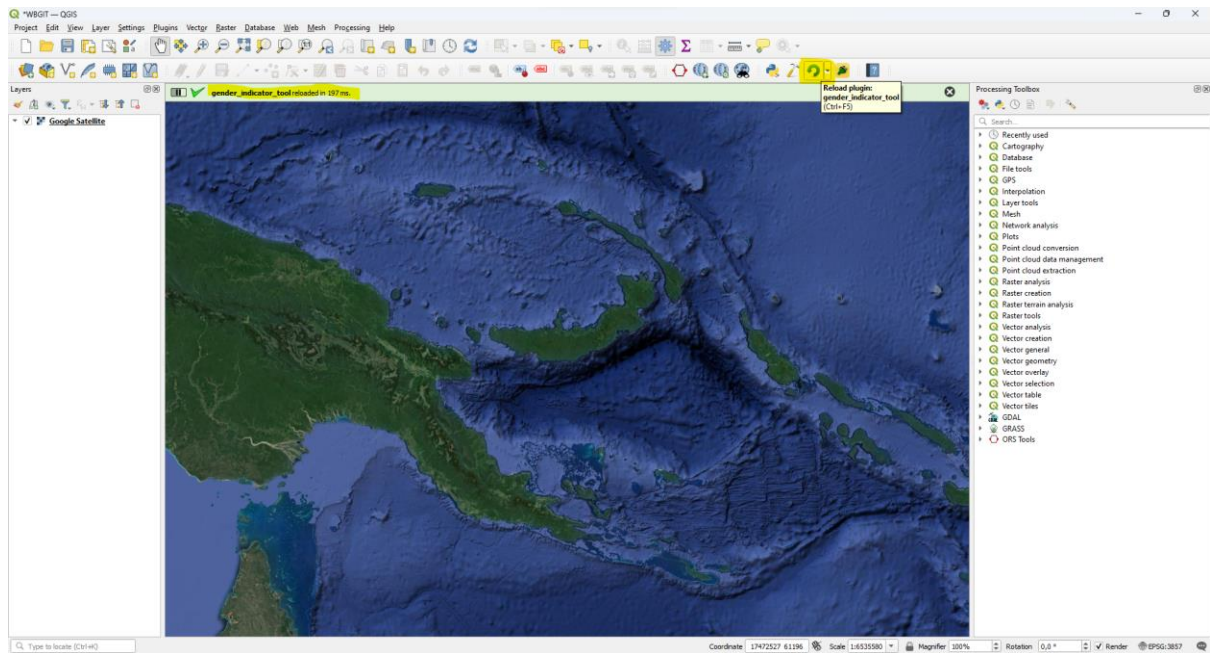
1. Install the “Plugin Reloader” plugin.
 - 2.1 Navigate to and open “Manage and Install Plugins...” under the plugins tab in QGIS.
 - 2.2 In the search bar type “plugin reloader”.
 - 2.3 Select the “Plugin Reloader” plugin and click on the install button.



- 2.4 Navigate to the “Plugin Reloader” configuration window under the Plugins tab.
Plugins → Plugin Reloader → Configure
- 2.5 From the drop down list select the “gender_indicator_tool” plugin and press “OK”.



2.6 If you encounter an unexpected error in the tool that has not...



OR

If the “Plugin Reloader” does not resolve the error close QGIS and restart it again, and re-run the process you were trying to execute.

APPENDIX A SIDS CRS

Country	WGS84 / UTM CRS	EPSG
Antigua and Barbuda	WGS 84 / UTM zone 20N	32620
Belize	WGS 84 / UTM zone 16N	32616
Cabo Verde	WGS 84 / UTM zone 26N	32626
Comoros	WGS 84 / UTM zone 38S	32738
Dominica	WGS 84 / UTM zone 20N	32620
Dominican Republic	WGS 84 / UTM zone 19N	32619
Fiji	WGS 84 / UTM zone 60S	32760
Grenada	WGS 84 / UTM zone 20N	32620
Guinea-Bissau	WGS 84 / UTM zone 28N	32628
Guyana	WGS 84 / UTM zone 21N	32621
Haiti	WGS 84 / UTM zone 18N	32618
Jamaica	WGS 84 / UTM zone 17N	32617
Kiribati	WGS 84 / UTM zone 1N	32601
Maldives	WGS 84 / UTM zone 43N	32643
Marshall Islands	WGS 84 / UTM zone 58N	32658
Mauritius	WGS 84 / UTM zone 40S	32740
Micronesia (Federated States of)	WGS 84 / UTM zone 57N	32657
Nauru	WGS 84 / UTM zone 58N	32658
Niue	WGS 84 / UTM zone 1S	32701
Palau	WGS 84 / UTM zone 53N	32653
Papua New Guinea	WGS 84 / UTM zone 55S	32755
Samoa	WGS 84 / UTM zone 2S	32702
Sao Tomé and Príncipe	WGS 84 / UTM zone 32N	32632
Solomon Islands	WGS 84 / UTM zone 57S	32757
St. Lucia	WGS 84 / UTM zone 20N	32620
St. Vincent and the Grenadines	WGS 84 / UTM zone 20N	32620
Suriname	WGS 84 / UTM zone 21N	32621
Timor-Leste	WGS 84 / UTM zone 52S	32752
Tonga	WGS 84 / UTM zone 60S	32760
Tuvalu	WGS 84 / UTM zone 60S	32760
Vanuatu	WGS 84 / UTM zone 59S	32759