

Appendix A

Table A1 Specification of the geospatial tools in the GeoITC dataset.

No.	Tool Name	Function Description	Parameter Name
1	OSM Downloader	This tool allows users to download OpenStreetMap (OSM) data by selecting an area using a rectangle.	Download Area, Output Format
2	OpenTopography DEM Downloader	This tool downloads Digital Elevation Models (DEMs) for the extent defined by the user, from OpenTopography.	DEM Type, Download Extent, Output Raster
3	Points Along Geometry	This algorithm creates a point layer, with points distributed along the lines of an input vector layer.	Input Layer, Distance, Start Offset, End Offset, Output Layer
4	Turning Radius Calculation	This tool calculates the turning radius for points along a line (road).	Input Layer, Sorting Field, Angle Field, Output Layer
5	Split Lines by Maximum Length	This tool splits lines (or curves) from an input layer into multiple parts, where each part has a specified maximum length.	Input Layer, Maximum Line Length, Output Layer
6	Extract Specific Vertices	This tool takes a vector layer and generates a point layer with points representing specific vertices in the input geometries.	Input Layer, Vertex Indices Length, Output Layer
7	Sample Raster Values	This tool creates a new vector layer with the same attributes as the input vector layer and adds raster values corresponding to the point locations.	Input Layer, Raster Layer, Output Column Prefix, Output Layer
8	Field Calculator	This tool allows users to calculate new or update existing fields in a vector layer. It supports creating virtual fields that are computed dynamically based on expressions	Input Layer, Output Field Name, Output Field Type, Output Field Length, Expression
9	Deepness	This tool applies an ONNX model for segmentation and analysis on input raster data.	Input Layer, ONNX Model Type, ONNX Model File Path, Resolution, Batch Size
10	Intersection	This tool extracts the overlapping portions of features in the Input and Overlay layers	Input Layer, Overlay Layer, Input Fields to Keep, Overlay Fields to Keep, Output Layer

11	Voronoi Skeleton	This tool creates a Voronoi diagram for polygons or computes the center line/skeleton of polygons.	Input Polygons Layer, Factor for Output Smoothness, Maximum Dangle Length of Skeletons, Output Layer
12	Geometry by Expression	This tool updates existing geometries or creates new geometries for input features using a QGIS expression.	Input Layer, Output Geometry Type, Geometry Expression, Output Layer
13	Points to Path	This tool connects the features of a point layer and creates a new line layer.	Input Layer, Order Expression, Path Group Expression, Output Layer
14	Set M Value	This tool sets the M value for geometries in a vector layer.	Input Layer, M Value, Output Layer
15	Variable Width Buffer (by M Value)	This tool creates variable width buffers along lines, using the M value of the line geometries as the diameter of the buffer at each vertex.	Input Layer, Segments, Output Layer
16	Rearrange Bands	This tool creates a new raster layer using selected band(s) from a given raster layer.	Input Layer, Selected Band(s), Output Layer
17	Zonal Statistics	This tool calculates statistics of a raster layer for each feature of an overlapping polygon vector layer.	Input Layer, Raster Layer, Output Column Prefix, Statistics to Calculate, Output Layer
18	Reproject Layer	This algorithm reprojects a vector layer to a new coordinate reference system (CRS).	Input Layer, Target CRS, Output Layer