



PRESENTATION ON

DEVELOPMENT OF QGIS PLUGIN

FOR

LAND RECORDS

INFORMATION SYSTEM

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## PROBLEM STATEMENT

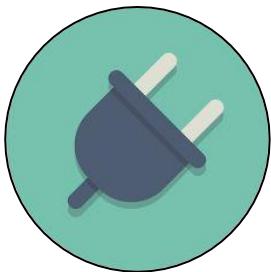
- Traditional method of maintaining land record system suffer from following disadvantage
  - Outdated records.
  - Lack of efficiency
  - Lack of Accessibility
  - Lack of accuracy
  - Prone to fraud
- There is a critical need for a modernized digital solution to ensure the uniqueness, transparency, and up-to-date maintenance of land records.

# 3 PHASES OF PROJECT

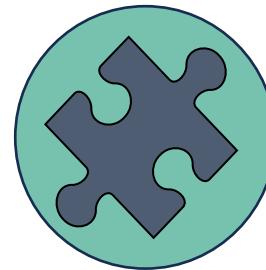
1.  
Image Segmentation and Boundary Detection

2.  
Plugin Development for Land Record System

3.  
Quantum Computing and Image Processing



1



# WHAT ARE PLUGINS?

- Used to add or extend functionalities
- Tailor user specific needs
- External and User Defined
- Built in python /C++
- User Designed
- Growth

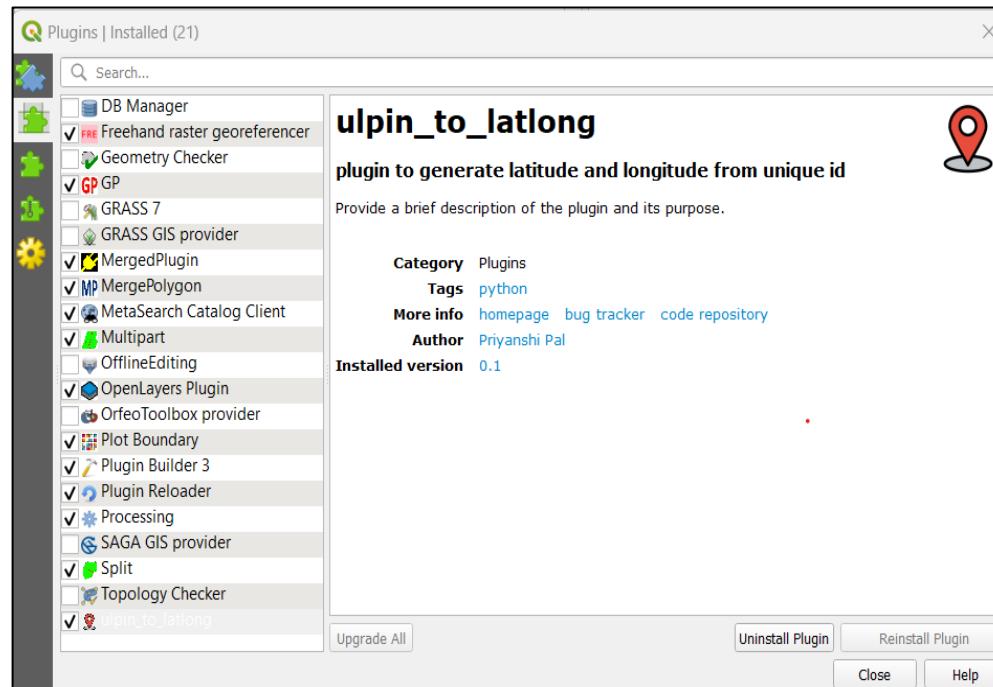


Fig 1: Manage and Install Plugins



2

# PLUGINS CREATION

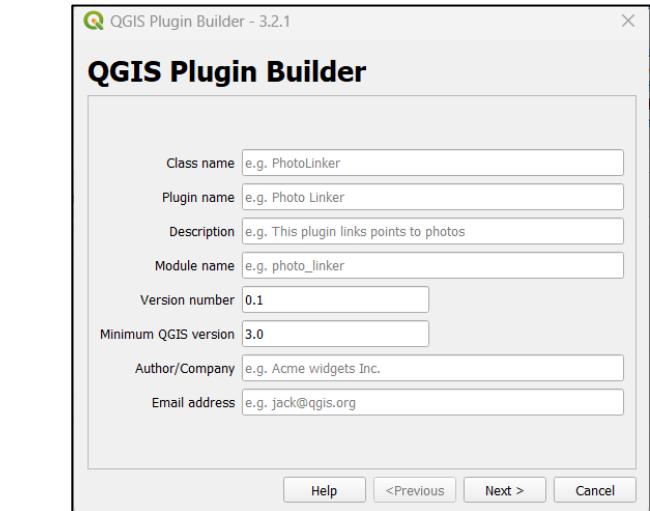


Fig 2: Plugin Builder

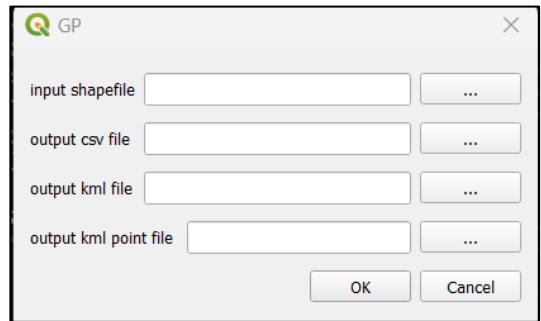


Fig 6: Plugins

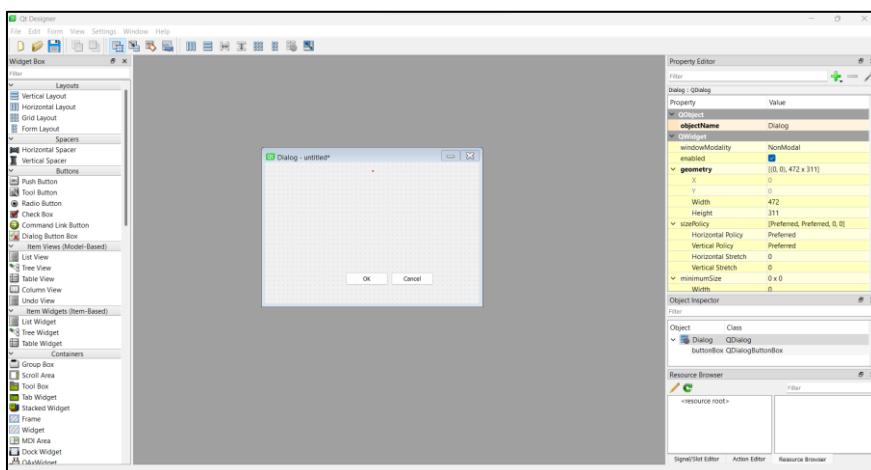


Fig 3: Qt Designer

```

E:\SEM 3 > Internship > gp > GP.py > GP > run
1 # *-* coding: utf-8 -*-
2 """
3 ***** A QGIS plugin
4 CREATING GENERAL PLUGIN FOR ALL FILES
5 Generated by Plugin Builder: http://g-sherman.github.io/Qgis-Plugin-Builder/
6 -----
7 begin : 2023-02-19
8 git sha : $Format:%H
9 copyright : (C) 2023 by Priyanshi Pal
10 email : priyakumari2000@gmail.com
11 -----
12 -----
13 -----
14 -----
15 """
16 """
17 This program is free software; you can redistribute it and/or modify
18 it under the terms of the GNU General Public License as published by
19 the Free Software Foundation; either version 2 of the License, or
20 (at your option) any later version.
21 """
22 -----
23
24 from qgis.PyQt.QtCore import QSettings, QTranslator, QApplication,QVariant
25 from qgis.PyQt.QtGui import QIcon
26 from qgis.PyQt.QtWidgets import QAction,QFileDialog
27 from qgis.core import QgsVectorLayer, QgsProject,QgsFeature
28 from qgis.utils import iface
29 # Initialize QT resources from file resources.py
30 from .resources import *
31 # Import the code for the dialog
32 from .GP_dialog import GPDialog
33 import os.path
34 import geopandas as gpd
35 import processing
36 import features
37 import csv

```

Fig 4: Python File

Name	Date modified	Type	Size
__pycache__	24-02-2023 10:15 AM	File folder	
help	19-02-2023 09:10 PM	File folder	
i18n	30-12-2022 10:40 AM	File folder	
scripts	30-12-2022 10:40 AM	File folder	
test	19-02-2023 09:10 PM	File folder	
_init_.py	19-02-2023 09:10 PM	Python Source File	2 KB
GP	22-02-2023 09:36 PM	Python Source File	24 KB
GP_dialog.py	19-02-2023 09:10 PM	Python Source File	2 KB
GP_dialog_base.ui	25-04-2023 12:58 PM	UI File	4 KB
icon.png	23-04-2023 10:09 PM	PNG File	83 KB
Makefile	19-02-2023 09:10 PM	File	8 KB
metadata.txt	19-02-2023 09:10 PM	Text Document	2 KB
pb_tool.py	19-02-2023 09:10 PM	Configuration Sou...	3 KB
plugin_upload.py	30-12-2022 10:40 AM	Python Source File	4 KB
pylinterc	30-12-2022 10:40 AM	File	9 KB
README.html	19-02-2023 09:10 PM	Microsoft Edge HT...	2 KB
README.md	19-02-2023 09:10 PM	Text Document	1 KB
resources.py	19-02-2023 09:11 PM	Python Source File	6 KB
resources.qrc	19-02-2023 09:10 PM	QRC File	1 KB

Fig 5: Files Generated

3

# DESIGNED PLUGINS

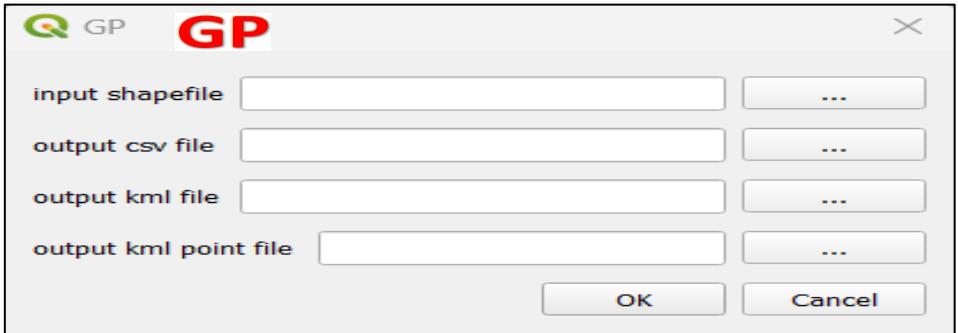


Fig 6: Generating Points

Clipboard		Font	
A	B	C	D
1	Id	ID1	1
2	0	0	2
3	0	0	3
4	0	0	4
5	0	0	5
6	0	0	6
7	0	0	7
8	0	0	8
9	0	0	9
10	0	0	10
11	0	0	11
12	0	0	12
13	0	0	13
14	0	0	14
15	0	0	15
16	0	0	16
17	0	0	17
18	0	0	18
19	0	0	19
20	0	0	20
21	0	0	21
22	0	0	22
23	0	0	23
24	0	0	24
25	0	0	25
26	0	0	26
27	0	0	27

Fig 7: Original Shapefile

A	B	C	D	E	F	G	
1	Id	ID1	Xcentroid	Ycentroid	Latitude	Longitude	unique id
2	0	1	531432.1424	2674951.426	24.18169925	88.2939605	825LLR-E295UO-HO
3	0	2	631662.0368	2674945.891	24.18163004	88.29622287	825LJM-E2986U-HO
4	0	3	631556.0257	2674995.418	24.18208613	88.29518391	825M2M-E2975N-HO
5	0	4	631463.7943	2674995.117	24.18209112	88.29427603	825M2R-E2968K-HO
6	0	5	631748.8096	2674957.953	24.1817317	88.29707809	825MLR-E2992E-HO
7	0	6	631614.1851	2675014.748	24.182225581	88.29575814	825M7V-E2997NM-HO
8	0	7	631664.6623	2675011.395	24.18222131	88.29625469	825M6T-E2987U-HO
9	0	8	631552.1857	2674981.461	24.18196043	88.29514484	825LUO-E2974G-HO
10	0	9	631671.8257	2675051.727	24.1825849	88.29632888	825MY8-E298A8-HO
11	0	10	631424.2571	2675010.079	24.18222953	88.29388823	825M75-E295RZ-HO
12	0	11	631497.0874	2675065.747	24.18272611	88.29461018	825MMN-E29612-HO
13	0	12	631650.7024	2675085.73	24.1828937	88.29612406	825MRT-E2983S-HO
14	0	13	631563.186	2675082.044	24.18286774	88.29526229	825MR3-E29786-HO
15	0	14	631683.3829	2675081.018	24.18284842	88.29644532	825MQG-E298DT-HO
16	0	15	631615.912	2675089.865	24.18293395	88.29578199	825MT5-E297ZD-HO
17	0	16	631306.3952	2675037.417	24.18248622	88.29273058	825MF6-E294MQ-HO
18	0	17	631578.4177	2675058.699	24.18265567	88.29541009	825MKF-E297CQ-HO
19	0	18	631794.7905	2675034.179	24.18241615	88.29753764	825MDO-E299GP-HO
20	0	19	631643.3036	2675118.546	24.18319064	88.29605423	825NSU-E2981M-HO
21	0	20	631940.7904	2675118.11	24.18316178	88.29898242	825NS1-E29AUM-HO
22	0	21	631253.1348	2675116.063	24.18320083	88.29221342	825N68-E2946L-HO
23	0	22	631575.09	2675137.523	24.18336771	88.29538452	825NBF-E297C0-HO
24	0	23	631824.7451	2675145.382	24.18341777	88.29784265	825N1-E299QA-HO
25	0	24	631811.7349	2675142.074	24.18338899	88.29771429	825NC4-E299MA-HO
26	0	25	631743.216	2675138.104	24.18335888	88.29703948	825NB6-E29917-HO
27	0	26	631766.0228	2675150.346	24.18346752	88.29726509	825NEJ-E29989-HO

Fig 8: CSV File

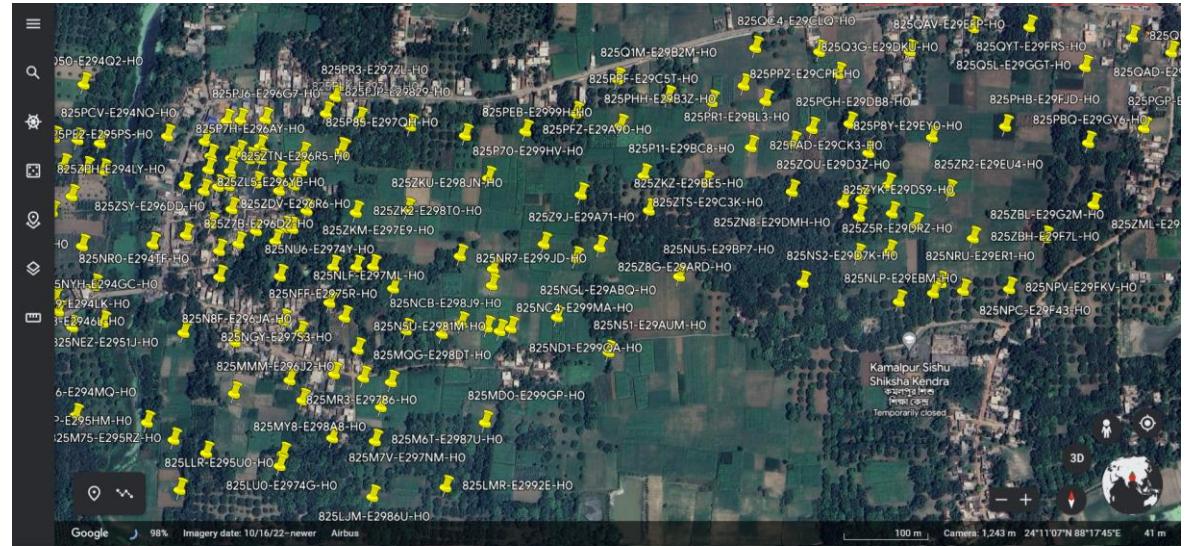


Fig 10: KML Point File

# 3 DESIGNED PLUGINS

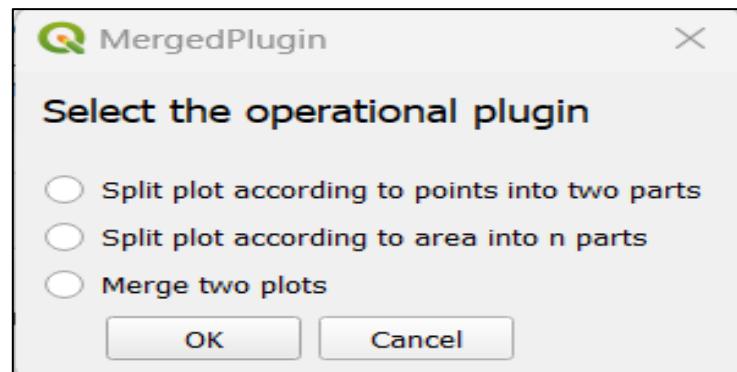
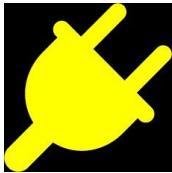


Fig 11: Merge Plugin

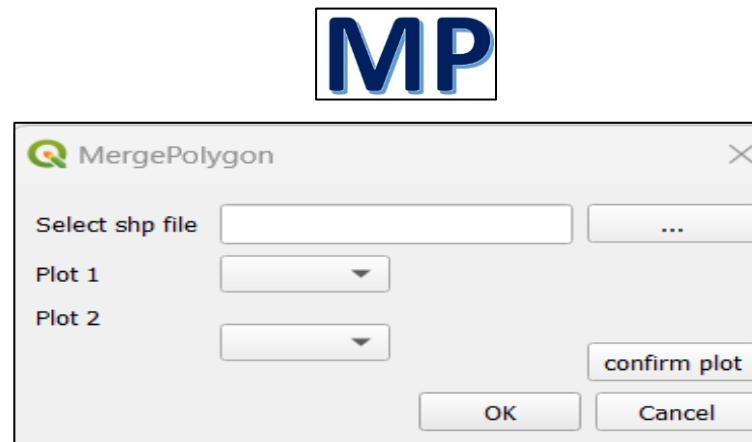
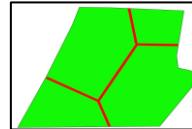


Fig 12: Merge Two Plots

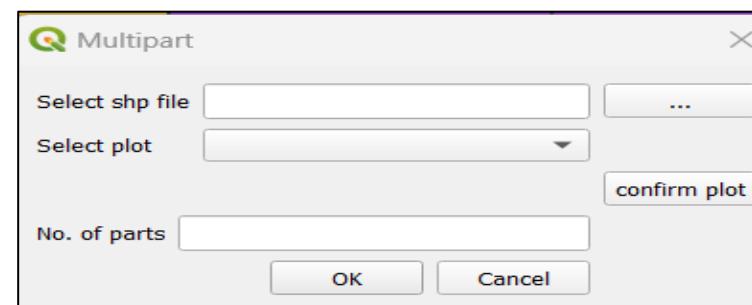


Fig 13: Split Into N Parts

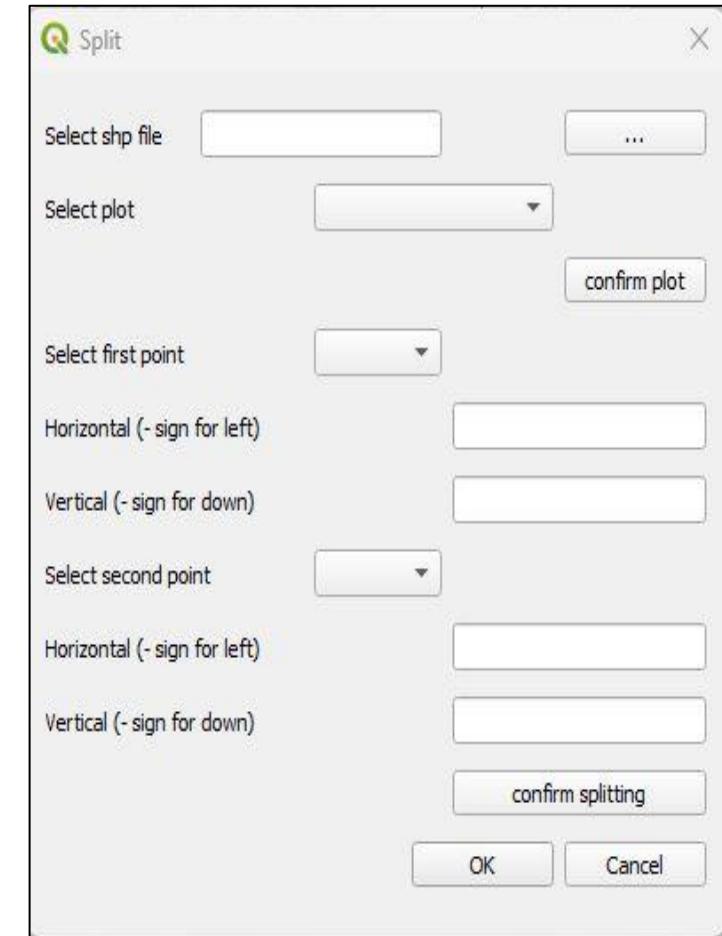
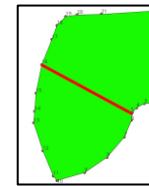


Fig 14: Split Into Two Parts

# 3 DESIGNED PLUGINS

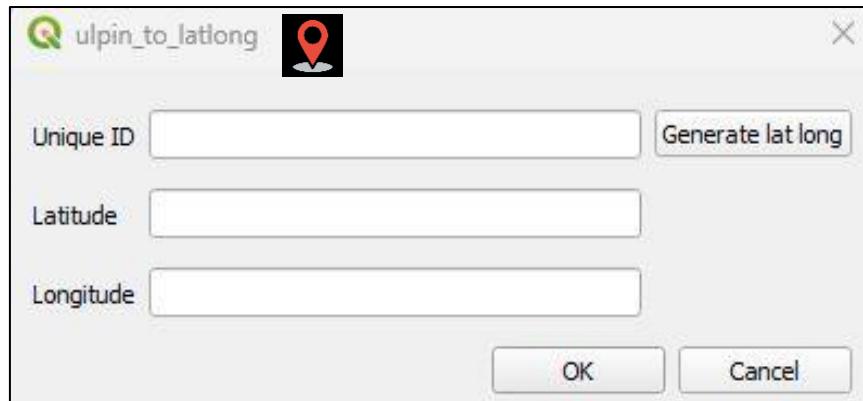


Fig 15 :Unique Id Of Plots To Latitude & Longitude

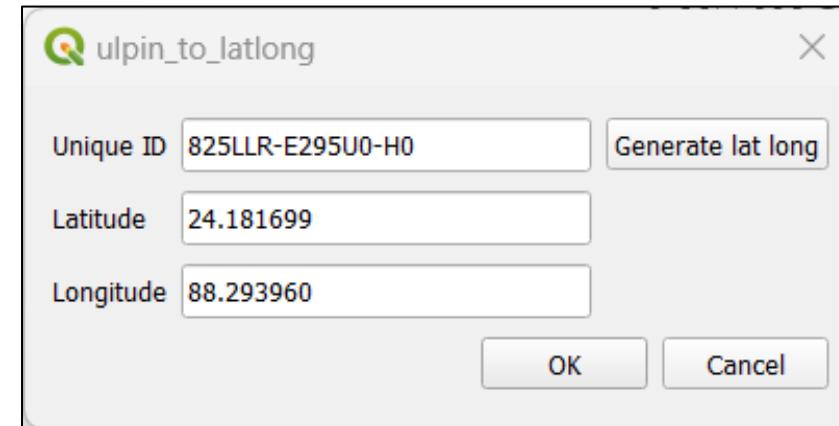


Fig 16 : Generating Output

	A	B	C	D	E	F	G
1	Id	ID1	Xcentroid	Ycentroid	Latitude	Longitude	unique id
2	0	1	631432.1424	2674951.426	24.18169925	88.2939605	825LLR-E295U0-H0

Fig 17: Details of Latitude , Longitude and Unique ID

## 4

## WORKING OF SPLIT

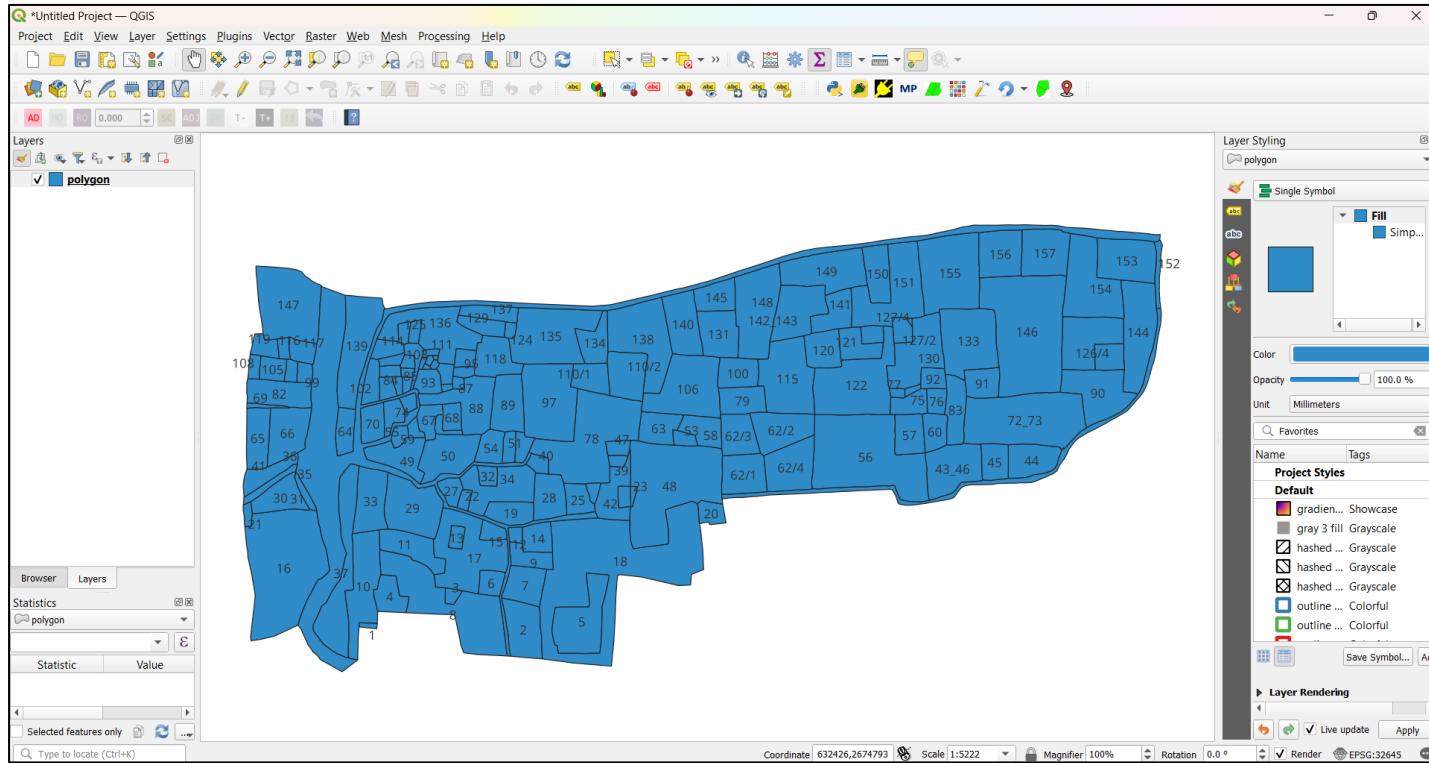


Fig 18: Display

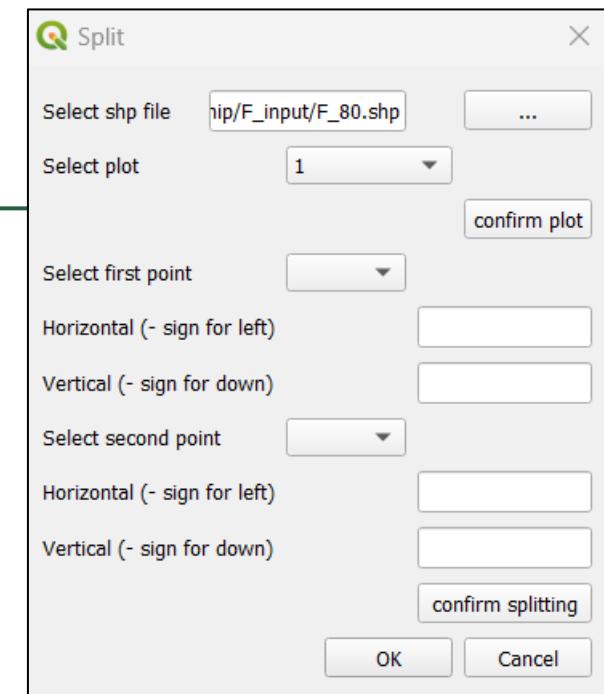


Fig 19: Input

## 4

## WORKING OF SPLIT

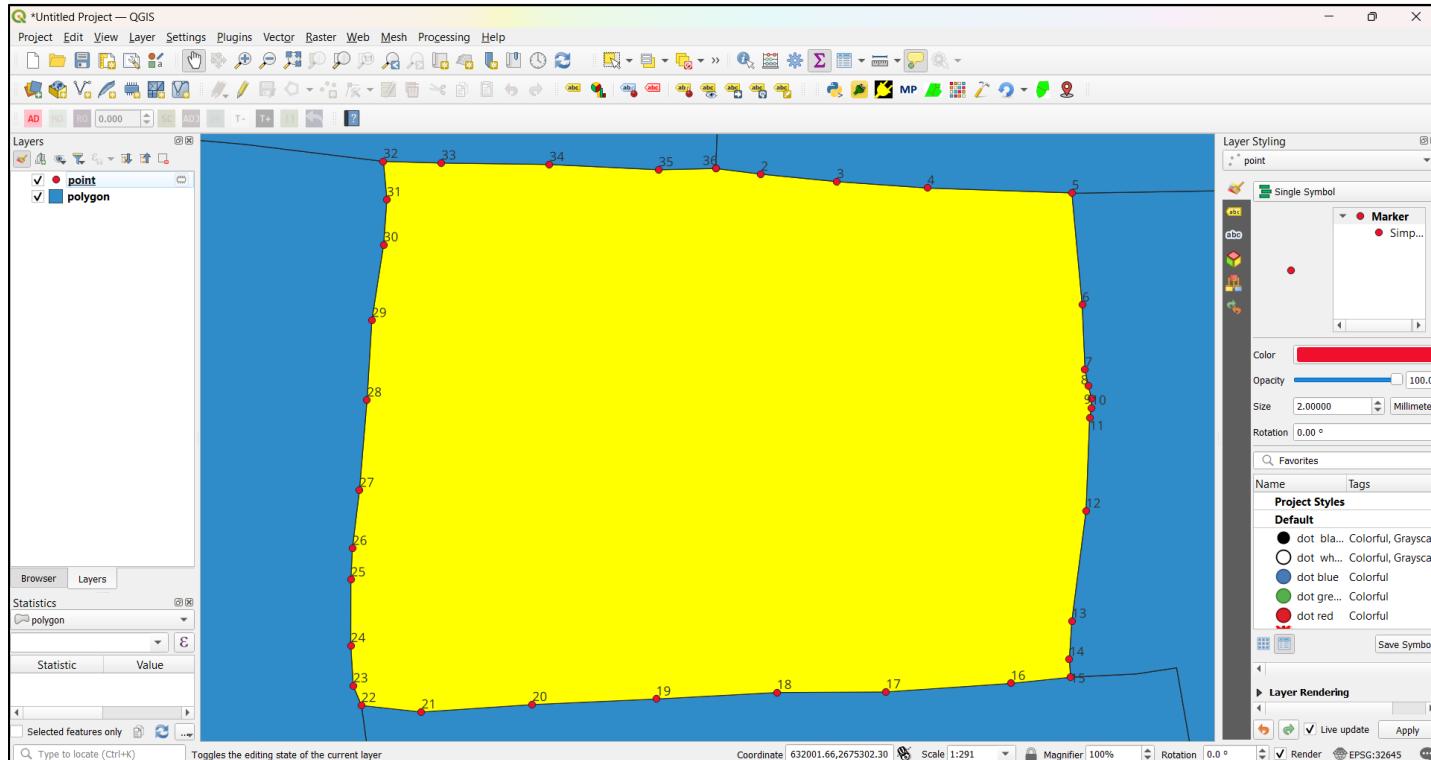


Fig 18: Display

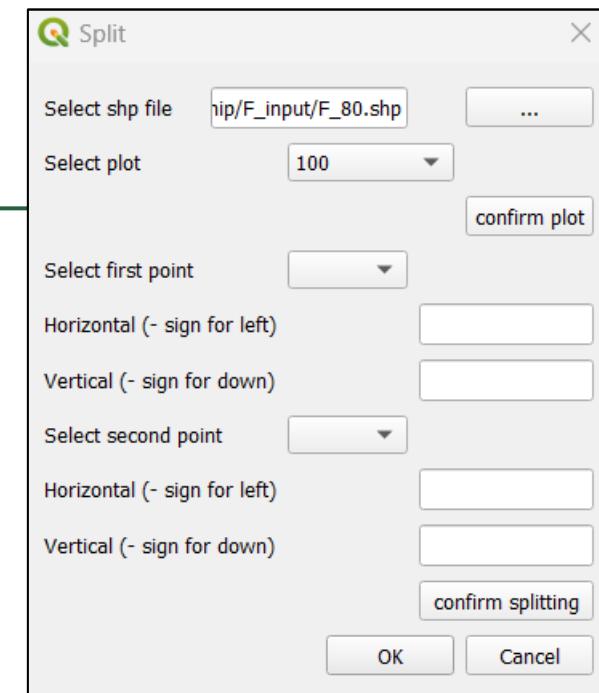


Fig 19: Input

## 4

## WORKING OF SPLIT

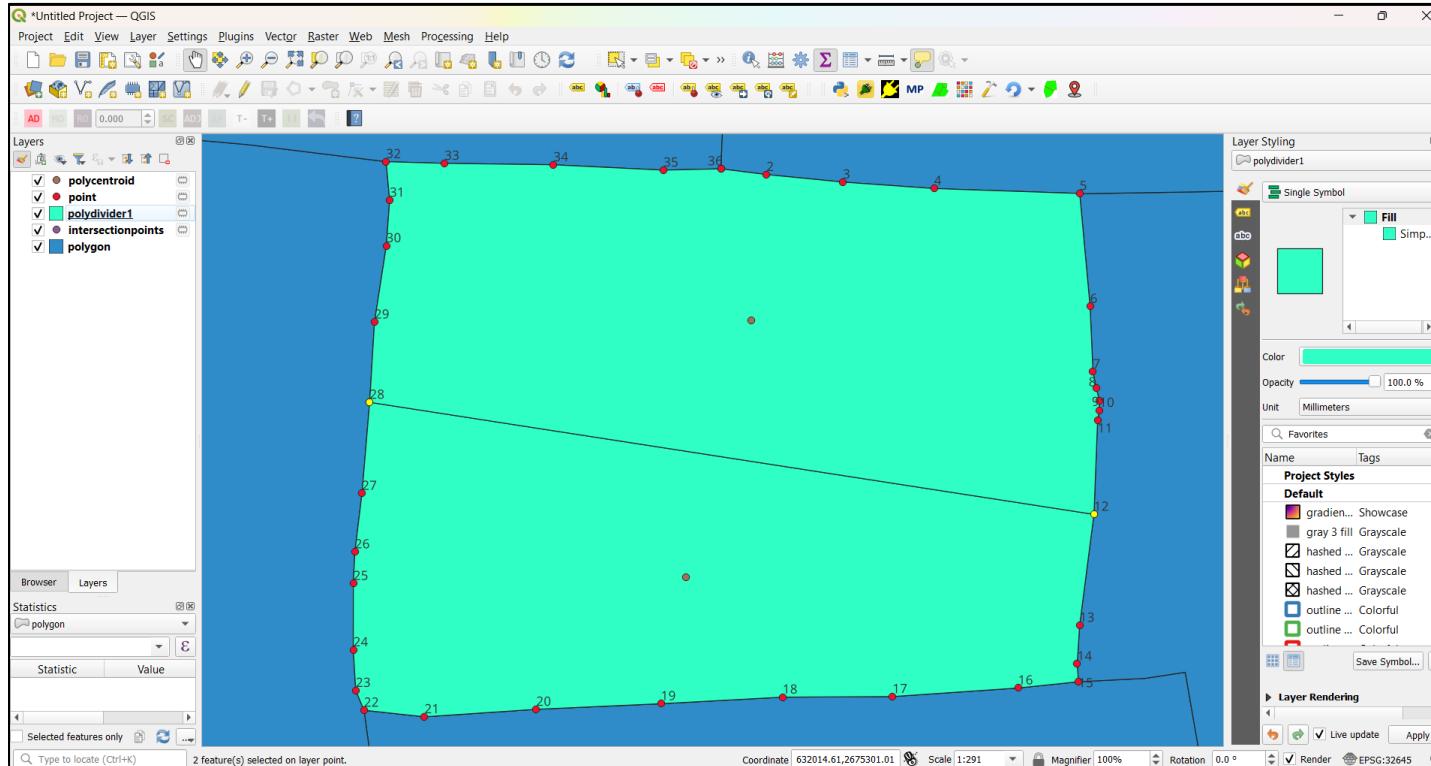


Fig 18: Display

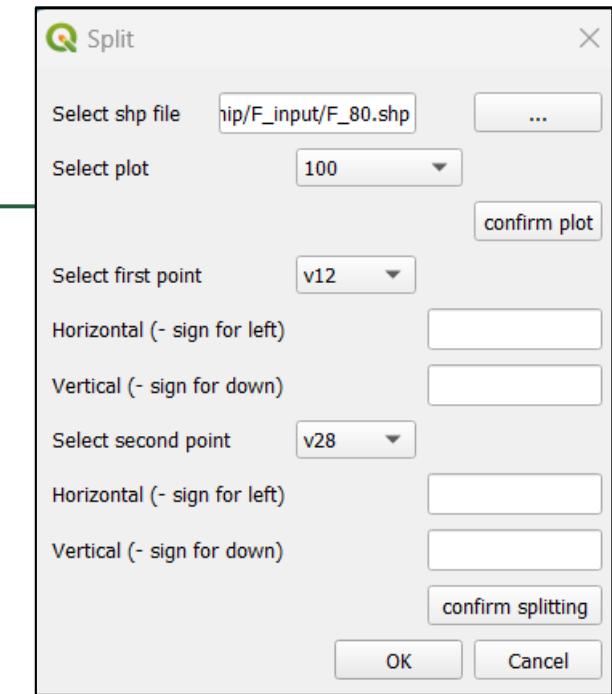


Fig 19: Input

## 4

## WORKING OF SPLIT

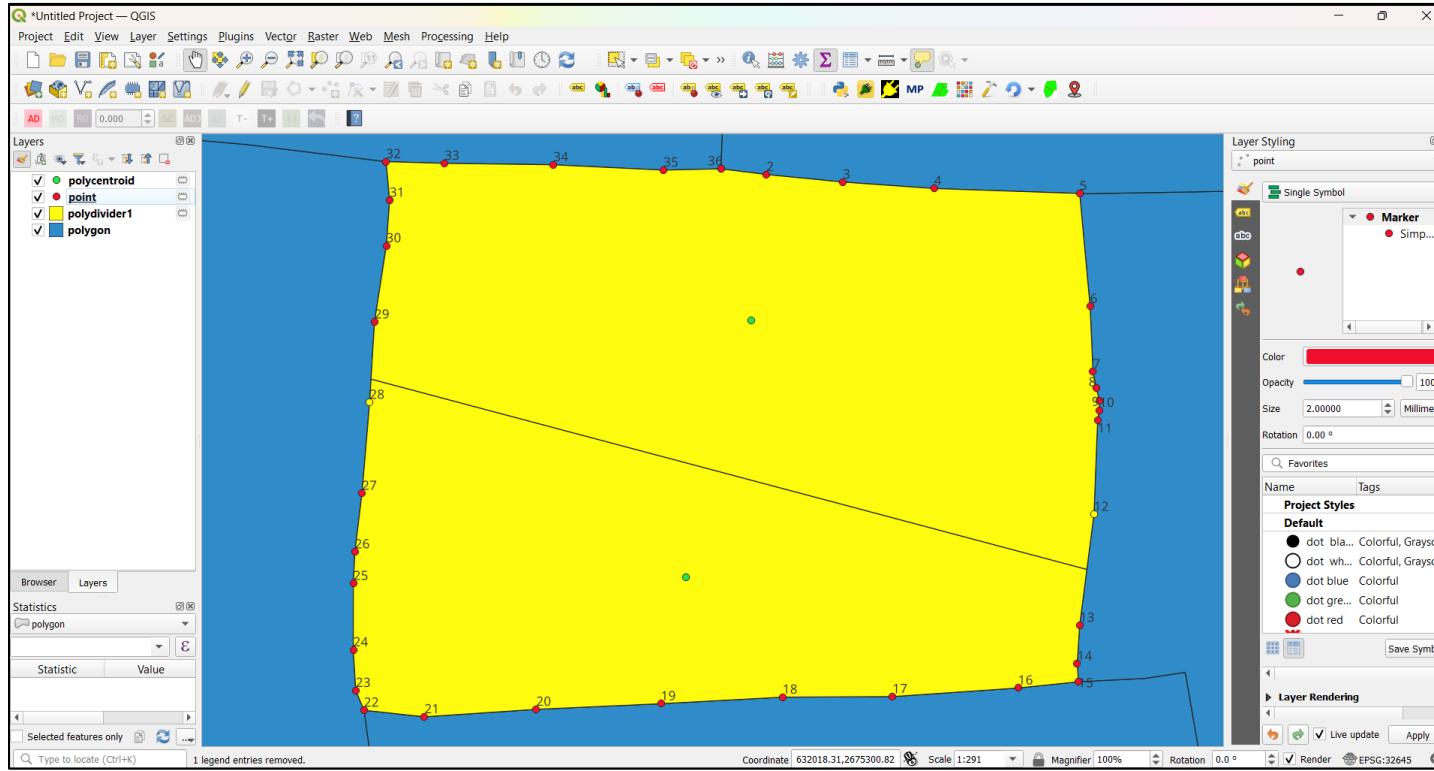


Fig 18: Display

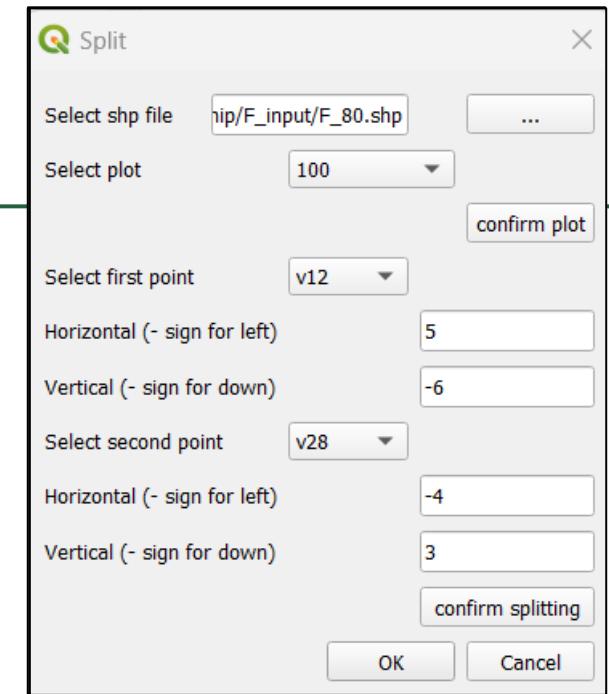


Fig 19: Input

# 4

## WORKING OF SPLIT

### Original Shapefile

polygon — Features Total: 158, Filtered: 158, Selected: 0	
Id	ID1
100	0 100

### Unique Point Generation

polygon — Features Total: 158, Filtered: 158, Selected: 0							
Id	ID1	Xcentroid	Ycentroid	Latitude	Longitude	unique id	Multipolyg
100	0 100	631980.506981...	2675325.80009...	24.1850338371...	88.2993923545...	825P11-E29BC8...	POLYGON ((631980.5378397151 2675348.115119665, 631984.2881336114 2675347.6468966985, 631990.56...

### Splitting Result

166	0 100/1	631977.654834...	2675314.56223...	24.1849326015...	88.2993632519...	825ZT4-E29BBB...	POLYGON ((632011.2055054586 2675319.739217738, 632011.2055054586 2675319.739217738, 632010.028831886...
167	0 100/2	631983.017153...	2675335.69053...	24.1851229345...	88.2994179677...	825P3Q-E29BD...	POLYGON ((631980.5378397151 2675348.115119665, 631984.2881336114 2675347.6468966985, 631990.56342327...

## 5

# WORKING OF MERGE PLUGIN

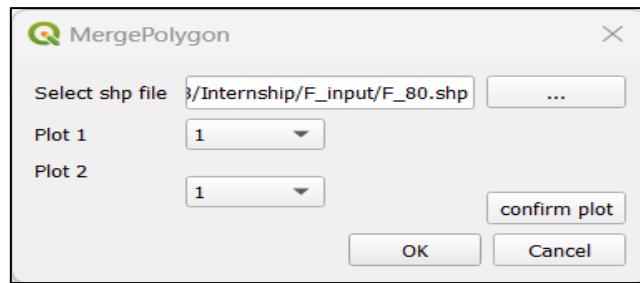


Fig 20: Input

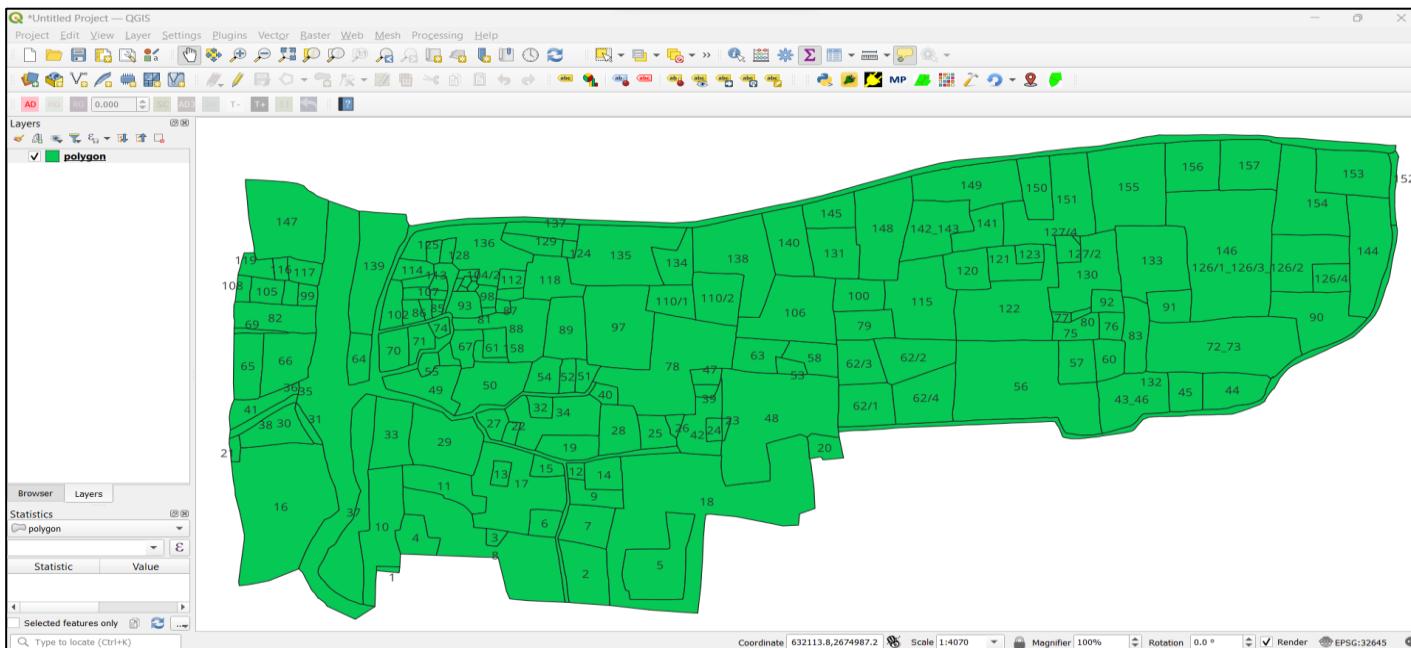


Fig 21: Display

## 5

# WORKING OF MERGE PLUGIN

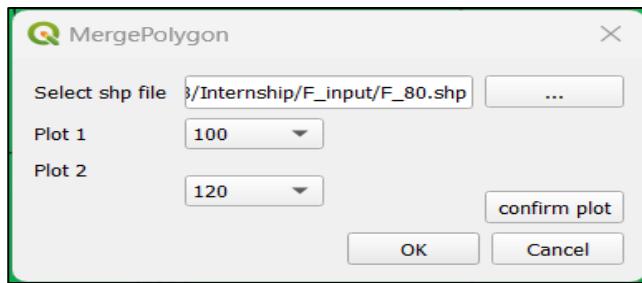


Fig 20: Input

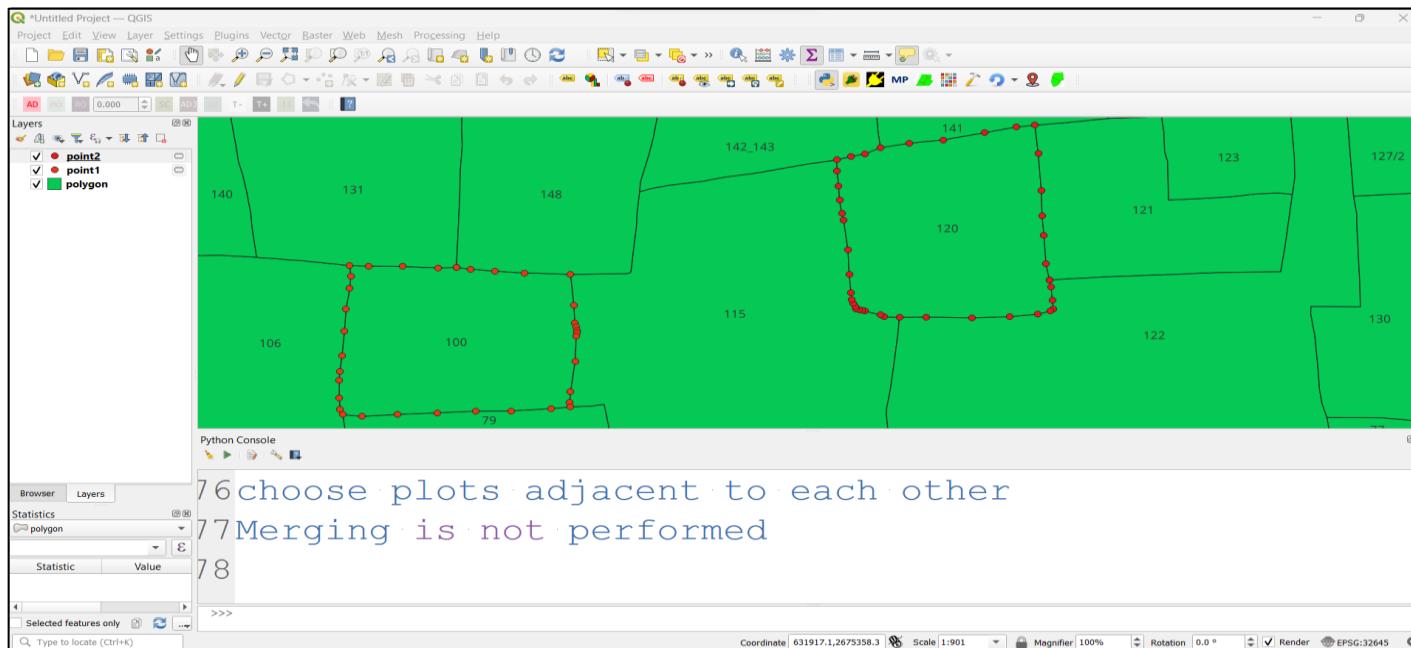


Fig 21: Display

## 5

# WORKING OF MERGE PLUGIN

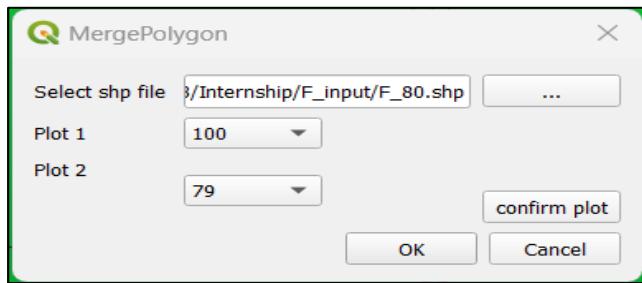


Fig 20: Input

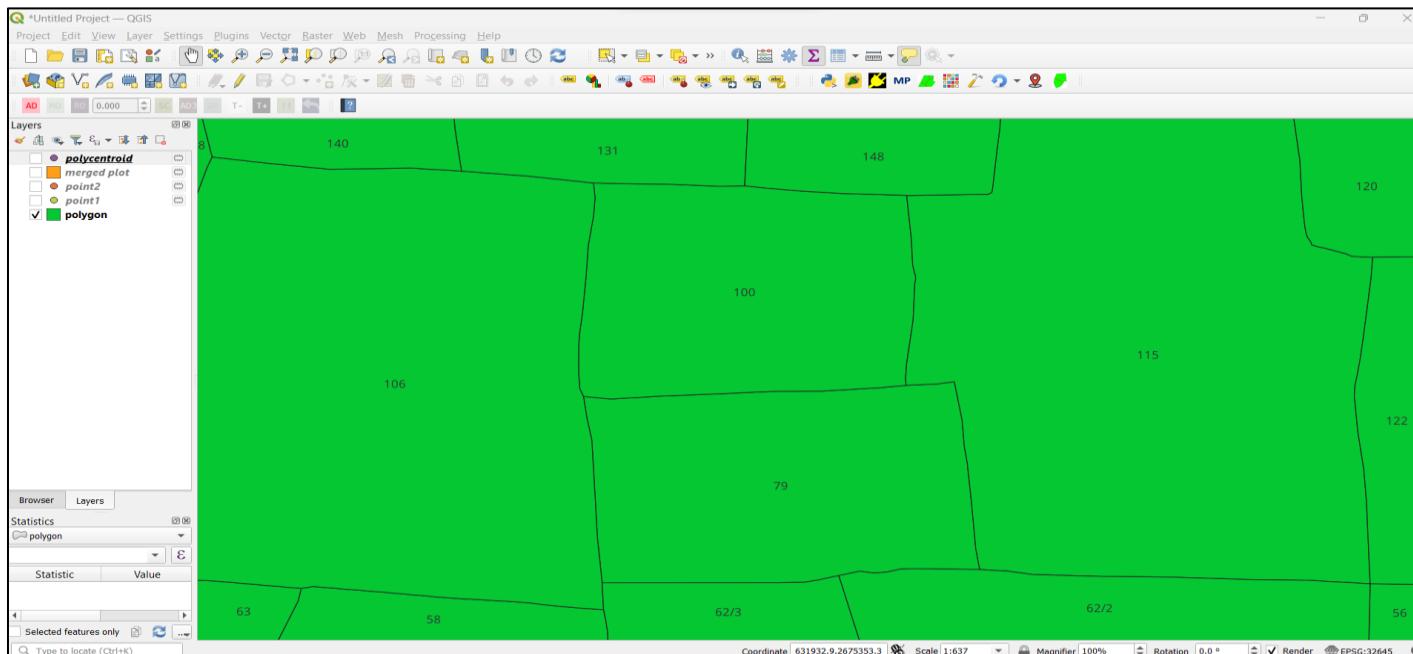


Fig 21: Display

## 5

# WORKING OF MERGE PLUGIN

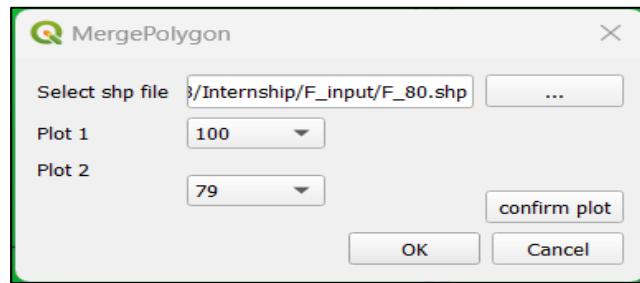


Fig 20: Input

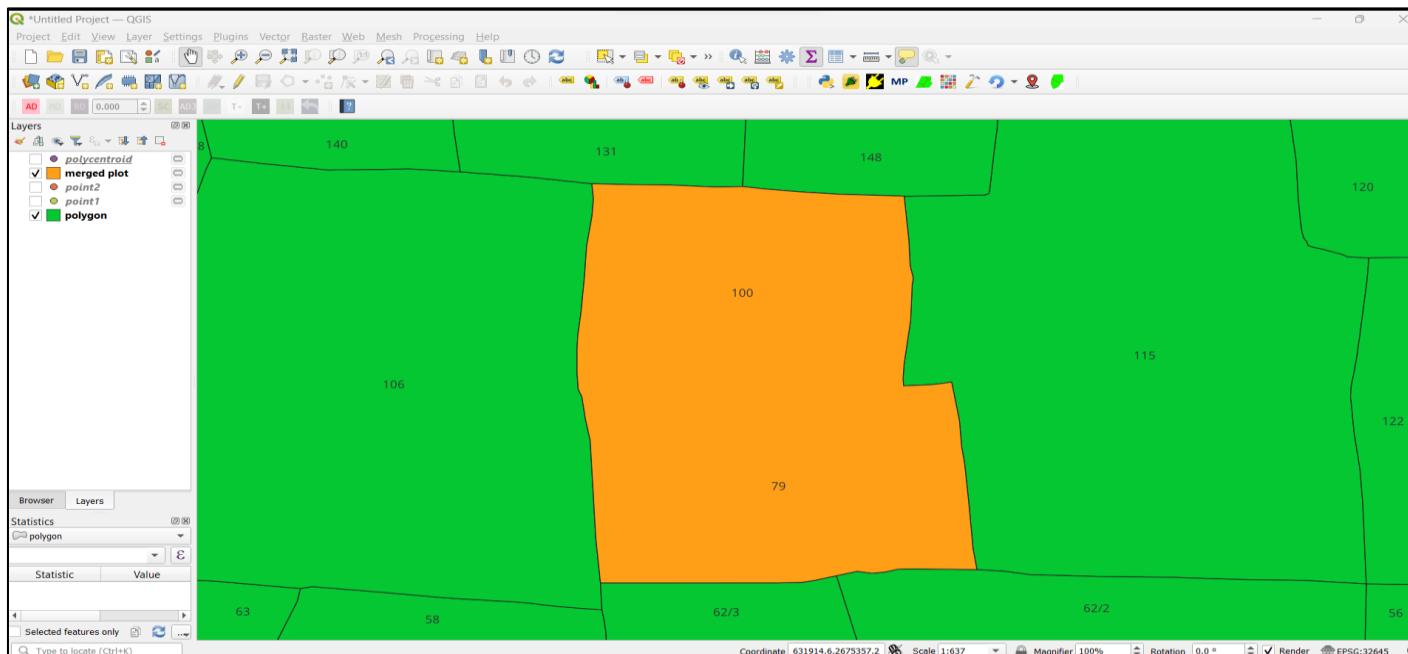


Fig 21: Display

## 5

# WORKING OF MERGE PLUGIN

## Original Shapefile

Id	ID1	Xcentroid	Ycentroid	Latitude	Longitude	unique id	Multipolyg
74	0_79	631987.120882...	2675284.94576...	24.1846643783...	88.2994537203...	825ZKZ-E29BE5...	POLYGON ((632023.3253999033 2675267.121881165, 632011.3589675699 2675267.303483461, 632008.837273566...

Id	ID1	Xcentroid	Ycentroid	Latitude	Longitude	unique id	Multipolyg
100	0_100	631980.506981...	2675325.80009...	24.1850338371...	88.2993923545...	825P11-E29BC8...	POLYGON ((631980.5378397151 2675348.115119665, 631984.2881336114 2675347.6468966985, 631990.56...

## Merging Result

164	0_100_79	631983.893871...	2675304.87914...	24.1848446422...	88.2994237791...	825ZQC-E29BD...	POLYGON ((631984.2881336114 2675347.6468966985, 631990.5634232732 2675347.029156739, 63199...
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# 6

## H/W & S/W REQUIREMENT

### H/W REQUIREMENTS

- At least a 32-bit computer is required.
- At least 4 Gb of RAM
- Windows 7 or above should be installed.
- Intel i4 core 1.3 GHz processor

### S/W REQUIREMENTS



Fig 22: QGIS



Fig 23: Qt Designer



Fig 24: OS Geo4Shell



Fig 25: XAMPP



Fig 26: Postgres SQL Database

# DATA FLOW DIAGRAM

GP (Generating Point)

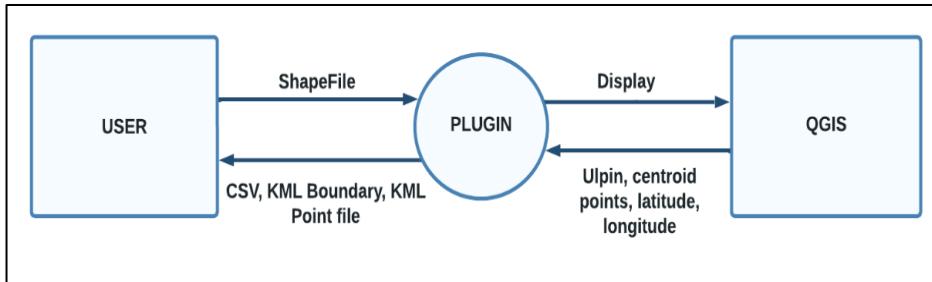


Fig 27: Level-0

Merge Plugin

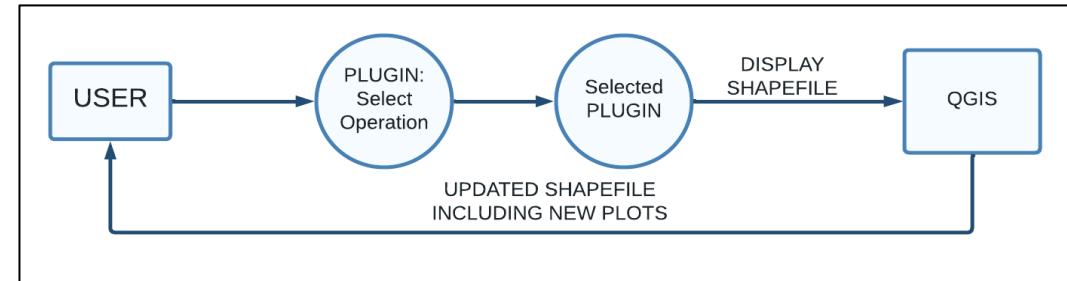


Fig 29: Level-0

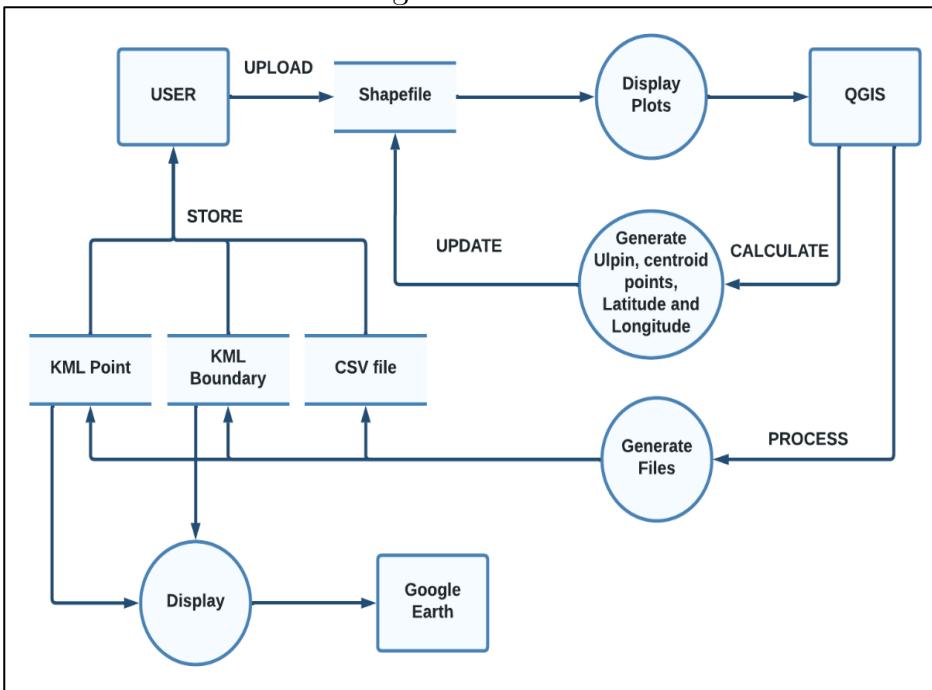


Fig 28: Level-1

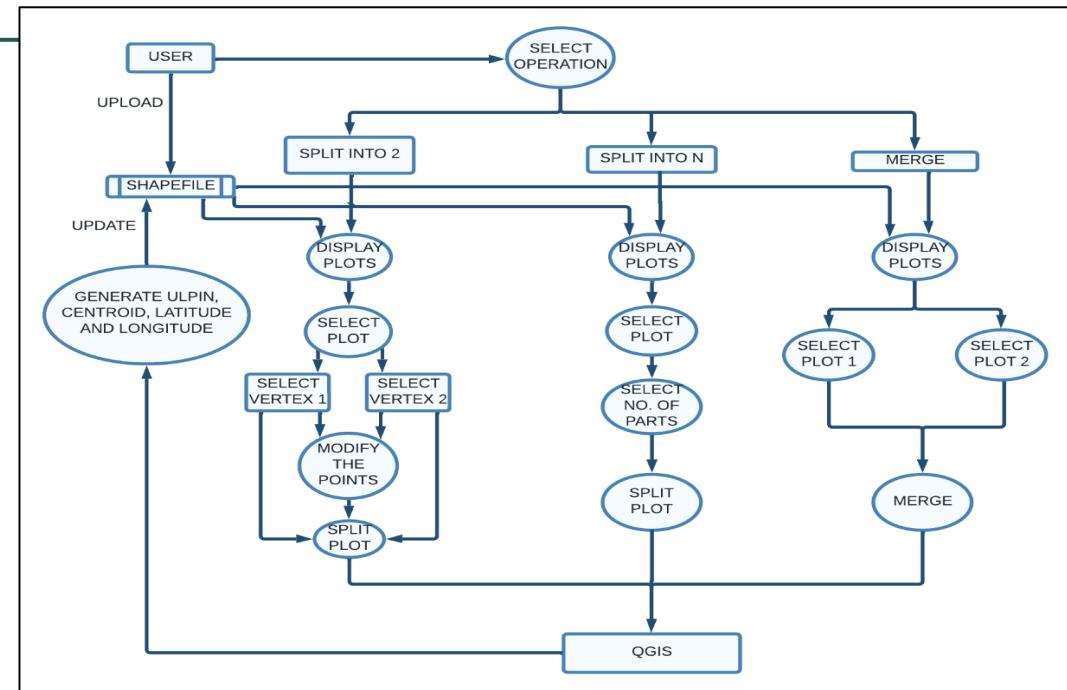


Fig 30: Level-1

# DATA FLOW DIAGRAM

Land Record System

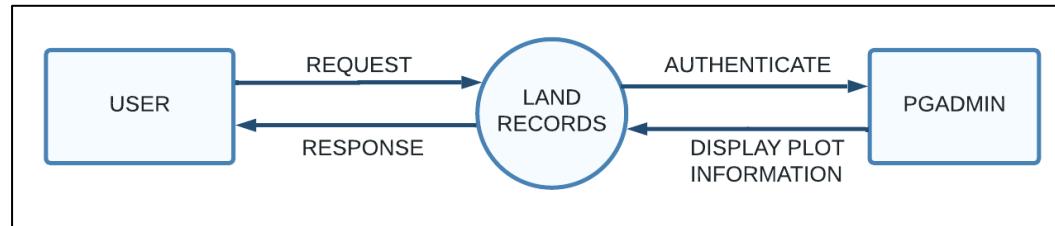


Fig 31: Level-0

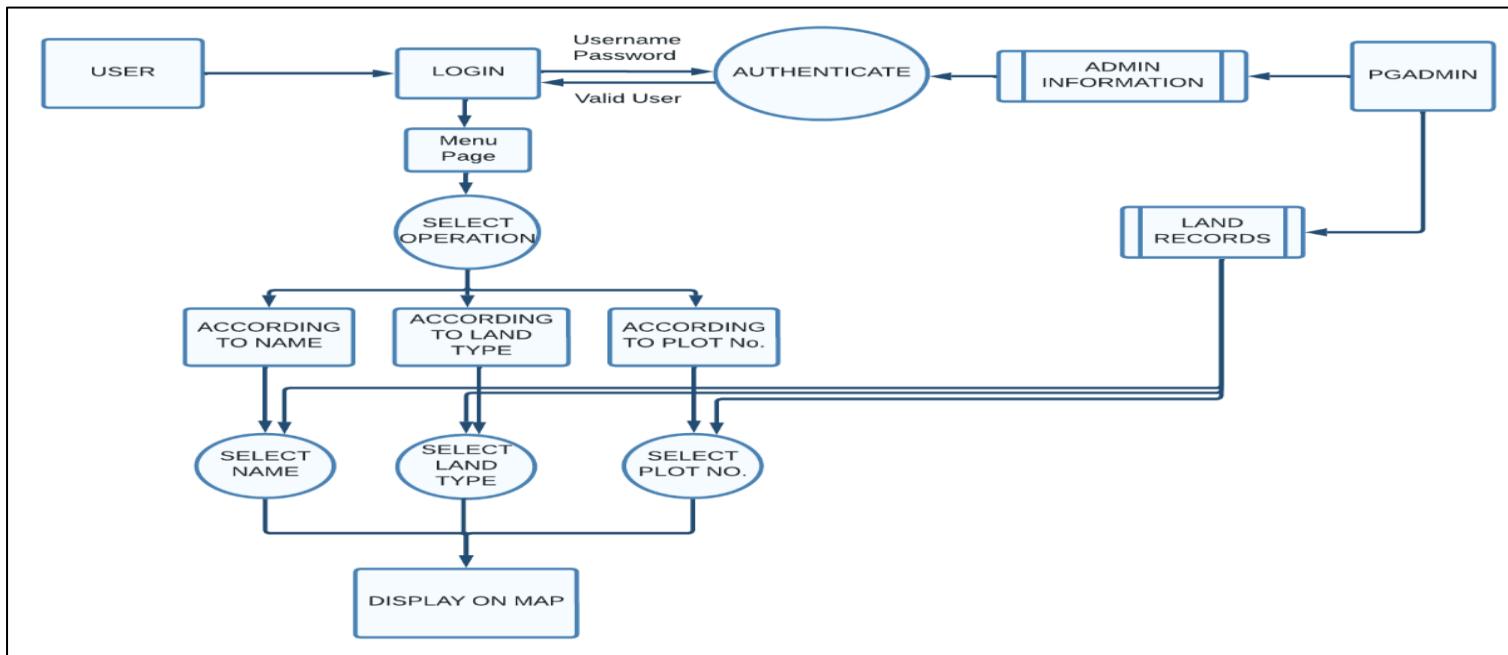


Fig 32: Level-1

## USE CASE DIAGRAM

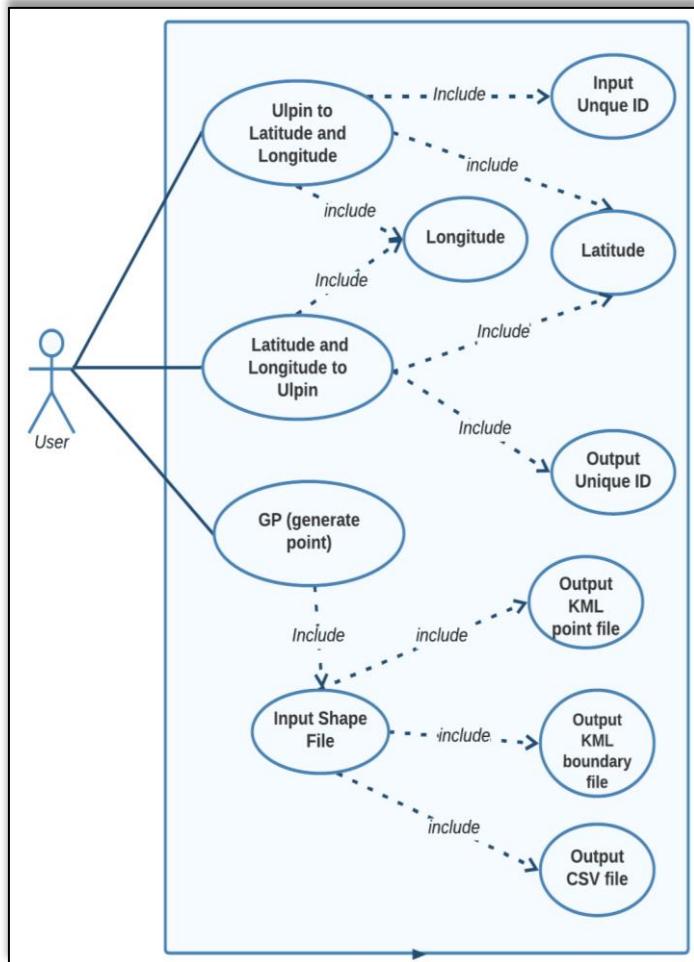


Fig 33: GP (Generating Point)

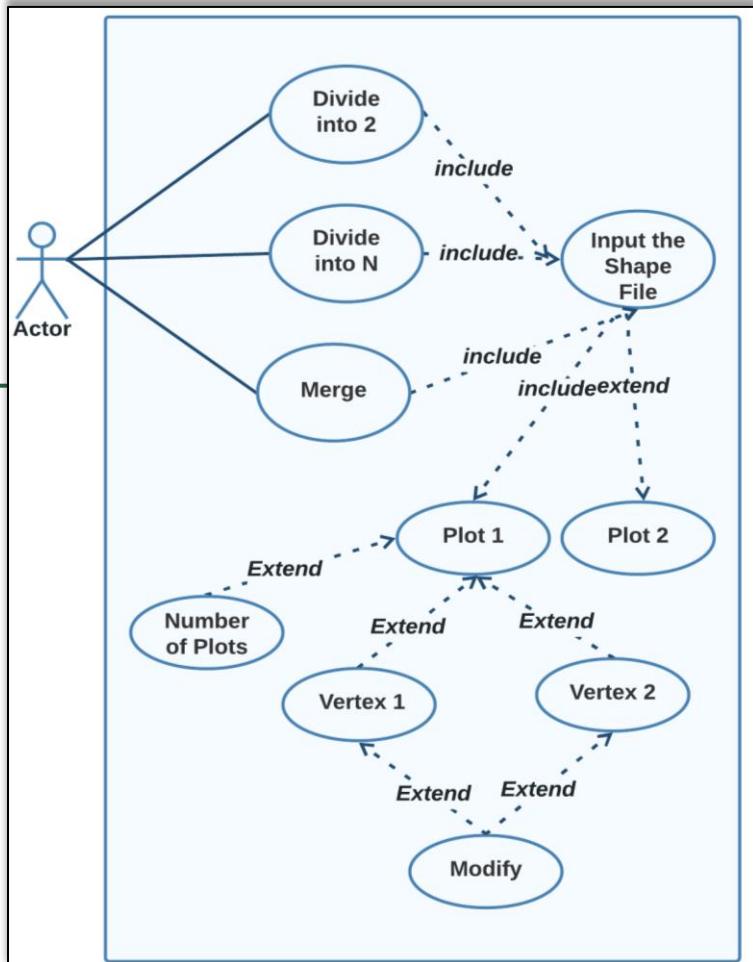


Fig 34: Merge Plugin

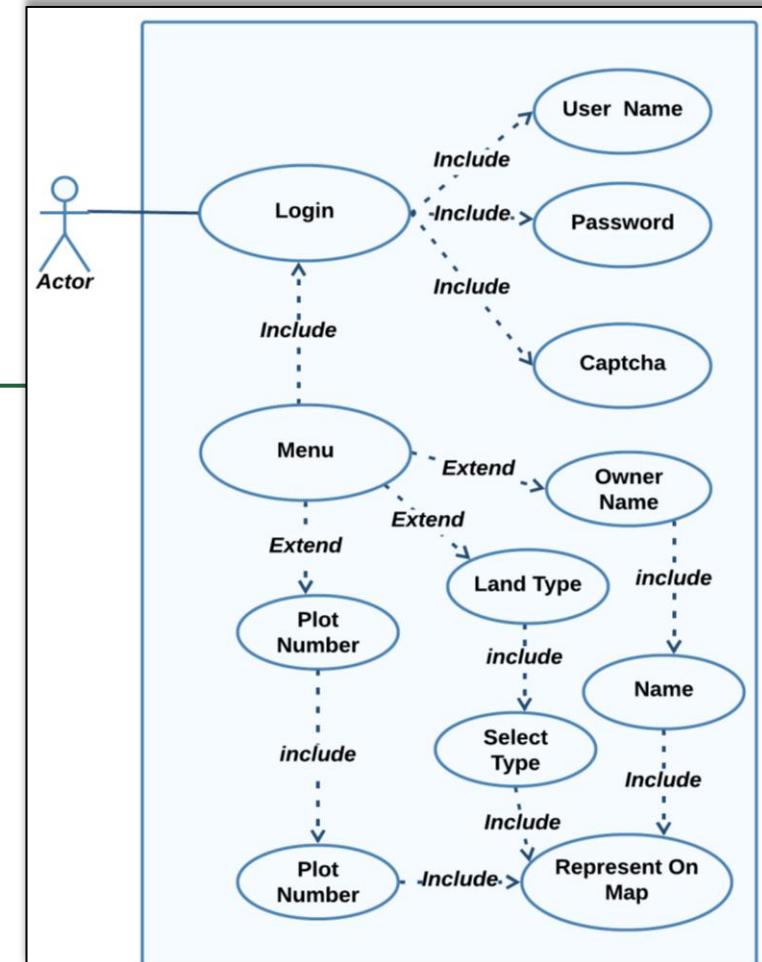


Fig 35: Land Record System

# DATABASE DIAGRAM

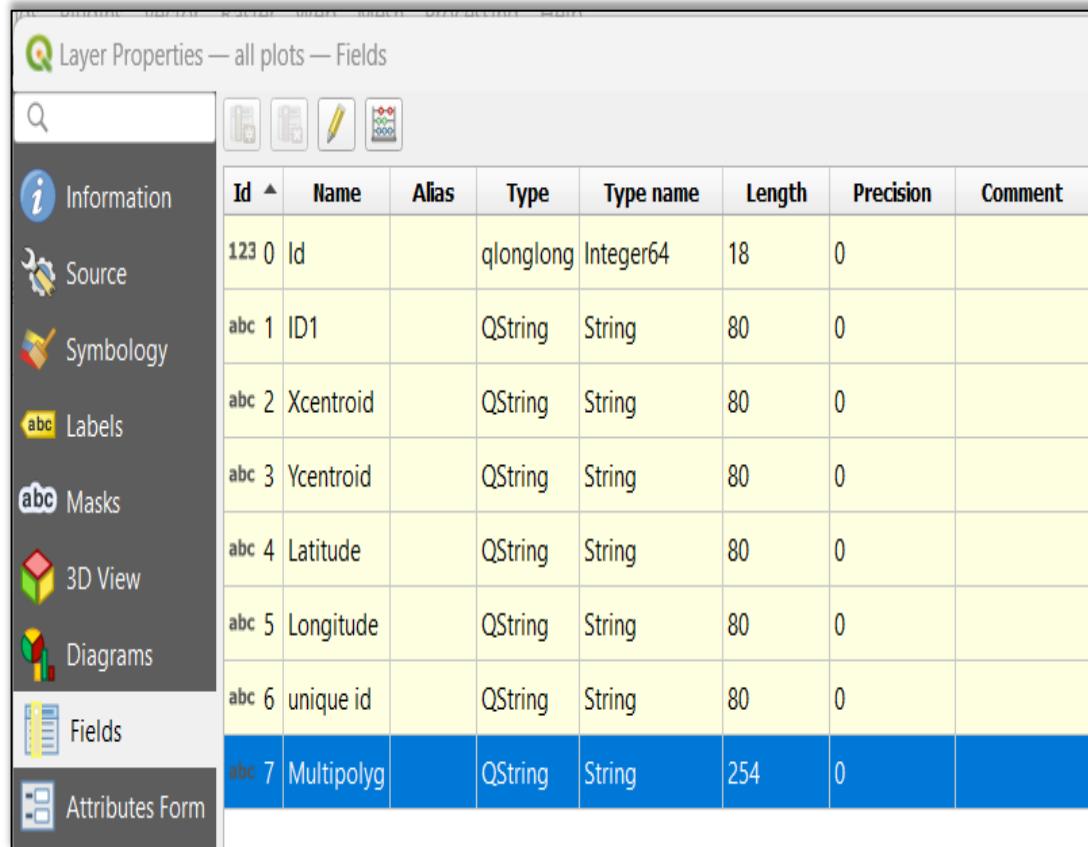


Fig 36: Shape File Database

	<b>Id</b>	<b>ID1</b>	<b>Xcentroid</b>	<b>Ycentroid</b>	<b>Latitude</b>	<b>Longitude</b>	<b>unique id</b>	<b>Multipolyg</b>
1	0	1	631432.1423503223	2674951.4263499007	24.181699251118875	88.29396050008059	825LLR-E295U0-H0	POLYGON ((631445.2588752121 2674954.710717373, 631445.2389467361 2674952.5513, 631444.4245091974 2674946.484508361, 631...
2		0	631662.0367968058	2674945.890694973	24.181630041294298	88.29622287286836	825LJM-E298U0-H0	POLYGON ((631685.9232106835 2674978.5359557117, 631686.7009154165 2674972.056487325, 631686.9285176201 2674955.554066592, 631...
3		0	631556.0257169572	2674995.417674136	24.182086126829592	88.29518390912071	825M2M-E2975N-H0	POLYGON ((631571.2145961599 2675002.8690603557, 631569.5011711541 2674998.8311192733, 631565.7580762729 2674993.156635366, 63...
4		0	631463.7942525354	2674995.116947423	24.18209112191296	88.29472630370907	825M2R-E296K8-H0	POLYGON ((631487.7078373055 2674970.254417524, 631445.9894394325 2674972.1851908774, 631444.1231422413 2674979.41507385, 631...
5		0	631748.8095615463	2674957.9532396877	24.181731698190706	88.29707808759777	825LMR-E2992E-H0	POLYGON ((631778.752554466 2674979.214379633, 631778.9028373992 2674968.310584931, 631778.6503446525 2674958.09317386, 63177...
6		0	631614.1850965546	2675014.7480436894	24.18225581362064	88.29575814337515	825MV-E297NM-H0	POLYGON ((631635.8076409191 2675029.71196009, 631634.9394480139 2675025.961031246, 631632.246407623 2675015.9802058423, 63163...
7		0	631664.6622637566	2675011.394592518	24.18222130545118	88.29625469202061	825M6T-E298T-U-H0	POLYGON ((631696.8518518034 2675034.6853834307, 631693.723743452 2675010.049689867, 631692.1658791675 2675010.7896792204, 63...
8		0	631552.187229599	2674981.4613785134	24.1819604263030916	88.29514483924241	825LUU-E2974G-H0	POLYGON ((631529.419321172 2675026.544228967, 631530.101954338 2675023.225592852, 631530.8110937857 2675017.998402732, 631531...
9		0	631671.8256678773	2675051.7269176426	24.182584896962166	88.296328882609	825MY8-E298A8-H0	POLYGON ((631661.017301759 2675073.007901382, 631661.7791985063 2675060.535897331, 631676.1407097562 2675060.315675496, 6316...
10		0	631424.2571024355	2675010.078950785	24.182229528938468	88.2938882617373	825M7S-E295R2-H0	POLYGON ((631449.068999566 2675064.0854709793, 631448.767182731 267505.8139216923, 631449.142110814 267504.011231841, 631...
11		0	631497.087448392	2675065.747249304	24.182726113646495	88.29461017970995	825MM-M-E2962-H0	POLYGON ((631528.478995196 2675079.342287532, 631528.7295647744 2675071.4266870786, 631529.490681167 267507.293312819, 6315...
12		0	631650.702385029	2675085.729853956	24.18289370271442	88.2961240644651	825MRT-E29835-H0	POLYGON ((631660.3942731849 2675096.777604102, 631661.017301759 2675073.007901382, 631650.6699004435 2675074.5258414885, 631...
13		0	631563.186048283	2675082.044128933	24.182867743584502	88.2952622870217	825MR3-E2978E-H0	POLYGON ((631572.0175766309 2675072.923707047, 631571.4201685174 2675064.93047458, 631570.85994821 2675064.5060803886, 63156...
14		0	631683.3828979656	2675081.018487517	24.182848424766828	88.29644531548504	825MQG-E298DT-H0	POLYGON ((631702.2711314809 2675105.246882316, 631703.2807853644 2675096.2144138734, 631703.058917312 2675087.27502564, 63...
15		0	631615.9119620073	2675089.8646077937	24.1829394984019	88.2957819922961	825MT5-E297ZD-H0	POLYGON ((631637.5969125725 2675079.555351529, 631633.2894288054 2675078.8968409086, 631624.9502548074 2675078.075905119, 631...
16		0	631306.3951852913	2675037.4166060723	24.182486223941005	88.29273057932934	825MF6-E294MQ-H0	POLYGON ((631345.351509282 2675123.1457470916, 631355.5002366086 2675121.4866682143, 631356.031911525 2675116.8213197617, 63...
17		0	631578.4176938975	2675058.69878463	24.182655666801658	88.29541008657758	825MKF-E297CQ-H0	POLYGON ((631602.098034017 2675108.4938950124, 631601.1008711463 2675103.823401017, 631600.1292362235 2675079.315187244, 631...
18		0	631794.7904757451	2675034.178964875	24.182416145557188	88.2975376443956	825MD0-E299GP-H0	POLYGON ((631920.2088530476 2675131.793309745, 631921.717930096 2675124.8025361937, 631922.3418175562 2675114.04289426, 631...
19		0	631643.30361114067	2675118.5457659685	24.18319061422588	88.29605423054637	825N5U-E2981M-H0	POLYGON ((631677.4737426022 2675133.681879766, 631677.7443920161 2675121.8156260233, 631676.8878852755 2675106.3083656295, 63...
20		0	631940.7903673395	2675118.110250574	24.183161784264882	88.2988241868435	825N51-E294AU-H0	POLYGON ((631957.7547512845 2675131.758055714, 631962.907355527 2675103.33134544, 631940.138044154 2675100.8356293403, 63193...
21		0	631253.1348106582	2675116.0630149352	24.183200827370456	88.29221348086982	825N6B-E2946L-H0	POLYGON ((631259.7502693072 2675117.41076616, 631259.1828194974 2675113.361921176, 631258.3771701729 2675104.021302179, 631...
22		0	631575.0900454817	2675137.523316641	24.18336771128004	88.29538451917524	825NBF-E297C0-H0	POLYGON ((631579.5010364414 2675120.664090599, 631566.3847135797 2675124.872739046, 631563.5858683246 2675126.0342027736, 631...
23		0	631824.7450577143	2675145.381632178	24.183417767257318	88.29784265091118	825ND1-E299QA-H0	POLYGON ((631821.3045244428 2675127.061752332, 631821.2629680895 2675135.651228982, 631820.7382609124 2675145.848814384, 631...
24		0	631811.7348667613	2675142.074367175	24.183388993772116	88.29771428638938	825NC4-E299MA-H0	POLYGON ((631820.8089564737 2675157.430063135, 631820.823197632 2675105.8343877215, 631820.7382609124 2675145.848814384, 631...

Fig 37: Attribute Table

# DATABASE DIAGRAM

**sibitrans1**

General Columns Advanced Constraints Parameters Security SQL

Inherited from table(s) Select to inherit from...

**Columns**

Name	Data type	Length/Precision	Scale	Not NULL?	Primary key?	Default
gid	integer			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	nextval('sibitrans1')
objectid	double precision			<input type="checkbox"/>	<input type="checkbox"/>	
id	double precision			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
lu_lc_code	numeric			<input type="checkbox"/>	<input type="checkbox"/>	
area_sqm	numeric			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
land_type	character varying	50		<input type="checkbox"/>	<input checked="" type="checkbox"/>	.
new_sl_no	character varying	50		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
area_ac	numeric			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
owner_name	character varying	254		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
remarks	character varying	254		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
ulpin	character varying	14		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
geom	geometry			<input type="checkbox"/>	<input checked="" type="checkbox"/>	

**Buttons:** Close, Reset, Save

Fig 38: Original Data Table -Sibitrans1

**OName**

General Columns Advanced Constraints Parameters Security SQL

Inherited from table(s) Select to inherit from...

**Columns**

Name	Data type	Length/Precision	Scale	Not NULL?	Primary key?	Default
owner_name	character varying	254		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Fig 39: Intermediate Table OName

**Plot**

General Columns Advanced Constraints Parameters Security SQL

Inherited from table(s) Select to inherit from...

**Columns**

Name	Data type	Length/Precision	Scale	Not NULL?	Primary key?	Default
new_sl_no	character varying	50		<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Fig 40: Intermediate Table Plot

**LType**

General Columns Advanced Constraints Parameters Security SQL

Inherited from table(s) Select to inherit from...

**Columns**

Name	Data type	Length/Precision	Scale	Not NULL?	Primary key?	Default
land_type	character varying	50		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Fig 41: Intermediate Table LType

# 10

## LAND RECORD SYSTEM



Fig 42: Login Page

# 10 LAND RECORD SYSTEM

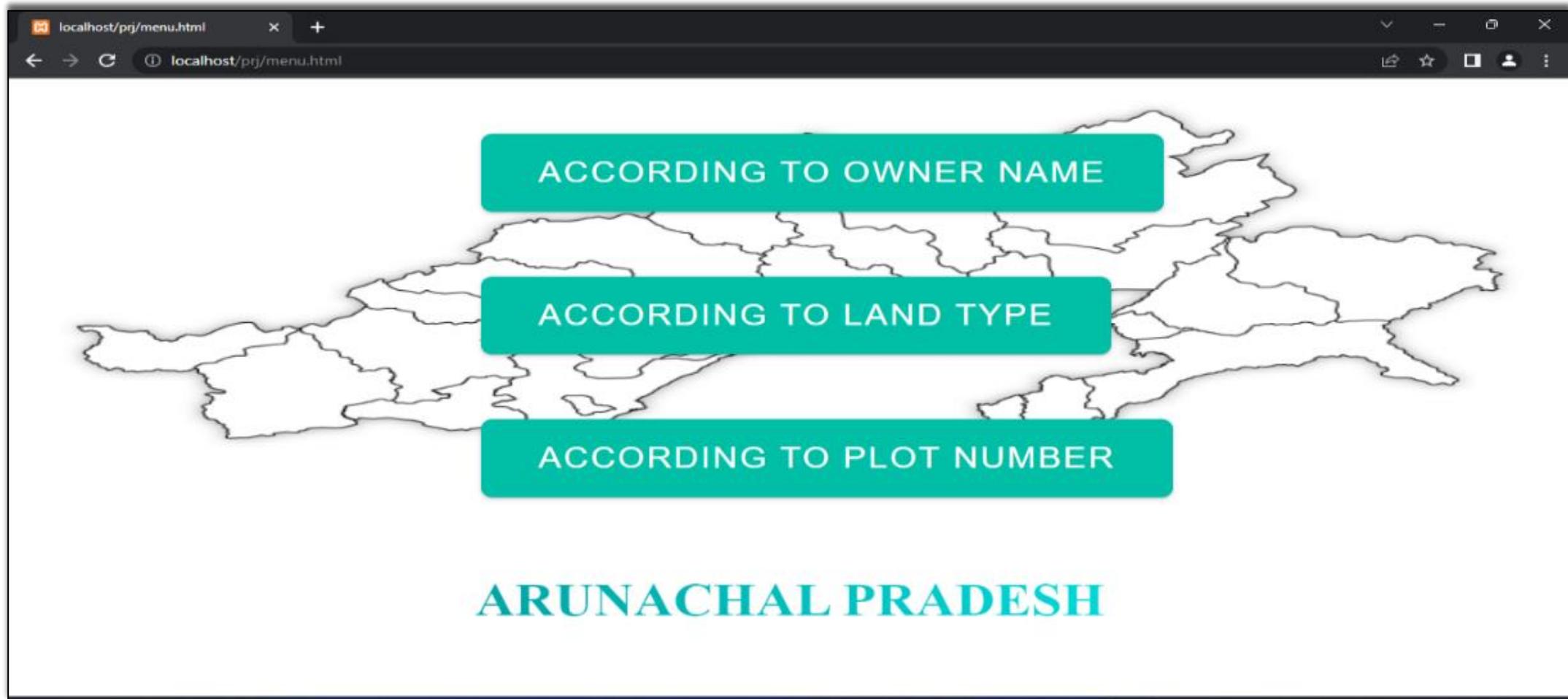


Fig 43: Menu Page

# 10 LAND RECORD SYSTEM

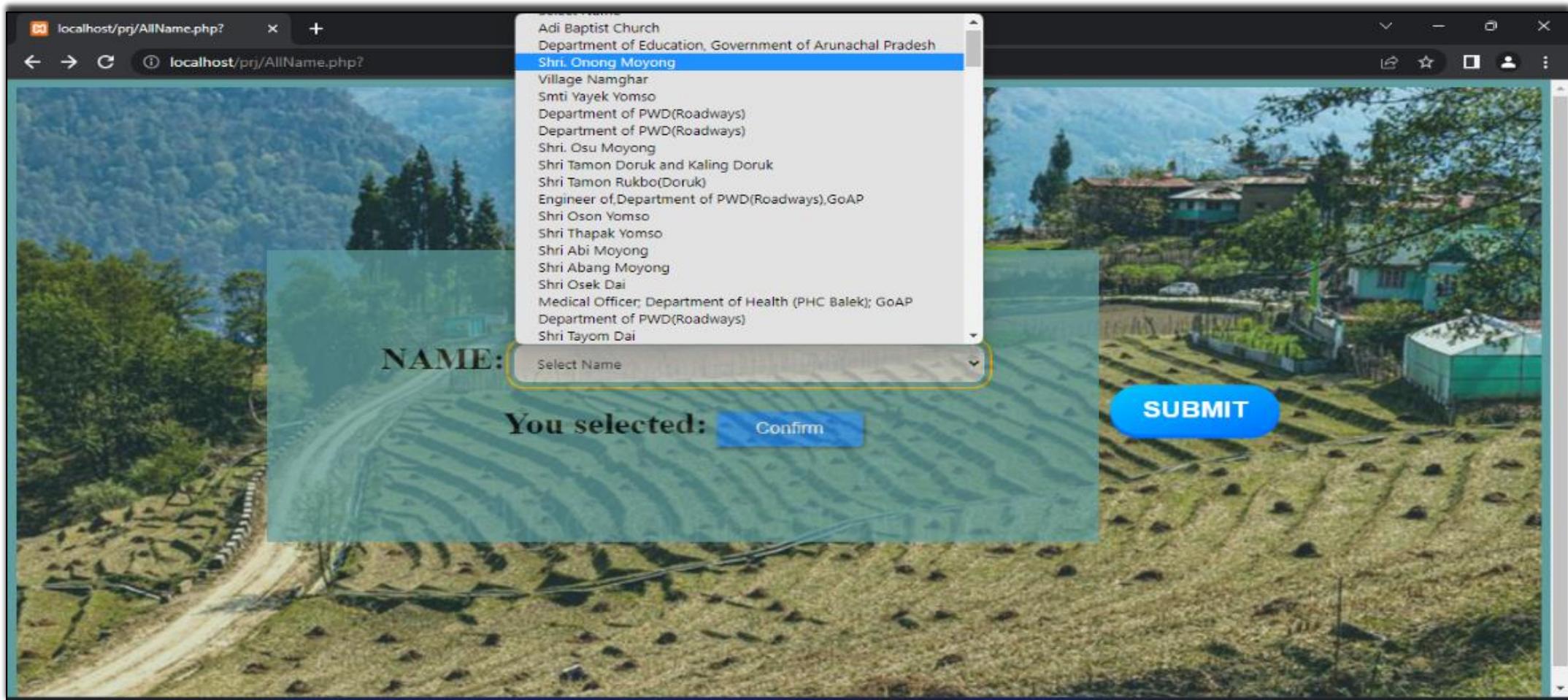


Fig 44: Entity Selection Page

# 10 LAND RECORD SYSTEM

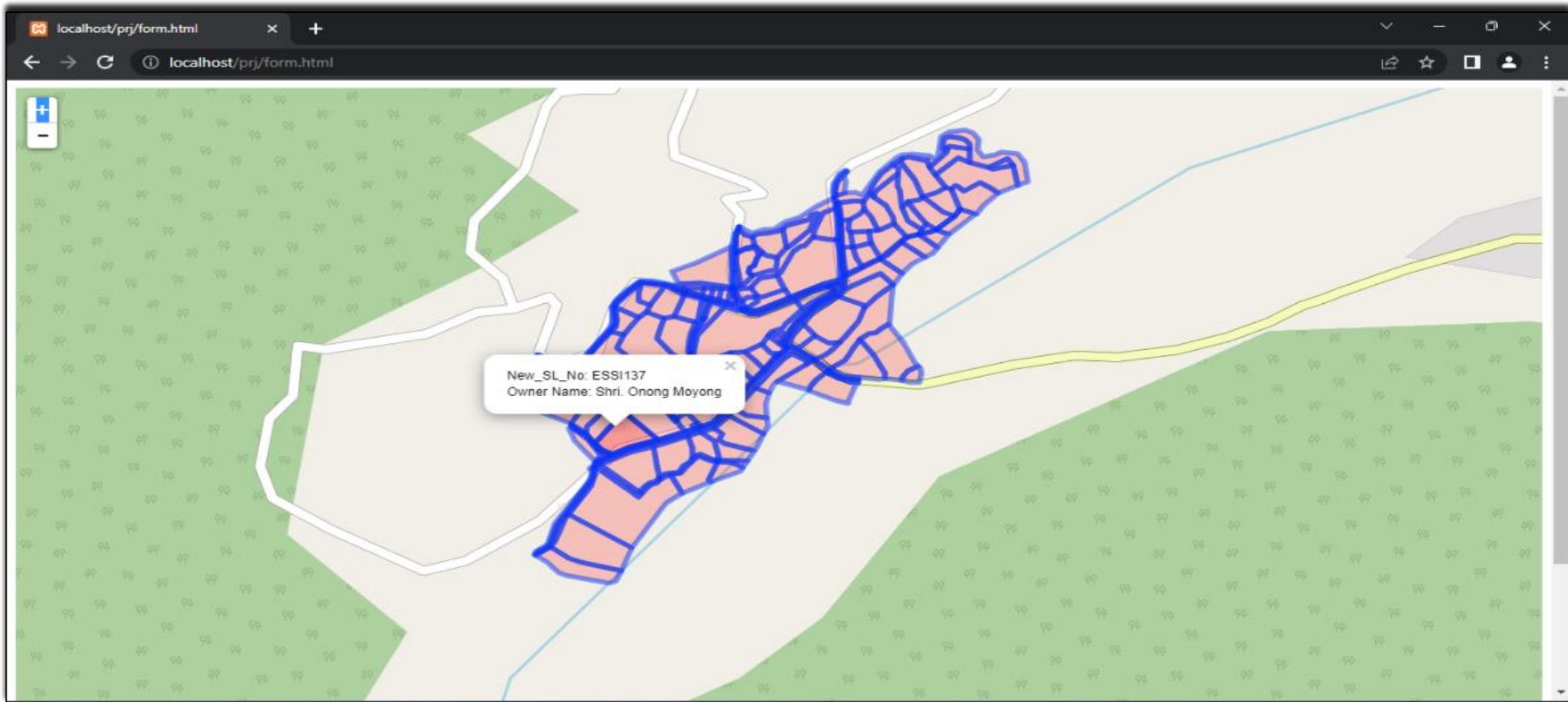


Fig 45: Display Map

# 11

## FUTURE SCOPE

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- Expansion to More States
- Integration with Advanced Technologies
- Mobile Application Development

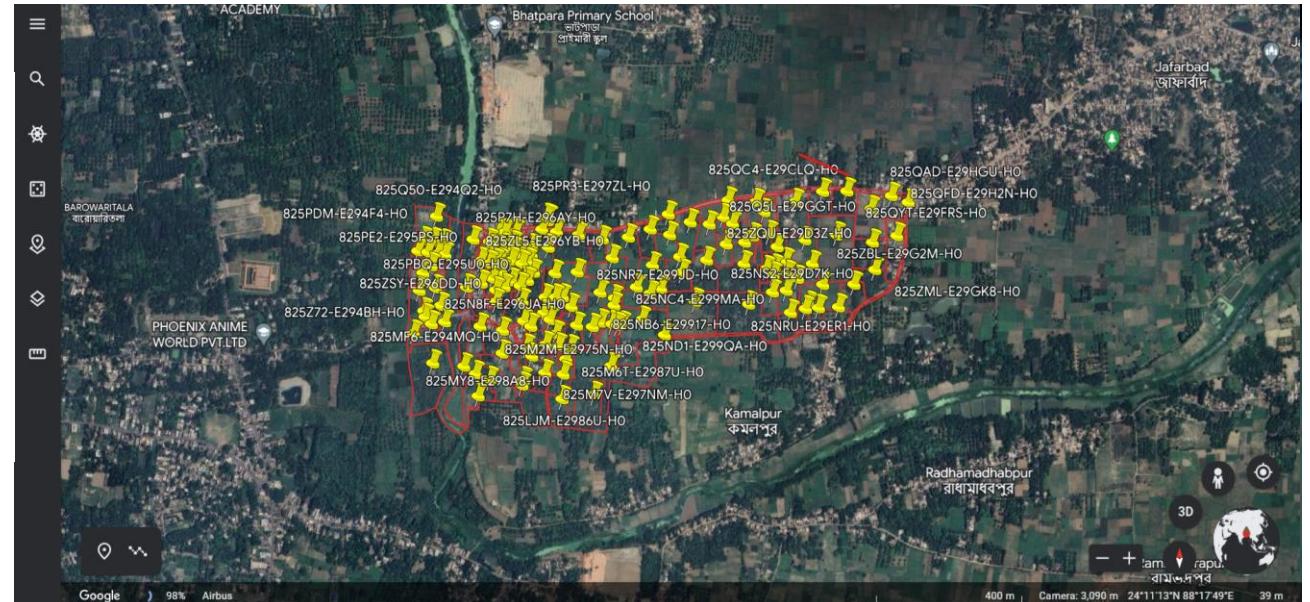


Fig 35: Google Earth

# 12

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- [https://docs.qgis.org/3.22/en/docs/pyqgis\\_developer\\_cookbook/](https://docs.qgis.org/3.22/en/docs/pyqgis_developer_cookbook/)
- Download XAMPP ([apachefriends.org](http://apachefriends.org))



THANK YOU