THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF LANDS, HOUSING AND HUMAN SETTLEMENTS DEVELOPMENT.

PROPOSED MANUAL FOR SPATIAL DATA CONVERSION AND VALUATION BLOCKS PREPARATION.

(ZERO DRAFT)
2021

INTRODUCTION

The Ministry of Lands has been responsible for carrying all activities concerning land management all over the country with main activities of Planning, Surveying the land parcels and Grant occupancy rights. These activities constitute to the main role of "Land Administration".
Most of the data prepared on carrying these activities have been handled well and hence they are used for different purposes.

Note;
SRS – Survey Registration System
GIS – Geographical Information System
TP – Town Planning Map
LAD – Land Administration Department
SMD – Survey and Mapping Department
The data conversion process has started by introduction and simple training on Quantum GIS. The Data conversion team which comprises of different technical staffs, will be grouped into the following Units.

Data conversion;

This refers to the overall process of converting or transforming data from **analog** or paper format into **digital** format.
In our course of context, data conversion covers all procedures of analyzing the available paper filed data, extracting their attributes and transform them all into digital format using the special GIS software available for spatial data processing like 'Quantum GIS' as well as using other software for non-spatial data processing such as 'Excel'.

Conversion of spatial data involves the following line of activities to be completed;

1. **Physical Data Verification**
   - Verify data completely by counting (inventory)
   - Analyze number of wards, valuation block and record them all.
   - Analyze and prepare well known legal boundaries, layers of physical features such as roads, swamp areas, railway, power – lines, rivers, mountains, reserved land
   - All documents associated are counted and kept together.

2. **Data Validation and Conversion.**
   - In this stage we check the correctness of the data, give the Index and do the conversion. Then the correct data will be transformed into compatible digital format before entered into the system.

   Example;
   - The Last registration number for survey plan/TP is 2000
   - We dig out the last 1999 maps and their documents
   - We file all related documents together
   - We count and record the number of pages for all documents
   - Clean documents and restore to remove folds
   - Re-draw the maps which cannot to restored.

Requirements.
To carry on the spatial data conversion activity, the following are the requirements;

SN	ITEM	Specifications	Purpose	Quantity
1	Maps	- A4, A3, A2, A1, or A0 printed map(s)	Data to be converted	-
2	Scanner	- Support A4, A3, A2, A1, or A0	For scanning Images	
3	Computer	- Desktop - Ram 16 GB - HDD 1TB	Acting server for the shared folders	1
4	External HDD	1 TB	Backups and data collection	8
5	Electric Stabilizer		Control electric shock	1
6	Router	Wireless	Supporting LAN	1
7	Network Switch	24 Ports	Supporting LAN	1
8	UTP Cables	CAT 6	Supporting LAN	200m
9	Cable head pins	RJ 45 pins	Supporting LAN	50
10	Cotton wool	Soft, white	Removing dusts on map	2 bundle
11	Spirit		Cleaning maps	2 Liters
12	Ruler or Straightedge		Drawing lines	2 pieces
13	Iron		Removing folds on map	1
14	Rotrin Pen (0.3, 0.4, 0.5)		Drawing on maps	2 sets

15	Clach Pencil		Drawing lines and put maps	1 dozen
16	Scale ruler		Drawing straight lines	4 pieces
17	Wooden table	Wide according to the size of maps	Ironing surface	1
18	Maker pens	Different colors	For indexing and recording	12 boxes
19	Masking tape	white	Tightening the broken maps	12 pieces
20	Extension cables		For power distribution	6 pieces
21	User computers	Harddisk 1TB, Ram 8GB	For data conversion users	Depends with number of users

Preparations:

Before the process of Data Conversion start, the following should be prepared.

1. Preparing the Local Area Network that will be used to connect all devices used in the process.
2. Configuring the server computer that will be used to save all the documents.
3. Create users in the server who will be accessing the shared folders.
4. Creating Folders for both TP and Survey documents *(Table 2)*
5. Prepare the excel templates that will be used for recording the map details during recording *(Image 1)*
6. Give permission to the users who will be sharing the folders
7. Clean the Scanner and the Iron base
8. Arrange and Clean the wide wooden table to be used for ironing the maps.
9. Prepare Tables and chairs for staffs

TP Folders found in "TP_Conversion" (main) Folder

No	Folder Name	Record Unit	Scan Unit	Georeference Unit	Vectozition Unit
1	TP_RECORD	Full control	Read only	Read only	Read only
2	TP_RECORD QC	Full control	Read only	Read only	Read only
3	TP_SCANNING	Read only	Full control	Read only	Read only
4	TP_SCANNING QC	Read only	Full control	Read only	Read only
5	TP_GEOREFERENCING	Read only	Read only	Full control	Read only
6	TP_GEOREFERENCING QC	Read only	Read only	Full control	Read only
7	TP_VECTORIZATION	Read only	Read only	Read only	Full control
8	TP_VECTORIZATION QC	Read only	Read only	Read only	Full control
9	TP_COMPILATION	Paste/Save	Paste/Save	Paste/Save	Paste/Save
10	TP_COMPILATION QC	Read only	Read only	Read only	Full control
11	TP_FLASH DATA	Full control	Full control	Full control	Full control
12	TP_COMPLETE	***To be accessed by authorized TP officer***			
13	TP_FINAL	***To be accessed by authorized TP officer***			

SMD Folders found in "SMD_Conversion" (main) Folder

No	Folder Name	Record Unit	Scan Unit	Georeference Unit	Vectozition Unit
1	SMD_RECORD	Full control	Read only	Read only	Read only
2	SMD_RECORD QC	Full control	Read only	Read only	Read only
3	SMD_SCANNING	Read only	Full control	Read only	Read only
4	SMD_SCANNING QC	Read only	Full control	Read only	Read only
5	SMD_GEOREFERENCING	Read only	Read only	Full control	Read only
6	SMD_GEOREFERENCING QC	Read only	Read only	Full control	Read only
7	SMD_VECTORIZATION	Read only	Read only	Read only	Full control
8	SMD_VECTORIZATION QC	Read only	Read only	Read only	Full control
9	SMD_COMPILATION	Paste/Save	Paste/Save	Paste/Save	Paste/Save
10	SMD_COMPILATION QC	Read only	Read only	Read only	Full control
11	SMD_FLASH DATA	Full control	Full control	Full control	Full control
12	SMD_COMPLETE	***To be accessed by authorized survey officer***			
13	SMD_FINAL	***To be accessed by authorized survey officer***			

Data Conversion steps:
A. Spatial Data Conversion

For spatial data conversion, we have Five main Units *(Ref. Table 2 above)*;

I. Map indexing Unit

- All maps are collected and arranged properly foe easy visualization.
- By using special pen/ink one staff will write the Index Number according to the agreed format;
-

Note: *The Index will have the following format;*

<u>For TP</u>

- ***DOM_08_DCC_TP0001 for TP Map where;***
  - DOM is the Region short name (DODOMA)
  - 08 is the Region Code for Dodoma is 08
  - DCC is the council short name for Dodoma City Council
  - 0001 is the ascending number for the particular TP drawing brought to be converted. It means that is the first TP map brought to be converted.

- ***DOM_08_DCC_TP0001/1 where;***
  - 0001/1 means the first amendment on TP

<u>For Survey plan</u>

- ***DOM_08_DCC_SP00001_Reg No. where;***
  - **DOM_08_DCC_SP00001** is the Index for the TP on which the survey plan belong
  - **Reg No** is the Registered Plan Number

II. Recording Unit

1. This Unit receives and identify all the documents to be converted file after file.
2. Recording the Registration Number of the Map (TP or Survey)
3. Enter into Excel all data associate with the Map
4. The Excel template will be found in the shared record folder.
5. All the data filled in excel will be stored in 'SMD_RECORD' and 'TP_RECORD' folders specifically
6. The record Quality Checking person will copy files from 'SMD_RECORD' or 'TP_RECORD' and open them in his computer to check the data quality by considering the following;
   - If all attributes as shown in the table below are named as it shown in the table
   - If all attribute columns are filled with data without leaving a single cell
   - If the data filled in the attribute columns follows the correct naming agreed and upper ad lower cases are well observed
   - checking other qualities as directed
7. Map will be sent to the Scanning Unit.
8. The daily activity must be saved in the folder within with the name of person and date

Attributes that are filled into the Excel Template during recording include the following:

Na	SMD ATTRIBUTES FOR RECORDS				TP ATTRIBUTES FOR RECORDS		
	Attribute Name	Sample Format	Data Type		Attribute Name	Sample Format	Data Type
1	id_sp	D14/328/45	String		rev_date	2017-10-29	String
2	reg_pn	45851	String		block	B	String
3	block_num	AC or 21	String		parcel_no	23	String
4	plot_num	12	String		rec_name	Kanwa	String
5	locality	Kibaoni	String		drawn_by	Donald Mshana	String
6	district	Nzega	String		supervisor	Elibariki Ngorovil	String
7	region	Tabora	String		tp_number	08/MTB/ 72/100319	String
8	scale	1000	String		acceptedby	Tabora Municipal Council	String
9	data_enter	Mwaisa	String		basemap	Toposheet 2007	String
10	enter_date	2011-06-28	String		adjoin_tp	08/CHY/ 06/012021	String
11	approved_d	2012-12-30	String		units	Sqm, Ha or Acre…	String
12	tp_no	08/CHY/ 06/012013	String		scale	1000 or 2500	String
13	cal_area	746	String		mtaa	Ntobo	String
14	council	Nzega Town	String		block	B	String
15	unit	Sqm, Ha or Acre	String		parcel_no	2	String
16	la_zone	Magharibi	String		tp_firm	Tabora Municipal Council	String
17	lot_type	Plot or Farm	String		tp_type	Regularization or New Plan	String
18	remark	No TP, No Area, Repeat Number, No number	String		lot_type	Plot or Farm	String
19					checked	Tabora Municipal Council	String
20					checkby	Dalila Ngereza	String
21					localition	Ntobo	String
22					revision	2021-07-23	String
23					remark	Local	String
24					tp_index	DOM_08_DCC_0001	String

25					region	Dodoma	String
26					ward	Kikuyu Kusini	String
27					district	Dodoma	String
28					council	Dodoma City	String
29					design_by	Winston	String
30					approvedby	Ng'wandu	String
31					appvdate	2020-09-21	String
32					rec_date	2020-11-27	String

III. Scanning Unit

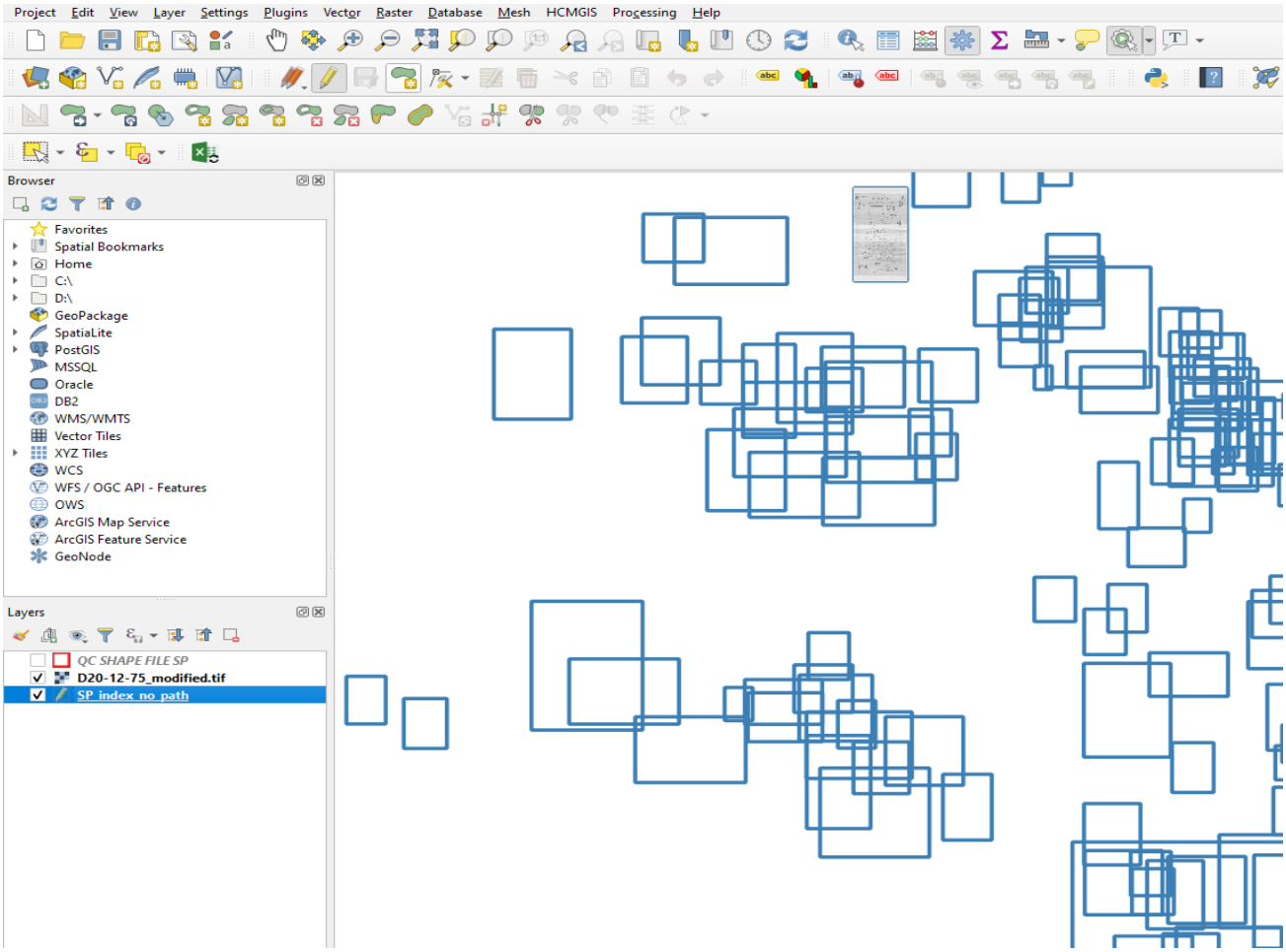
- The recorded and Indexed maps will be cleaned by removing all the dusts and folds by using soft wool, spirit and by ironing if necessary.
- The scanning size will depend with the size of the map sheet but will be saved in tiff format with minimum memory size that does not alter the quality and visualization.
- Then the map will be scanned and saved into the dedicated "**TP_SCANNING"** ***folder*** or "**SMD_SCANNING"** ***folder*** available in the server according to the agreed standards and format ***(tiff format).***
- The Scanning Quality Checking person will examine the quality of maps scanned if the image is clean enough to display all necessary features and the image size is not too big.
- The Checked Scanned Image that have met standards will be saved into **'SMD_SCANNING QC**' and **'TP_SCANNING QC'** folders respectively
- Image will be used by Geo referencing Unit
- The daily activity must be saved in the folder within with the name of person and date

IV. Georeferencing Unit

- The Scanned map Image will be Geo-referenced according to the standard and format agreed.
- At least four points should be taken for georeferencing.
- In case of any technical doubt or fault noticed, the map will be re-corrected and sent back to the Scanning Unit to be scanned again.
- If no issues the geo-referenced map will be saved into **"TP_GEOREFERENCE"** ***folder*** and **"SMD_GEOREFERENCE"** ***folder*** in the server.
- The data Quality checking person will copy the georeferenced data into his computer to check if the standards are met and the qualified data will be saved into **'SMD_GEOREFERENCED QC'** or **'TP_GEOREFERENCED QC'** folders
- The geo referenced data will be ready vectorization.
- The daily activity must be saved in the folder within with the name of person and date

V. Create Index from Geo-referenced plan

- ICT or GIS will use the scanned images and overlay with georeferenced plan/TP drawing and create Indexes
- Index is a Simple rectangular or square boxes that can be used to retrieve the georeferenced image to be as a reference to the vector map.
- It helps to get the overview of the map hence help to determine gaps
- Index will help to know the projection that has been used during georeferencing
- By using Index, no need to search a map, you just use the image tiles.


Project Edit View Layer Settings Plugins Vector Raster Database Mesh HCMGIS Processing Help
Browser
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PostGIS
MSSQL
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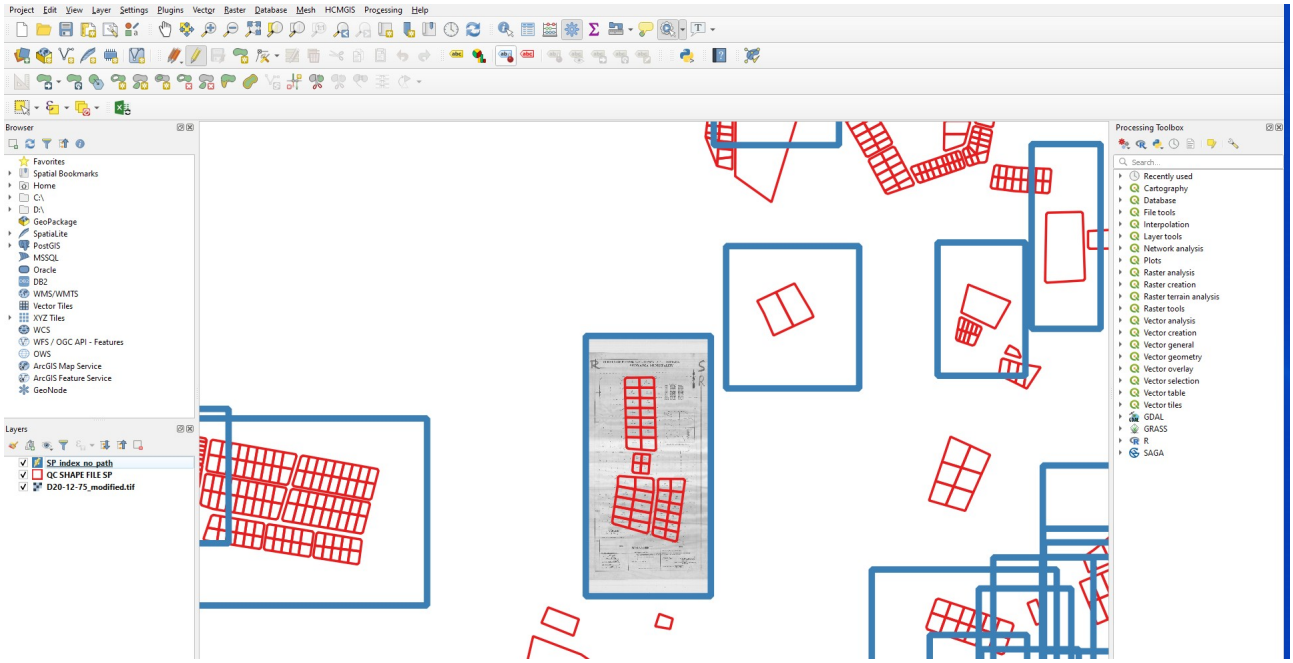
DB2
WMS/WMTS
Vector Tiles
XYZ Tiles
WCS
WFS / OGC API - Features
OWS
ArcGIS Map Service
ArcGIS Feature Service
GeoNode
Layers
QC SHAPE FILE SP
D20-12-75_modified.tif
SP_index_no_path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QC SHAPE FILE SP
D20-12-75_modified.tif
Processing Toolbox
Recently used
Cartography
Database
File tools
Interpolation
Layer tools
Network analysis
Plots
Raster analysis
Raster creation
Raster terrain analysis
Raster tools
Vector analysis
Vector creation
Vector general
Vector geometry
Vector overlay
Vector selection
Vector table
Vector tiles
GDAL
GRASS
R
SAGA

VI. Vectorization Unit

- The georeferenced data will be vectorized according to the format.
- People doing vectarization will be given data by the supervisor.
- The vectorized data will be saved into **Vectorized TP** *folder* and **Vectorized Survey** *folder* in the server.
- Digitize the spatial data (Converting the map features into digital format)

Attributes that are filled into attribute table during vectorization include the following:

SURVEY ATTRIBUTES FOR VECTORIZATION					TP ATTRIBUTES FOR VECTORIZATION		
	Attribute Name	**Sample Format**	**Data Type**		**Attribute Name**	**Sample Format**	**Data Type**
1	reg_pn	11987	String		use	Open Space	String
2	block_num	DG,B or 2	String		use_group	J	String
3	plot_num	150,12A or 1/4	String		use_class	d	String
4	drawn_by	Eliud Randa	String		tp_number	08/NZG/ 23/10072021	String
5	mp	152/1/iv	String		mtaa	Ntobo	String
6	comps	E21/240	String		parcel_no		String
7	approveby	Bakari Zemah	String		tp_firm	Makazi Consult Ltd	String
8	digit_user	John Ngaiza	String		locality	Nzuguni	String
9	digit_date	2021-04-16	Date		digtizer	Elibariki Ngorovil	String
10	surv_type	Private or Government	String		dit_date	2021-09-14	Date
11	surveyor	Renatus Kimbuya	String		index_no	DOM-08-DCC-0765	String
12	surv_date	2003-12-08	String		remarks		String
13	id_sp	E21/240/76	String				
14	remarks		String				
15	index		String				

Note;

Compilation folders

- Will be used in transition. When supervisor wants to distribute files for vectorization, he will copy all files from the **'GEOREFERENCE QC'** folder into **'COMPILATION'** folder.
- He will record all files on the template and save the template in **'COMPILATION QC'** folder
- Then, he will distribute the files to the people working with vectorization
- the distribution will be by ***'CUT'*** the file from compilation folder into the folder of the responsible person for vectorization. This will help to avoid redistribution of single file to more than one person.
- He will record date and name of the person given the file against the file name in the previous template saved in the '**COMPILATION QC'** folder.
- '**FLASH'** folder will be used to carry moving files only which are not in process yet.

Data Organization.

After data conversion, all data must be organized.
Let say we have completed conversion of spatial data for one ward.

- The data recording files will be combined together
- The vectorized files will be combined together
- The record attributes will be added into respective attribute table of the vectorised data
- After getting the combined data with all attributes filled fully from record and vectorization in the single file, then the complete data will be saved in the **'SMD_COMPLETE'** or **'TP_COMPLETE'** folders

Data Transformation.

By using either software of computation parameters, the complete data will be transformed into WGS 84 format that is acceptable format into the modified ILMIS System. All compulsory field must be filled and well organized. The ICT and Cartographer people will use Quantum GIS Software to make the final quality checking and the correct data will be saved in '**SMD_FINAL'** and '**TP_FINAL'** folders respectively.
Data from the **FINAL** folder is considered to be ready for entering into the system.

New Data.

All new prepared data from field must be in the digital format as the data in **FINAL** folders. All attributes must be filled properly and other standards followed.
Before uploading the data from field must be checked to make sure that they are in the same standard

QUALITY ASSURENCE (QC)

In spatial data conversion is way of preventing mistakes or any defect during the process of transforming data either from raster to vector or from one type of geometry to another, the quality assurance is guarantee during the whole step by step of the data conversion.

In order to maintain quality of the data converted the procedure were classed into following stage with their quality check.

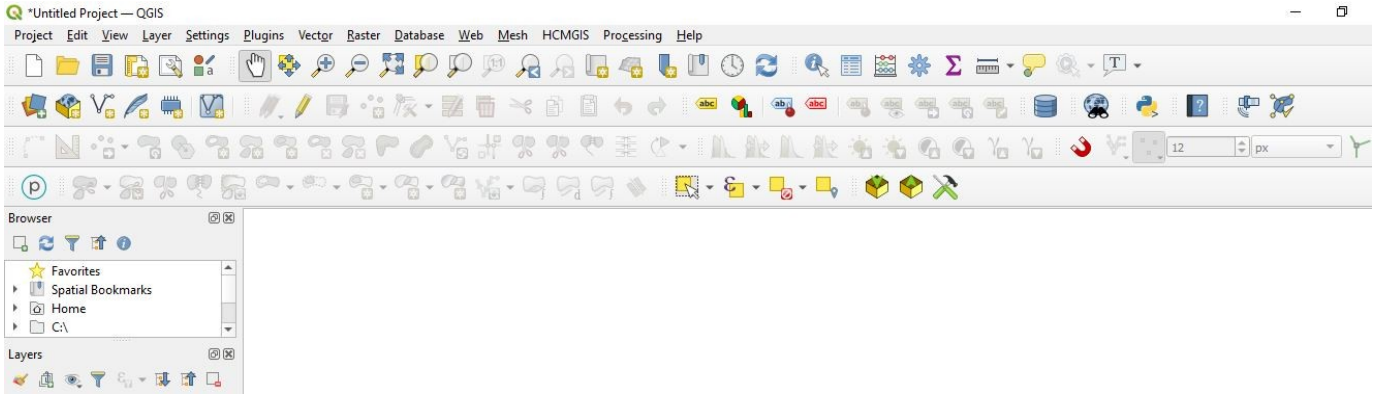
1.Data conversion stages.

Here the same data will pass through the technical person in those stage for following step by step. example step one in working schedule is Recoding. This remove the possibility of fault done because it checked in a stage wise.

Stage No	Stage Name
1	Record
2	Record Quality Check
3	Scanning
4	Scanning Quality Check
5	Georeferencing
6	Georeferencing Quality Check
7	Vectorization
8	Vectorization Quality Check

2. The use of the same Gis software Quantum Gis (Qgis) during data process.

Quantum Gis is the open Gis software which rich in functional tools and the use of the same software insure the same snapping accuracy and analysis procedure.



3. Attribute control

In order to maintain the data input quality we were using mechanism of control of field, the attribute field which using to feed the record were provide and not editable and field is according the data type. Example *approve_date*, the field data type is Date.

Attributes Template

S_no	TP Attributes	Survey Attributes
1	tp_index	tp_index
2	tp_number	tp_number
3	region	region
4	district	district
5	council	council
6	ward	ward
7	designed _by	reg_pn (Region plan number)
8	drawn_by	block_number
9	approved_by	plot_number
10	supervisor	locality
11	tp_number	mtaa
12	accepted_by	scale
13	approve_date	approved_date
14	basemap	cal_area
15	adjoin_tp	unit
16	units	la_zone
17	scale	Lot type
18	revision	
19	revision_date	
20	location	
21	mtaa/street	

4. Using of basic Data.

This was the quick method of check the data location name and place or data shifting the basic data used were location boundary map, all open map resource because it is free in Quantam Gis also data from Government Agency TANROAD, TRC and TARURA.

5. Replica the data in data conversion.

This is method of doing the same thing at per and is helpful to make a bench mark control of the data entry, during the data conversion in record stage data entry and vectorization stage some of record are replica to record stage. We use this method as the quality check of the data entry.

from shapefile			from record	
S/N	FIELD		S/N	FIELD
2	reg_pn	reg_pn	1	id_sp
3	block_num	block_num	2	reg_pn
4	plot_num	plot_num	3	block_num
5	drawn_by		4	plot_num
6	mp		5	locality
7	comps		6	district
8	approveby		7	region
9	digit_user		8	scale
10	digit_date		9	dat_enter
11	surv_type		10	enter_date
12	surveyor		11	approved_d
13	surv_date		12	tp_no
14	sur_date		13	cal_area
15	Remarks		14	council
			15	unit
			16	la_zone
			17	lot_type

Quality check methodology in a stage wise

B) Record Quality Check.

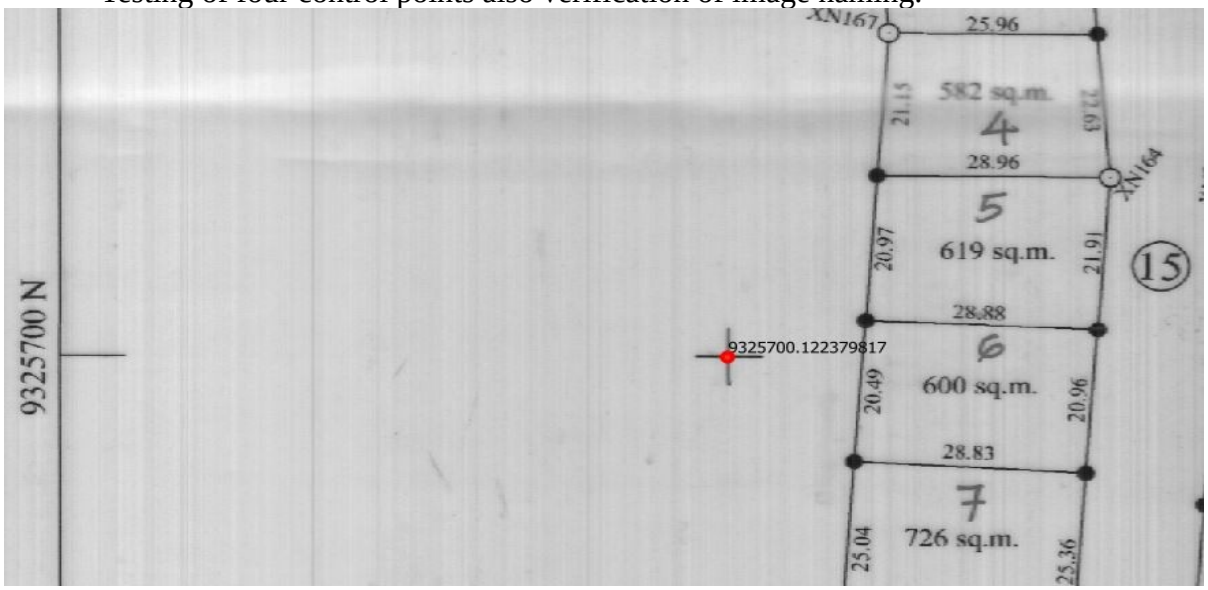
Record naming and status, no gap to record.

C) Scanning Quality Check

Image size(dpi) and file type (Tiff)

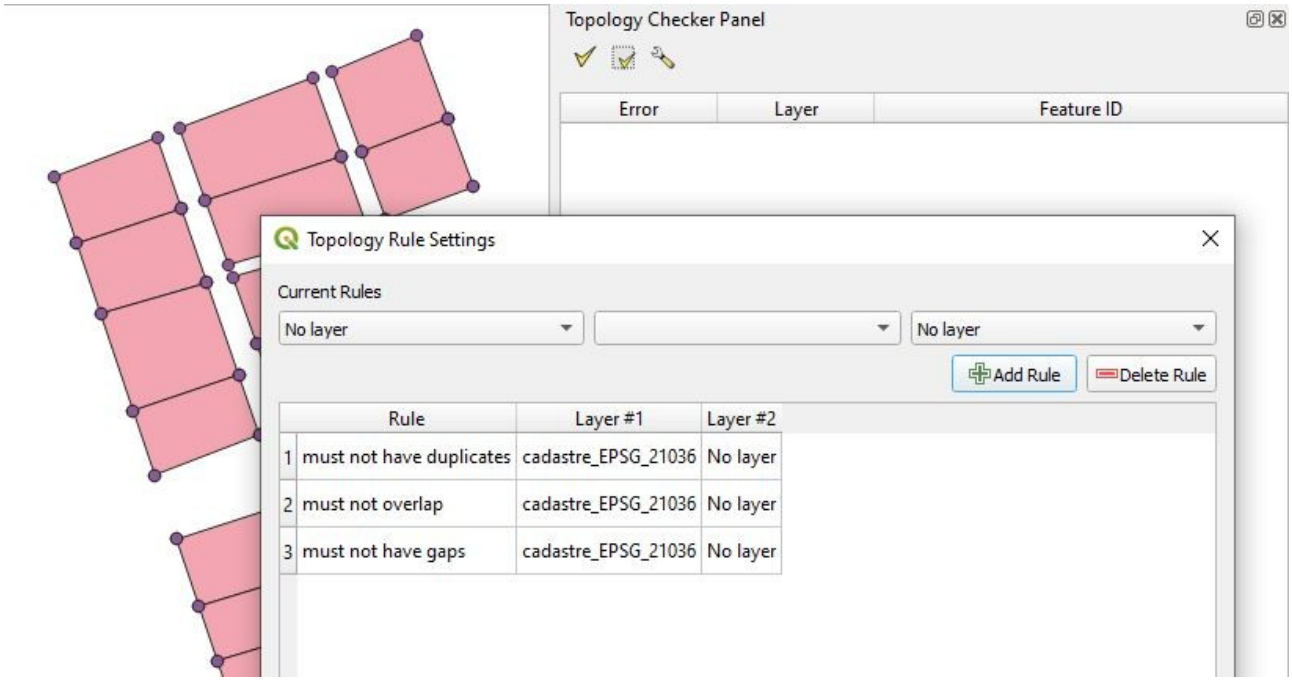
D) **Georeferencing Quality Check.**

Testing of four control points also verification of image naming.



E) **Vectorization Quality Check.**

Establish of topology check overlaps, Gaps and intersection



PREPARATION OF VALUATION BLOCKS RATES

Valuation Blocks Rates management is a new functionality to be added in the improved ILMIS. It gives a way of identifying the valuation block spatial information and association with corresponding land values, premium rates and land rent rates.

The introduction of 'Valuation Blocks rates management' functionality has become important in order to enable automatic calculation of land rent and other taxes through the use of parameterized land values. It will eliminate manual calculation of other known land taxes since only land rent calculation was initially automated.

It enables the use of coordinate system to determine the geographical position of the parcels and make it the basis of tax calculation by using land values with corresponding tax rates. By considering land parcel size, land use located for the parcel, unit of measure and associate rates, the valuation block rates will help to calculate the respective value from the system.

To prepare the Valuation blocks, the following procedures are as followed;

1. **Data Preparations.**
   - Collect survey/TP maps which are georeferenced and vectarized.

     - ***Georeferencing*** *is the process of assigning locations to geographical objects within a geographic frame of reference. It is fundamental to geospatial technologies in general, and geographic information system (GIS) in particular*.
     - **Vectarization/*Digitizing in GIS*** *is the process of converting geographic data either from a hardcopy or a scanned image into vector data by tracing the features. During the digitzing process, features from the traced map or image are captured as coordinates in either point, line, or polygon format*.

   - Prepare the land values.
   - Prepare the corresponding tax rates (Premium and Land rent rates)

2. **Data Verification and Validation.**
   - Verify the collected data.
   - Check the validity of the data.

3. **Spatial Data Preparations**
   - The shapefile of the boundary on which spatial data is prepared and loaded in QGIS
   - Create the valuation block and fill the following attributes;

     - **region**
       - Region name

     - **district**
       - District name

     - **council**
       - Council name

     - **locality**

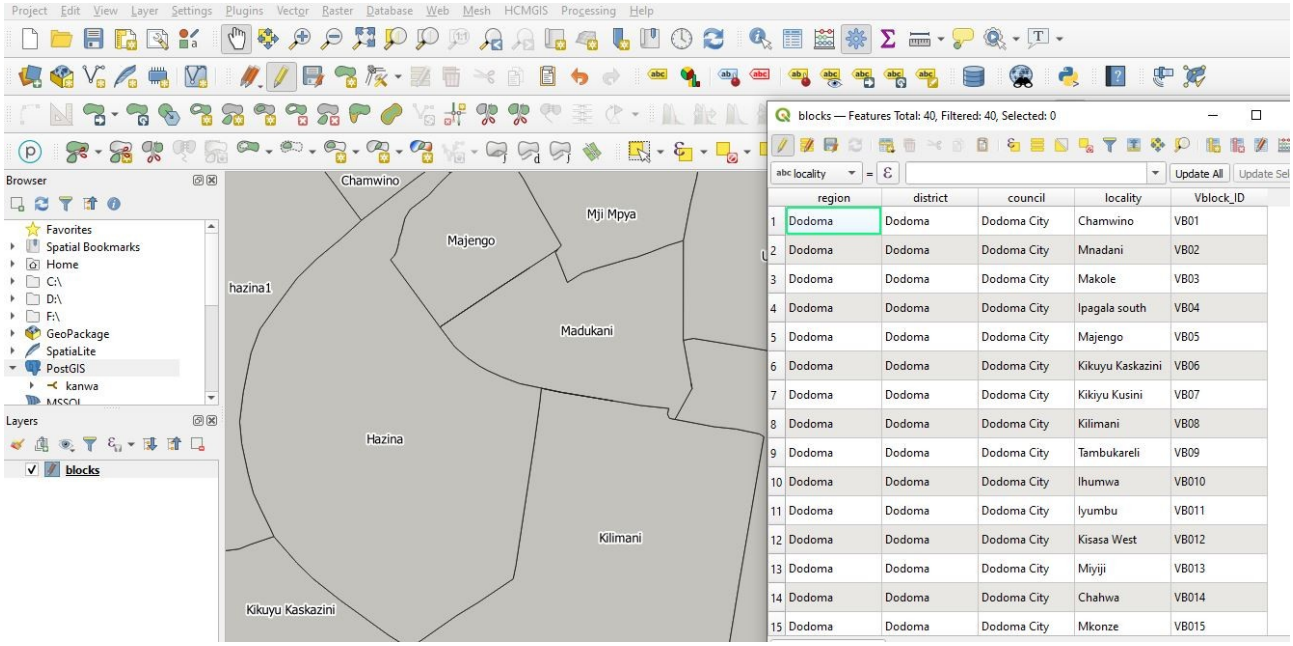
- Locality name

- **Vblock_ID**
  - Valuation block id number. It should start with **'VB…'** then number e.g **'VB001'**

Example;
Table of attributes of the shapefile

region	district	council	locality	Vblock_ID
Dodoma	Dodoma	Dodoma City	Hazina	VB025
Dodoma	Dodoma	Dodoma City	Jamuhuri	VB026

Preparation of valuation block shapefile in QGIS.



4. **Valuation Rates Preparation.**
   - The valuation rates are prepared in '**CSV'** format with the following columns
     - **Block**
       - This column will be filled with the valuation block id number as shown in the example below.

     - **USE**
       - This column will be filled with different land uses as they exist on the area, as well as any new land use planned to be existing. Though there is no restriction even to fill all land uses as they exist according to the law.

- **YEAR**
  - This column will be filled with the year when the values were approved to be used.

- **RATE**
  - This is the rate per unit of measure
- **UNIT OF MEASURE**
  - This is the required unit of measure depending on the use.

- **LAND VALUE**
  - The column will be filled with the amount for each use in the given unit of measure

Example of CSV file filled for some uses

Block	USE	YEAR	RATE	UNIT OF MEASURE	LAND VALU
VB300	Residential	7/1/2012	45	sqm	1000
VB300	Commercial/Residential	7/1/2012	90	sqm	1200
VB300	Commercial/Service Trade/restaurant	7/1/2012	225	sqm	1500
VB300	Schools/Institutes/Colleges etc	7/1/2012	67.5	sqm	800
VB300	Hospitals/Dispensaries etc	7/1/2012	67.5	sqm	900
VB300	Hotels	7/1/2012	225	sqm	700
VB300	Tourist Hotels/Beach hotels	7/1/2012	337.5	sqm	500
VB300	Light Industries	7/1/2012	168.75	sqm	500
VB300	Heavy Industries	7/1/2012	135	sqm	500
VB300	Farm	7/1/2012	10000	acre	500
VB300	Charitable Schools/Institutions	7/1/2012	8000	acre	500
VB300	Public Open Spaces and Botanical Gardens	7/1/2012	10000	acre	500
VB300	Private Open Spaces and Botanical Gardens	7/1/2012	20000	acre	500
VB300	Public Parking	7/1/2012	25000	acre	500
VB300	Private Parking	7/1/2012	225	sqm	500
VB300	Public Marine Ports Areas	7/1/2012	60000	acre	500
VB300	Private Marine Ports Areas	7/1/2012	225	sqm	500

After uploading the block valuation shapefile in the system, the CSV file will also be uploaded. The valuation rates will be inherited to the valuation block map accordingly and effect to the parcel.

NB: All column headers must strictly be written as shown in this manual.

SPATIAL JOINING

After QC of Vectarized data, there should be data joining to get the correct data for transformation. The attributes collected during recording have to be joined to the attributes collected during vectorization.

from shapefile			from record	
S/N	FIELD		S/N	FIELD
2	reg_pn	reg_pn	1	id_sp
3	block_num	block_num	2	reg_pn
4	plot_num	plot_num	3	block_num
5	drawn_by		4	plot_num
6	mp		5	locality
7	comps		6	district
8	approveby		7	region
9	digit_user		8	scale
10	digit_date		9	dat_enter
11	surv_type		10	enter_date
12	surveyor		11	approved_d
13	surv_date		12	tp_no
14	sur_date		13	cal_area
15	Remarks		14	council
			15	unit
			16	la_zone
			17	lot_type

The repeated attributes will be used as joining key to join the two columns. Here the repeated attributes are reg_pn, block_num and plot_num.

SPATIAL DATA TRANSFORMATION

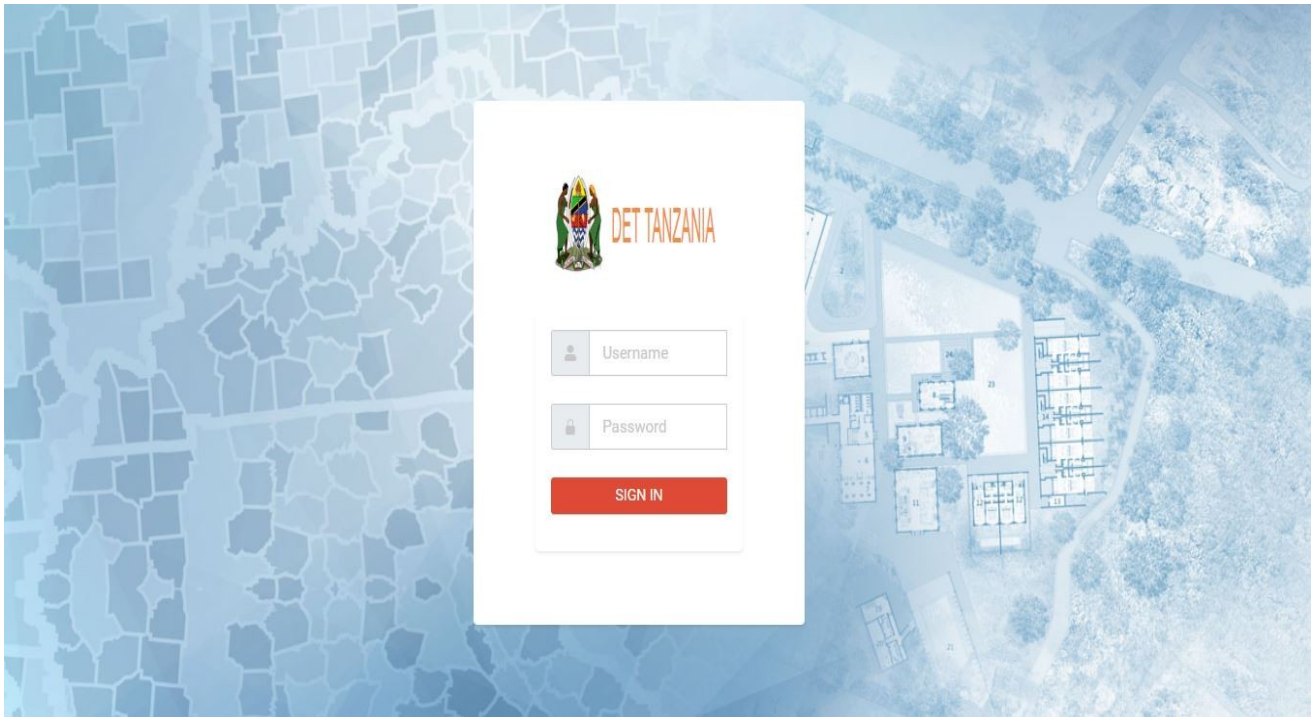
AIM

To transform the digital spatial data from one coordinate system.
We have a bulk spatial data in Arc 1960 coordinate system countrywide. But our ILMIS consumes WGS84/TAREF 11 coordinate system. Hence there is a high demand to transform all the data from Arc 1960 coordinate system into the consumable WGS84/TAREF 11.

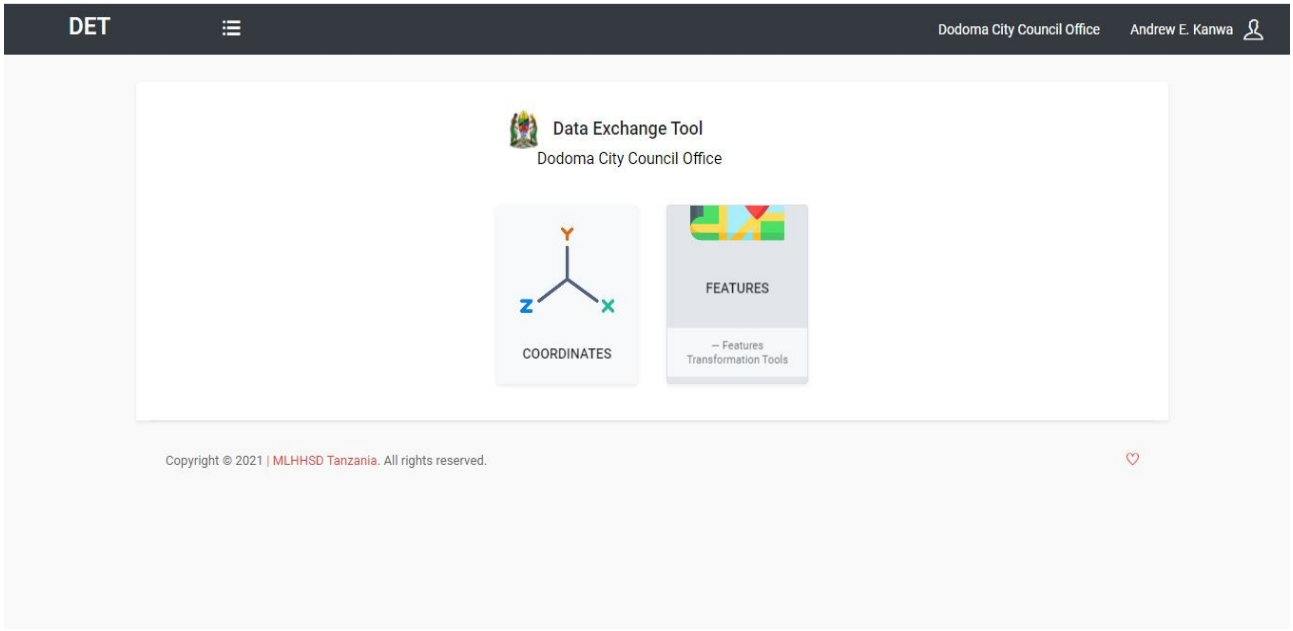
We have developed a too for transformation known as ILMIS-Data Exchange Tool (ILMIS – DET) which is a web based system works by transform the coordinates.

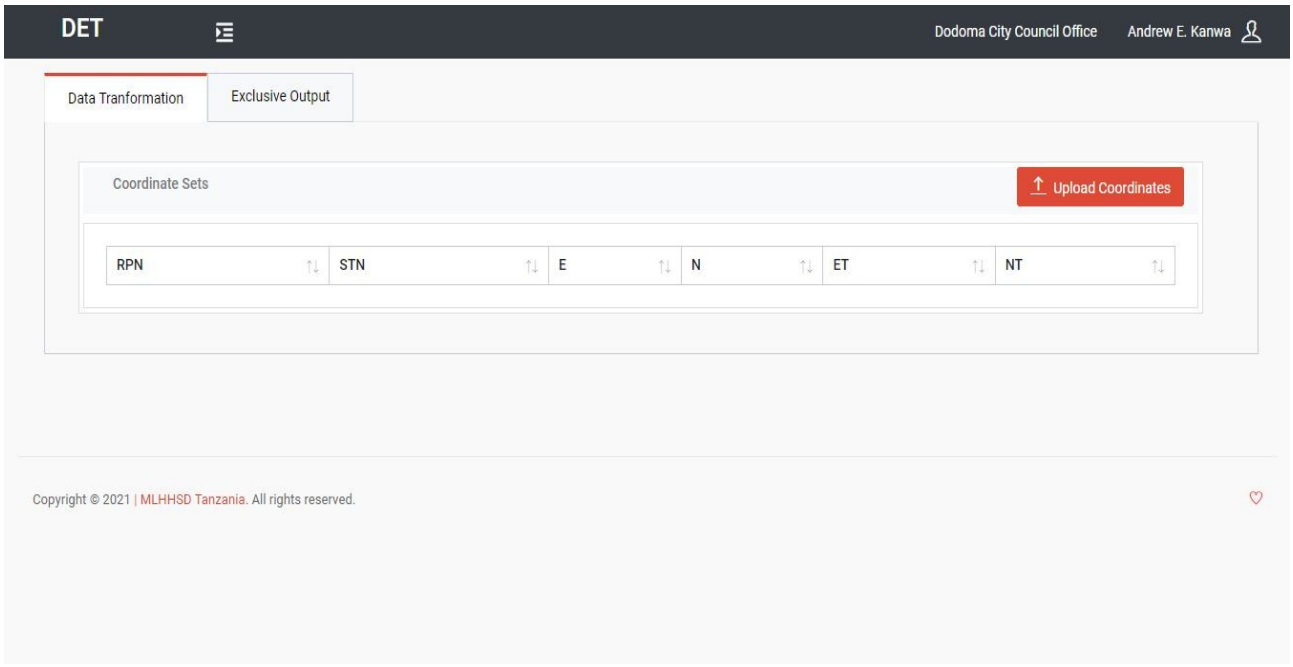
Procedures:

1. **Login into the system**
   - Enter your username and password.



2. **Enter points**
   - Click on the XYZ button on left top to enter coordinates
   - The attributes include RPN- Register Plan Number, STN-Station, E-Easting, N – Northing, ET – Easting Transformation, NT- Northing Transformation

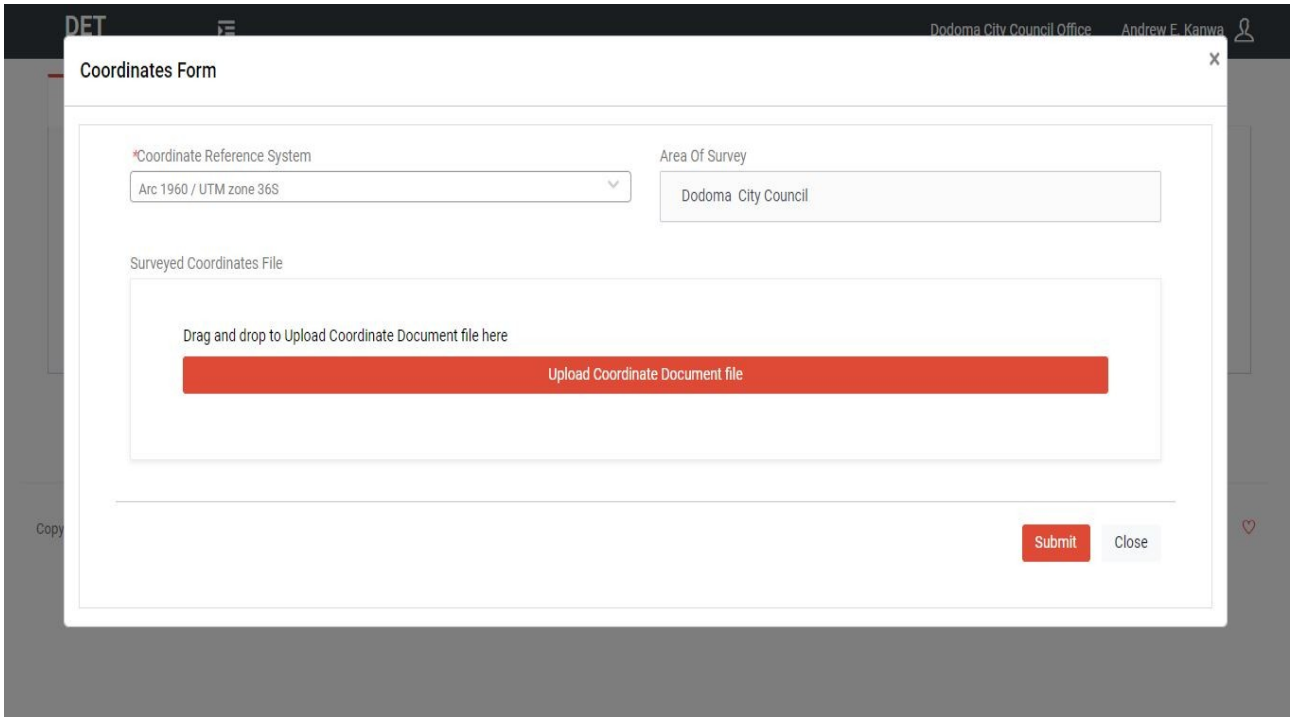




3. Upload Coordinates

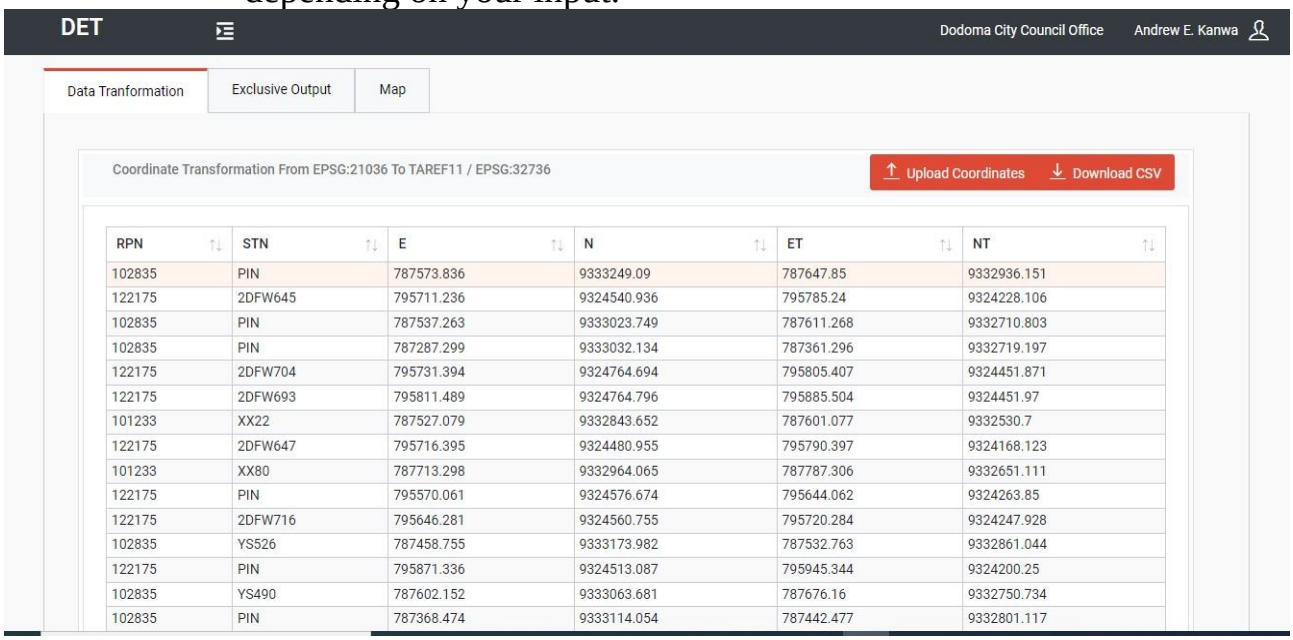
- Click on the red button on top right.
- The new window will open
- Click on “upload coordinates document file” to choose the file from your computer

- Then Click on submit button

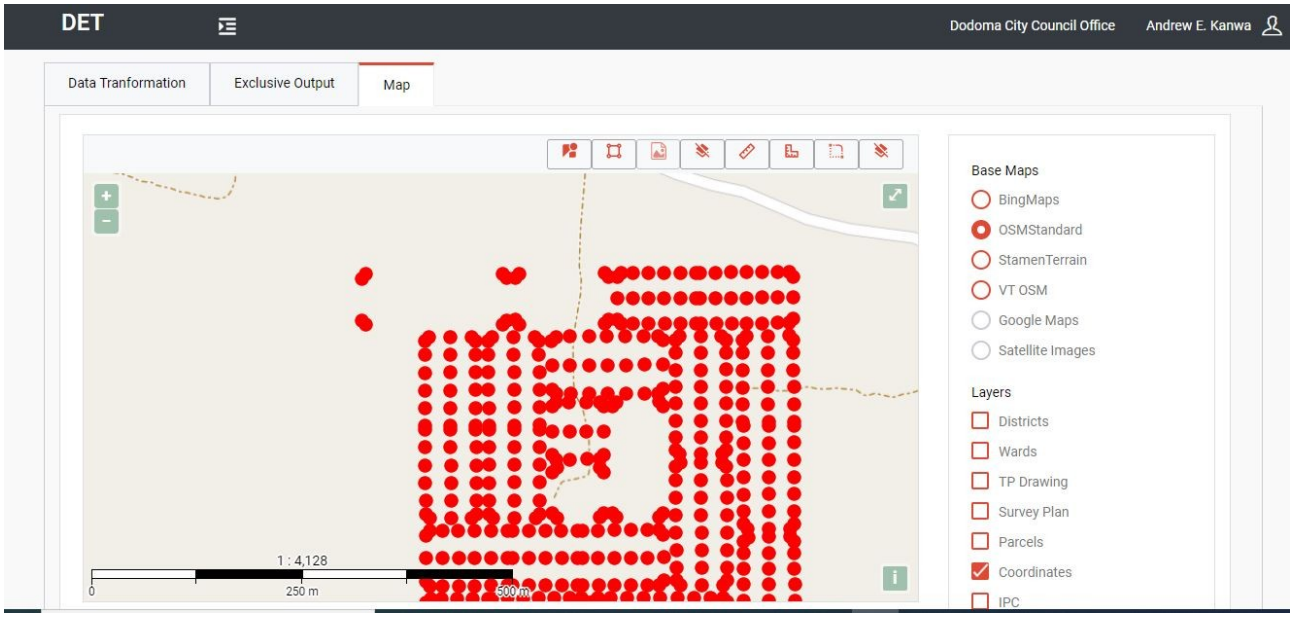


4. Output

- The uploaded data will be transformed into WGS84/TAREF 11 and you will see the output.
- The output of data transformation can be viewed in
  - Two pairs (Click on Data Transformation button on top left) and you can download CSV or upload more coordinates by clicking on the respective button
  - One pair (Click on Exclusive Output button on top) and you can download the CVS file by clicking on the red button
  - Map View (Clicking on the map button)
    - Select the background by clicking on the Base Maps round box
    - Select Layer by clicking on the corresponding check box on layers depending on your input.



RPN	STN	E	N	ET	NT
102835	PIN	787573.836	9333249.09	787647.85	9332936.151
122175	2DFW645	795711.236	9324540.936	795785.24	9324228.106
102835	PIN	787537.263	9333023.749	787611.268	9332710.803
102835	PIN	787287.299	9333032.134	787361.296	9332719.197
122175	2DFW704	795731.394	9324764.694	795805.407	9324451.871
122175	2DFW693	795811.489	9324764.796	795885.504	9324451.97
101233	XX22	787527.079	9332843.652	787601.077	9332530.7
122175	2DFW647	795716.395	9324480.955	795790.397	9324168.123
101233	XX80	787713.298	9332964.065	787787.306	9332651.111
122175	PIN	795570.061	9324576.674	795644.062	9324263.85
122175	2DFW716	795646.281	9324560.755	795720.284	9324247.928
102835	YS526	787458.755	9333173.982	787532.763	9332861.044
122175	PIN	795871.336	9324513.087	795945.344	9324200.25
102835	YS490	787602.152	9333063.681	787676.16	9332750.734
102835	PIN	787368.474	9333114.054	787442.477	9332801.117



Map View

5. **Log Out**
   - You can log out after downloading the CSV file containing the transformed coordinates.

LAND DIVISION FILES CONVERSION (LD FILES)

Every plot that has been lodged at the Land Office by the client must have its own separate file. The files contain all the necessary details and documents associated. The documents contained include client details, parcel details, payment details, transaction details and evidences if any.

In order the details to be included into the ILMIS system they need to be converted from hardcopy format into softcopy format. This transformation from hardcopy into softcopy format need to be done by Scanning and recording.

REQUIREMENTS:

No	**ITEM**	**USE**
1	Mark pen	Marking
2	Staple machine and pins	Removing pins before scanning
3	Punching Machine	For punching documents in the folder
4	Green tags	Tie the documents
5	Yellow tags	Labeling/ Sticker
6	Glue	Attaching passport picture on application form (LF 19)
7	Minute paper	Recording documents
8	Ream	Recordings and Checklist
9	File folders	In case needed if the available folders can no longer be used e.g demaged.
10	Checklist	For checking the available documents
11	Scanner	For Scanning
12	Workstation computers	For storage of scanned files
13	Network devices	For connectivity between scanner and
14	Cotton wool, Spirit	For cleaning, in case needed.

The following steps are included during Scanning of existing files.

a) ***RECORD NUMBER OF FILES AVAILABLE (Take stock)***
On reaching to the specific Land office such as Regional Land Office, the LD files to be converted form Commissioner for Lands Office will be brought to the team.

   i. Record number of files from Commissioner for lands Office
   ii. Arrange all files in order (Location wise or LD numbers)

b) ***IDENTIFICATION OF FILE CONTENTS (Open File)***
After arranging all files accordingly, file contents must be anaysed and recorded.
   i. Count folio documents available in the file and record them
   ii. Fill the ***Checklist*** and tie the checklist on the file
   iii. Arrange the documents as shown in the checklist

File checklist before scanning.

SN	***Document***	***Status (Put tick mark for available document)***
1	LF 19	
2	Proof of Citizenship	
3	Consent from Land Allocation committee	
4	Invoice	
5	Government Receipt	
6	Title Certificate	
7	Other documents	
	Affidavit	
	Birth certificate	
	Certificate of Incorporation	
	Certificate of Registration	
	Consent from the Director general	
	Death Certificate	
	Deed of Gift	
	Marriage certificate	
	Memorandum and Article of Association	
	Minutes of Family meeting	
	Others (mention)	

c) SCANNING FILE CONTENTS

i. Scan documents in order as arranged in the file according to the checklist.
ii. Name the scanned documents with proper names as shown in the checklist.
iii. Save the file to the destination.

- ***Creating destination paths in the server computer:***
  - Create parent folder with name of the **council.**
  - Create child folder with the name of the **ward** inside the **council** folder.
  - Create the **location/locality** folder inside the **ward** folder.
  - On scanning, while saving the plot or farm, write the following format
    - ***Plot or farm number/Block name/Location name***
  - ***Consider an example below:***
    - Plot No: 12
    - Block: B
    - Location/Locality: Kanyerere
    - Ward: Butimba
    - Council: Mwanza City Council
  - ***From the above data, Create folders as follows;***
    - **Mwanza City>Butimba>Kanyerere**

Create folder named Mwanza City, Inside Mwanza city create folder called Butimba, Inside Butimba create folder called Kanyerere.

- **Plot No 12/Block B/Kanyerere**
  On scanning, give the name of the plot as shown above, and same at the Kanyerere folder.

d) FOLDING FILE CONTENTS & MARK AS SCANNED

i. Arrange the back in the documents in the files as illustrated in the checklist.
ii. Mark file as scanned by putting “S” on the right top side.

REGISTRAR OF TITLES FILES CONVERSION

Every Title that has been registered at the Registrar of titles' Office has its own separate file. The files contain all the necessary details and documents associated with registration. The documents contained include client details, parcel details, payment details, post transaction details and evidences if any.

In order the details to be included into the ILMIS system they need to be converted from hard-copy format into soft-copy format. This transformation from hard copy into soft-copy format need to be done by Scanning and recording.

REQUIREMENTS:

No	ITEM	USE
1	Mark pen	Marking
2	Staple machine and pins	Removing pins before scanning
3	Punching Machine	For punching documents in the folder
4	Green tags	Tie the documents
5	Yellow tags	Labeling/ Sticker
6	Glue	Attaching passport picture on application form (LF 19)
7	Minute paper	Recording documents
8	Ream	Recordings and Checklist
9	File folders	In case needed if the available folders can no longer be used e.g demaged.
10	Checklist	For checking the available documents
11	Scanner	For Scanning
12	Workstation computers	For storage of scanned files
13	Network devices	For connectivity between scanner and
14	Cotton wool, Spirit	For cleaning, in case needed.

The following steps are included during Scanning of existing files.

a) ***RECORD NUMBER OF FILES AVAILABLE (Tale stock)***
On reaching to the specific Land office such as Regional Land Office, the LD files to be converted form Registrar of Titles office will be brought to the team.
- Record number of files from Registrar of title
- Arrange all files in order (Location wise or RT numbers)

b) ***IDENTIFY THE TRANSACTION TYPE***
At RT Office there are different post-registration transactions. Each transaction has its own kind of files/documents which are legal documents. Therefore its very important to recognize the transaction type as it will determine the available coduments

c) ***CHECK THE FILE CONTENTS AND RECORD THEM***

After arranging all files accordingly, file contents must be anaysed and recorded.

- Recognize the transaction type as it will determine the documents
- Count folio documents available in the file and record them
- Fill the ***Checklist*** and tie the checklist on the file. Write down the Transaction type and then list documents attached in the checklist
- Arrange the documents as shown in the checklist

File checklist before scanning.

TRANSACTION NAME: ……...……..

SN	***Document***	***Status (Put tick mark for available document)***
1	Certificate of Occupancy	

d) ***SCANNING FILE CONTENTS***

i. Scan documents in order as arranged in the file according to the checklist.
ii. Name the scanned documents with proper names as shown in the checklist.
iii. Save the file to the destination in RT Main folder.

- ***Creating destination paths in the server computer:***
  - Create parent folder with name of the **council.**
  - Create child folder with the name of the **ward** inside the **council** folder.
  - Create the **location/locality** folder inside the **ward** folder.
  - On scanning, while saving the plot or farm, write the following format
    - ***Plot or farm number/Block name/Location name***
  - ***Consider an example below:***
    - Plot No: 12
    - Block: B
    - Location/Locality: Kanyerere
    - Ward: Butimba
    - Council: Mwanza City Council
  - ***From the above data, Create folders as follows;***
    - **Mwanza City>Butimba>Kanyerere**

Create folder named Mwanza City, Inside Mwanza city create folder called Butimba, Inside Butimba create folder called Kanyerere.

- **Plot No 12/Block B/Kanyerere**
  On scanning, give the name of the plot as shown above, and same at the Kanyerere folder.

e) ***FOLDING FILE CONTENTS & MARK AS SCANNED***
   a) Arrange the back in the documents in the files as illustrated in the checklist.
   b) ***Mark file as scanned by putting "S" on the right top side.***

MASOMO YA UTAMBUZI WA VIPANDE VYA ARDHI.

DIBAJI
Utambuzi wa vipande vya ardhi ni zoezi lenye kufanikisha upatikanaji wa taarifa za kijiografia za ardhi kwa maeneo ambayo hayajapangwa na kupimwa. Maeneo haya yanao wamailiki wanaoendelea na shughuli mbalimbali za kila siku.
Kwaajili ya kufanikisha vema zoezi la Anuani za makazi na sensa ya watu na makazi mwaka 2022, taarifa za kila kipande cha ardhi ni muhimu kutambulika.

LENGO
Wizara ya ardhi, nyumba na maendeleo ya makazi kama mdau maalum wa uratibu na usimamizi wa shughuli zote za ardhi nchini, pia kama mdau muhimu katika zoezi la sensa na anuani za makazi, imedhamiria kutambua kila kipande cha ardhi ambacho hakijapangwa na kupimwa kupitia zoezi hili la Utambuzi.

Wananchi wote wenye kumiliki vipande vya ardhi nchini ni wahusika wakuu katika kutekeleza zoezi hili. Zoezi la Utambuzi wa vipande vya ardhi litasaidia sana katika kufanikisha mazoezi ya sensa na anuani za makazi maana litatoa taarifa ya kijiografia ya kila kipande cha ardhi kitakachotambuliwa. Taarifa hizi pia zitatumika kama taarifa za msingi katika kuandaa michoro ya mipango miji, kutoa leseni za makazi na kupata takwimu za milki za ardhi kwaajili ya mipango mbalimbali ya maendeleo. Hivyo taarifa sahihi za wamiliki halali wa vipande vya ardhi ndizo zitakusanywa na wataalam kwaajili ya kufanikisha zoezi hili.

MAHITAJI
Ili kufanikisha zoezi hili, wataalam wenye sifa za kuwa watambuzi watawezeshwa kutumia mfumo maalum wa wizara ya ardhi uitwao ILMIS kukusanya taarifa stahiki. Vifaa vinavyotakiwa katika kukusanya taarifa hizi ni pamoja na;

NA	KIFAA	SIFA	MATUMIZI
1	SIMU	INFINIX SMART 5	Kukusanya taarifa za vipande vya ardhi
		SAMSUNG A12	
2	POWERBANK		Kuchaji kwa dharura simu.
2	TABLET	SAMSUNG TABA6/A10 + GARMIN GLO GPS	Kukusanya taarifa za vipande vya ardhi
3	BEGI	LISILOPITISHA MAJI	Kuhifadhi vifaa
4	MAVAZI NA VIFAA VYA USALAMA	REFLECTOR, RAINBOOT/SAFETY BOOT, RAIN COAT, MWAVULI, HUDUMA YA KWANZA	Matumizi ya dharura kulingana na mabadiliko ya hali ya hewa na afya.
5	KITABU CHA MATUMIZI YA MFUMO	Toa nakala ngumu	Maelezo ya namna ya kutumia mfumo
6	FOMU YA MAHUDHURIO		Kujaza mahudhurio ya wajumbe/viongozi wa mtaa ulioambatana nao.

HATUA ZA KUTEKELEZA KAZI.

Maandalizi.

1. Hakikisha unavyo vifaa vyote tajwa hapo juu.
2. Hakikikisha simu yako ina chaji ya kutosha
3. Hakikisha programu ya ILMIS ndani ya simu inafanya kazi kadri inavyopaswa.
4. Fika Ofisi za ardhi za Mkoa husika/Halmashauri husika saa 2 asubuhi ili kupangiwa majukumu.

Namna ya Utekelezaji.

1. Ufikapo uwandani, wasili ofisi ya mtaa husika kujitambulisha.
2. Unapokwenda kuanza kazi, hakikisha unaye mwenyeji yaani kiongozi wa mtaa husika.
3. Kabla ya kuanza kazi, salimia na kumjulia hali mteja/mwananchi.
4. Tambua pande nne za dunia kadiri ya hapo uliposimama yaani Mashariki, Magharibi, Kusini na Kaskazini.
5. Jitambulishe na utoe sababu ya kufika hapo yaani kusema lengo la kufanya utambuzi.
6. Ulizia taarifa za mipaka halali ya eneo husika, kisha chukua alama za majira ya nukta ya mipaka kila palipo na kona.
7. Wakati wa kuchukua taarifa za mipaka hakikisha majirani wanakuwepo ili kuonesha mpaka ulioafikiwa na pande zote.
8. Kusanya taarifa za Umiliki, Aina ya Umiliki na taarifa zote kadri ya maelekezo ya mfumo kwenye simu yako bila kuacha chochote.
9. Hakikisha unakusanya taarifa za Mmiliki halali, iwapo mtoa taarifa si mmiliki ni ndugu/jamaa/mpangaji/jirani basi ahusike kama ***Contact person*** sio kama mmiliki.
10. Hakikisha unajiridhisha na taarifa nazokupatia mtoa taarifa ambae si mmiliki.
11. Namba ya simu, kitambulisho cha Taifa/Kura/Leseni ya Udereva au vinginevvyo na picha ya mmiliki ni muhimu sana.
12. Baada ya kukamilisha taarifa zote hifadhi taarifa za mmiliki katika programu ya simu yako.
13. Baada ya kukamilisha zoezi la siku nzima, Andika jina na kumsainisha Mjumbe/Kiongozi wa mtaa uliyeambatana nae siku nzima, mapoja na namba ya simu na jina la mtaa.

Zingatia:

- Iwapo kwa sababu maalum umekuwa na zaidi ya mjumbe mmoja kwa siku, uwaweke wazi kwamba malipo yatatolewa kwa mjumbe mmoja tu kati yao.
- Zoezi la utambuzi wa mipaka ya mtaa, atalipwa mjumbe mmoja **(1)** pekee katika mtaa wake husika.
- ***Zoezi la utambuzi wa vipande vya ardhi katika maeneo, watalipwa wajumbe wanne (4) pekee, na kila mjumbe atapaswa kuwa ameambatana na mtaalam wa utambuzi.***

Prepared by ILMIS Development Team.
Last Update 29 March 2022.