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## Training Site for Surveyor and Project Manager

Welcome to the training site for surveyors and project managers. This site is developed under collaboration between Humanitarian OpenStreetMap Team (HOT) and Pacific Disaster Center (PDC) in the event of capacity development for data collection using OpenStreetMap to support InAWARE, a disaster management platform developed by Pacific Disaster Center (PDC).

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# Data Collection Methodology

## Objectives:

- Understand Data Collection Preparation
- Understand Data Collection Workflow
- Knowing Tools that used in Data Collection
- Understand How to Collect Data in the Field

Data collecting or commonly known as field survey is an important aspect in mapping activity especially in disaster management. Even though technology advancement nowadays such as aerial and satellite imagery is capable to help us to map remotely, there are some information that only can get by going to the mapping area. Therefore, field survey is the only option which can help us to get some specific information that we need.

When doing field survey, you need to know the proper methodology to do it. This is an important thing as it will help you to complete your field survey efficiently and effectively. Moreover, a good data collecting will gives you good output both from quality and quantity aspect. In this chapter, you will learn about the methodology and workflow when doing field survey particularly in HOT-PDC InAWARE project.

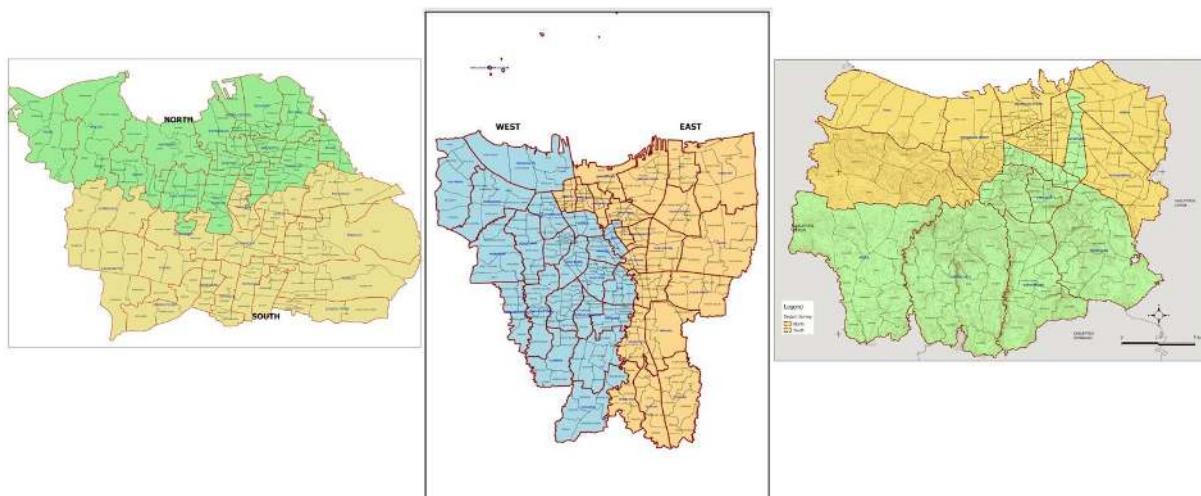
## I. Data Collecting Preparation

Before doing mapping activity for HOT-PDC InAWARE, *Humanitarian OpenStreetMap Team* (HOT) Indonesia have made organized and systematic plan. This needs to be done so the mapping activity can be run efficiently and effectively and also to maintain data quality. There are some preparation activities before going to the field as follows:

- Divide Survey Area and Survey Team

Dividing survey area means to narrow the focus for each survey team whereas they will responsible for certain areas, as explained further in **Survey Methodology for OpenStreetMap** module, that lead by 2 (two) *Mapping Supervisor* who is responsible for all mapping areas in his/her zone. Moreover, determining field survey team need to consider both technical aspect and local knowledge of the mapping area for each member of the team.

The importance of technical aspect such as have good understanding to use the survey tools while local knowledge such as know the mapping area well and can speak in local language will become a benefit that can help them to get information from people and community in their survey area.



Divided Area in HOT PDC InAWARE Project Cities

- Manage The Survey Permit Letter

In an activity that involves multi-stakeholder and organizations and has wider scope of mapping area, survey permit letter is an important thing to have before going to the field. This letter usually issued by Local Government or Local Disaster Management Agency (BPBD) and relatively more trusted by the local people rather than permit letter from HOT. Therefore, you can get the information easily from the people and local community if you bring the permit letter when doing field survey because they already know and understand your mission coming to their area.

- **Determine Mapping Objects**

Before doing field survey, it would be better if you discuss with the local government about what information and object they need to be collected in their area. Thus, this will lead you to determine what objects that should become priority to be mapped. Each city / mapping area will have their own identity in many aspects such as topography, types of hazard, and social-economic. Those aspects will be considered to determine priority objects and information that need to be collected in the field. For instance, place of worship, HOT only mapped big mosque and church in DKI Jakarta while in Semarang, any mosque and church have to be mapped regardless its size. According to local disaster management agency in DKI Jakarta, if the flood happened, they only use big mosque as evacuation shelter because it can accommodate many affected people while Semarang use all of their place of worship including mosque and musala (small mosque) as evacuation shelter because there always small scale hazard happen and they do not need a big mosque as a shelter for affected people but instead they use any mosque closest to hazard area.

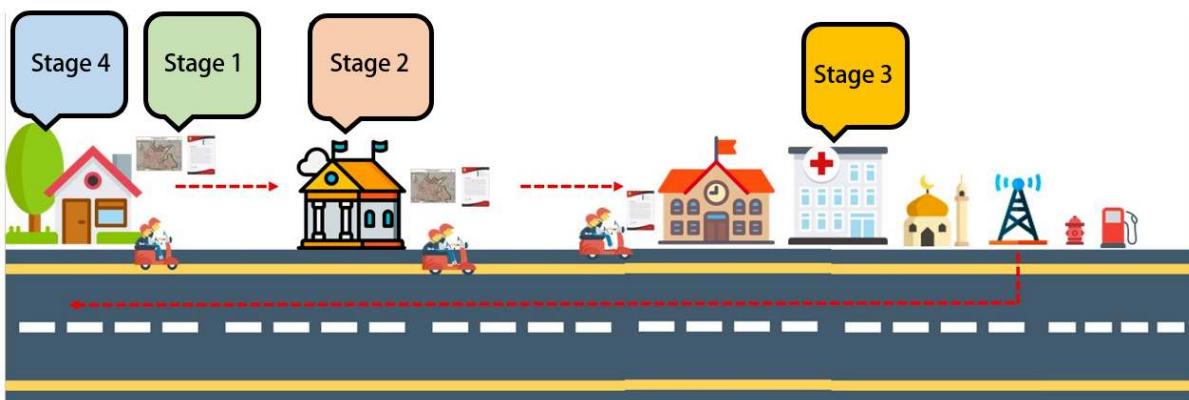
Generally, the purpose to determine priority mapping objects based on need of the local government is to make sure the output of this mapping can be used for them and also local people and communities. Thus, it will make the output become more sustainable.

- **Mapathon and Survey Team Training**

Survey team training is an internal activity where *Quality Assurance* and *Data Entry* will be taught about technical things that they have to know during the mapping activity such as using survey application in their smartphone, using survey map, upload survey data to the server, input survey data into OSM using JOSM, validate the survey data, etc. Moreover, conducting mapathon, a remote mapping activity, with local universities could help to complete the baseline data such as roads and building footprint before the survey teams hit the field.

## II. Data Collection Workflow

Field survey activity does not begin in mapping area, instead it started from *basecamp* until come back to *basecamp* before doing data input. The picture below shows the data collection workflow:



Data Collection Workflow

- **Stage 1**

The survey team, consisted with 2 (two) *Data Entry* riding a motorbike from basecamp to their mapping area village office. They bring **A Survey Permit Letter** which issued by the BPBD and **Survey Map** with them.

- **Stage 2**

First stop is the village office. Then, they will meet with the village office representative to **asking permission** doing field survey in the village for couple days ahead. They also discuss with the representative to **update the village boundary administration** up to sub-village level (RW) using the survey map.

- **Stage 3**

After finished updating village boundary, the survey team continue their field survey to **collect and map** all the priority objects and critical infrastructures in the village. They use survey application in their *smartphone* to collect the information for the objects. The survey team will be doing this activity for 2-4 days in one village.

- **Stage 4**

After they finished, they have to **upload** their survey data into the server (ona.io) then back to the office to **input all field survey data** using JOSM and *upload* them to the *OpenStreetMap*.

The next step is *Quality Assurance* (QA) will *download* the data and check its quality based on topology and information (tag). After that, the Mapping Supervisor will re-check the validated data from Quality Assurance. Therefore, the data quality keep maintained before re-upload back to the *OpenStreetMap* and can be used by other users. The material and explanation related to OpenStreetMap data quality assurance will explained further in other modules.

### **III. Data collection Tools**

When doing field survey, the survey team need to know all the tools that they use in the field. Availability of the tools is a vital factor that can decide the field survey process and output. These are the tools that we use when doing field survey in the field:

- **Smartphone**

This is the most important tools when doing field survey. Please note when choosing smartphones that will be used, you need to see its specification such as storage capacity, RAM capacity, GPS location service and more importantly its system has to be an Android. Moreover application that need to be installed such as *OpenMapKit*, *ODK Collect* dan *OSM Tracker*.

- **Power Bank**

This tools also support tools in field survey activity. When doing field survey, the team always activate GPS location and internet connection in their *Smartphone*. Therefore the battery capacity will decreasing fast. Power bank is a solution for the problem and make sure the survey team can finish their survey without run of battery problem.

- **Stationery**

This tool will help the survey team to write any information in the field. Moreover, it will help them to draw administration boundary of their mapping village on survey map. The stationery such as color pen, ruler, and notes.

- **Survey Map**

Survey map can help the survey team to identify their mapping area. Thus, it used as a media to update boundary administration of the mapping area. How to make a map for field survey explained further in **Make Survey Map using QGIS** module.

- **Survey Permit Letter**

As mentioned before, the survey permit letter is a vital thing to have before doing field survey. This letter should be issued by local government such as village office or local disaster management agency (BPBD) so could be help the survey team to asking permission and communicate with the local people and get the information that need to be collected in the field.

- **GPS**

GPS is an alternative tool if your smartphone has trouble and can not be used to collecting data. Moreover, GPS can be used as a validation tool to re-check the data from the field.

#### IV. Field Data Collection

##### 1. Infrastructure Data Collection

When doing data collection in the field, the survey team have to use *android smartphone* which has installed applications as follows:

- *ODK Collect*

This application is used to gathering information of objects that the survey team collection in the field. You won't need to print dozen of paper for survey form. Moreover, this application allows you to take pictures and coordinate location of your object.

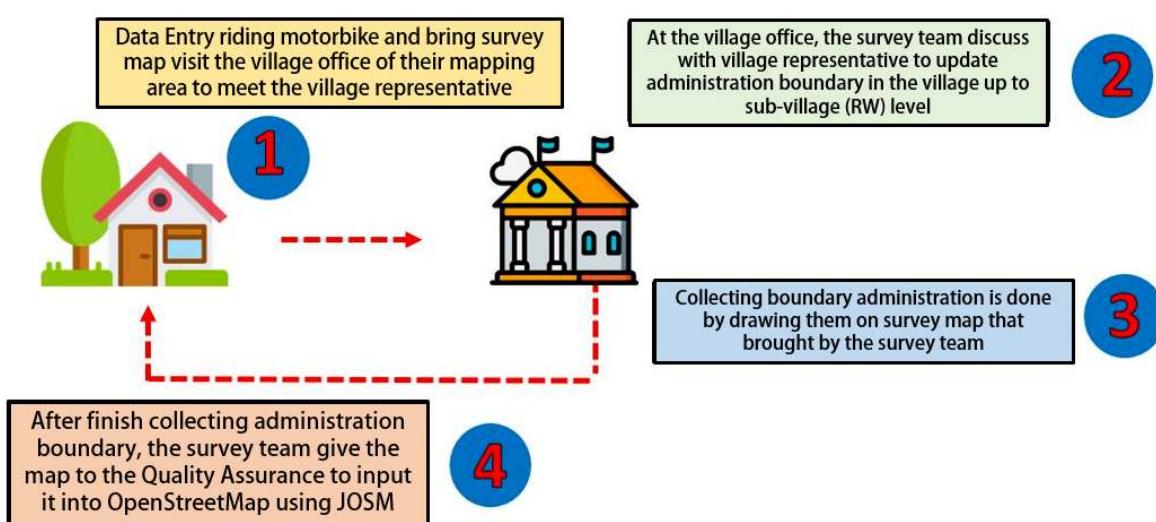
- *OpenMapKit (OMK)*

OMK is an extension application for *ODK Collect* where allow the survey team to give information based on OpenStreetMap tag standard. This application also can allow you to add nodes of object on satellite imagery that have been added before in OMK. Those information will be saved into ODK Collect and later being uploaded into server such as *ona.io* or others.

- *OSMTracker*

This application help the survey team to record field survey progress and coverage of their mapping area. OSMTracker also has function to record survey track similar with conventional GPS and show it on OpenStreetMap background map. OSM Tracker also can take pictures, notes, or short video to mark your objects.

Overall, collecting data for infrastructure is done by tracking all area of the team survey village are and collect all priority objects and its essential information in the survey area both by visual assessment and interact with local people. After that, the field survey will be uploaded to *google drive folder* that has been made before by *Quality Assurance* and to *ona.io* server as a *backup* data if there is something happened with the data such as accidentally removed or deleted. Last step, input all the field survey data using JOSM. Below is a workflow for doing data collection for infrastructure:



Workflow of Infrastructure Data collection

Notes :

1. Infrastructure Data collection usually takes 2-4 days to be finished for 1 village.
2. Duration of field survey depends on area size and data density in the mapping area.

3. All field data survey MUST BE UPLOADED daily every day to ke google drive dan ona.io server and deleted in the smartphone after that. This need to be done to anticipate smartphone memory running of capacity and as a report to Quality Assurance who will be doing validation to the data.
4. If there is rejection from the local people, the survey team should ask help from local government or BPBD to escort them in the field.



### Documentation of Infrastructure Data Collection

#### 3. Administration Boundary Data Collection

Collecting administration boundary data is slightly different than infrastructure. If the infrastructure data is collected using *ODK Collect* and *OMK* application in *smartphone*, collecting administration boundary use survey map that made by *Mapping Supervisor*.

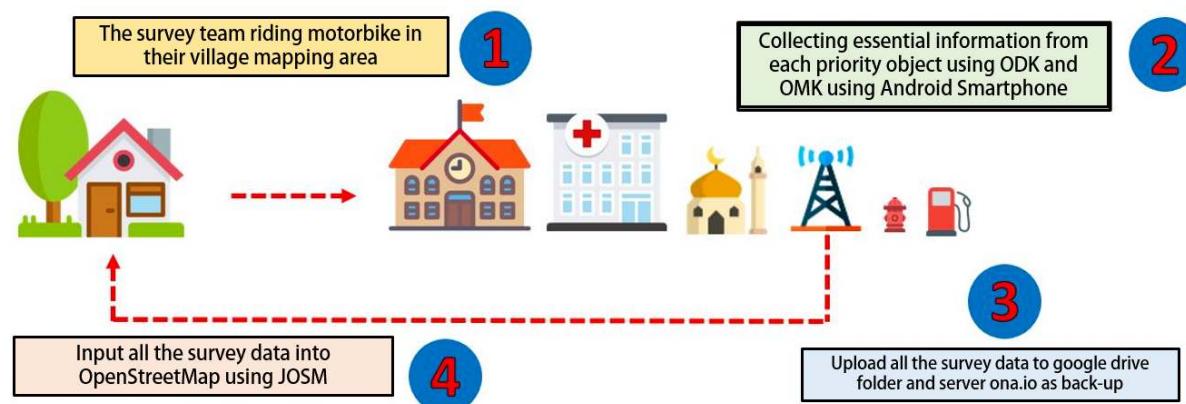
Collecting administration boundary need communication skill and personal approach to village representative and local people. Generally, collecting administration boundary is done by coming to the village office with bring survey map and discuss it with village representative up to sub-village (RW) boundary. The village representative review the survey map and help the team survey by drawing the administration boundary on the map.



#### Documentation of Administration Boundary Data Collection

After the administration boundary have been updated, the survey team give the map survey to the *Quality Assurance* to input into *OpenStreetMap* using JOSM. For further explanation about how to input administration boundary using JOSM can be seen in **Drawing Administration Boundary using JOSM** module.

The picture below describes workflow about collecting data for administration boundary:



#### Workflow of Administration Boundary Data collection

**Notes :** Collecting data of administration boundary have to involve village representative. If the village representative does not know the boundary, please ask the local head of mapping area (RW) to come to the village office. If the local head of mapping area can not come to the village office, the survey team HAVE TO visit his/her house and bring the survey map to discuss about the administration boundary in their area. If the local head refuse to help, the survey team should ask local disaster management agency (BPBD) to help them collecting administration boundary in that area.

#### SUMMARY

You have finished workflow and methodology of data collection when doing the field survey. Knowing all the steps and methodology, you can do the field survey effectively and efficiently so the result can get as expected and have good quality and quantity based on *OpenStreetMap* standard.

# Getting started with OpenStreetMap

## Objective:

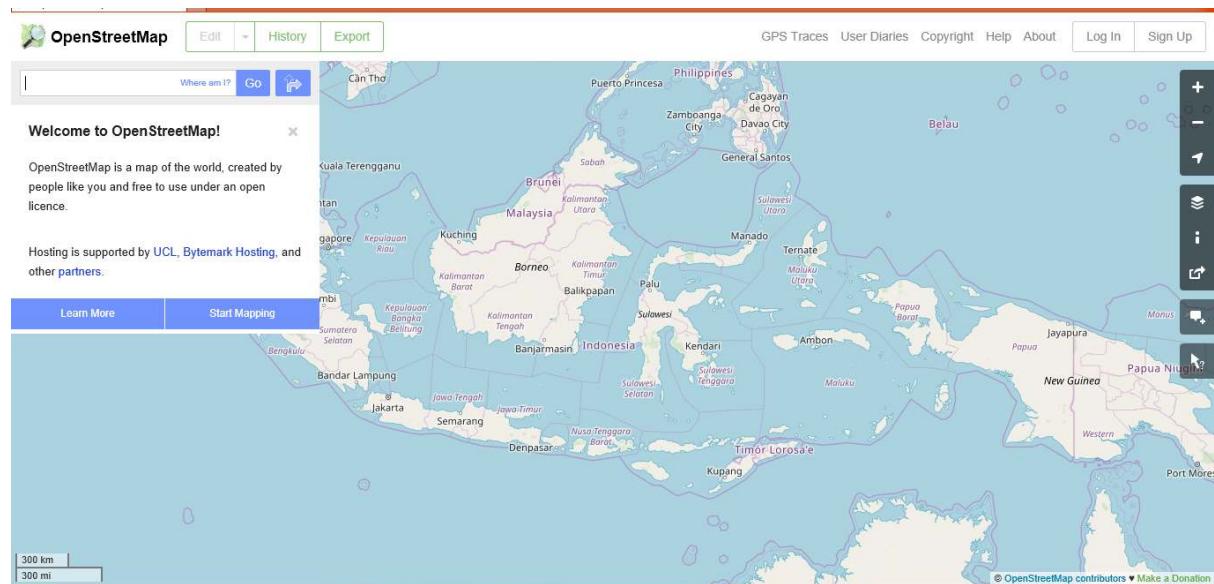
- To be able to operate and navigate the OpenStreetMap website
- To be able to see object information in OpenStreetMap
- To be able to create share link in OpenStreetMap
- To be able to save images from OpenStreetMap
- To be able to create user account in OpenStreetMap
- To be able to understand the basic concept of attribute in OpenStreetMap
- To be able to understand history in OpenStreetMap

After you understand the basic of OpenStreetMap in the previous module, you can immediately start using OpenStreetMap. In this module you will start to get to know the OpenStreetMap site, create an OSM account, and find out the menu buttons and how to use them.

## I. Visit the OpenStreetMap website

To be able to visit OpenStreetMap (OSM) site, make sure your computer is connected to the internet network. The steps to visit OpenStreetMap site are as follows:

- Open the web browser in your computer such as **Mozilla Firefox, Google Chrome, Internet Explorer, Safari**, etc.
- Type [www.openstreetmap.org](http://www.openstreetmap.org) in the address bar at the top of the window and press Enter.
- When the page has finished loading, you should see the page below:

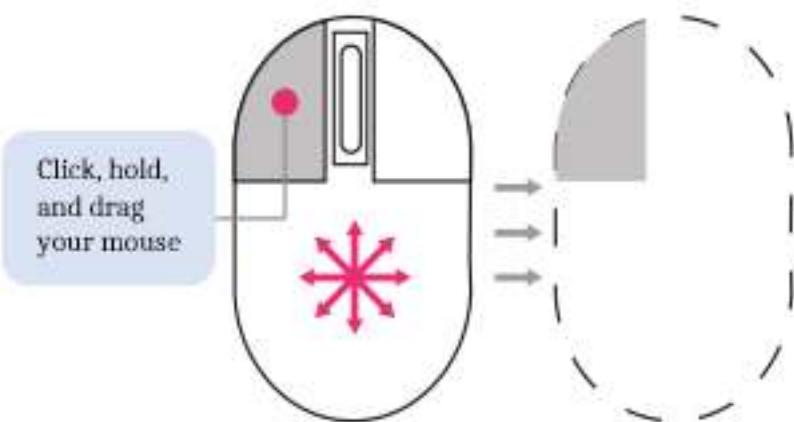


OpenStreetMap website ([openstreetmap.org](http://openstreetmap.org))

## II. Navigate the map

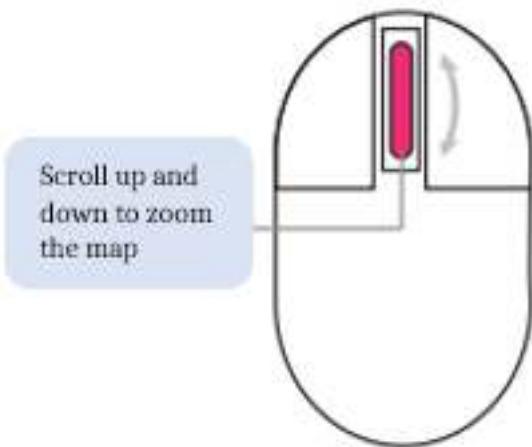
In the main view of the OpenStreetMap website, you will see a large map in it. You must be able to navigate the map so you can go to a location that you want. Here are the ways to navigate the map on OpenStreetMap:

- Use the left mouse to drag the map view. Left-click on your mouse, then hold and drag the map to the location that you want. If you don't have a mouse, you can press and hold the right touchpad and then move the cursor.



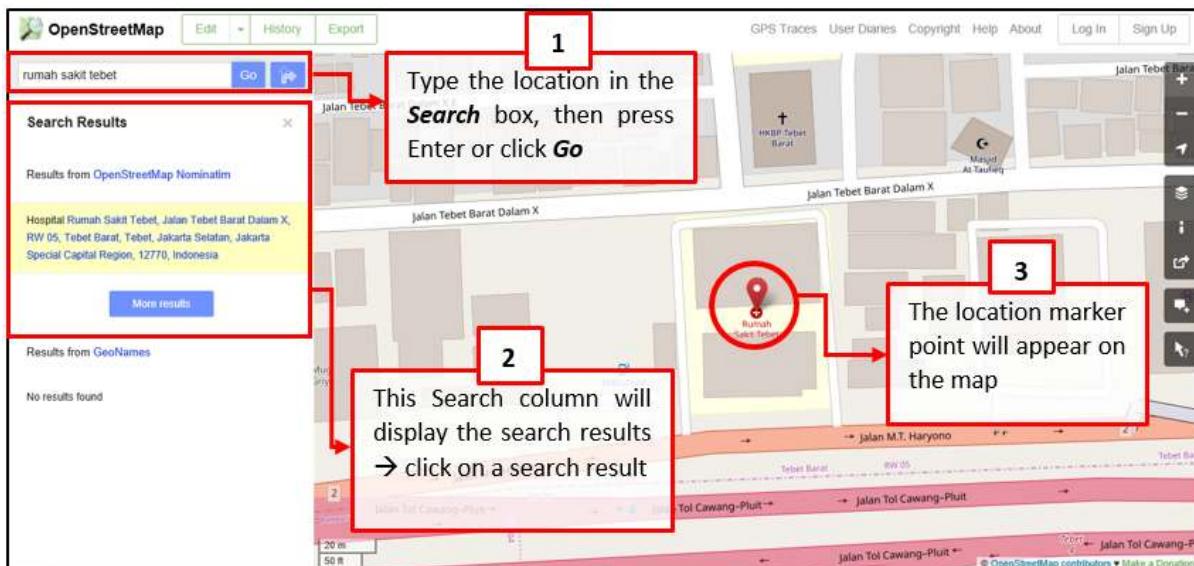
#### How to drag the map view

- Use (+) and (-) button in the upper right corner of the map to zoom in and zoom out the map view. You also can use your mouse scroll-wheel to zoom your map. Scroll your mouse up to zoom in, while scroll down to zoom out.



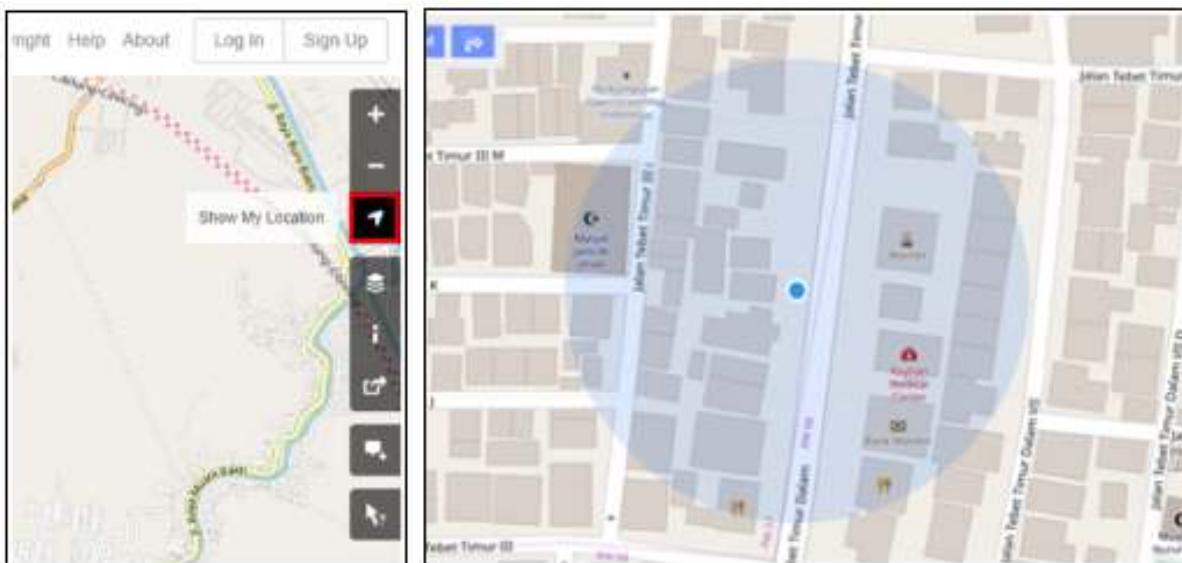
#### How to zoom in and out the map view

- To search the location based on the name, type the location name on the **Search** box in the upper left side on the screen. You can type it in the search column, then press **Enter** or click **Go**. After that a **Search Results** box will appear below the search column, then you can choose and click on the search. The map will automatically move to the location you chose.



#### Steps to find location using Search box

- To display your current location, you can go to the map panel to the right of the map and click **Show My Location** button. Then, the map will automatically display your current location point (blue dot). Make sure to enable the GPS on your laptop or computer to allow OSM to get your current location.



The display of Show My Location feature

### III. Change different style options for the map

OpenStreetMap contains geographic data from all over the world. Although stored in one database, the data can be displayed in several styles. The steps to change style map in OSM are as follows:

- Click **Layers** button in the right panel on the map.



The Layers button to change background layer

OSM has four types of layers with different functions, namely:

- *Standard*: This layer shows all the objects on the OSM map.



Standard Layer

- *Cycle Map* : This layer emphasizes cycling routes and pedestrian roads.



### Cycle Map layer

- **Transport Map:** This layer emphasizes transportation routes on the map such as highways and bus stop.



### Transport Map Layer

- **Humanitarian:** This layer emphasizes important objects or amenities on the map such as school, hospital, etc.

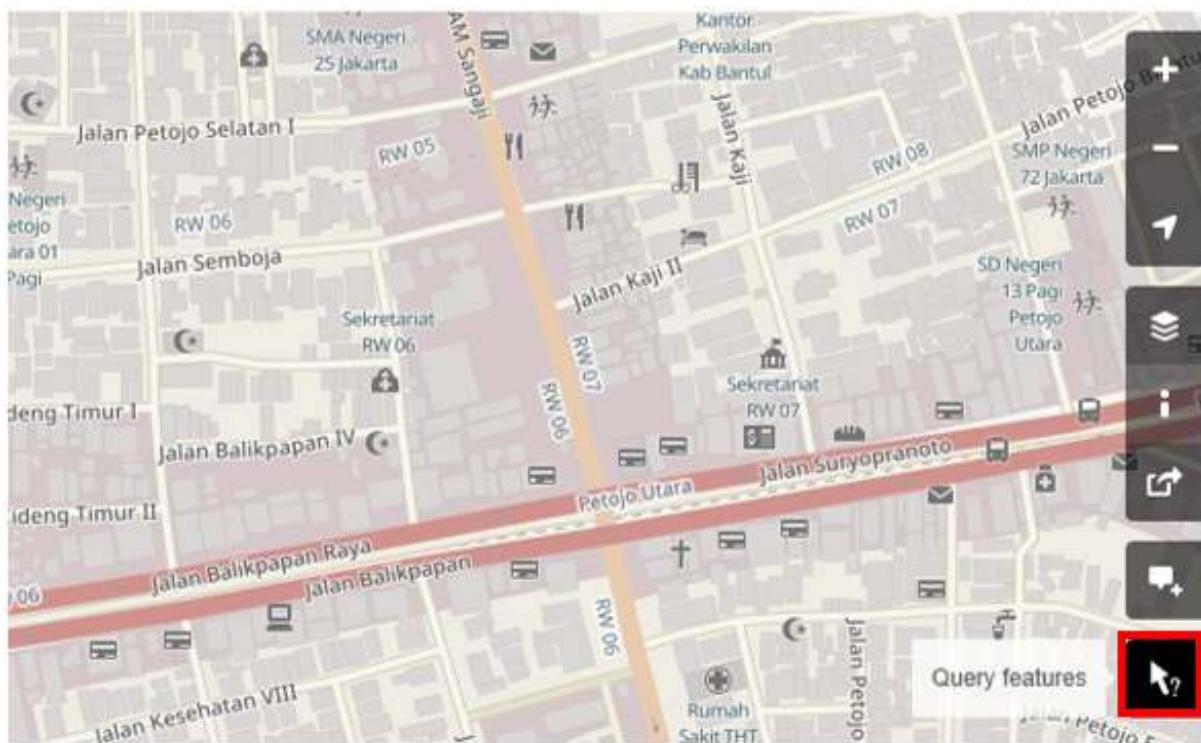


### Humanitarian Layer

## IV. See the object information in OpenStreetMap

In the OpenStreetMap page, besides see the current location and navigate the map, you also can see the feature information using Query Features. The steps to use Query Features are below:

- Click on **Query Features** button on the panel in the right. After you clicked it, you should see the question mark on your cursor. This indicates that the query features function is activated.



#### Query Features button

- Now you can choose an object or location that you want to identify. For this example, we click on a governmental office building (Dinas Kesehatan) in Jakarta.
- You should see a box appears in left corner that displays **Nearby Features** and **Enclosing Features** options. Nearby Features shows the description of any object that is closest to the location of your chosen point, while Enclosing features shows all the object information that have a close range location with your chosen point. Try to click one feature in the Nearby Features, click **Governmental office Dinas Kesehatan** for this example.

#### Nearby features dan Enclosing features in Query Features

- After you clicked it, the information detail about Dinas Kesehatan building will appear in the left box. The information displayed is a tag or object attribute regarding general information objects such as object names, addresses, building levels, and others.

Way: 494063985

#otosm-project-2751 #missingmaps  
#PDCJakarta

Edited over 1 year ago by Akrimullah  
Version #4 - Changeset #49684541

Tags

addr:city	DKI Jakarta
addr:full	Jalan kesehatan No.10
backup_generator	yes
building	government_office
building:condition	good
building:floor	ceramics
building:levels	8
building:roof	concrete
building:structure	confined_masonry
building:walls	glass

10 m  
30 ft

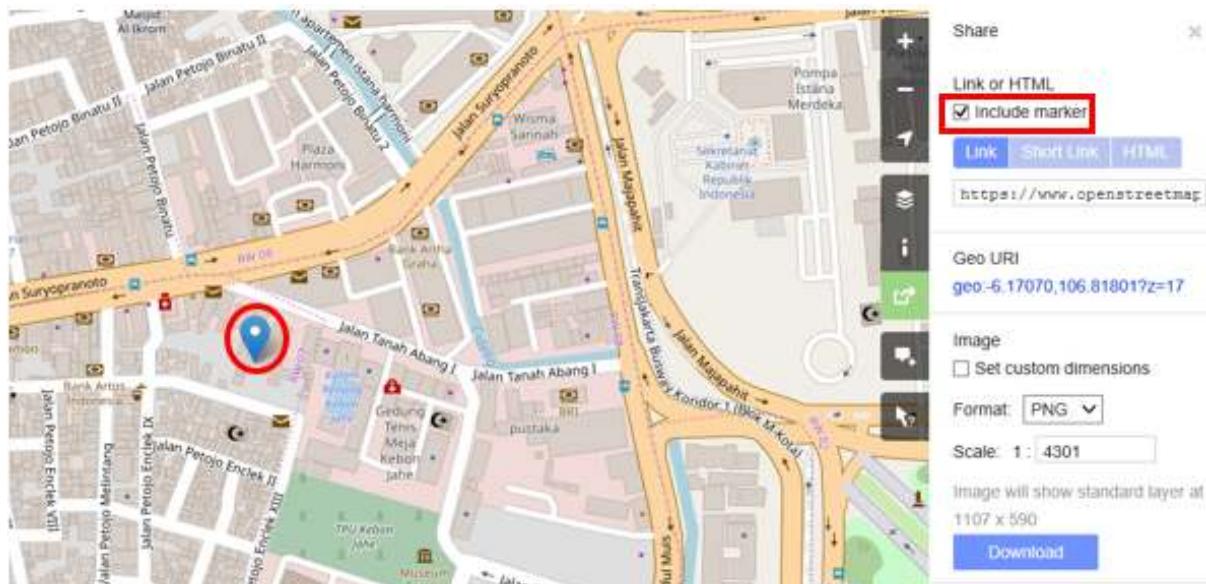
© OpenStreetMap contributors. Tiles style by Humanitarian OpenStreetMap Team hosted by OpenStreetMap France

## Query Features result

### V. Share with link in OpenStreetMap

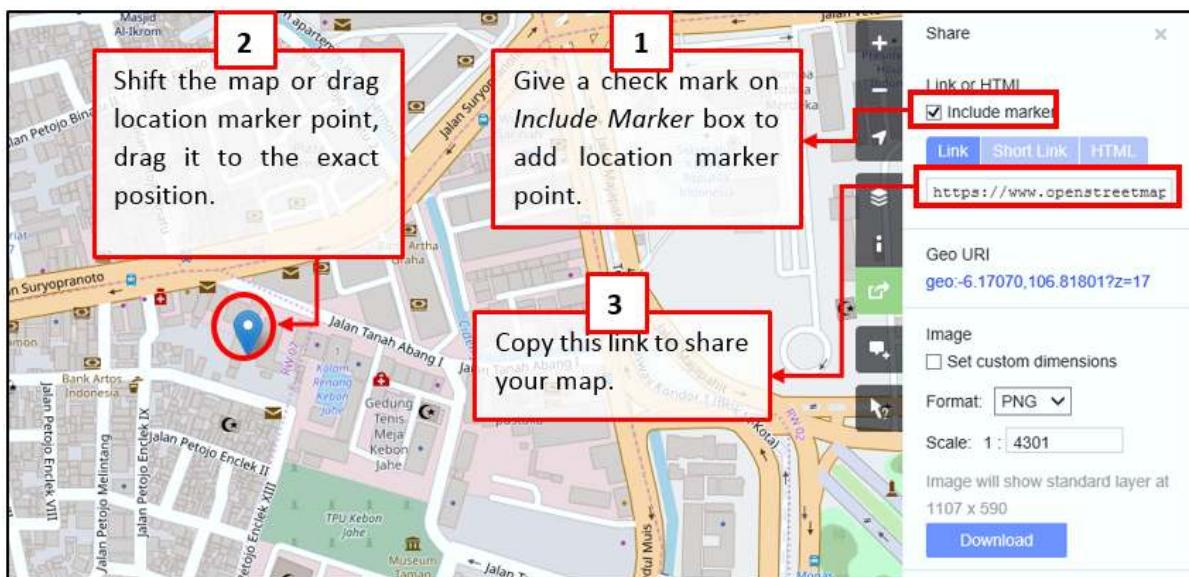
You can share links of your OpenStreetMap maps to others for various purposes, such as sharing the location of your current position with your colleagues and so on. To be able to share OpenStreetMap maps, the steps are as follows:

- Click the **Share** button on the right panel, then the Share column will appear.
- Check the **Include marker** to add the location marker point. You can move or drag the marker point to the desired location. Just click and hold the location marker then you drag to the desired location point. Another way is to shift the map so that the location marker is in the position you want.



## Add marker point

- Once the marker position has fixed, you can copy the link in the **Link** box and share the link according to your needs. You can also copy a shorter version of the link in the **Short Link** box or copy the HTML code in the **HTML** box.

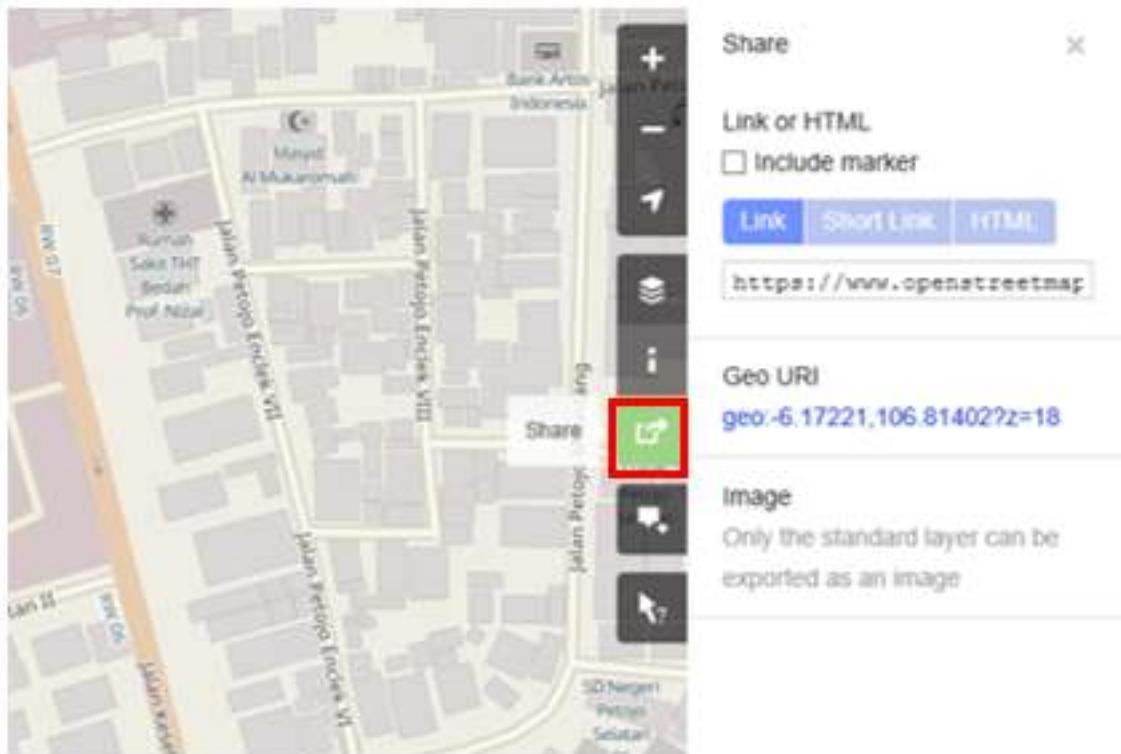


Share the link of the map in OpenStreetMap

## VI. Export map as an image

Besides changing the layer map, you also can export the map as an image and choose the various format file such as .png, .jpg, .svg, and .pdf. The steps to export the map are as follows:

- Click on the **Share** icon in the right of your map. Then the Share column will appear on the right side of your screen.



Share button to export the map

- After that, specify the area on the map that you want to export as an image. Give a check mark on the **Set custom dimensions** box in the **Image** section, then adjust the size of the box or adjust the scale in the **Scale** section.

Note : You can only export map as image if you set the Standard Layer view. If your map does not use the Standard Layer, you need to change it first on the Layers menu.

- You can choose the format of the export image in the **Format** dropdown menu. After that, click **Download** button to download the image and save the image to your folder location.

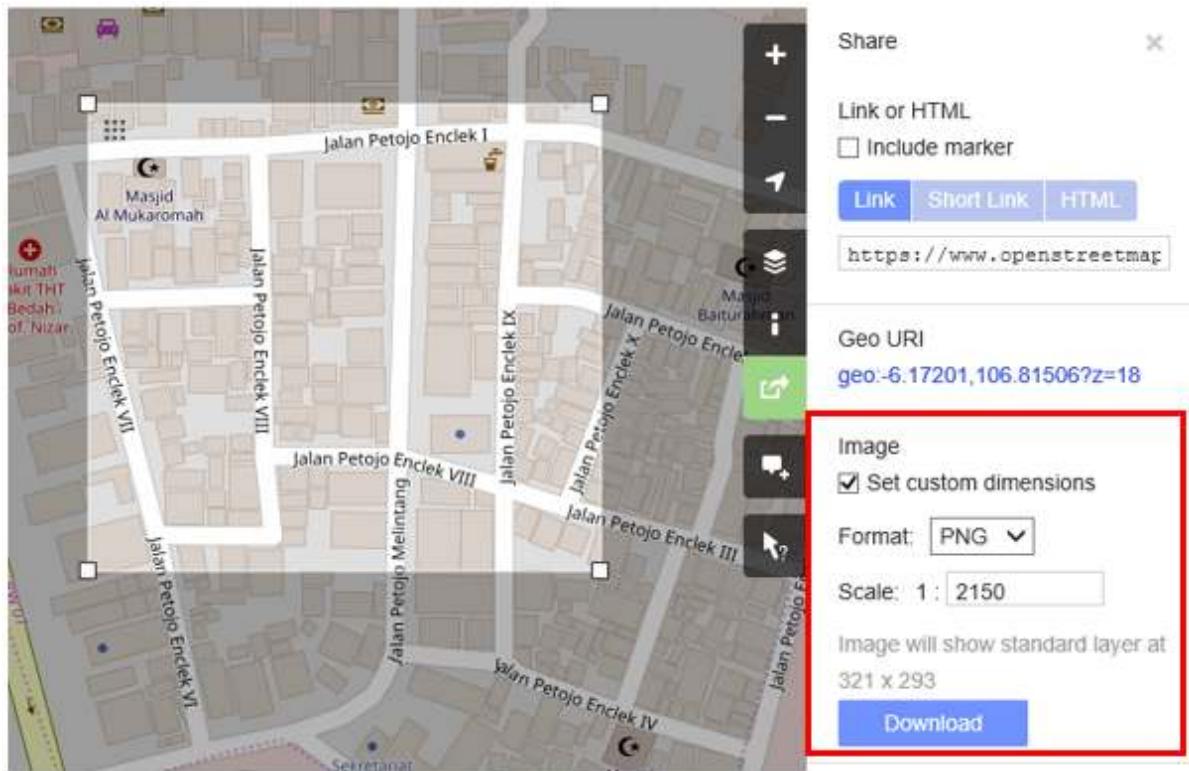
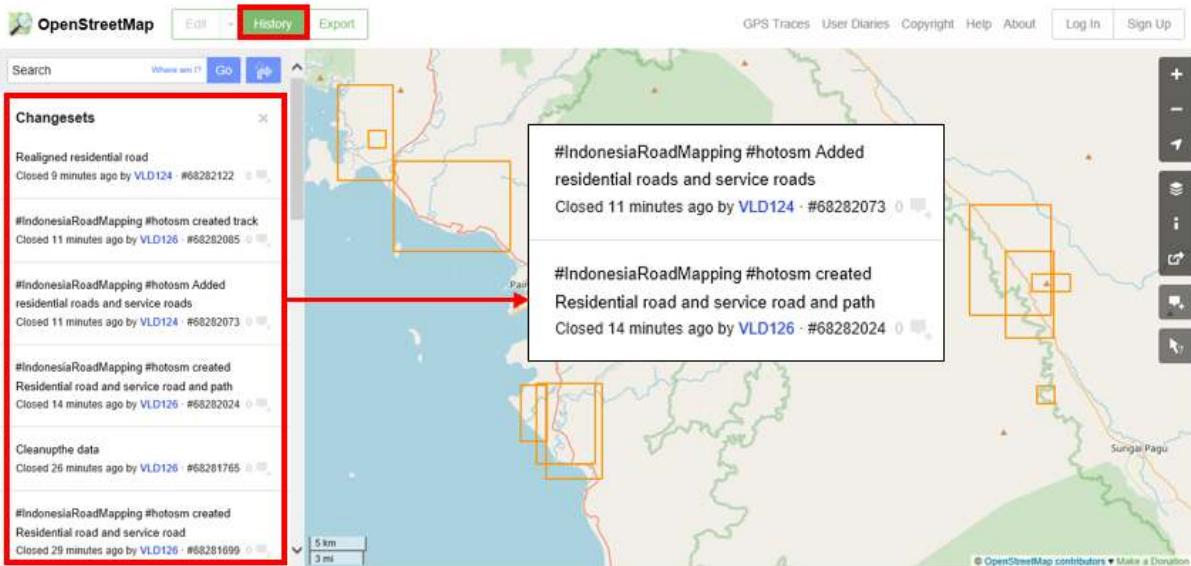


Image section to export the map

## VII. See the editing history in OpenStreetMap

When you edit objects or make changes to OpenStreetMap, you can see the editing history of objects in that area. The steps to see editing history are as follows:

- You can see the information by clicking on the **History** menu button on the top left of the map.
- After that, the **Changesets** column will appear at the bottom of the Search box and orange boxes will appear on the map that indicates which areas have just been edited. Changeset is a version of every change uploaded by OSM users. The information that we can see in the Changesets column is as follows:
  1. Changeset comment. It is recommended that you write the short comment when uploading changes or changeset. Comments can contain information about any changes that you made or specific hashtags.
  2. Upload time information.
  3. OSM username.
  4. Changeset number. This number is a unique number as the changeset identity.



### Changeset history in OpenStreetMap

- You can click one of the changeset on the changeset list or you can immediately select the orange box on the map. After you select one of the changeset, you will get details about the changeset.

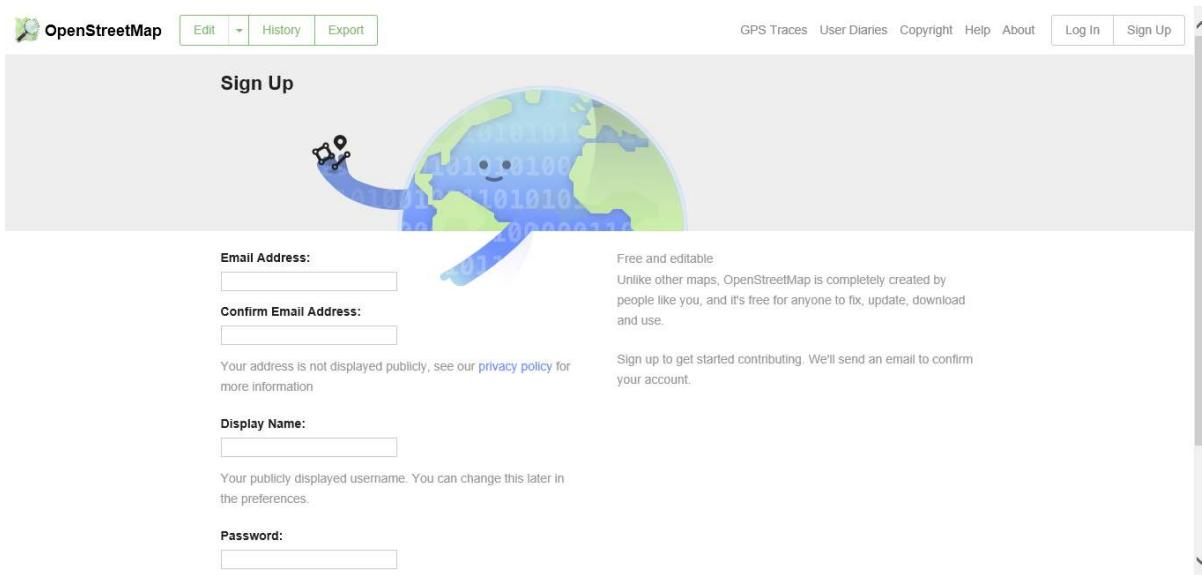
created_by	ID 2.3.0
imagery_used	DigitalGlobe Premium Imagery;OpenStreetMap GPS traces
locale	en-US

### The changeset details

## VIII. Create an OpenStreetMap Account

You have seen the display and main menus from the OpenStreetMap website, now you will learn how to create an account at OpenStreetMap and make the first contribution on OpenStreetMap. The steps are:

- Click **Sign Up** on the OpenStreetMap page. You should see a new page that look like this:

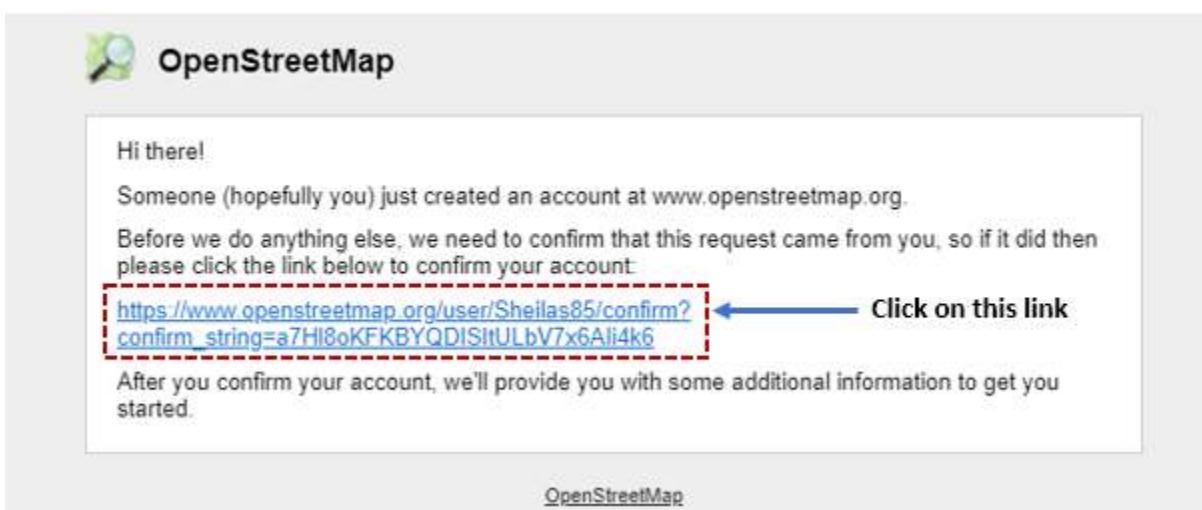


### Sign up page

- There are five boxes on this page that you need to fill in to register an account with OSM. Firstly, enter your **email address** in the first two boxes. You should enter the same email address in both boxes. Later, you will need to open your email to confirm your account with OpenStreetMap.
- In the third box, enter the username that you would like to have. If you try to use a simple name, it is likely that someone has already claimed the name. You will not be able to choose a username that someone else has chosen before, so pick the available name for your username.
- Enter a new password in the fourth and fifth boxes. You should enter the same password in both boxes and the password. You should not use an important one such as the password for your email. After you have completed all the boxes, click **Sign Up** at the bottom of the page.

At this stage, you have successfully registered yourself on the OpenStreetMap site, but your account is still not active yet. To activate it, the steps that must be taken are as follows:

- Open the new tab on your browser and open your email.
- If everything was successful with your registration, you should see an email from OpenStreetMap in your inbox.
- Open the email. Click on the link that is identified below:



### Notification of OSM registered account

- After that, a new tab of OSM page will appear in your browser. If everything went well, congratulations you already have an OSM account!

Note : If a problem occurs, a problem message will appear. Make sure that the email you entered is the same as in the first two boxes and your password. If the box for the user name is red then someone else has already used the name and you have to look for another name.

- On the OpenStreetMap page, click **Log In** in the upper right corner. Enter your OpenStreetMap username and password then press **Enter**. You should now be logged in and you will see your username on the top right of the OpenStreetMap site.

Congratulations! If you have done all the steps in this section, you already have an OpenStreetMap account and already know how to navigate the OpenStreetMap website.

## VIII. The basic concept of OpenStreetMap attribute

### 1. The attribute concept on object

When you draw an object as a point, line, or polygon in OSM, you still need to add information about the object such as object name, address, or other supporting information. This information will help other users when using OSM data for various purposes. Information provided by users on OSM objects is called an **attribute** or **tag**.

An attribute/tag is like a label that you can place on an object. For example, if you draw a square, this is only a square without any object information. But you can add attributes to describe that object, for example you draw a square that is a building; the name of the building is "Tebet Hospital"; 10 level building.

### 2. Components in OpenStreetMap attribute data

You can add as many attributes / tags as you want to an object. Attributes are stored as a pair of text, named **Key** and **Value**. **Key** is general information that explains the function of an object. In one key, it can consist of many values. For example schools, mosques, and hospitals have key=amenities (important facilities). Although the three objects have different types of functions, but all three objects have the same key. Whereas **Value** is information that more specifically explains the type of an object. Because this value describes specific information about an object, so that one type of value can only describe the type of the object itself. Not the same as a key that can explain general information about the object. In OpenStreetMap, an attribute is added by formatting a key-value pair that represents physical features on the ground, for example:

Key	Value
amenity	hospital
building	yes
building:levels	10
name	Rumah Sakit Tebet

The example of object attributes

In the example above, there are four kinds of key & value attributes, including object amenities for hospital (amenity = hospital), building objects (building = yes), building level 10 (building:levels = 10) and object name 'Tebet Hospital' (name = Tebet Hospital).

### 3. World and Indonesian OpenStreetMap tagging guidelines

For providing information on the object that you mapped, you need to ensure that the information is correct and suitable with OpenStreetMap rules. You need to make sure the reference is correct if you

want to describe features by tag. OpenStreetMap has provided a special Wikipedia page that you can refer to. You can see the page on the Map Features Wiki page at [https://wiki.openstreetmap.org/wiki/Map\\_Features](https://wiki.openstreetmap.org/wiki/Map_Features).

Name	Template	Description
3D	<code>{{Template:Map Features:3D}}</code>	The basic version (generic).
Aerialway	<code>{{Template:Map Features:aerialway}}</code>	The basic version (generic).

## Main page of Wiki Map Features and list of feature table

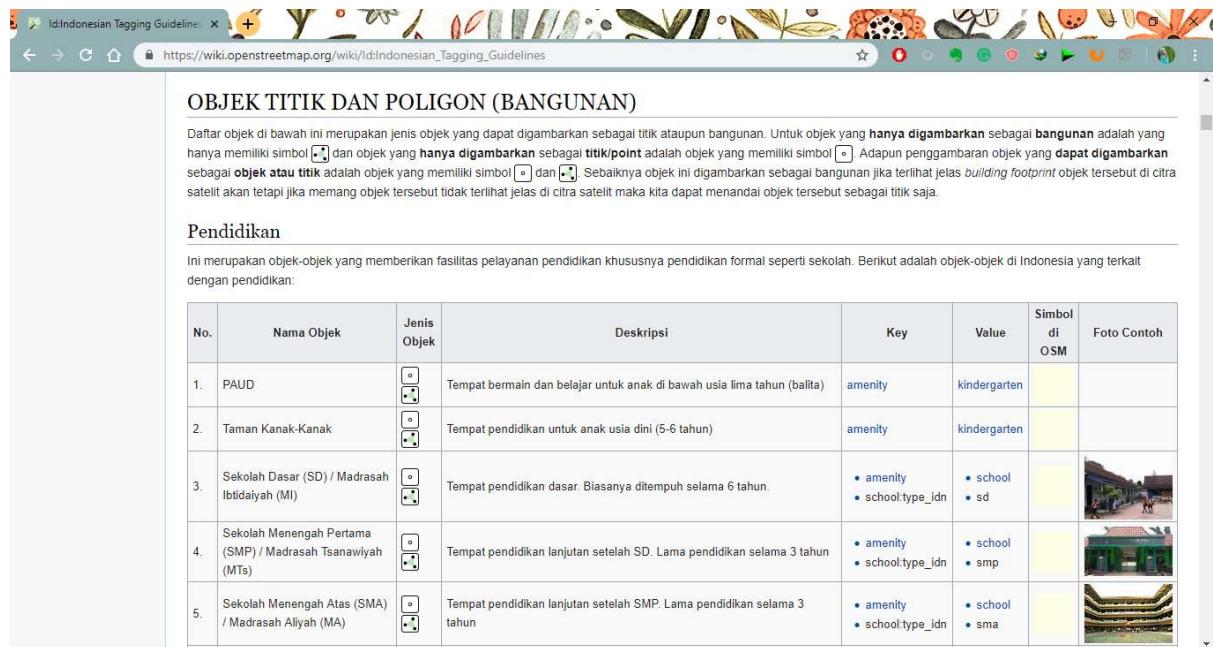
Pages from Map Features that contain information about objects in OpenStreetMap are considered not enough to help especially for specific objects that usually only exist in a certain country, including Indonesia. Sometimes users do not get enough information about the object tag and they end up skipping the object because of different names.

Usually objects in Indonesia have their own local names such as Posyandu (health service for children and infants), Pesantren (Islamic boarding school), and others. You do not need to be confused in searching for and memorizing attribute lists because you can see a list of object attributes that you can see on the Wikipedia page [https://wiki.openstreetmap.org/wiki/Id:Indonesian\\_Tagging\\_Guidelines](https://wiki.openstreetmap.org/wiki/Id:Indonesian_Tagging_Guidelines)

## Indonesia Wiki OSM Tagging Guideline

The Wikipedia page was specifically created to provide references to OSM objects attributes in Indonesia.

On that page, the objects will be divided into several categories which will be adapted from the objects in Indonesia.



The screenshot shows a web browser window with the title 'Id:Indonesian Tagging Guidelines'. The URL is [https://wiki.openstreetmap.org/wiki/Id:Indonesian\\_Tagging\\_Guidelines](https://wiki.openstreetmap.org/wiki/Id:Indonesian_Tagging_Guidelines). The page content is titled 'OBJEK TITIK DAN POLIGON (BANGUNAN)' and discusses the types of objects in Indonesia, specifically focusing on education facilities. It includes a table listing five types of schools with their OSM keys and values, and sample images of each type.

No.	Nama Objek	Jenis Objek	Deskripsi	Key	Value	Simbol di OSM	Foto Contoh
1.	PAUD		Tempat bermain dan belajar untuk anak di bawah usia lima tahun (balita)	amenity	kindergarten		
2.	Taman Kanak-Kanak		Tempat pendidikan untuk anak usia dini (5-6 tahun)	amenity	kindergarten		
3.	Sekolah Dasar (SD) / Madrasah Ibtidaiyah (MI)		Tempat pendidikan dasar. Biasanya ditempuh selama 6 tahun.	• amenity • school:type_idn	• school • sd		
4.	Sekolah Menengah Pertama (SMP) / Madrasah Tsanawiyah (MTs)		Tempat pendidikan lanjutan setelah SD. Lama pendidikan selama 3 tahun	• amenity • school:type_idn	• school • smp		
5.	Sekolah Menengah Atas (SMA) / Madrasah Aliyah (MA)		Tempat pendidikan lanjutan setelah SMP. Lama pendidikan selama 3 tahun	• amenity • school:type_idn	• school • sma		

## List of Indonesia object attributes

## SUMMARY

If you can follow and practice all the sections in this chapter, then you have succeeded in creating an OSM account, operating and navigating the OpenStreetMap website. In addition, you have also successfully shared OSM map images and shared links to other people. In the next chapter you will learn how to use Java OpenStreetMap (JOSM).

— title: Using ODK Collect weight: 2 —

#### Objective:

- Able to explain ODK Collect as one of the tools to collect infrastructure data
- Able to set the initial setup for ODK Collect
- Able to apply how to use ODK Collect for data collection survey

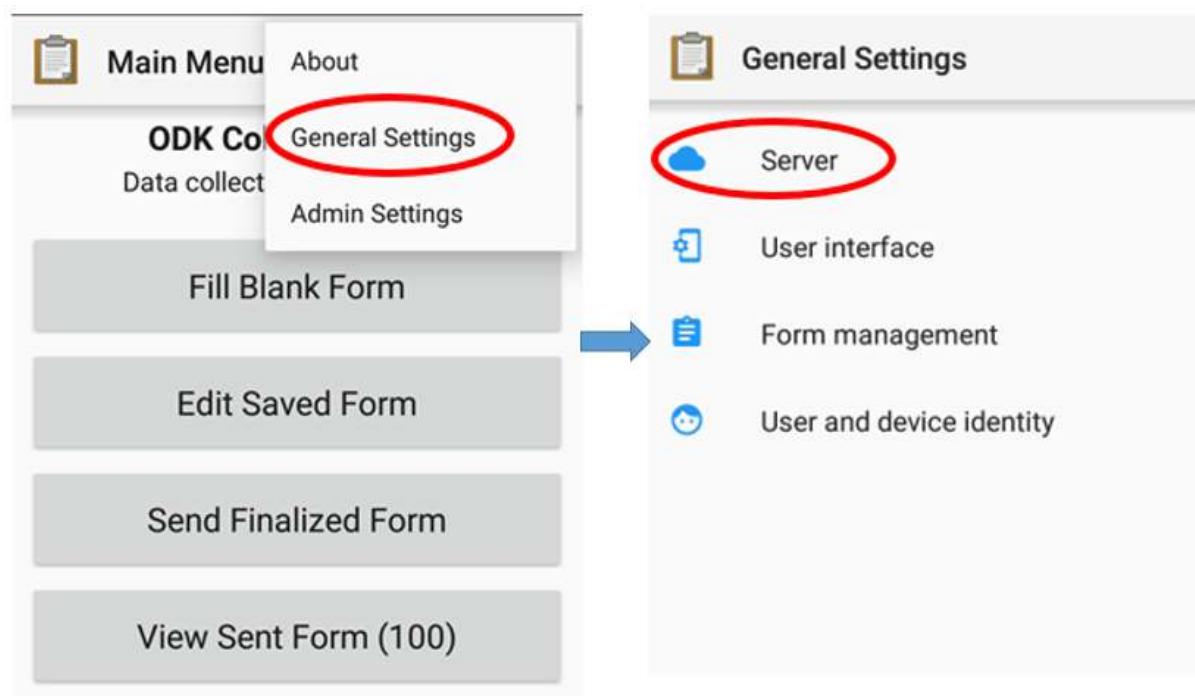
#### I. What is ODK Collect?

Open Data Kit Collect (ODK Collect) is a data collection application on Android. ODK Collect can replace form survey from paper to digital. Therefore, this application will help the mapping and data collection activities in the field which also allow to save the location and photo information at once.

#### II. Initial Setup for ODK Collect

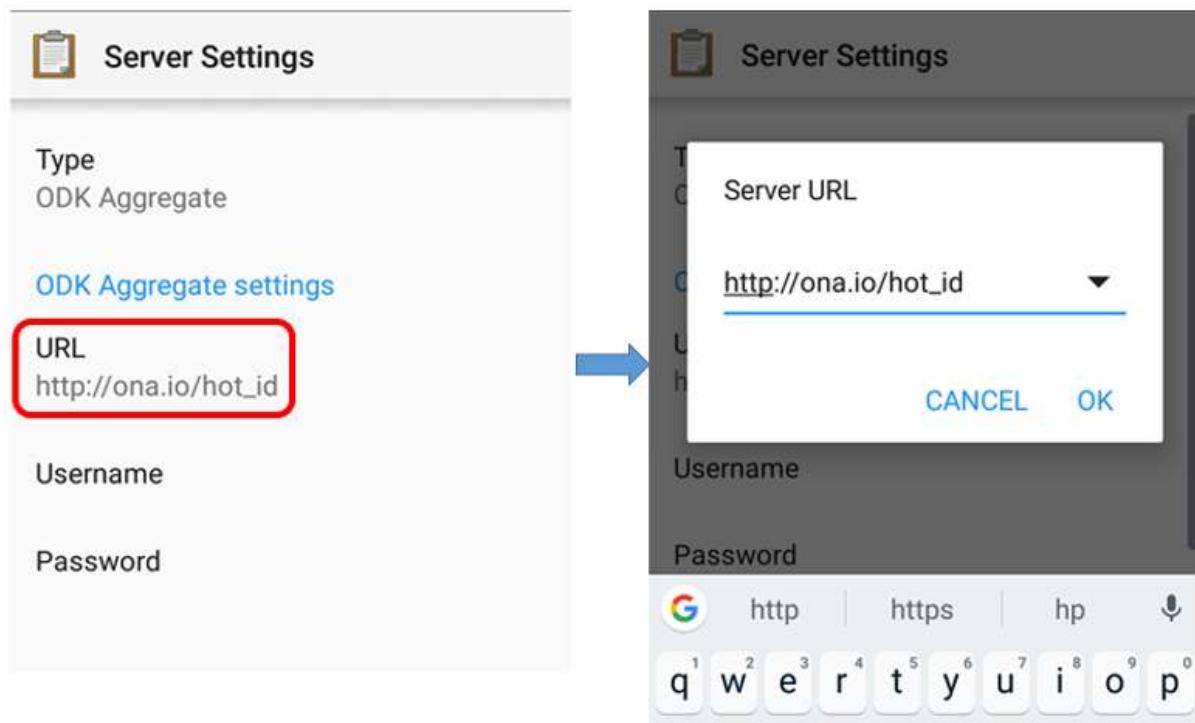
**1. Set the URL Server** To take the form survey from the server for the first time, the user needs to set the URL server. There are the steps:

- Open ODK Collect and press the three point button in the upper right corner, select **General Settings** → **Server**



Option to fill the URL address menu in ODK Collect

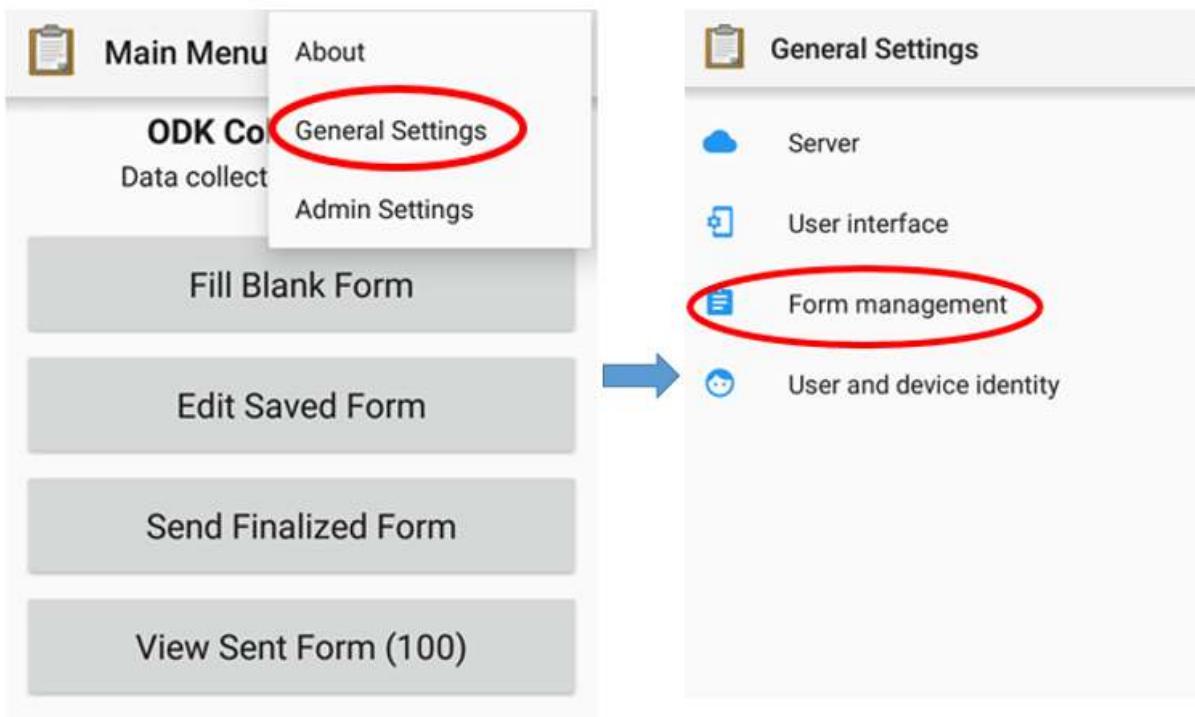
- Type the URL address server in **URL** → **OK**



Step to fill the URL address in ODK Collect

**2. Set the Image Size** In addition to the location point, you can also take a picture as additional information. You can set the picture resolution as desired. But, the picture resolution will also affect the amount of your phone memory or file which will be uploaded to the server later. It is recommended that you choose the smallest resolution of the image during initial setup. You can follow this step:

- Open ODK Collect and press the three point button in the upper right corner, select **General Settings** → **Form Management**.



Option menu to set image resolution

- Select **Image Size** then select the **Very Small (640px)** option.

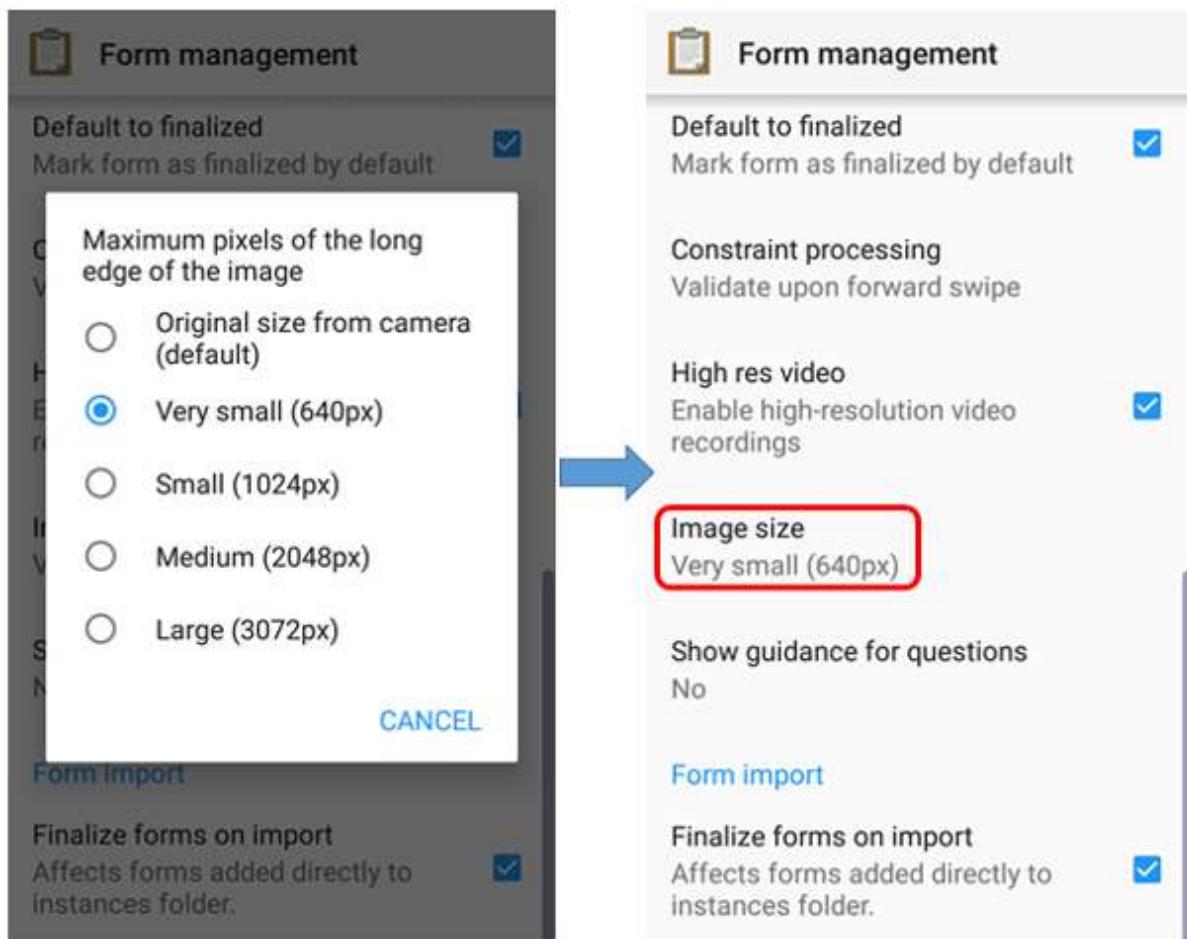
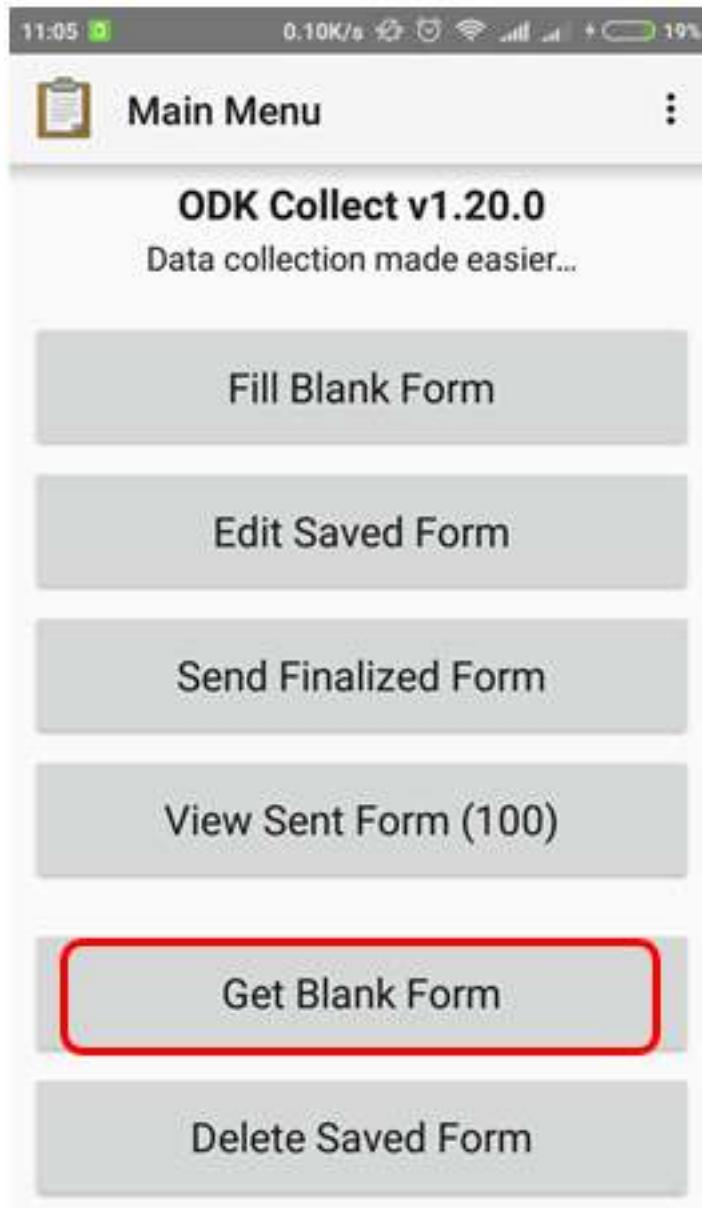


Image Size menu to set the image resolution

### III. ODK Collect basic operations

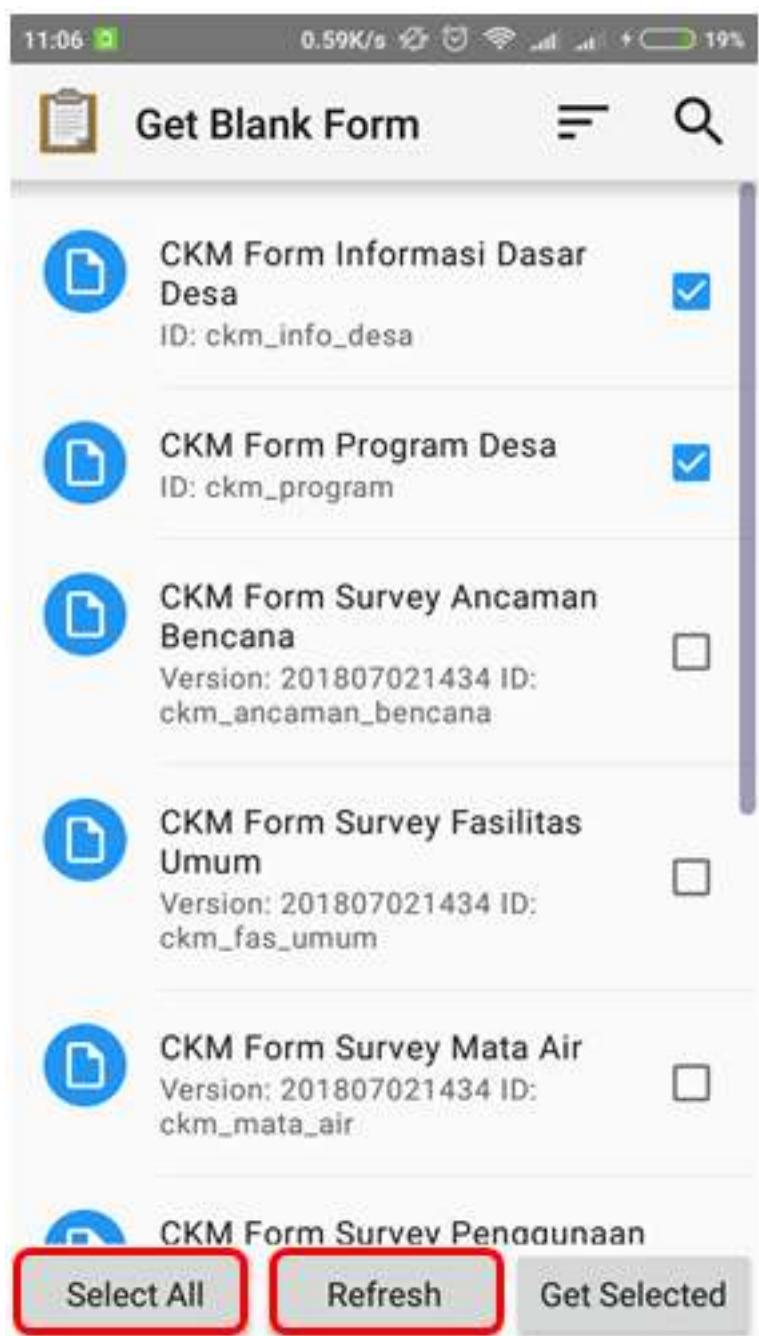
**1. How To Get a Blank Form Survey From Server** Before you fill-out the form survey that you made before, you need to download the blank survey form from specified server. For further explanation about create a survey form in ODK, you can learn in **Making Survey Form for ODK & OMK applications** module. You can follow this step to take a blank survey from the server:

- Press **Get Blank Form** and wait for the form to download from the server and make sure your internet is active.



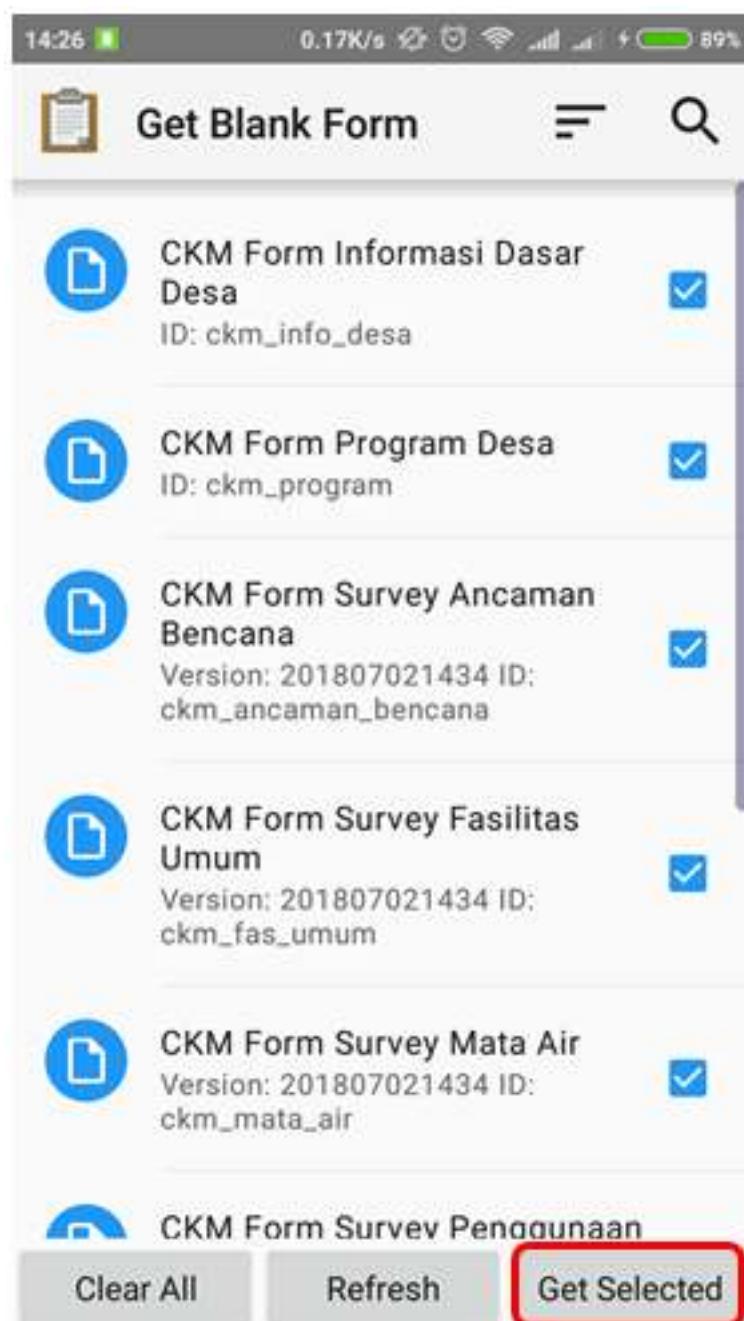
Get blank form options to take form on a server

- Select the available form, tick the check box or if you want to select all the form, you can **Select All**. If your form does not appear, can press **Refresh** to reload the page.



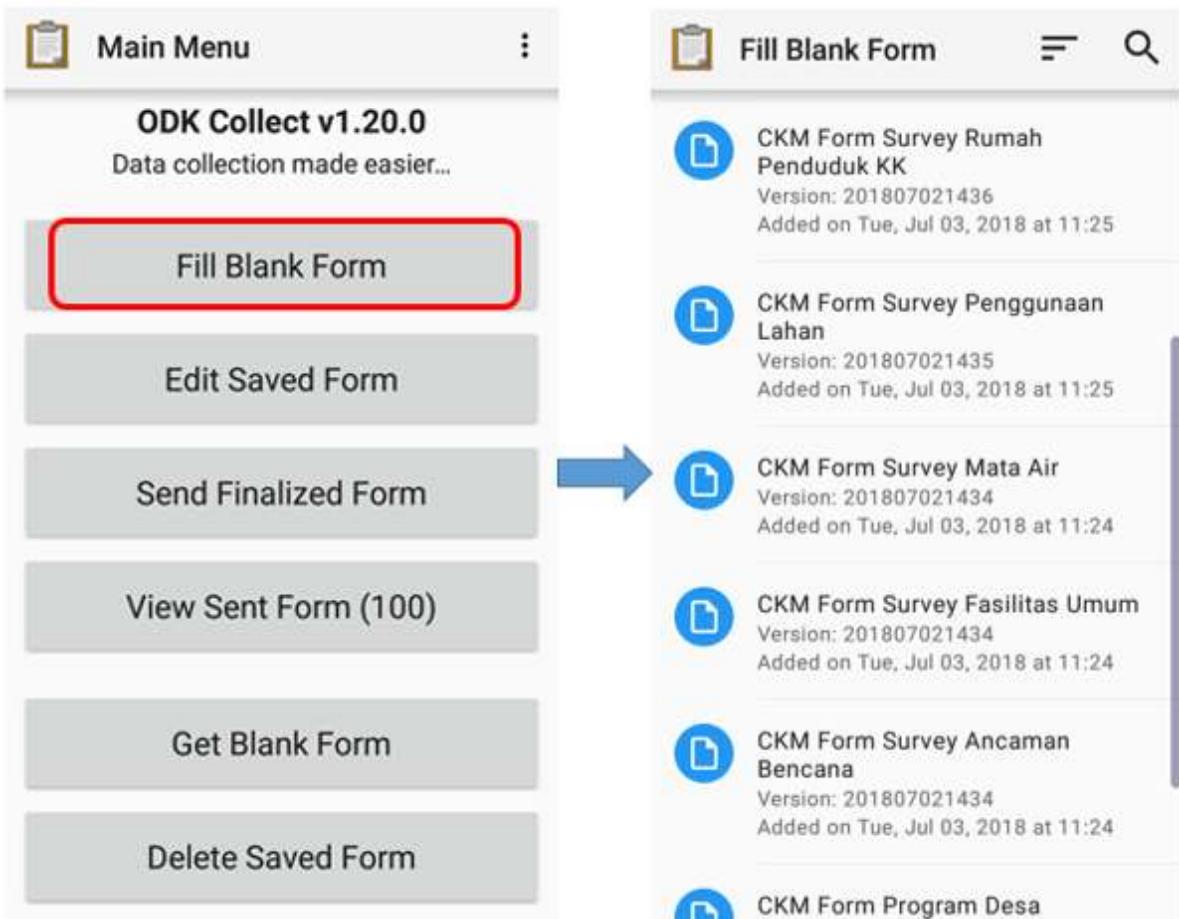
Page display on Get Blank Form menu

- After select the form, you can press **Get Selected** to download the selected form.



Page display on the Get Blank Form to get the survey form

2. **Fill the Survey Form** \* To fill the form, back to the start page and select **Fill Blank Form** menu. And then select one form blank that you want to fill in the survey form list.



Fill Blank Form options for filling out the survey form and blank survey form list

- Swipe to right or left on the screen to move the next/previous page. Questions that have a red star in the top left are required and you can not go to next question if the answer is empty.



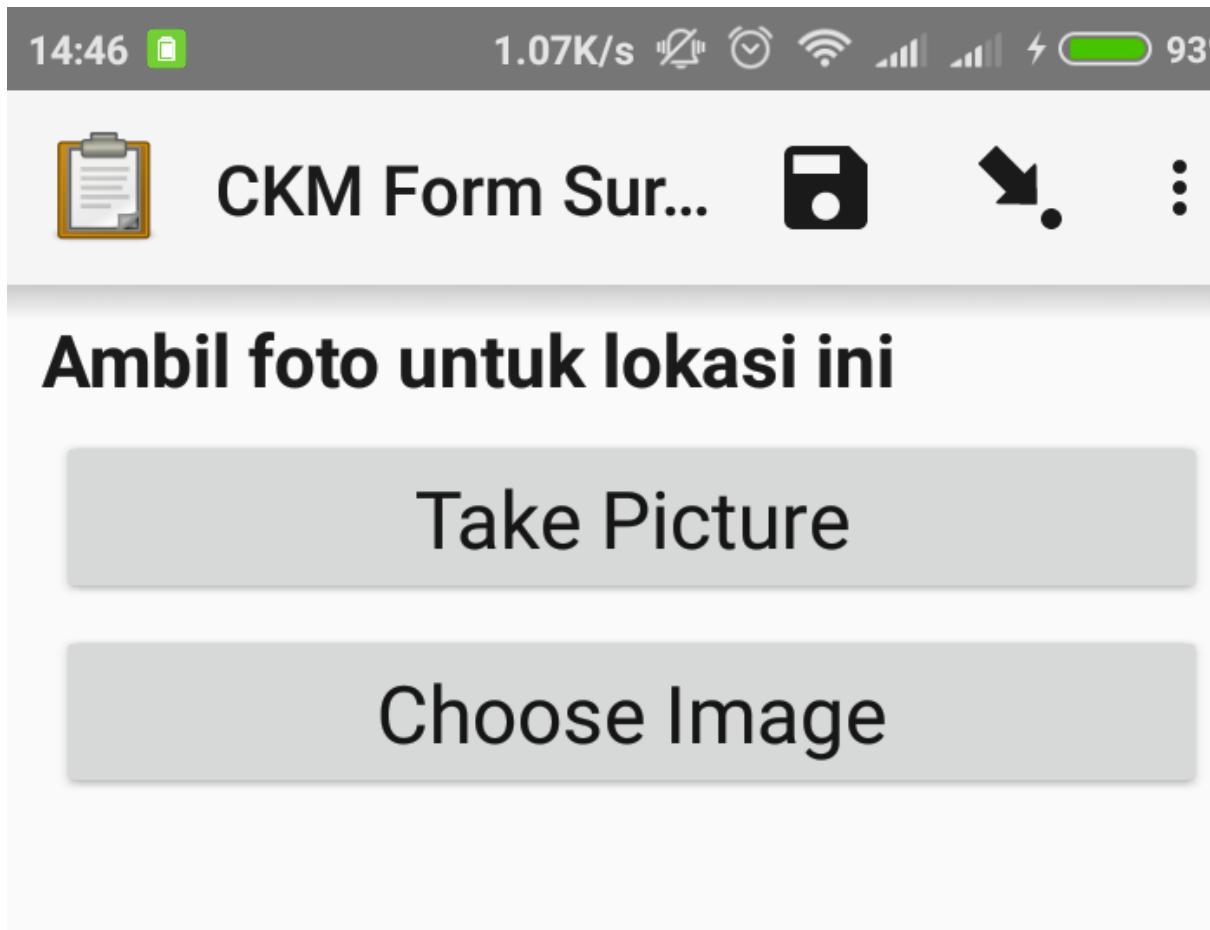
## \* Nomor PERANGKAT/ALAT GPS

Lihat pada perangkat GPS yang digunakan

- GPS 1
- GPS 2
- GPS 3
- GPS 4
- GPS 5
- GPS 6
- GPS 7
- GPS 8
- GPS 9
- GPS 10
- GPS 11
- GPS 12
- GPS Abu-abu
- GPS CKM

Examples of mandatory question (red star)

- You can take photos directly by choose **Take Picture** option or select a photo from your photo gallery by select **Choose Image**.



Take photo display in ODK Form

- To add object location points include OSM object tag, you can use additional application, that is OpenMapKit (OMK). You can immediately switch to OMK application by press **Launch OpenMap-Kit** on the form. You can learn about using OMK application in the module **Using the OpenMapKit**.



GRAB Jakarta...



## \* Pilih tag osm untuk objek ini

*Anda akan beralih ke aplikasi OpenMapKit untuk memilih tag bangunan*

Launch OpenMapKit

Launch OpenMapKit button on the survey form

- At the end, you can name the form, tick check **Mark form as finalized** and at the end choose **Save Form and Exit** to finalize the final form survey.



CKM Form Sur...



:

**You are at the end of CKM Form  
Survey Fasilitas Umum.**

Name this form

CKM Form Survey Fasilitas Umum

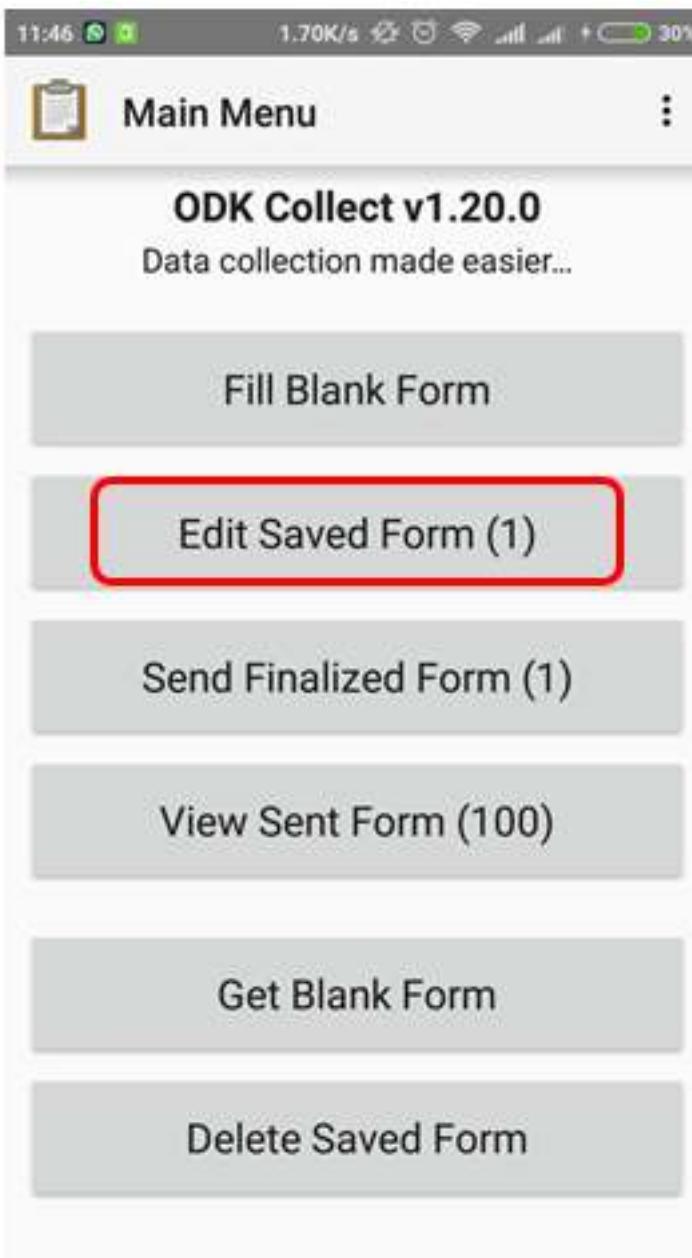
Mark form as finalized

Save Form and Exit

Finalization of page views on the survey form

**3. Edit the Completed Survey Form** The saved form automatically save in ODK Collect. If you want to edit the completed form, you can follow this step:

- You can back to start page and choose **Edit Saved Form**.



Edit Saved Form for edit the saved form

- Select the form that you want to edit by press the form and you can edit the form.



## Edit Saved Form



**CKM Form Survey Fasilitas Umum**

Finalized on Tue, Mar 05, 2019 at 14:47



**CKM Form Survey Fasilitas Umum**

Finalized on Tue, Mar 05, 2019 at 11:54



**CKM Form Survey Fasilitas Umum**

Finalized on Tue, Mar 05, 2019 at 11:55

Edit save form page to select the form that you want to edit

- Then, press floppy disk icon

The image shows two screenshots of a mobile application interface for survey data entry.

**Left Screenshot:** A list of survey data fields and their values. Fields include:

- \* Nomor PERANGKAT/ALAT GPS  
GPS-5
- \* Nama surveyor  
Budi
- Nama Desa  
MASEBEWA
- Nama Dusun  
Dusun Masebewa
- RT  
1
- Nomor Peta  
2
- Nomor Titik pada GPS  
001

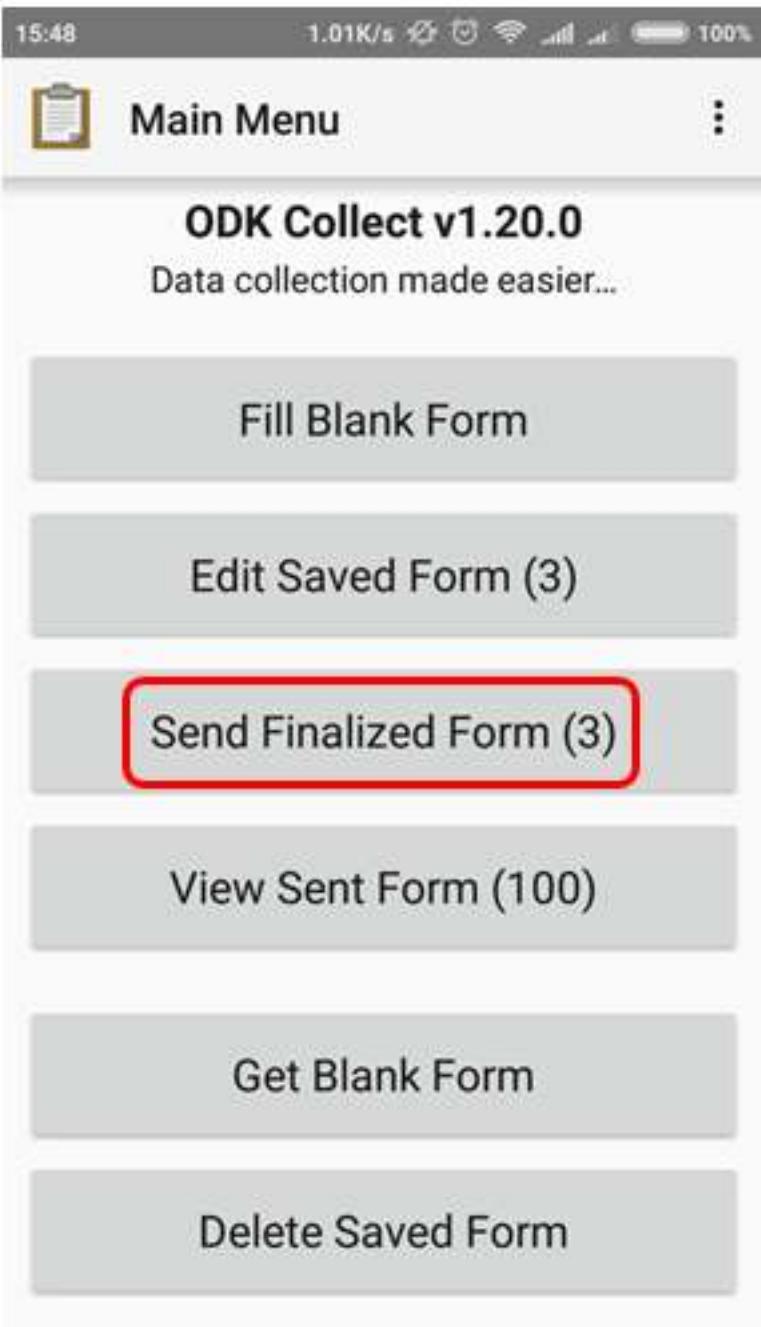
**Right Screenshot:** A modal window titled "Tipe Dinding" (Wall Type) with four options: Bata (radio button selected), Kayu, Bambu, and Seng. The "Send Finalized Form" icon is highlighted with a red box.

A large blue arrow points from the "Nama Dusun" field in the left screenshot towards the right screenshot.

Edit save form page to select the form that you want to edit

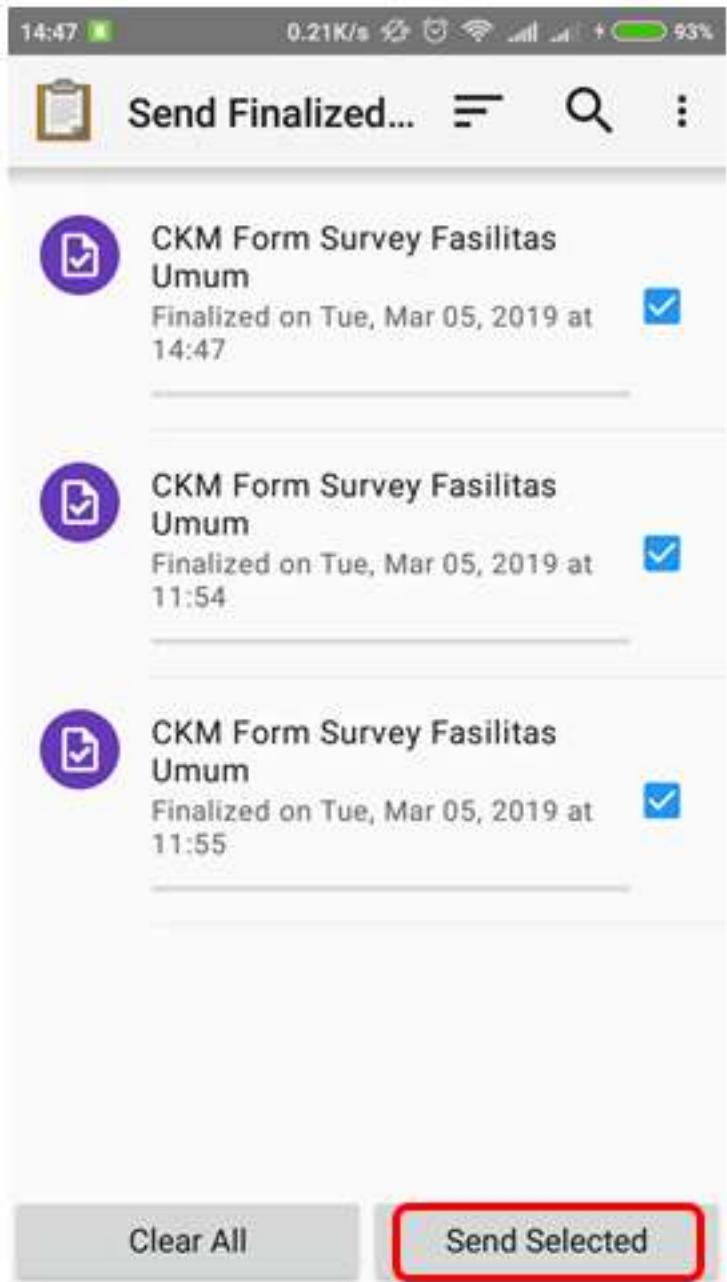
**4. Upload Survey Forms to Server** After you fill and save the form, the next step is upload form survey to server. You can follow this step to upload form to server:

- To upload the form return to the server, you can choose **Send Finalized Form**.



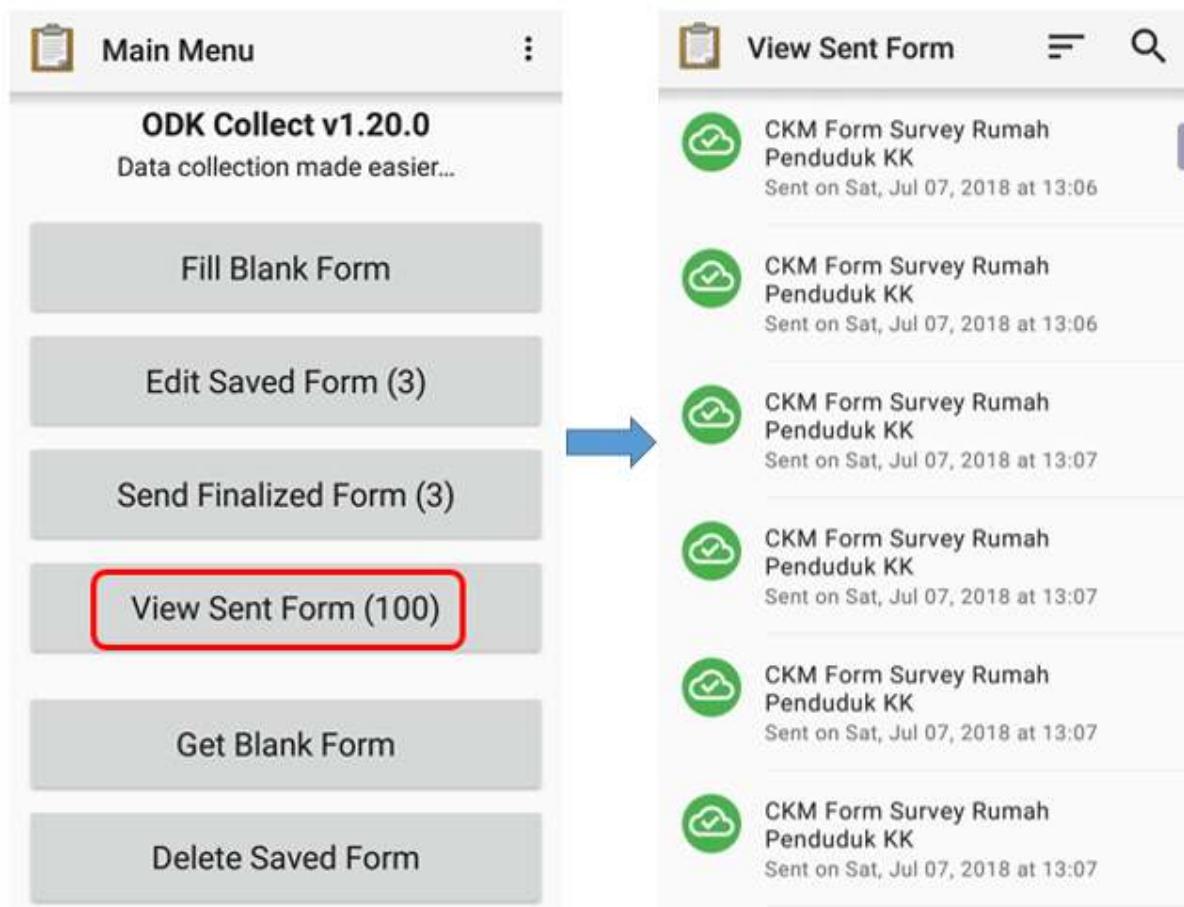
Send Finalized Form to upload a survey form to the server

- Form survey is saved on that page and ready to send. You can choose **Select All** to select all forms first.
- Make sure you are connected on the internet. Then press **Send Selected** and wait until the process\_upload\_ the form is complete.



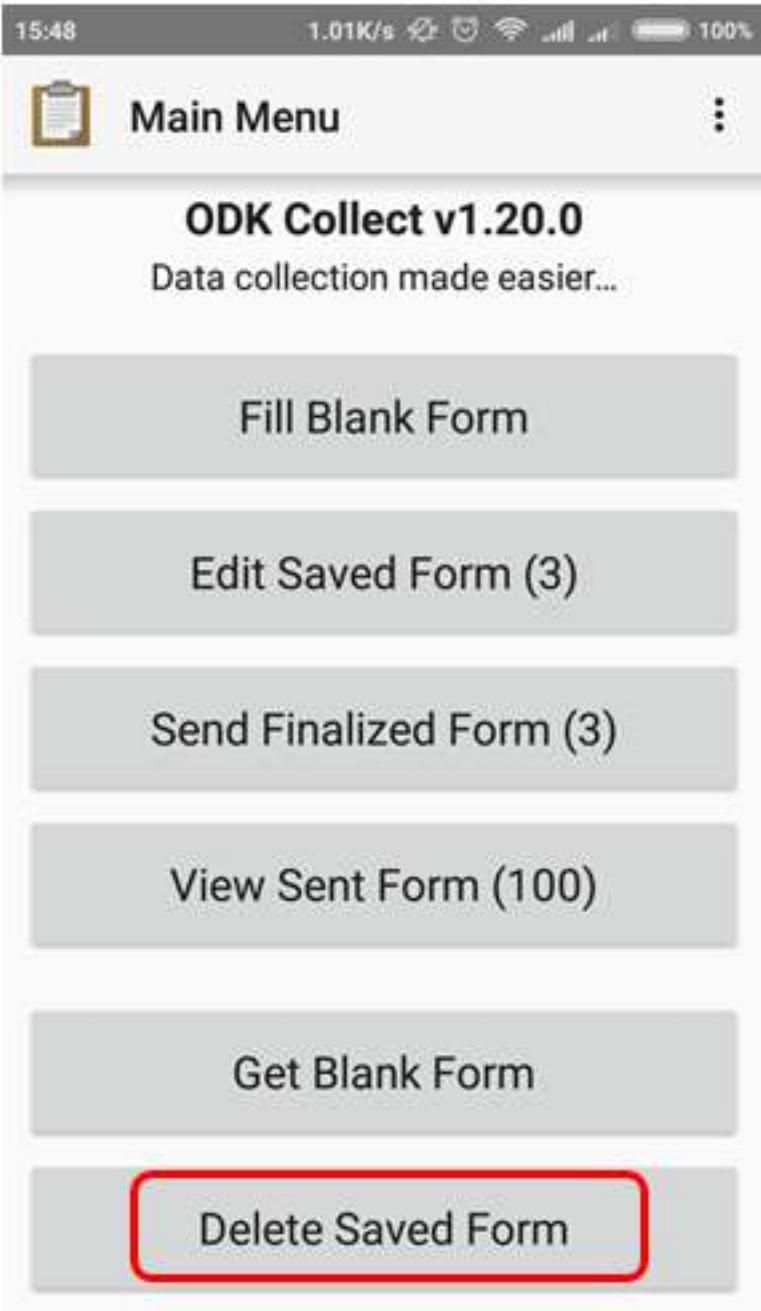
Survey forms that are ready to send in the Send Finalized Form

- All forms that have been successfully uploaded will be stored in **View Sent Form** menu and the icon turn into green.



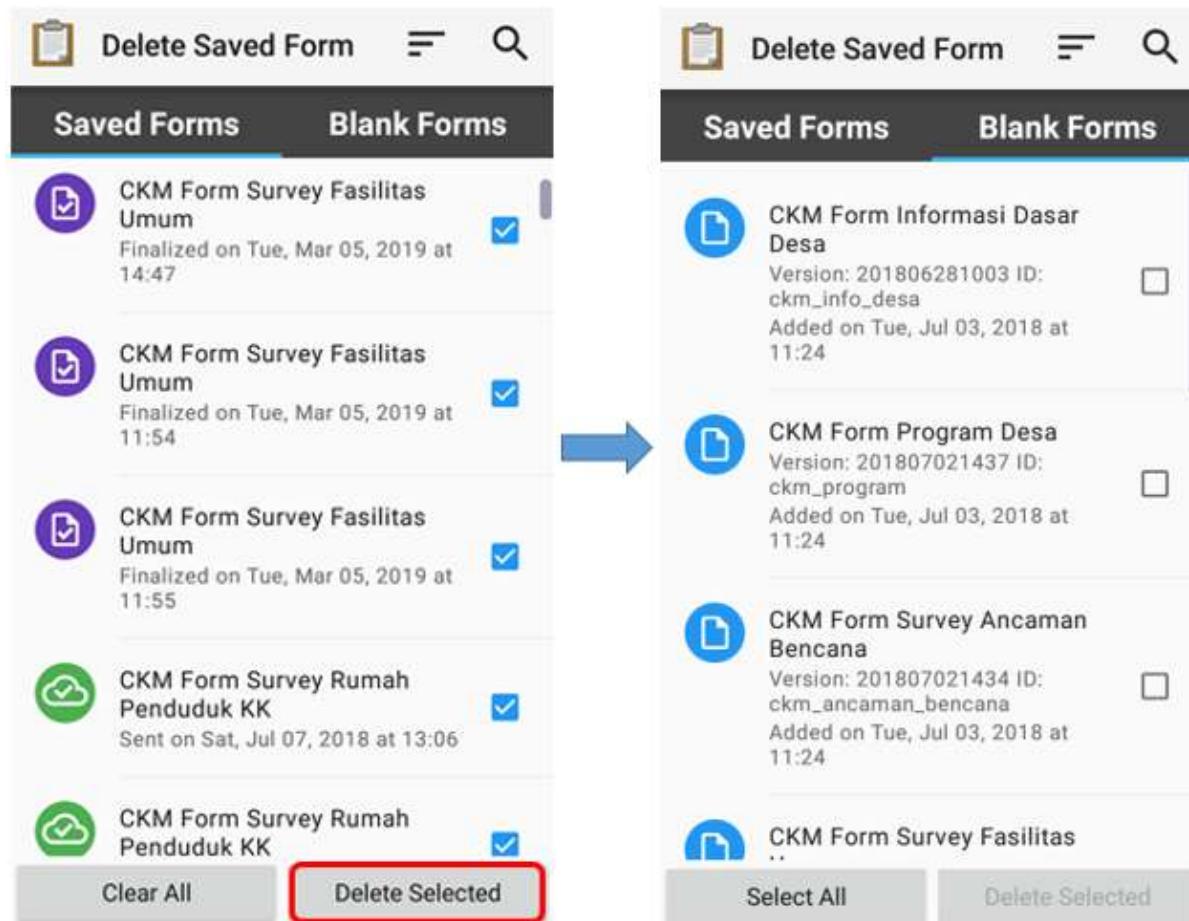
View Sent Form and survey form that have been successfully uploaded to the server

- After upload the form, you can delete the form in **Delete Saved Form** menu.



Delete Saved Form menu for delete the form

- You can delete the the filled form in **Saved Forms** option and delete the blank form in **Blank Forms** option. You should choose the form that you want to delete or **Select All** for delete all form.



#### Delete Saved Form option

- You need to confirm to delete the survey form by choose **Delete Forms**

16:11

0.83K/s



98%



## Delete Saved Form



### Saved Forms

### Blank Forms



CKM Form Survey Fasilitas

Umum

Finalized on Tue, Mar 05, 2019 at  
14:47



### Delete Selected

Delete 73 form(s)?

[Do Not Delete](#)

[Delete Forms](#)

Umum

Finalized on Tue, Mar 05, 2019 at  
11:55



CKM Form Survey Rumah  
Penduduk KK



Sent on Sat, Jul 07, 2018 at 13:06



CKM Form Survey Rumah

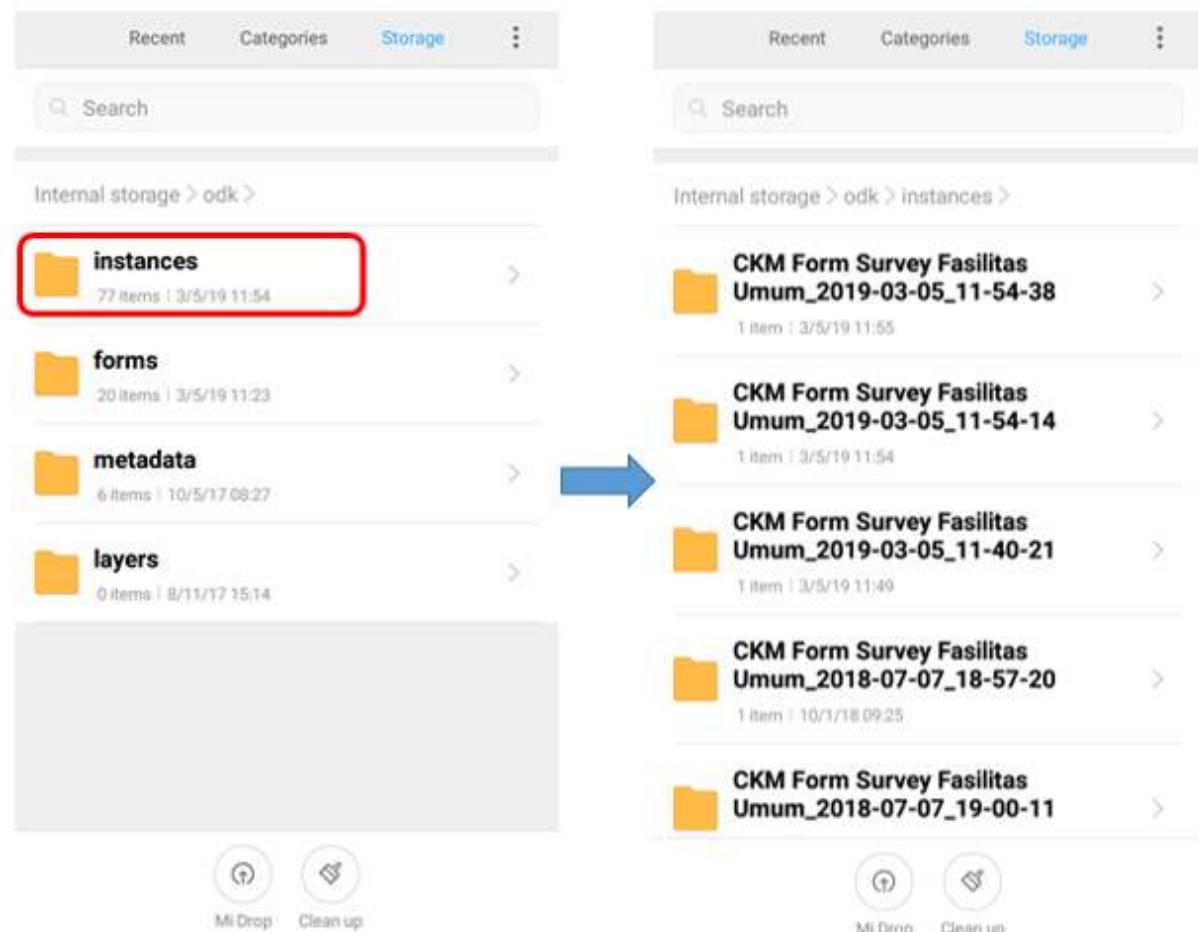
[Clear All](#)

[Delete Selected](#)

#### Delete confirmation dialog box

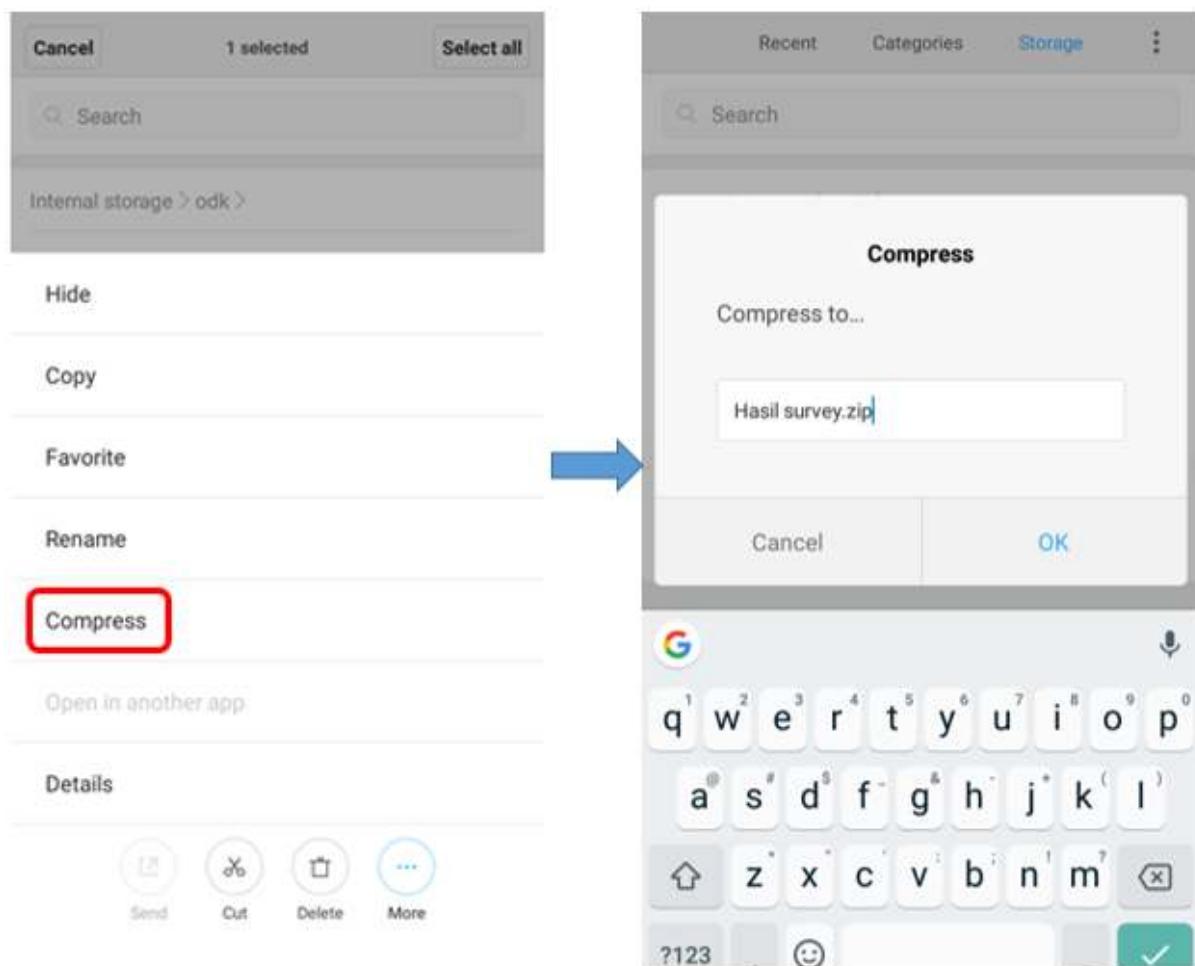
5. **Upload Survey Form to Google Drive** After you upload all the survey form to server, you need to save and upload the survey result file in .zip format in Google Drive folder that was created by your mapping supervisor. This is the step:

- Go File Manager or File Explorer on your smartphone and open your internal storage. Then open ODK folder. This folder contains all the survey result file which stored on ODK Collect application. Then select instances folder which contains \*.osm file from object survey result.



#### Instances folder in ODK folder and the survey result in instances folder

- Before you move **instances** folder to your computer, you need to convert the folder to .zip format by pressing the **instances** folder and select **Compress**. You can change the .zip file name.



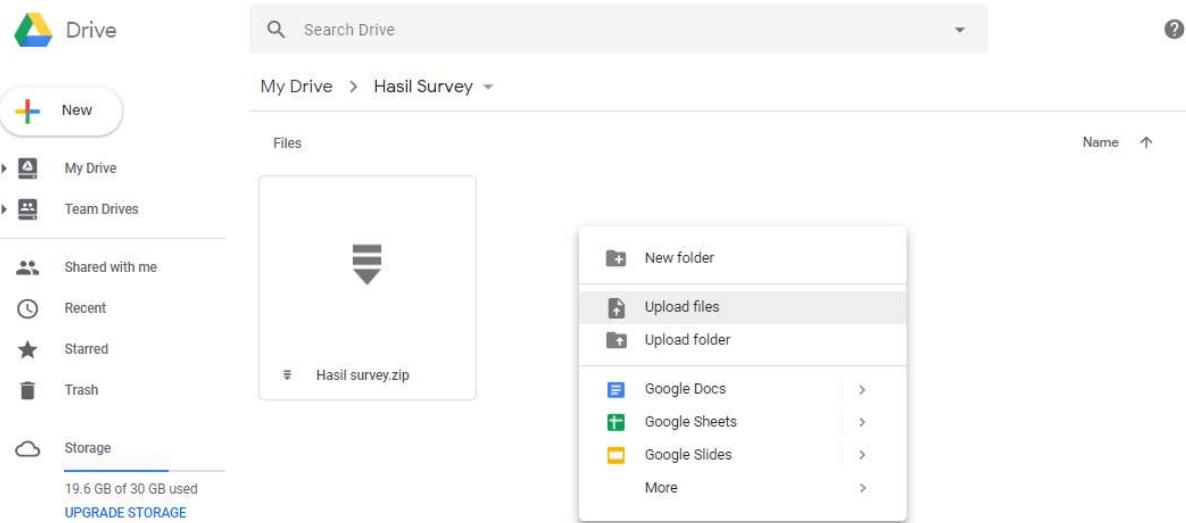
The step for convert to .zip format

- After you move .zip file to your computer, you can upload the file to Google Drive that already set by your mapping supervisor.



The .zip file that ready to move to computer

- You can upload the file to Survey Result folder (or another name that your mapping supervisor made) by click right on your mouse then choose **Upload Files** and choose the file that you want to upload.



The folder on Google Drive for upload .zip file

## SUMMARY

If you can follow all the stages in this module, you already then you have successfully understood the use of ODK Collect as a tool for collecting data in the field. In addition, you have also successfully implemented the operation of the initial settings in ODK Collect and how to use ODK Collect to retrieve field data. Later, you will learn about other data collection tools in the field, OpenMapKit (OMK) application.

# Using the OpenMapKit Application

## Objectives:

- Able to explain *OpenMapkit* as one of the tools for collecting infrastructure data
- Able to operate the initial setup for *OpenMapKit*
- Able to operate how to enter offline basemap for *OpenMapKit*
- Able to operate *OpenMapKit*

Previously you already learn the *ODK (OpenDataKit) Collect*, an android-based application to replace paper form for surveys. *ODK Collect* has extension called *OpenMapKit (OMK)*. This extension is used to add information on the position or location of the object surveyed.

## I. What is *OpenMapKit*

(OMK) *OpenMapKit* is an additional application that is used to support *ODK Collect* in determining the position of objects found during precise and precise field surveys. *OpenMapKit* can be run through *ODK Collect*, after you open and select one of the available forms. In determining the location of an object, *OpenMapKit* requires a map background in the form of a satellite imagery or OSM map. If you use the OSM as the map background, the thing to note is that the data must be available on the OSM server. Currently *OpenMapKit* only available on Android. You can download *OpenMapKit* for free through the *Play Store*.



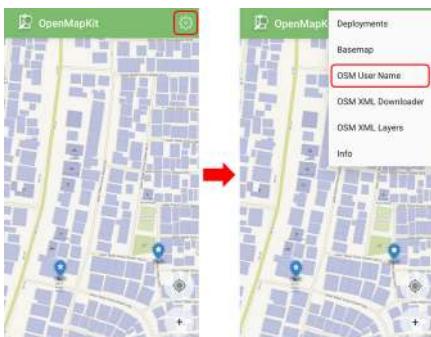
*OpenMapKit application on the Play Store*

Note: To be able to use *OpenMapKit* You have to install latest version of *ODK (OpenDataKit) Collect*, because the form filled in *OpenMapKit* is sourced from *ODK Collect*.

## II. Initial settings *OpenMapKit*

Before you use *OpenMapKit*, you must first make initial setup. The following are step by steps of the initial *OpenMapKit* setup:

- On the home page of *OpenMapKit*, press the **settings button** located in the upper right corner.
- Select **OSM User name** OSM and enter your User Name



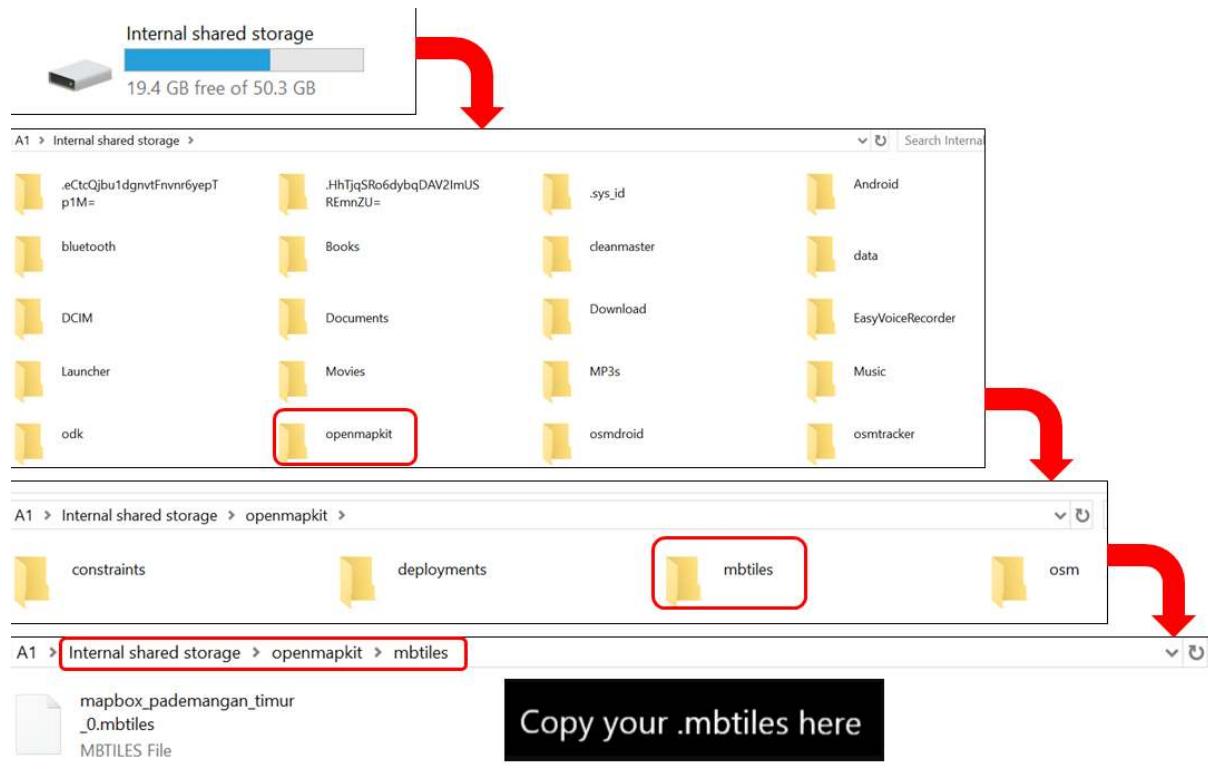
Display settings menu *OpenMapKit*

- By default, *OpenMapKit* will display the *Online Humanitarian OpenStreetMap*.

### III. Import the offline basemap for OpenMapKit

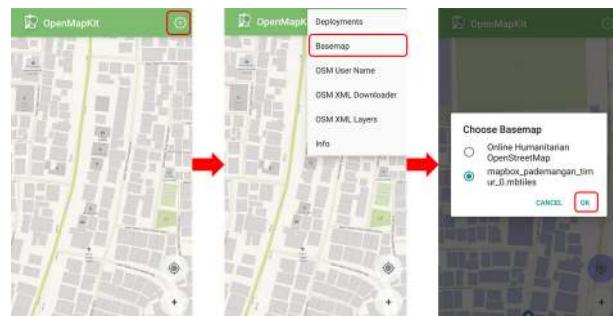
*OpenMapKit* provides an OSM map as a basemap that must be accessed using an internet connection. But don't worry, you can also enter offline basemap into *OpenMapKit* which is a map that can be opened without an internet connection. An offline basemap can make it easier for you to add information right at the location you are surveying. Here's how to add offline basemap:

- The format of the data used as a offline basemap in the application *OpenMapKit* should be formatted as .mbtiles. To create .mbtiles can be seen in the module **Make Mbtiles for OMK (OpenMapKit)**. After you have the .mbtiles file, connect your *smartphone* to your computer / laptop. Open the folder containing the .mbtiles file that will be copied to your smartphone. Select the .mbtiles file then copy it to **openmapkit → mbtiles** folder your internal storage.



#### Process of adding .mbtiles files to OpenMapKit

- If you have successfully copied .mbtiles, you can change the *OpenMapKit basemap* by pressing the **settings button** located in the top right corner and pressing **Basemap** then select the .mbtiles that you just entered. Then press **OK**.



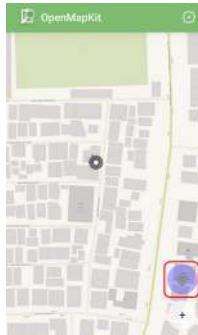
Display basemap settings in OpenMapKit

## IV. Basic Operation *OpenMapKit*

### 1. Download OSM data in *OpenMapKit*

Existing OSM data can be easier for you to add information about the building because you can choose the building directly and start adding an information based on the field. Therefore, you should download OSM first data before adding new information. Here's how to download OSM data in *OpenMapKit*:

- Navigate the map to your current location (for example, you are already on the survey location) by pressing the **round button** in the lower right corner of the screen until the round button is colored blue. A black dot will appear at your current location.



Navigate to the current location in OpenMapKit

- Press the **settings button** in the top right corner
- Select **OSM XML Downloader** to start download OSM data according to the view on the screen of your smartphone (the duration depends on the size of the area). Make sure you are connected to an internet connection when downloading OSM data. Note the color of the building, the building on the OSM \_basemap \_have brown color and the building from **OSM XML Downloader** is purple.



Building color on the OSM basemap (left) and downloaded building color (right)

- Your new downloaded OSM data will be saved in the format .osm which can be activated or deactivated via the **settings button** → **OSM XML Layer**.

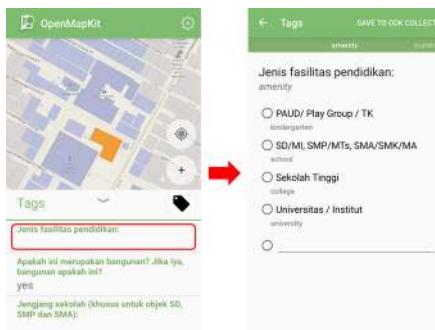


OSM XML Downloader menu and OSM XML Layers menu

## 2. Add building information in *OpenMapKit*

If you have successfully downloaded building data from OSM, you can add the building information by:

- Select the building to which the information will be added. Make sure the building is purple which indicates that the building has been downloaded from OSM. If the building is selected, the color will change to orange.
- You can fill the building information in accordance with the form you have chosen before in the *ODK Collect* application, with press the information tag in the first row located below.



Fill out building information using a form from *ODK Collect*.

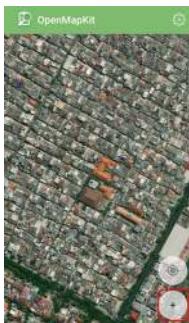
- When done, at the end of the page select **Save** to save the form to *ODK Collect*. If you have completed filling in the form, the building that you fill in the information will look like this:



Building that has been filled in the information

If the building data for location of your survey is not yet available in the OSM, you can map the building before conducting the survey. If you don't have time to do the mapping, you can use points to mark the object in the *OpenMapKit* by:

- Use *.mbtiles* you have entered previously to help mark the object accurately click **Settings → Basemap**
- Press the plus (+) icon in the lower right corner of your screen until it turns green. It will appear green marker with the words *Add Node* on it. Slide the map until the location of the marker is accurate with the object in the field.



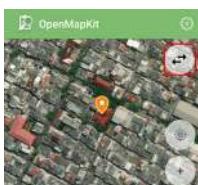
Add markers using the plus (+) icon

- Press **Add Node** if the point is accurate



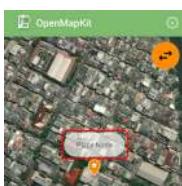
Add note button when add point

- If the point you add turns out to be in a position that is not in represent with the object in the field, you can move the point that has been added by clicking on the point to move then press the two arrow icon in the top right corner. The color of the point will turn orange and above it will be appear *Place Node*.



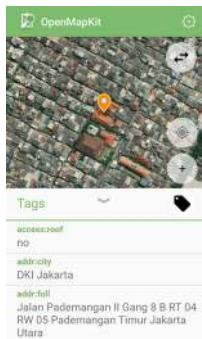
Swipe points that have been added

- Slide the map to the accurate point position, then press **Place Node**.



Place node button when shifting a point

- After the position is accurate as the object in the field, you can fill out the form the same as the previous step.
- Enter information that matches the conditions in the field. Swipe the screen right or left to change the page question on the form.
- At the end of the page, select **Save** to save the form to *ODK Collect*. If you finished to fill in forms, the marker that you fill in the information will look like this:



Point of objects already loaded with informations

- Now you can see the form has been successfully saved on the *ODK Collect*.

## SUMMARY

If you can follow and pay attention to all the stages in this chapter, you have successfully understood *OpenMapKit* as one of the field survey tools for collect infrastructure data. In addition, you have also successfully implemented the initial setup of *OpenMapKit*, how to enter offline basemap for *OpenMapKit* and how to use *OpenMapKit* to retrieve infrastructure data.

# Using OSMTrackers

## Objectives:

- Explain OSMTracker as one of survey tools for recording tracks and photos
- How to set up the OSMTracker for the first time
- Learn how to use OSMTracker

### 1. What is OSMTracker?

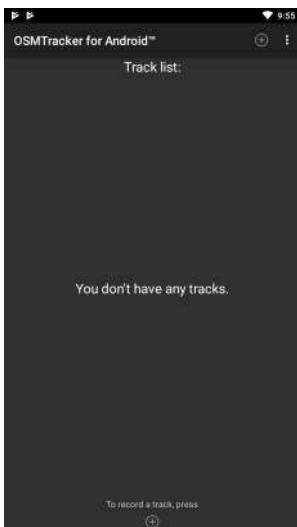
OSMTracker is an android application that allows us to record our survey data. Similar to GPS, OSM-Tracker is able to record waypoint and also track. If you want to learn more about GPS for field survey, you can see the **GPS Module**. What makes OSMTracker different with common GPS device is its capability to take pictures when you collect the survey data. With these images taken, it will make your mapping more easier because you can track back what object you have been taken and take a look into your pictures for more detail. Waypoint and track that you have collected can be converted into .gpx file so you can open your survey data using JOSM or you can directly upload your data into OpenStreetMap.

If you want to use OSMTracker you can download the application on your smartphone. Open your Google Playstore and search OSMTracker in search box.



You can download OSMTracker on Google Playstore

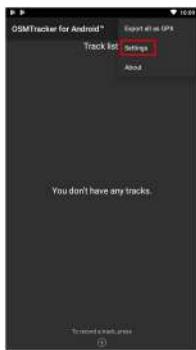
After the installation finished, open your OSMTracker application on your smartphone.



OSMTracker page display

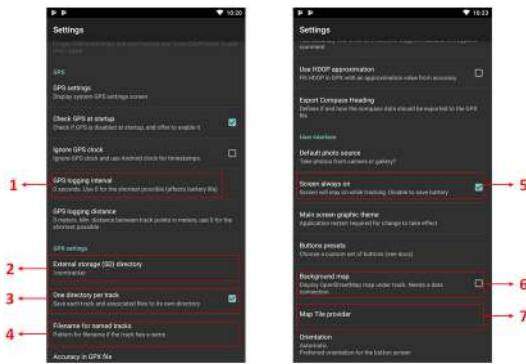
### 2. OSMTracker Setting

Before you can use the OSMTracker, there are few setting you have to do. Go to button on the top right corner and then select **Settings**.



## Select Settings menu on OSMTracker

On the settings page there are several things you have to look:



## Several configurations on Settings menu

### 1. GPS logging interval

This section will set how often your OSMTracker record the track. If you set the number smaller, OSMTracker will record the track more often. The default value for this setting is 0, which means that OSMTracker will always record your track. This will affect your battery life. You can change the number according to your need, for example 2 second.

### 2. External storage (SD) directory

This section determine where you want to save all your survey data on your smartphone. By default, OSMTracker will create a new folder called “osmtracker” on your smartphone’s internal storage. If you don’t want to change this setting, you can ignore this section.

### 3. One directory per track

If you activate this feature, each track you save will create a new folder in your internal storage.

### 4. Filename for named track

This section will set the labelling of you survey data. By default, the labelling consists of track name, survey date, and survey time. You can ignore this setting if you don’t want to change it.

### 5. Screen always on

If you activate this feature, you will let your smartphone always turn on when you use OSMTracker. When you using this setting, it will drain your smartphone’s battery fast. You can change it as you needed.

### 6. Background map

Use this setting to show the background map on your track. Activate this setting so you can see your survey track with map as its background.

### 7. Map tile provider

You can change your background map using this feature.

After all the setting is done, then you are ready to use your OSMTracker. Always remember to activate your GPS setting on your smartphone, then you can open your OSMTracker. If you are using OSM-Tracker for the first time, your home page will be empty. Later, all your survey data will show up on your home page.

### 3. OSMTracker Basic Operation

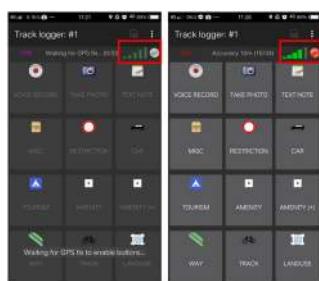
#### 1. Recording Survey Track

If you want to start your track recording, you can select the button + on your top right of your screen. You will see the Track Logger page.

Use button to start recording

Use + button to start recording your track

Remember to always check your GPS accuracy. All feature on OSMTracker will not available if you are not receiving a good GPS signal. Try to get GPS accuracy as best as you can (below 10 meter) to prevent a mistake when recording your current position. You can see your GPS signal indicator on your top right corner of your screen (look at the picture). The signal bar color will change to green and become full when you receive a good signal. Make sure you are in a good position to receive signal. Locate yourself on the open field and make sure you are not under the roof or tree.



Unable to activate track logger function because the GPS signal is not good enough (left); Track logger is activated if GPS signal is good enough (right)

When the GPS accuracy is good enough, then you can start to record your track. When you press the + button and the GPS accuracy is good enough, OSMTracker will automatically record your track.

#### 2. Recording Object using Waypoints and Picture

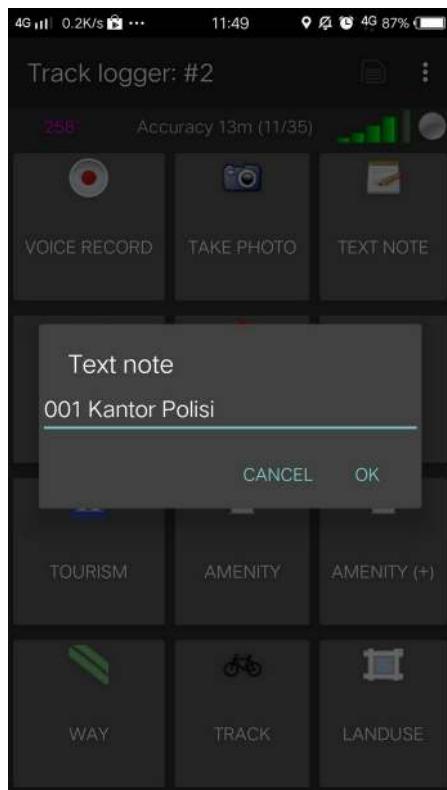
When you open your Track Logger page, there are many buttons to access, but if you want to record waypoints and also picture, you only have to use this 2 button:



Track logger page on OSMTracker

##### 1. Text Note

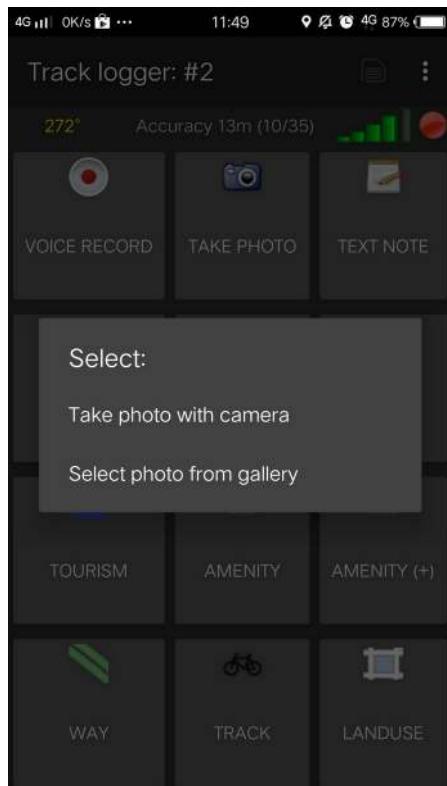
Use **Text note** to mark your current position as a waypoint. Just press this button and then fill the information. For example, you can label your waypoint with number and then the name of your object.



Text note function to record waypoint on your survey

## 2. Take Photo

Use **Take Photo** to take your object photos. You can straight use your smartphone camera or you can select the photo from your gallery.

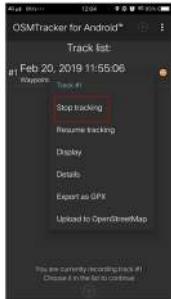


You can choose to take the photos straight from your camera or select from your smartphone's gallery

### 3. Stop and Continue Track Recording

If you want to stop your recording, you can follow these steps:

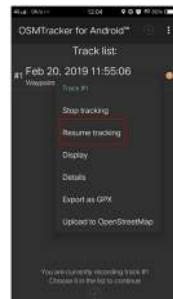
1. On the Track Logger page, please go back to your home page, then find one file track you have collected before. Press on that file for a while until additional menu is shows up.



Option to set stop tracking

2. Choose **Stop tracking**.
3. You can also press **■** button on the top corner on your Track Logger page to stop the recording and save your record.

If you want to continue your track record on your previous file, then you have to :



1. Press on your previous file until additional menu is shows up.  
Select to resume tracking
2. Then choose **Resume Tracking**

Note :

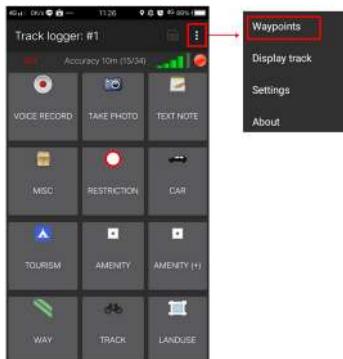


Figure 1: Ikon

If your file has an orange color clock icon, it means that your file still on track recording mode. This icon will disappear after you stop and save your file.

### 1. Showing List of Objects Collected

You can see list of objects you have collected. On Track Logger page, press the **■** button on the top right corner of your screen, then select **Waypoints**.



"Tombol untuk menampilkan daftar waypoints yang telah

dikumpulkan”

Button to show list of waypoints

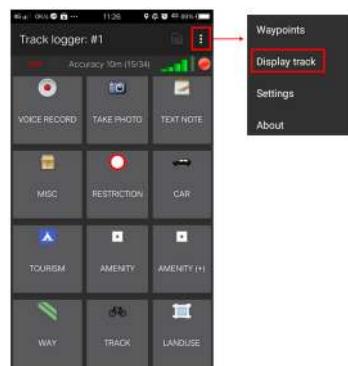
You will see the list of objects and the photos you have collected on the Waypoint list.



Waypoint list to see list of objects you have collected

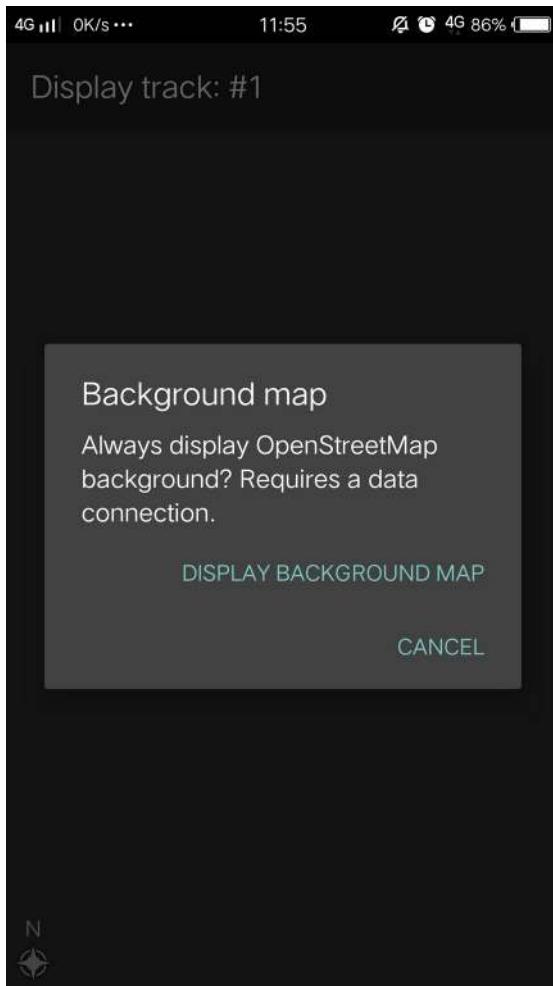
## 2. Showing Track and Waypoint Collected

You can also see your track and waypoints you have collected. On your Track Logger page, choose menu on the top right corner of your screen, then choose **Display Track**.



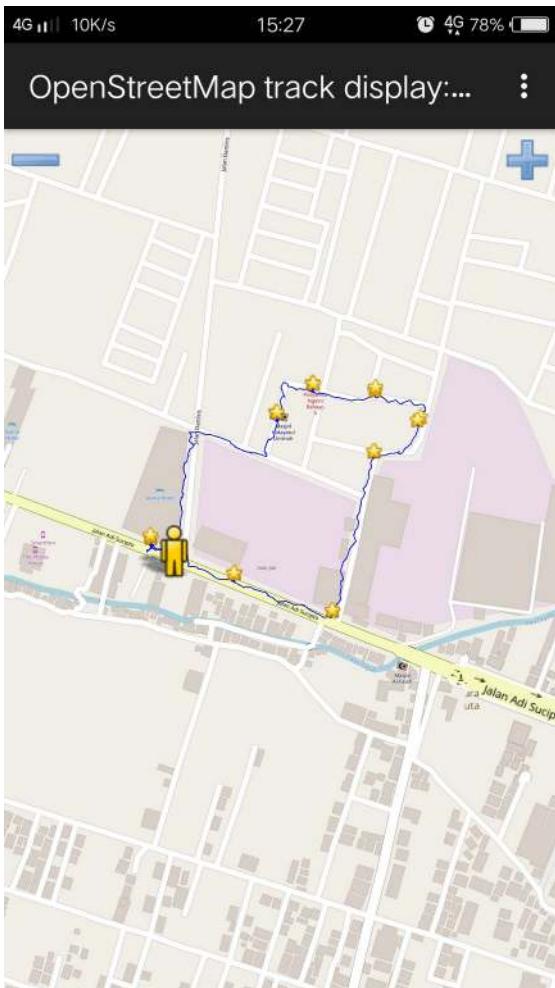
Display track button to see your track and objects you have collected

When you choose to display your track, OSMTracker will ask your permission to show the background map. Choose **Display Background Map**.



Option to display your background map

You will see the map with line, star, and people icon on the top of the map. The star icon represent the waypoints, the line represents the track you have collected, and the people icon shows where is your current position on the map.



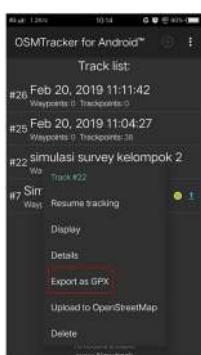
Track and object's collected on field survey

### 3. Saving the OSMTracker Data

After you collecting the data, you can save your data and use it for your mapping guide. In order to do that, you need to save your survey data as a .gpx data format. After that, you can upload it to OpenStreetMap server or you can move the data to your laptop.

### 4. Saving Track and Waypoints as .gpx Data

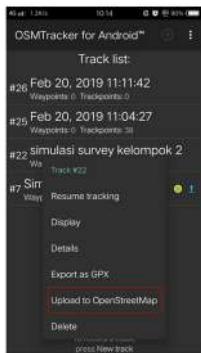
You can save your track and waypoint into .gpx data. You can open .gpx data with mapping software like **QGIS** and **JOSM**. On your survey file, select and press the file for a while, then select **Export as GPX**. If the process is successful, you can see the green dot on the right side of the file name.



Menu to save your survey data into GPX

### 5. Uploading Track to OpenStreetMap Server

You can upload your survey data to OpenStreetMap server. On your survey file, press and hold it for a while, then select **Upload to OpenStreetMap**.



Menu to upload your survey data into OpenStreetMap

On OpenStreetMap Upload page, you need to fill the form like name and file description. You can ignore on Tags section. On the bottom section, you can set the track for :

1. Private

Track will not shown up to the public. Trackpoints can be accessed on the time sequence using GPS API without time stamp.

2. Public

Track will be shown to the public and available for download to the other user.

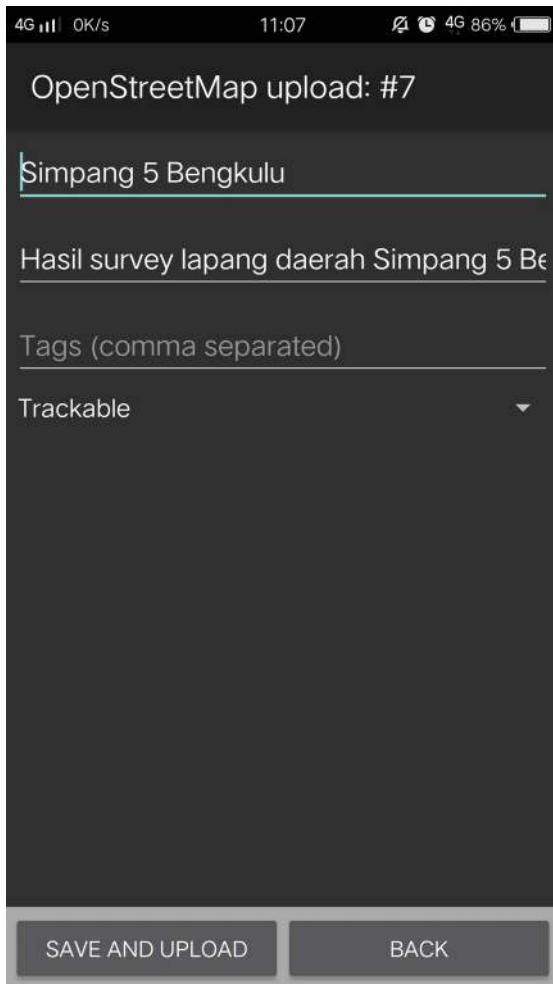
3. Trackable

Track will be shown to the public, but trackpoints still can be accessed by public GPS API. Other user can download your data but it will not connected with you.

4. Identifiable

Track will be shown to the public. Other user can download your data and can refer your OSM username.

For this option, you can choose Trackable or Public so another user can download your data.



Survey data is ready to upload into OpenStreetMap server

## 6. Copying Track and Waypoint to Laptop/Computer

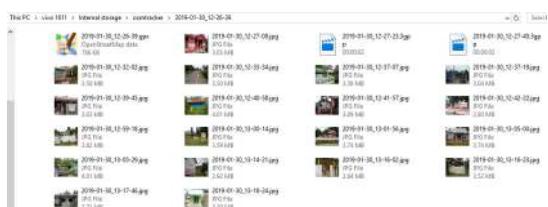
All the .gpx data stored in your internal storage of your smartphone. You can search the file using your file manager. To copy the data, you can follow the instruction:

1. Connect your smartphone to your laptop using your smartphone cable and then find folder called "osmtracker" in your smartphone.



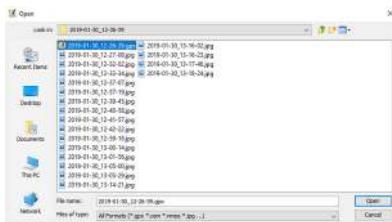
OSMTracker folder on your smartphone's storage

2. Inside of your OSMTracker folder, you can find a folder containing a .gpx data and photos. Copy the entire folder into your laptop.



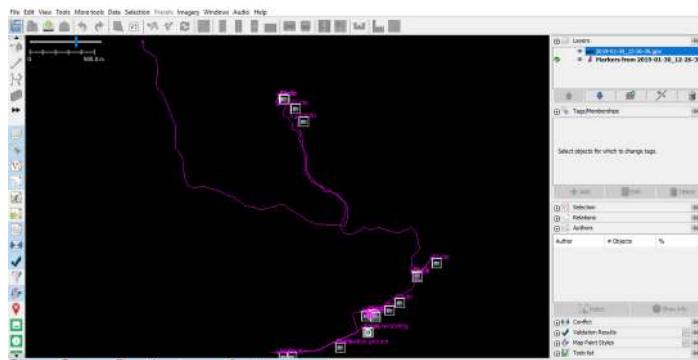
Example of OSMTracker data consist of .gpx file data and survey photos

3. Open your JOSM, and then open your gpx data. Select menu **File → Open** and then open the .gpx data format.



Open your file with .GPX format data on JOSM

- When you open your .gpx file, JOSM will automatically shows track and waypoint along with the photo as well.



Field survey data when you open it on JOSM

You can use your survey result as a guidance for your mapping using JOSM. The photos taken will help you identify what object you should create in JOSM.

## SUMMARY

In this chapter you have learned how to do a field survey using OSMTacker. OSMTacker allows you to record your track, waypoint, and take a picture of your survey object. You also have learned how to do an initial setting and how to operating your OSMTacker. You can use OSMTacker as your alternative tools for your survey in case if you don't have GPS.

— title: Adding Survey Data into OSM Using JOSM weight: 5 —

### Objectives:

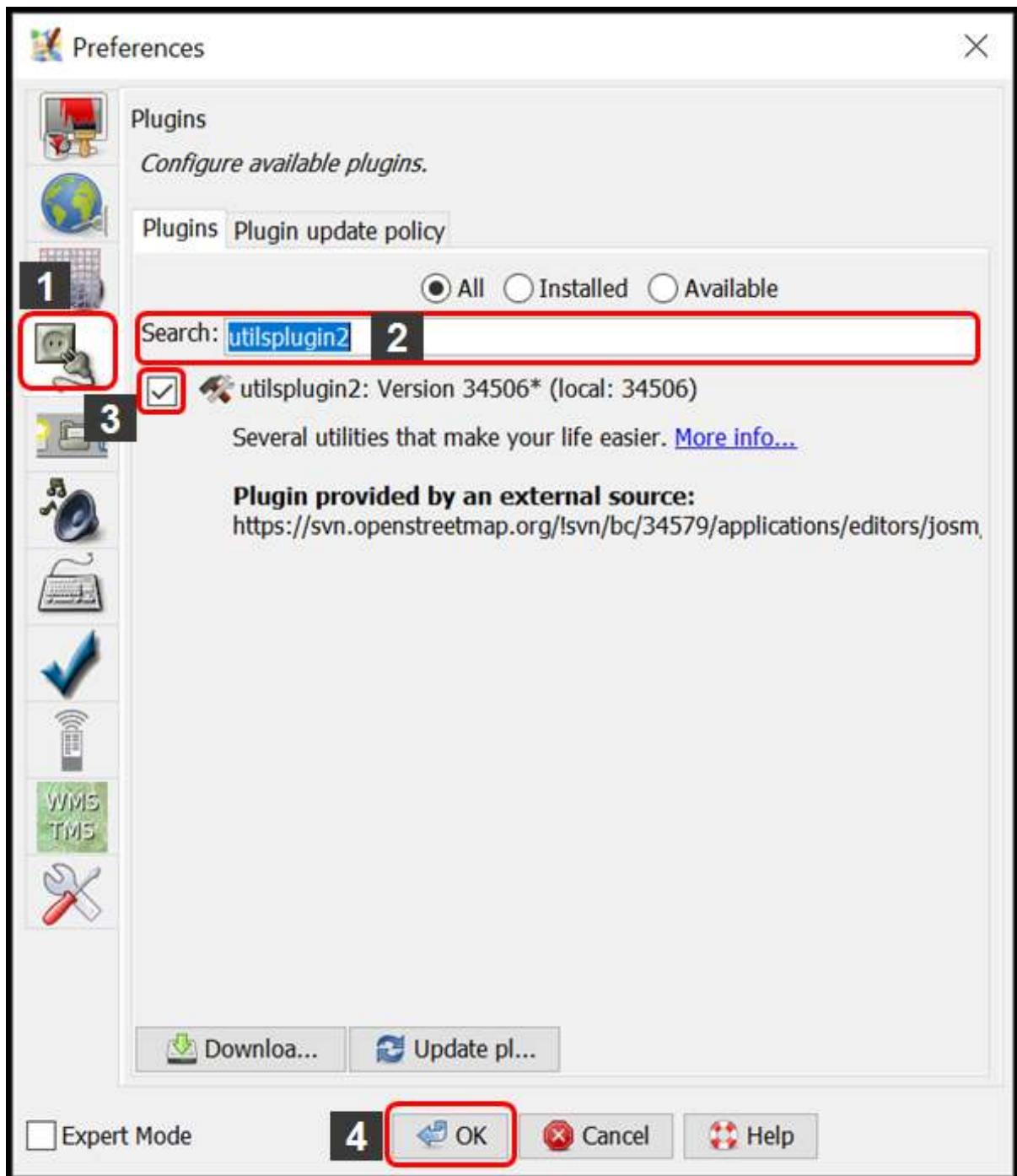
- To be able to install plugin Utilsplugin2
- To be able to merge all survey data
- To be able to save .osm file using JOSM
- To be able to download OSM data
- To be able to add satellite imagery layer on JOSM
- To be able to add and edit OSM data using JOSM
- To be able to upload changes into OSM
- To be able to view changes of OSM data in OSM website

Adding or mapping new objects in OSM is one way to enrich OSM data. Mapped object's information will be very limited when you add OSM data based on satellite imagery only. Field survey can be conducted to solve this problem. Field survey can help you add more information to the mapped object. You can learn more about survey toolkit in the **Field Data Collection Methodology** module. You need an OSM data editor to do the OSM mapping. There are a lot of OSM data editor available, but in this module the OSM data editor used is JOSM. JOSM has a lot of useful tools and plugins, making OSM mapping a lot easier.

## I. Installing plugin Utilsplugin2

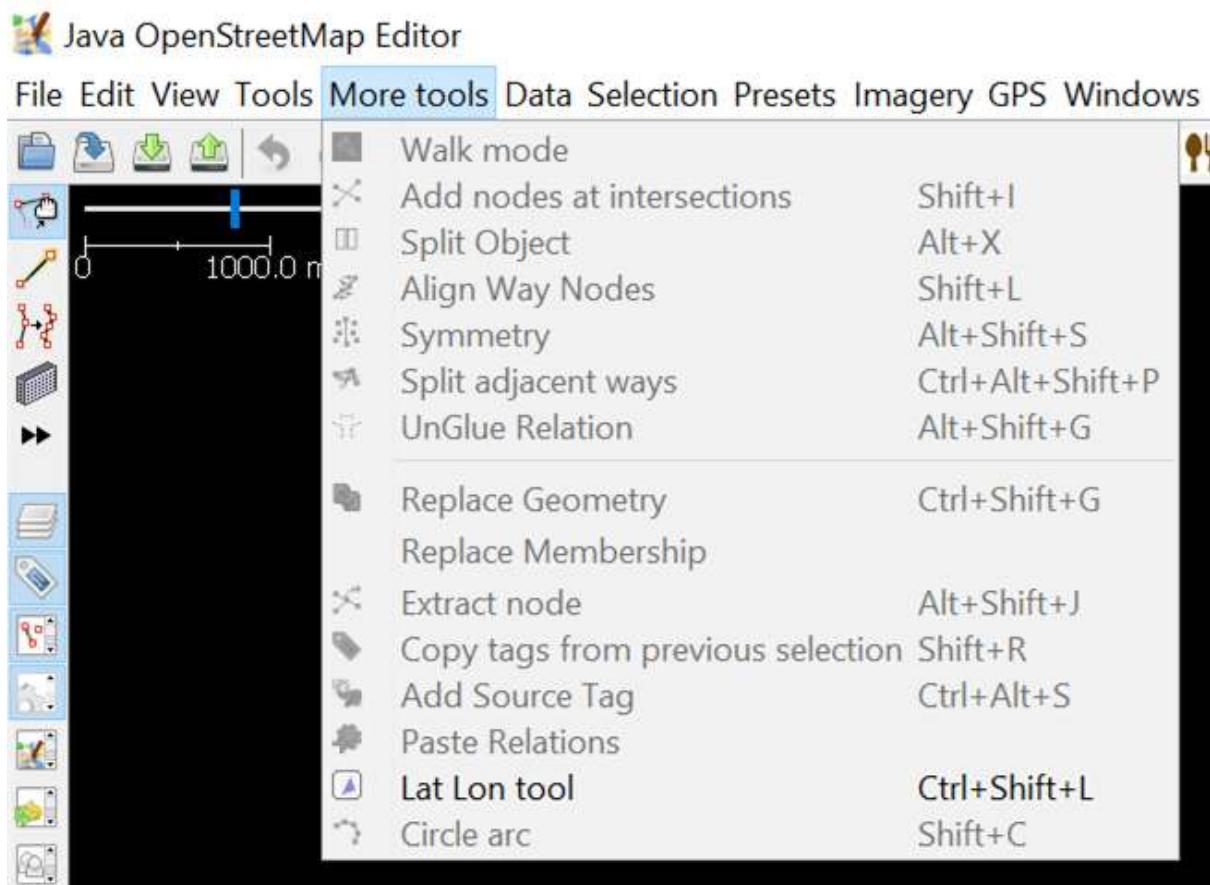
Before adding or editing OSM data using JOSM, install plugin you'll be using first. JOSM has a plugin called `utilsplugin2` whose one of the functions is makes copying preset/tag easier. To use this plugin, you have to install the plugin first since it is not installed by default. These are the steps to install plugin `utilsplugin2`:

- Open **JOSM**
- Click menu **Edit → Preferences**
- Select menu **Plugins** to install new plugin. If you haven't downloaded available plugins, click **Download List** first to download it. Make sure that you are connected to the internet.
- After downloading plugins, search the **utilsplugin2** by typing it in the search box. After you found it, give a check on the checkbox next to `utilsplugin2`.



Installing plugin utilsplugin2

- Click OK and wait until the installation process is finished. If the plugin has successfully installed, there will be **More tools** menu on your JOSM.



More tools menu on JOSM

**Note:** Sometimes JOSM ask you to Restart JOSM after installing new plugin to apply newly installed plugins. However, not all newly installed plugin needs JOSM restarting to be used after installation process finished.

## II. Merging All Survey Data

If you have finished conducting survey using field data collection toolkit such as ODK Collect and OpenMapKit, you can use the survey data as the reference to add object's information when mapping it in OSM. Survey data file format from ODK Collect and OpenMapKit is .osm. The amount of .osm file from ODK Collect and OpenMapKit will be the same amount as the surveyed objects since information of one object will be saved in one .osm file. Merge all .osm file to make it easier to use the survey data as mapping reference by following these steps:

- Go to File Explorer to where you save .osm file from ODK Collect and OMK.

WORK > Survey > Data Survey Jakut

Search Data Survey Jakut

Name	Date modified	Type
Jakarta Utara Data Collection Survey_2018-12-0...	4/11/2019 2:40 PM	File folder
Jakarta Utara Data Collection Survey_2018-12-0...	4/11/2019 2:40 PM	File folder
Jakarta Utara Data Collection Survey_2018-12-0...	4/11/2019 2:41 PM	File folder
Jakarta Utara Data Collection Survey_2018-12-0...	4/11/2019 2:41 PM	File folder
Jakarta Utara Data Collection Survey_2018-12-0...	4/11/2019 2:42 PM	File folder
Jakarta Utara Data Collection Survey_2018-12-0...	4/11/2019 2:42 PM	File folder
Jakarta Utara Data Collection Survey_2018-12-0...	4/11/2019 2:43 PM	File folder
Jakarta Utara Data Collection Survey_2018-12-0...	4/11/2019 2:43 PM	File folder

File directory for .osm file from ODK Collect

- Search all .osm file by typing “osm” in the **Search** box. Select all .osm file from the search results.

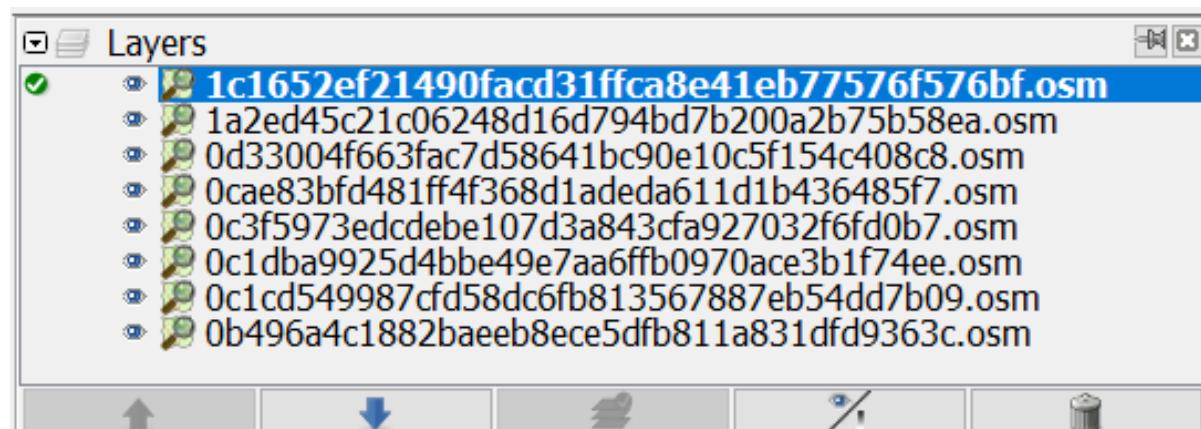
Search Results in Data Survey Jakut

osm

	1a2ed45c21c06248d16d794bd7b200a2b75b5...	Date modified: 12/3/2018 8:37 PM
	0d33004f663fac7d58641bc90e10c5f154c408c...	Date modified: 12/3/2018 8:37 PM
	1c1652ef21490facd31ffca8e41eb77576f576bf...	Date modified: 12/3/2018 8:37 PM
	0c1dba9925d4bbe49e7aa6ffb0970ace3b1f74e...	Date modified: 12/3/2018 8:37 PM
	0c1cd549987cf85dc6fb813567887eb54dd7b...	Date modified: 12/3/2018 8:36 PM
	0b496a4c1882baeeb8ece5dfb811a831dfd9363...	Date modified: 12/3/2018 8:36 PM

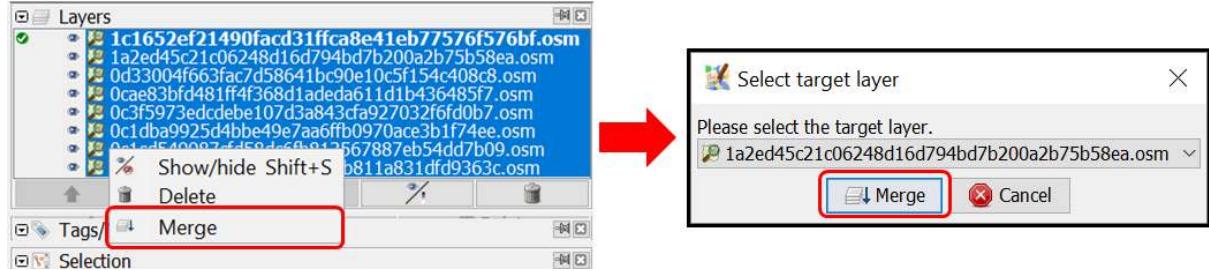
Search results for keyword “osm”

- Drag all selected .osm file to **JOSM**.



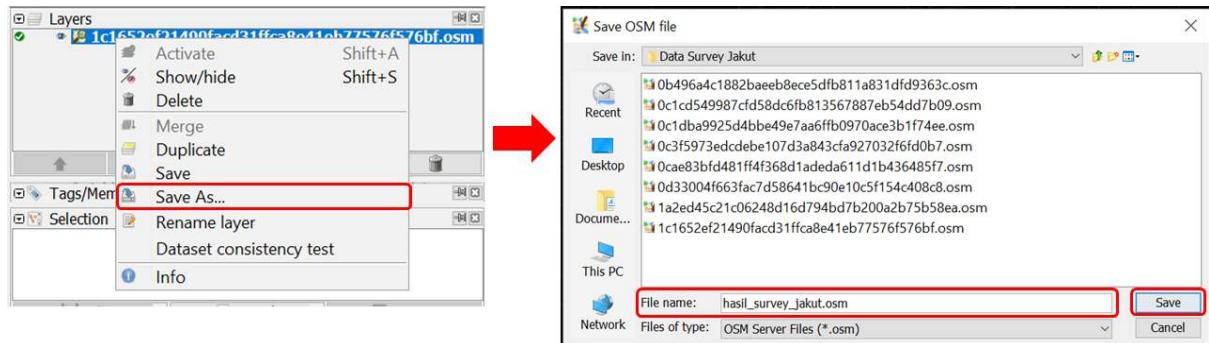
## Layers Windows after .osm file from ODK and OMK dragged into JOSM

- Select all those .osm layer by selecting the uppermost .osm layer, then pressing Shift and then selecting the lowermost .osm layer
- Right click on one of the .osm layer, then click Merge. Select target layer Windows will appear, you do not have to change the target layer, click Merge.



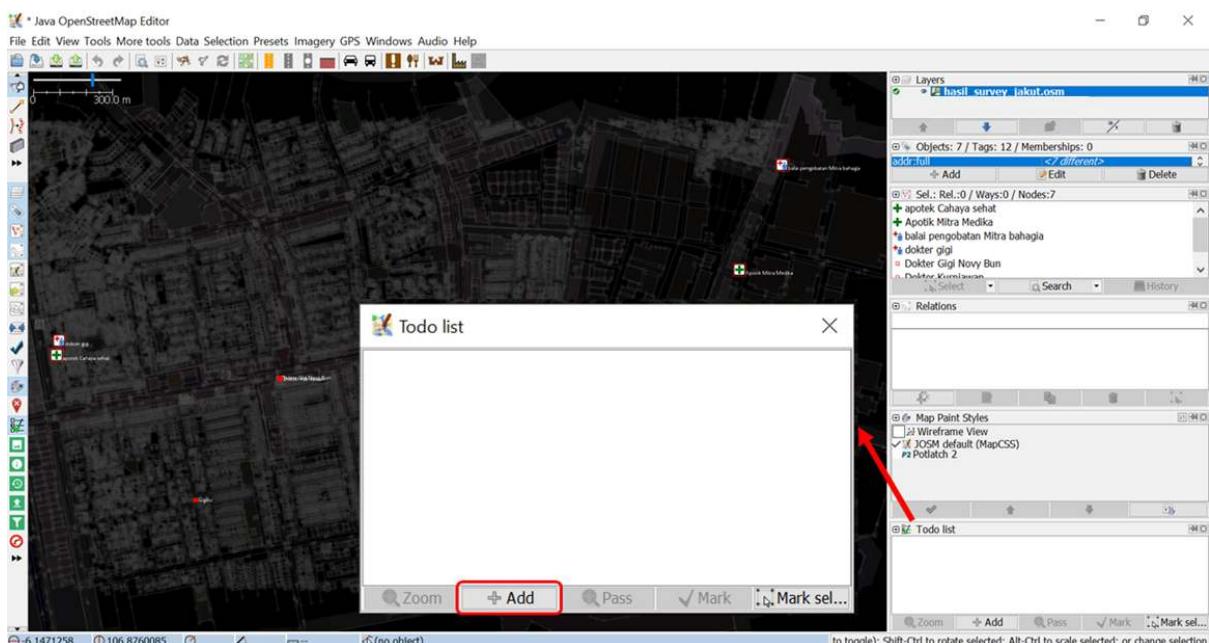
## Merging all survey data layer

- Save the merged layer and change the name by right-clicking on the merged layer, select Save As, change the layer name and then click Save.



## Saving the merged survey data layer

- JOSM provides a plugin named to-do to help you mark the mapped or unmapped object from the merged survey data layer. You can refer to Using to-do list on JOSM module to learn how to install and how to use to-do plugin in details. If you have already installed to-do plugin and activated Todo list Windows, select all objects nodes in the merged layer using Select object icon, then click Add on the Todo list Windows.

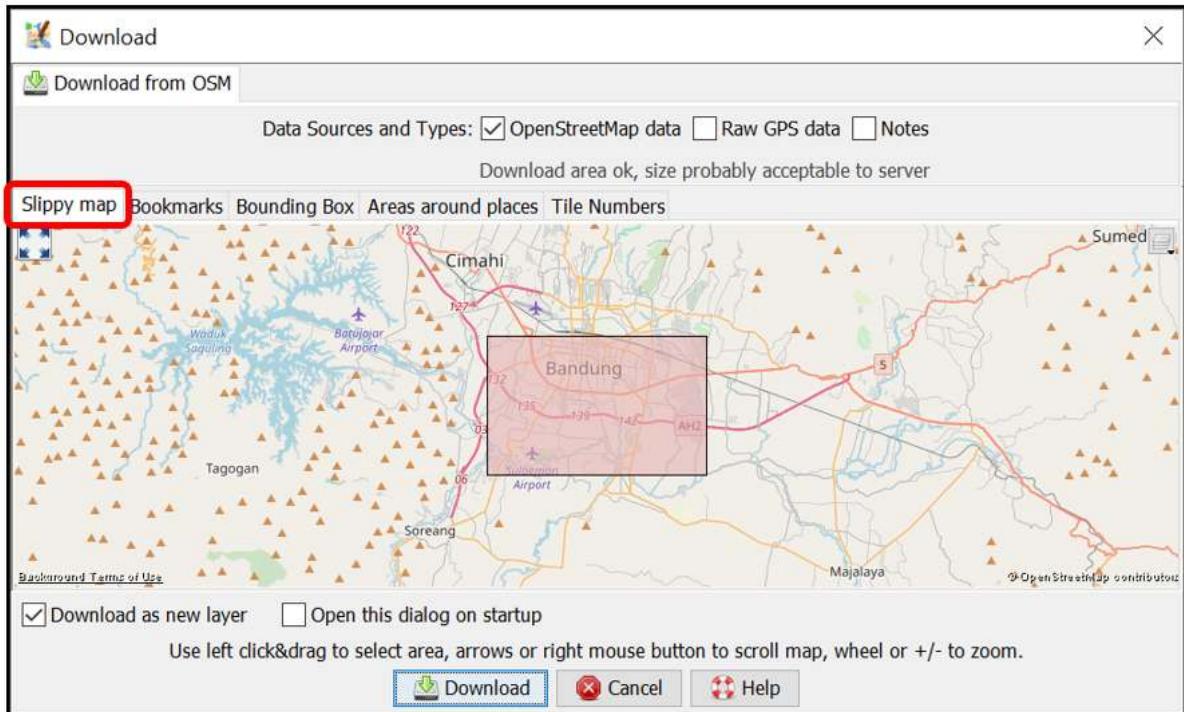


## Adding objects into Todo list

### III. Downloading OSM Data

After successfully merging all survey data, you need to download existing OSM data. Downloading OSM data aims to discover which objects already mapped and which objects have not already mapped on OSM. These are the steps to download OSM data using JOSM:

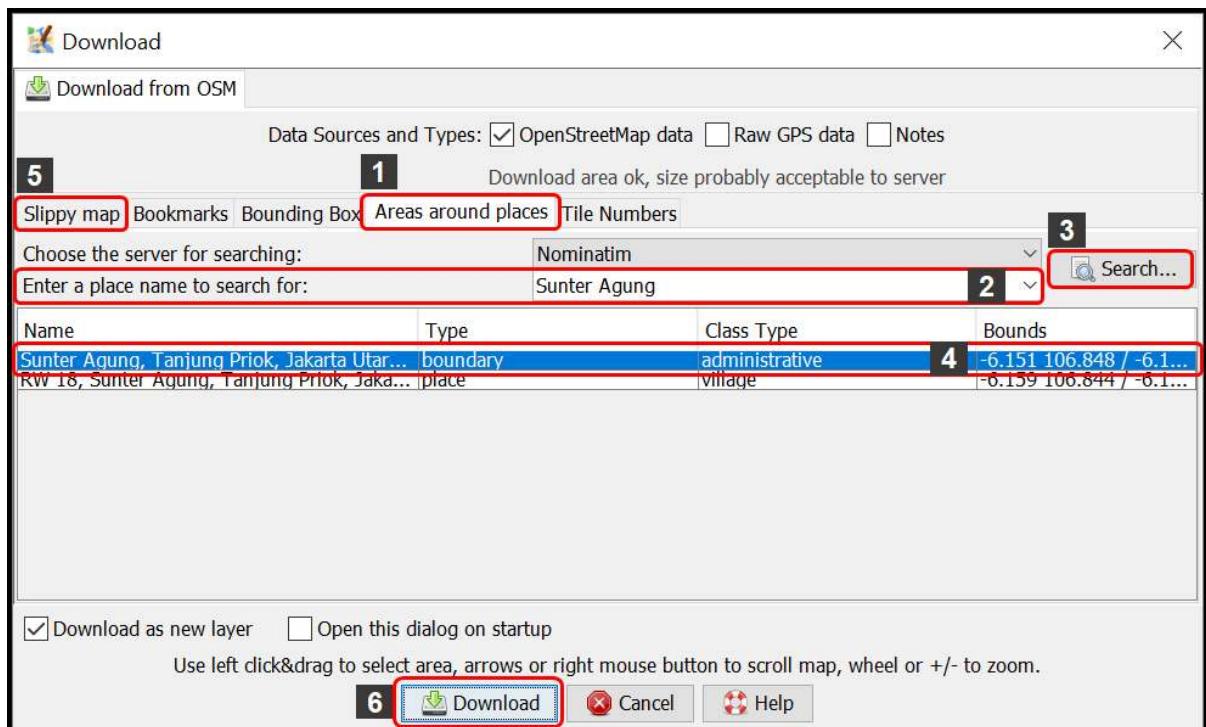
- Click menu **File → Download Data**
- Download Windows will appear. It will show you tab **Slippy Map** by default.



#### Download Windows on JOSM

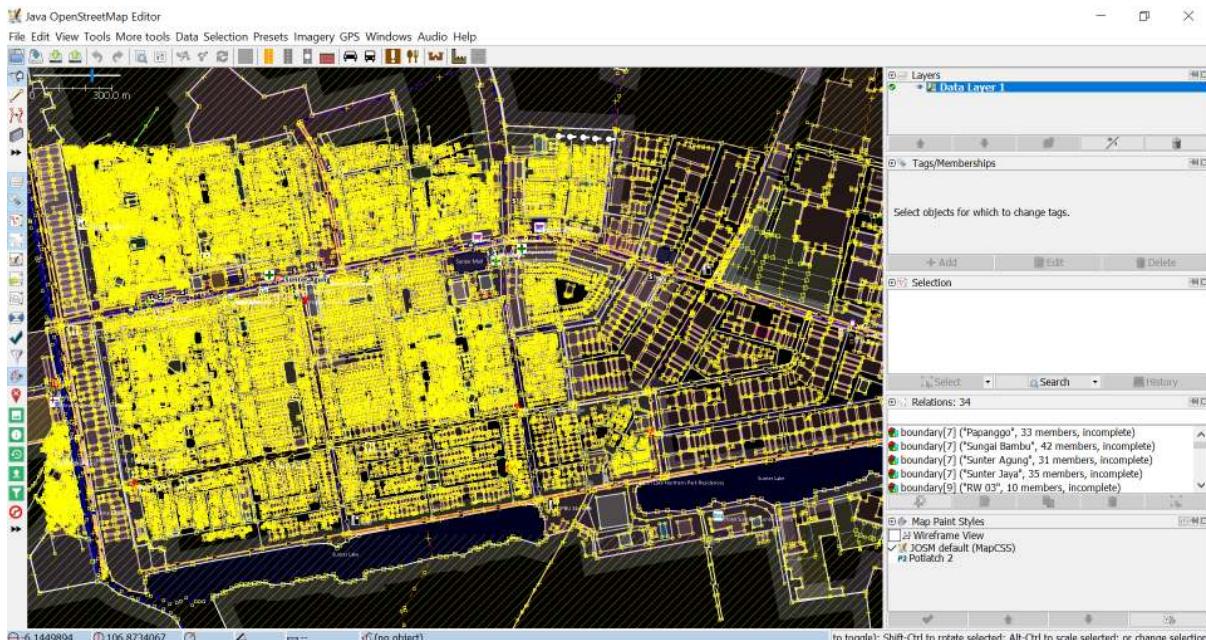
- If the map is not displaying your mapping area, slide the map by **right clicking and hold** your mouse and then **drag the map** to your mapping area. Draw a box at your mapping area by **left clicking and hold** your mouse and then **move** your mouse until a pink box cover the entire mapping area. Then click **Download**.
- If it is quite hard to find your mapping area by sliding the map, you can click tab **Areas around places** and type the name of your mapping area in the **Enter a place name to search for** box then click **Search**. The search result will show you names of your mapping area. **Click on one of the names** then go back to tab **Slippy Map**. The map on the tab **Slippy Map** will be directed to your mapping area. **Draw a box** covering your entire area of mapping, then click **Download**.

**Note:** Do mind the amount of existing OSM data in your mapping area. If there is already a lot of existing data, you should download it part by part since JOSM can not download an enormous amount of data at once.



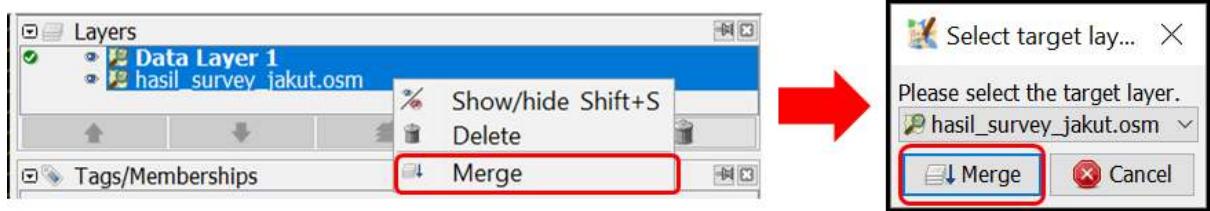
#### Tab "Areas around places" at Download Windows

- After finished downloading OSM data in your mapping area, there will be a new layer in the Layer Windows that will also be your editing layer to add or edit OSM data. Make sure that you **only add or edit data in the clear area, not in the shaded area**. The shaded area is not your downloaded area. And make sure your entire survey area is already downloaded. After downloading OSM data, your JOSM will look like this:



#### Tab "Downloading OSM data on JOSM" at Download Windows

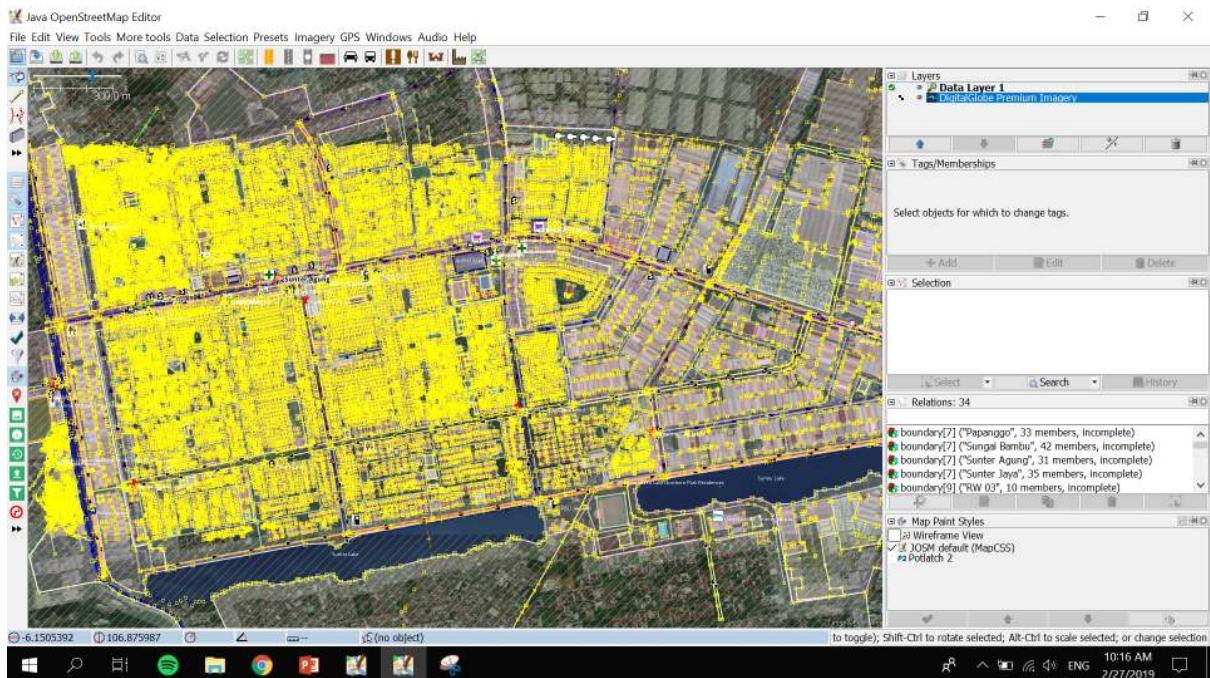
- If you already downloaded OSM data in all your area, merge your downloaded OSM data layer with your survey data layer. Select those **two layers** then **right click**, select **Merge**. Save on your survey data layer. Then click **Merge**.



Merging downloaded OSM data with survey data layer

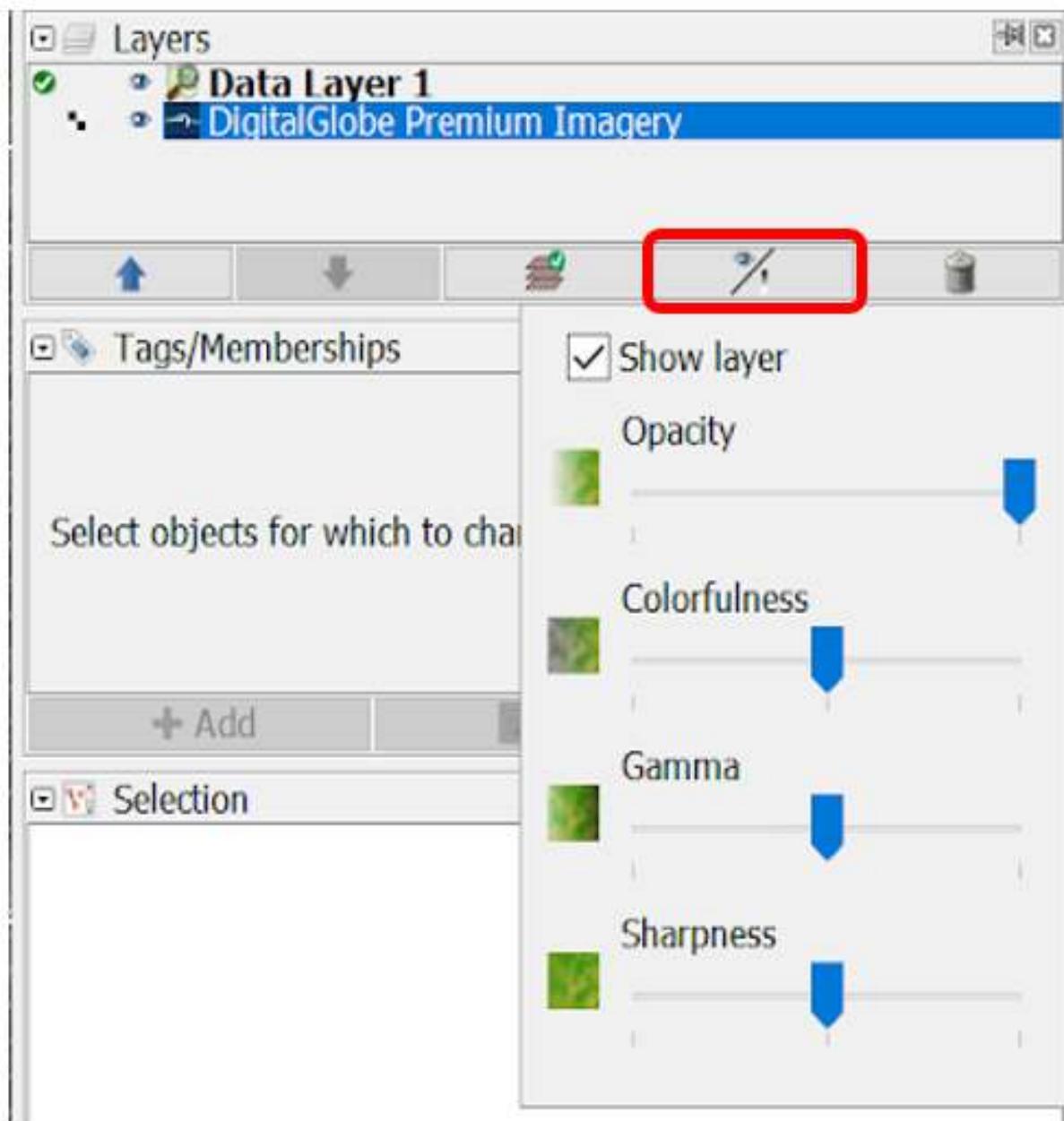
#### IV. Adding Satellite Imagery

- Add satellite imagery as another reference for mapping by clicking menu **Imagery** → choose one of the available imagery you want to use, such as **DigitalGlobe Premium Imagery**. After successfully adding satellite imagery, it is time to add OSM data. Your JOSM will look like this:



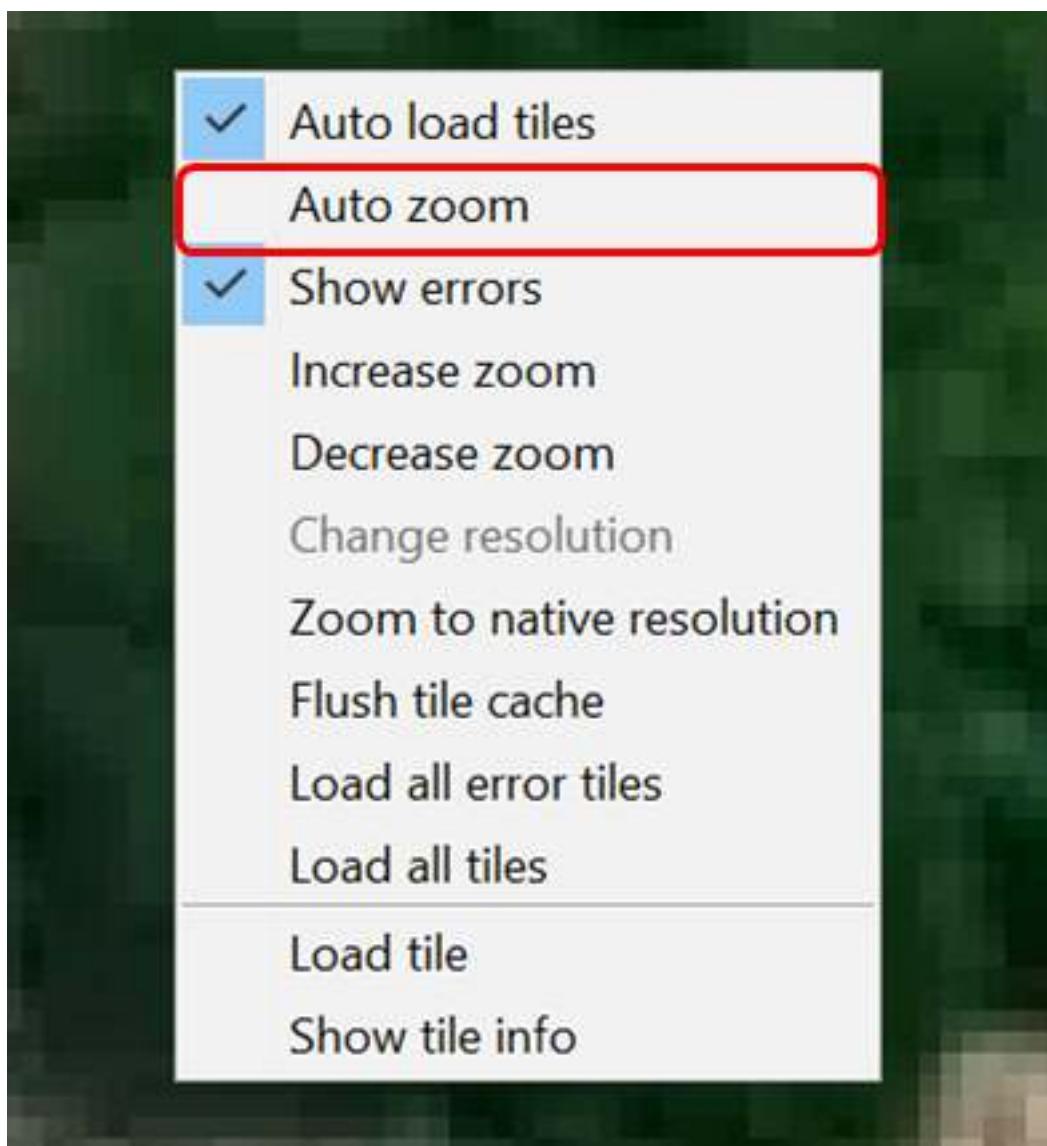
Adding satellite imagery on JOSM

- You can adjust the display of the satellite imagery. Select the satellite imagery layer, then click icon **Change visibility of selected layer** and adjust its display by sliding the blue button left or right.



#### Changing the display of satellite imagery

- If you use **DigitalGlobe Premium Imagery** as your reference, sometimes it has two versions of display when you zoom it in or zoom it out. Usually there is only one version of display aligned with the existing OSM data. Inactivate **Auto Zoom** feature so that the satellite imagery display won't change when you zoom it in or zoom it out. To inactivate Auto Zoom feature, **right click on the Satellite Imagery display → click Auto zoom** so that the checkmark next to Auto zoom disappear.

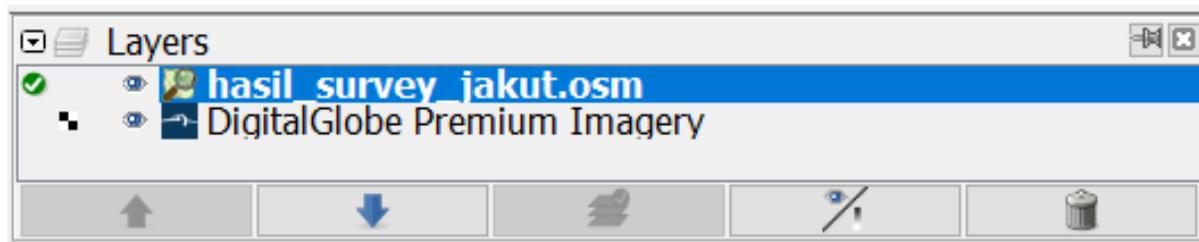


Inactivating Auto zoom for satellite imagery

## V. Editing OSM Data Using JOSM

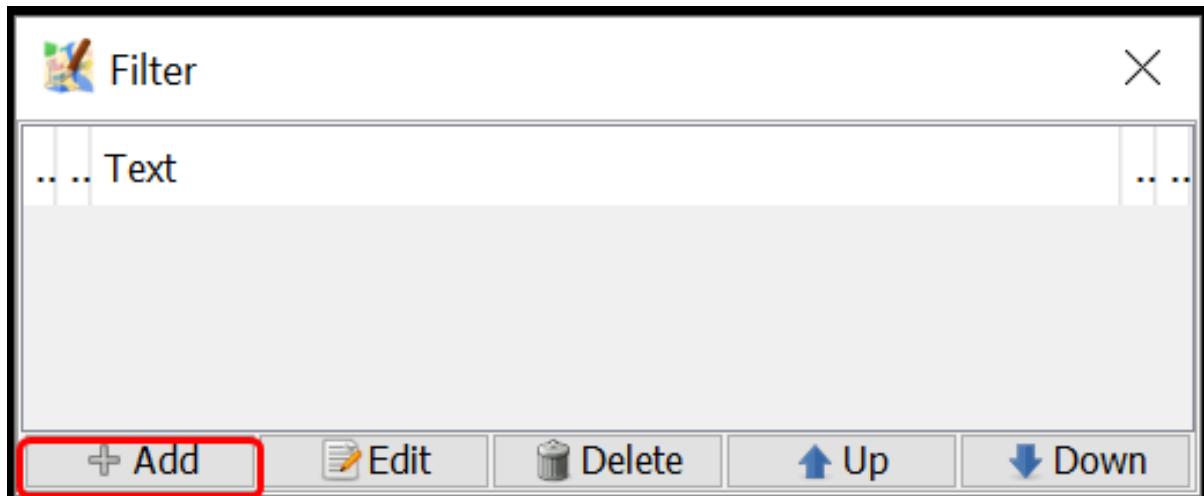
Now you are ready to add or to edit OSM data using JOSM. You can draw new objects or you can edit the existing objects using the tools mentioned in **Using JOSM** module. Here are the steps on how to add or edit OSM data using survey data, downloaded OSM data and satellite imagery that you already added before on JOSM:

- After successfully following the steps mentioned in the previous sections, there will be two layers on your JOSM: **satellite imagery layer** (in the picture below, the layer meant is DigitalGlobe Premium Imagery layer) and **merged survey data with downloaded OSM data layer** (in the picture below, the layer meant is *hasil\_survey\_jakut.osm* layer). It will look like this:

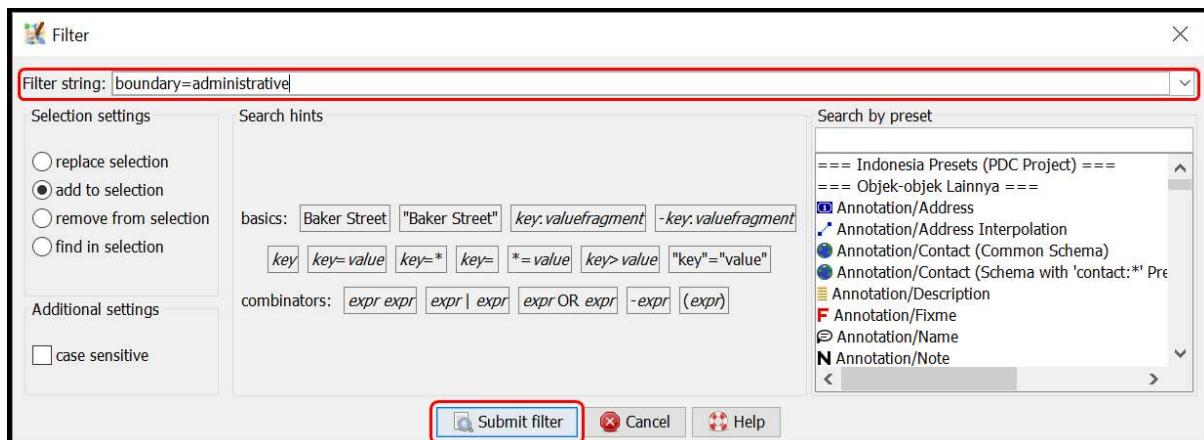


Satellite imagery layer and merged survey data with downloaded data layer

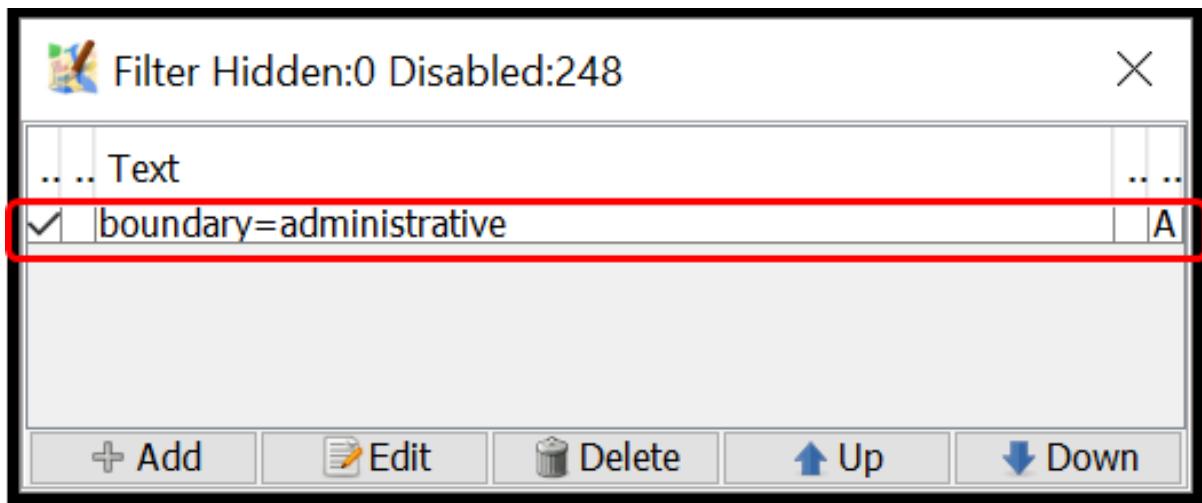
- You can use **Filter** feature on JOSM so that you don't accidentally make changes on other objects such as administrative boundaries. Administrative boundaries in OSM is a delicate objects, so if there are already administrative boundaries mapped on your mapping area then it is better to utilize the **Filter** feature. To use this **Filter** feature, activate the Filter Windows by clicking menu **Windows** → **Filter**. There will be Filter Windows in the right panel. Click **Add** in the Filter Windows, type **boundary=administrative** in the **Filter string** box and click **Submit Filter**. New filter will appear for the administrative boundaries. To turn off the filter, simply uncheck the checkmark on the left of the filter. You can find out more about **Filter** feature on JOSM in the **Using Filter on JOSM** module.



Filter Windows on JOSM

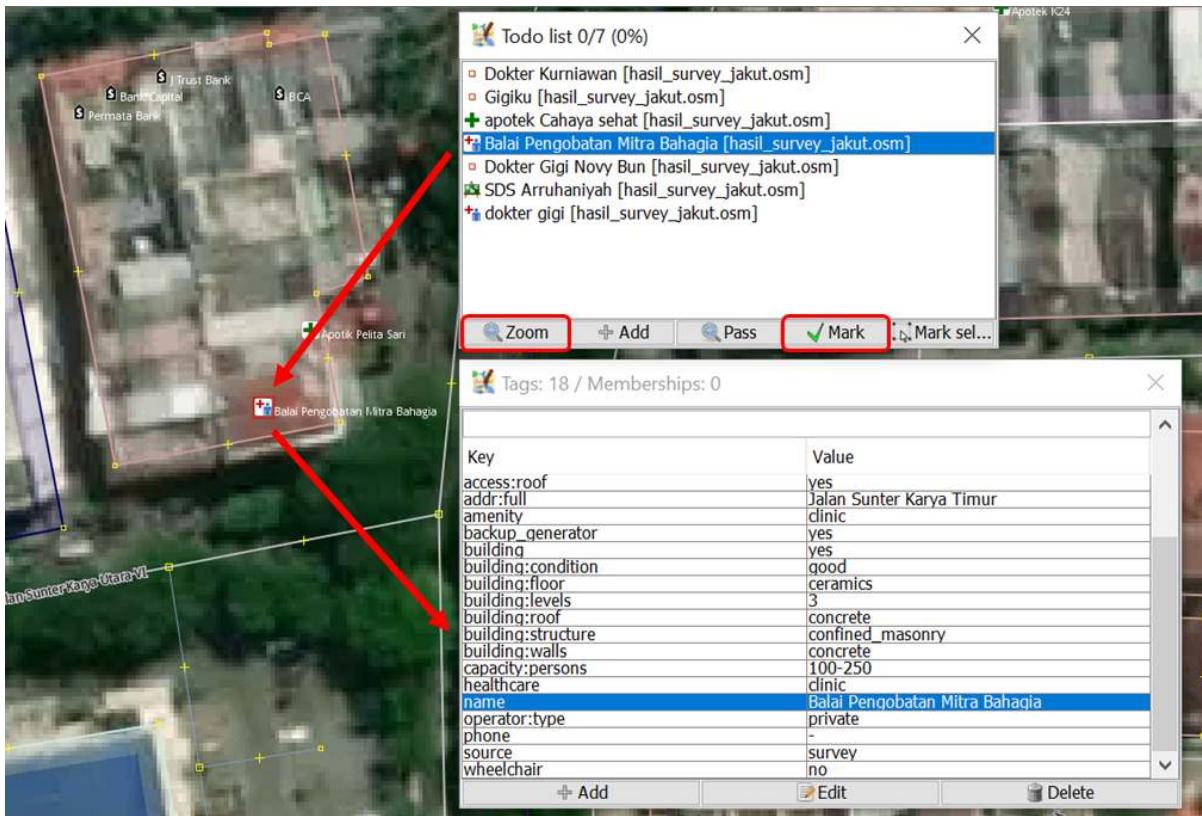


Adding filter string in the Filter Windows

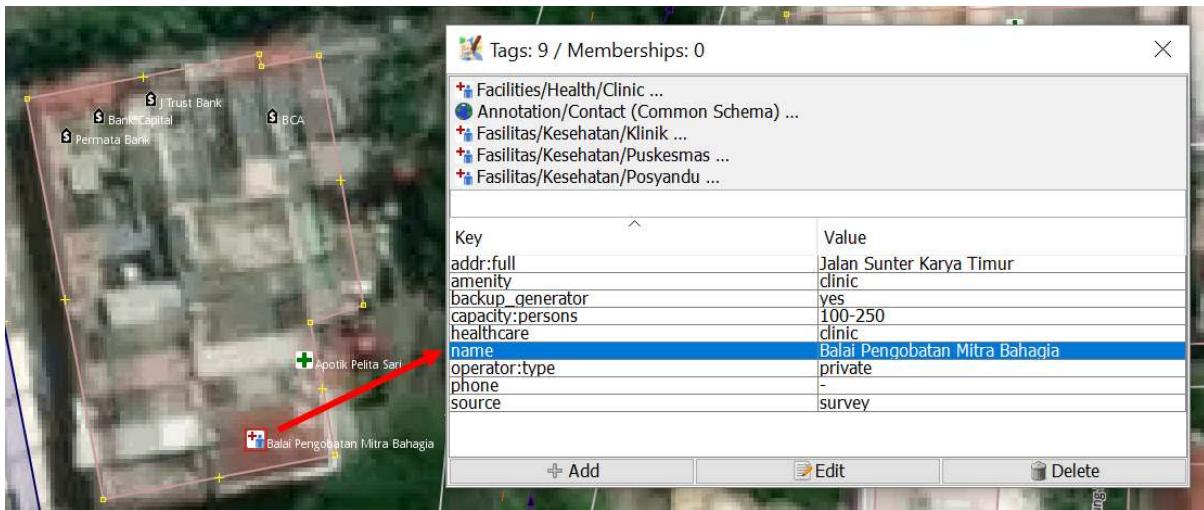


Newly added filter in the Filter Windows

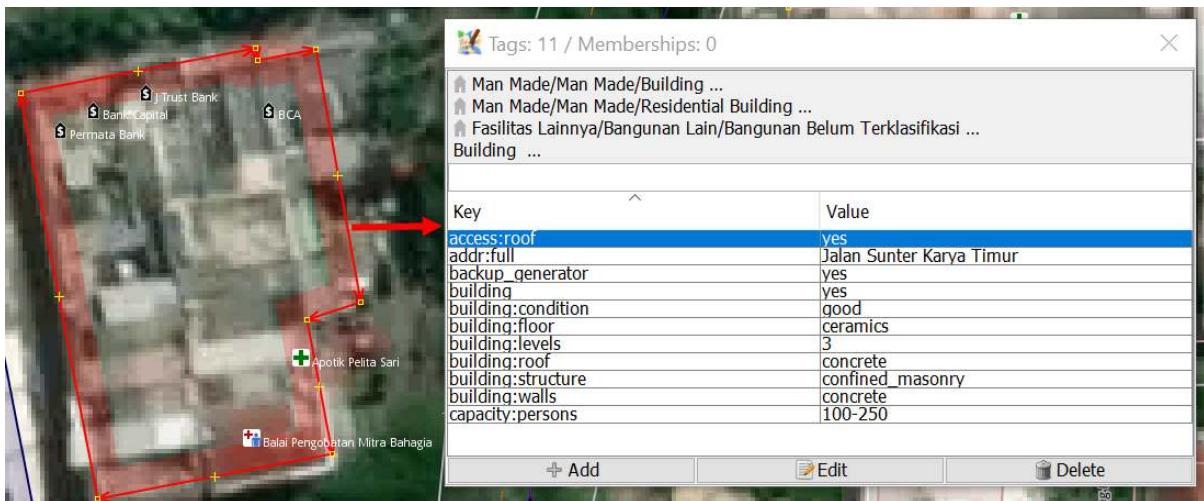
- Start mapping by zooming in to an object, select one object in the Todo list Windows and then click **Zoom**. After selecting and zooming in one object, you can copy the tag from the selected object to the downloaded OSM objects. Select the downloaded OSM object that aligns with the selected survey object, then click menu **More tools → Copy tags from previous selection** or press **Shift + R** on your keyboard. Make sure you selected the aligned survey object right before copying its tags to downloaded OSM object. Also make sure that the copied tags are consistent with OSM mapping guidelines and suitable for the object type. For example, in the picture below, a clinic located in a shophouse complex, mapped as a point and only have tags suitable for point object. While the building related tags added to the shophouse building where the clinic is located. When you finish copying tags for one object, click **Mark** to identify that it is just already mapped on OSM. Repeat until all of the objects mapped on OSM.



Using Zoom dan Mark feature on the Todo list Windows

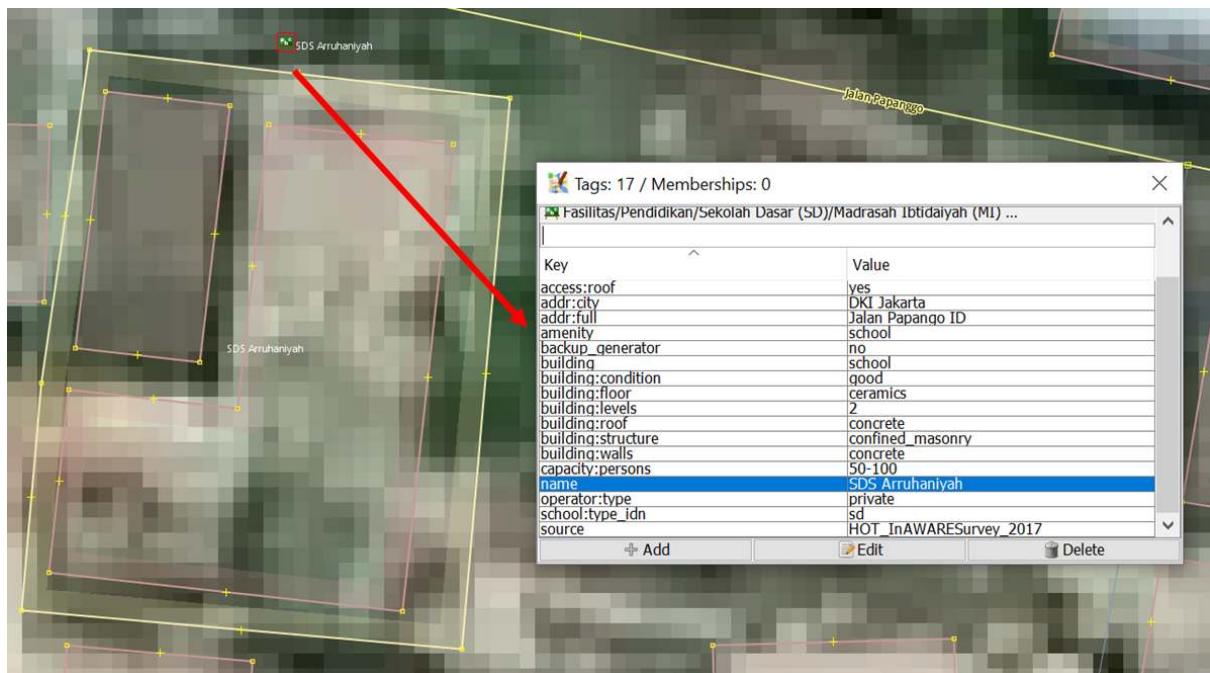


Tags suitable for point object

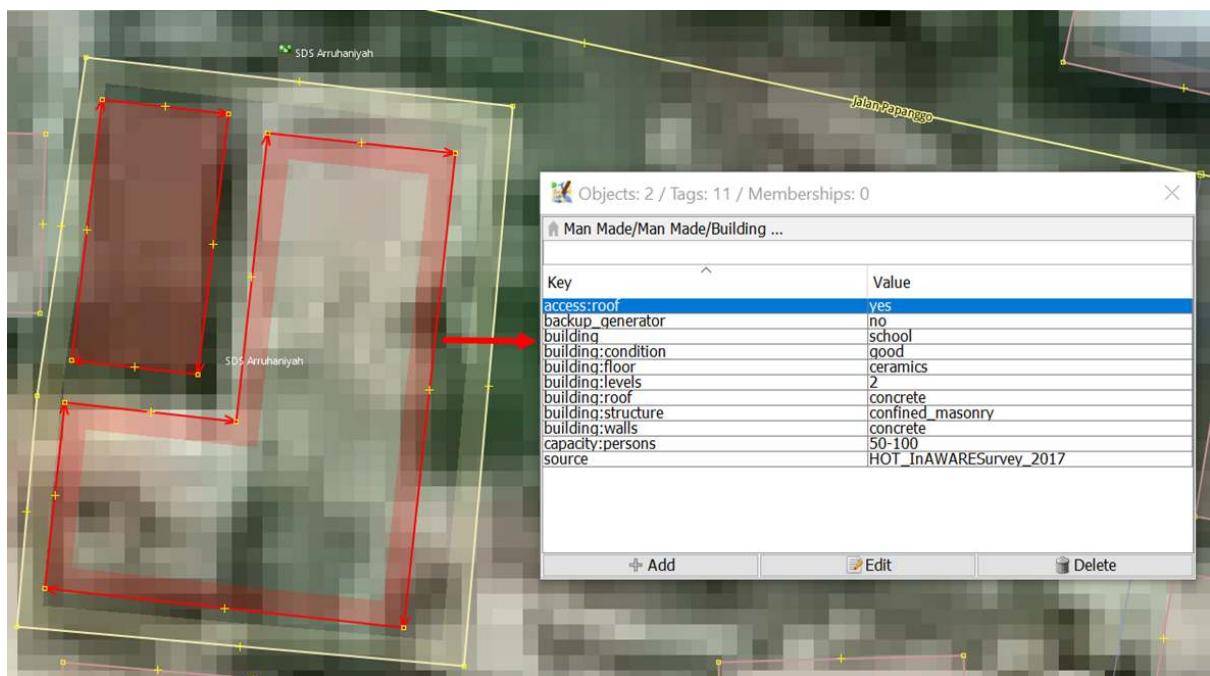


Copying building related tags using Shift + R

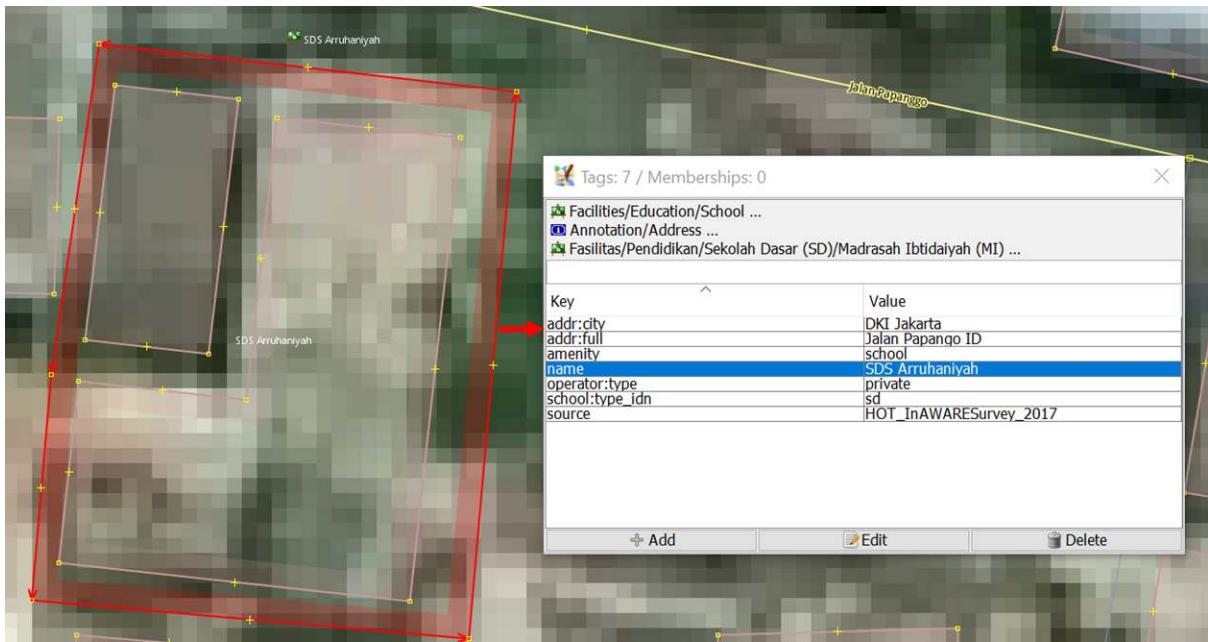
- Example given above is for point object. When you find an object that is supposed to map as a polygon, such as school complex which has more than one building inside, how to map it on OSM? Select the school object in the Todo list Windows and then click **Zoom**. Select the point object on the map. Copy the tag to the building polygon aligned with the point object by selecting the building polygon and then clicking menu **More tools → Copy tags from previous selection** or pressing **Shift + R** on keyboard. After copying the tags, delete tags that are not related to building and left only building related tags. Draw a polygon covering all school area using **Draw nodes**, then copy tags that are suitable for school area (tags that you deleted before in the building polygon) like **amenity**, **name** and **addr:full**. After that, delete the school point from the survey data since it has just been mapped as a school area polygon.



School point from survey data



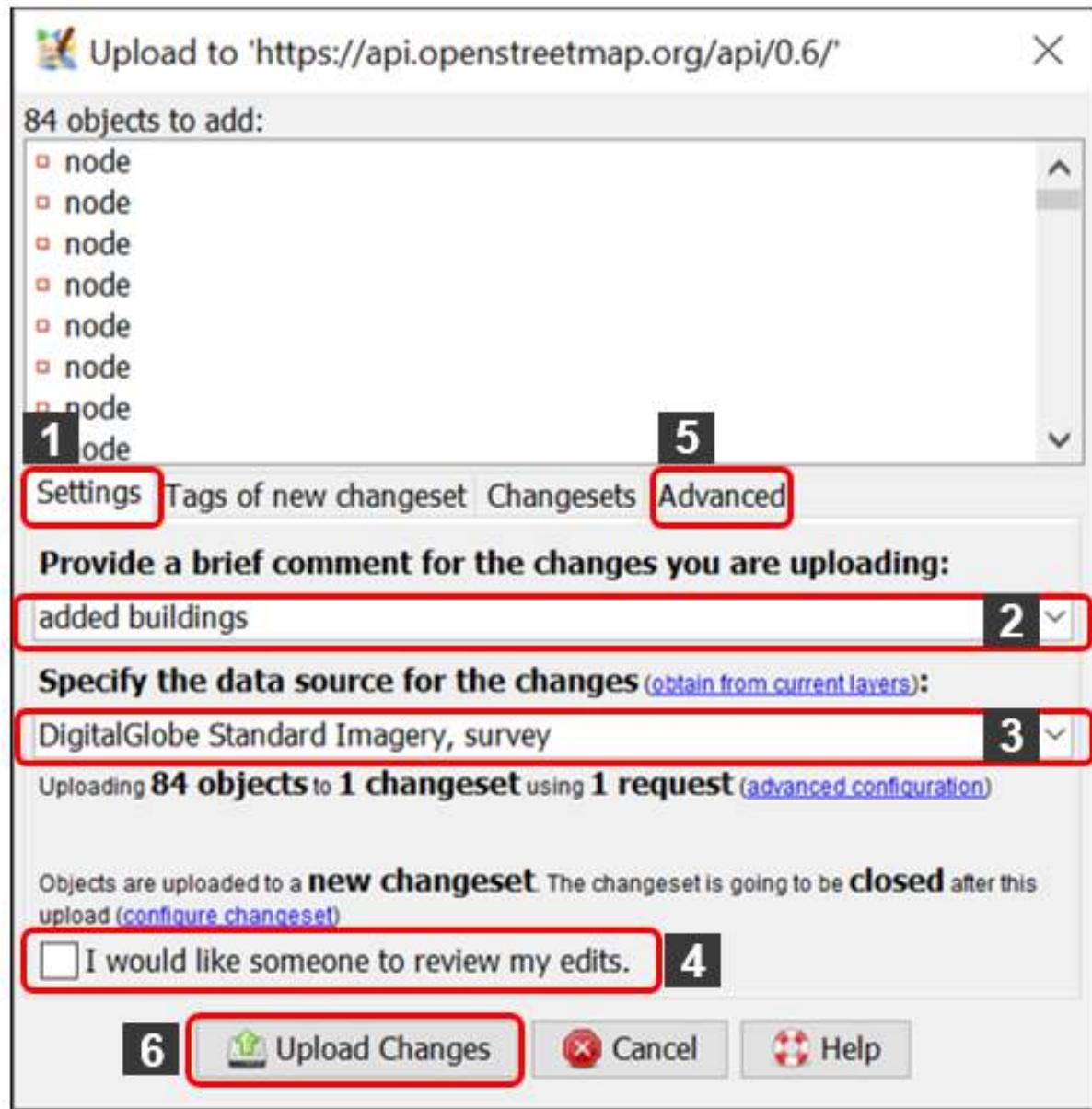
Tags suitable for school building



Tags suitable for school area

## VI. Saving Changes

- If you have already done mapping using JOSM, save changes to OSM server because the newly added objects are saved only in your computer. To save the changes you've made, click menu **File → Upload Data**.
- If you encounter warning/error after clicking Upload Data, it is better to fix warning/error first. You can find out more about fixing warning/error and common warning/errors found in **Survey Data Validation Using JOSM** module. However, if you don't have the time to learn how to fix warning/error, you can just go ahead and click **Continue Upload**. Upload Windows will appear.
- If there is no warning/error, Upload Windows will appear. On the Upload Windows, type a brief comment for the changes you've done in the comment box and specify the source(s) in the source box. Type the name of the satellite imagery and survey in the source box. If you want other contributors to review your edits, give a checkmark next to **I would like someone to review my edits**. Then click **Upload Changes**.

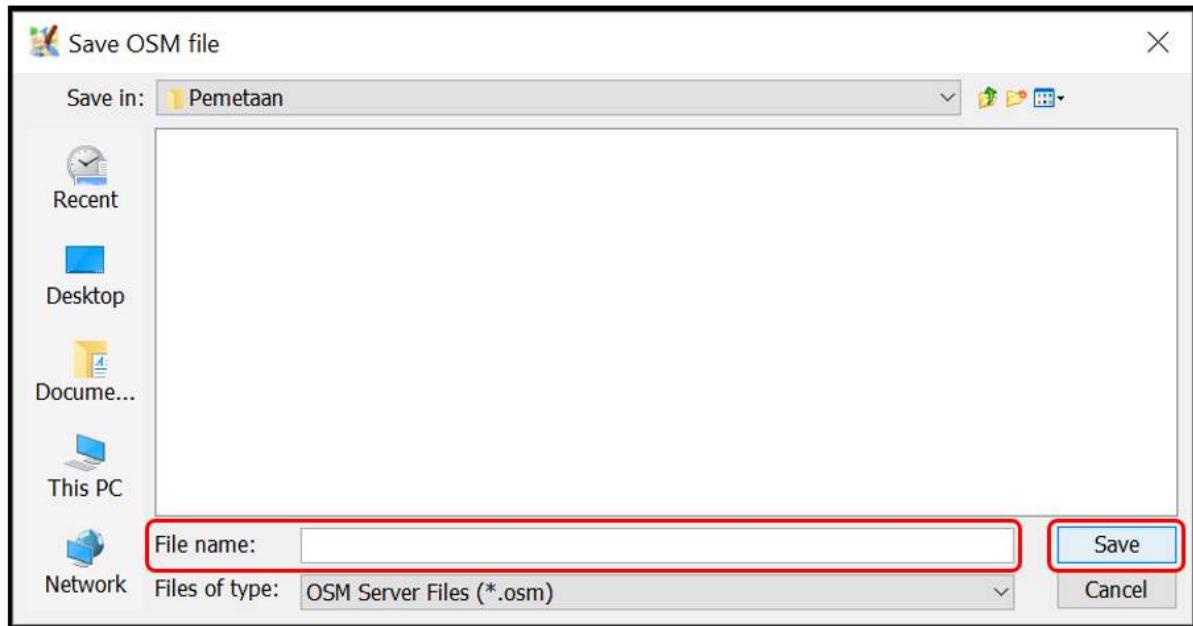


#### Upload Windows on JOSM

**Note:** You need to periodically upload your edits when mapping so that there won't be a hefty amount of edits to upload. The more edits you want to upload, the more time it takes to upload. If you already mapped a lot of edits and haven't done any upload, you can upload it by chunk. You can do it by clicking tab **Advanced** and select **Upload data in chunks of objects** in the Upload Windows. Type the **Chunk size** with how many changes you want to upload per chunk, such as 500. This can be done to avoid incomplete upload, especially when your internet connection is unstable that resulted in object duplication.

#### VII. Saving .osm File

- You can also save your editing layer by right clicking on your editing layer and click **Save**. **Save OSM file** Windows shown below will appear. Type the name of your file, then click **Save**. Your file will be saved in .osm format.



#### Save OSM File Windows on JOSM

**Note:** If you haven't finished mapping your area and you want to continue mapping it later, you can save your work as .osm file then you can continue mapping it later. You can open your saved .osm file by clicking menu File → Open, choose the file you want to open and click Open. After opening it, update the OSM data first by clicking menu File → Update Data and you can go ahead to continue mapping.

#### VIII. Viewing Changes in the Map

- You can view your changes by checking it on OSM website and directing it to your mapping area. Keep in mind, new changes can be viewed a while after uploading it to OSM server.



OSM map before and after mapping process

#### SUMMARY

If you can apply and follow through to all of the steps mentioned in this module, then you are able to go through OSM mapping process using JOSM successfully. You are able to do OSM mapping process, such as downloading OSM data, adding satellite image, editing OSM data, uploading changes, saving OSM data as .osm file and viewing changes. You can upload your changes periodically, such as by region or by village. If you already have finished conducting survey in one region or in one village, you can upload it directly to OSM. This shall be done so that your survey data is not piled up and others can perform data validation for your edits.

# Resolving Conflict on OpenStreetMap Data (OSM)

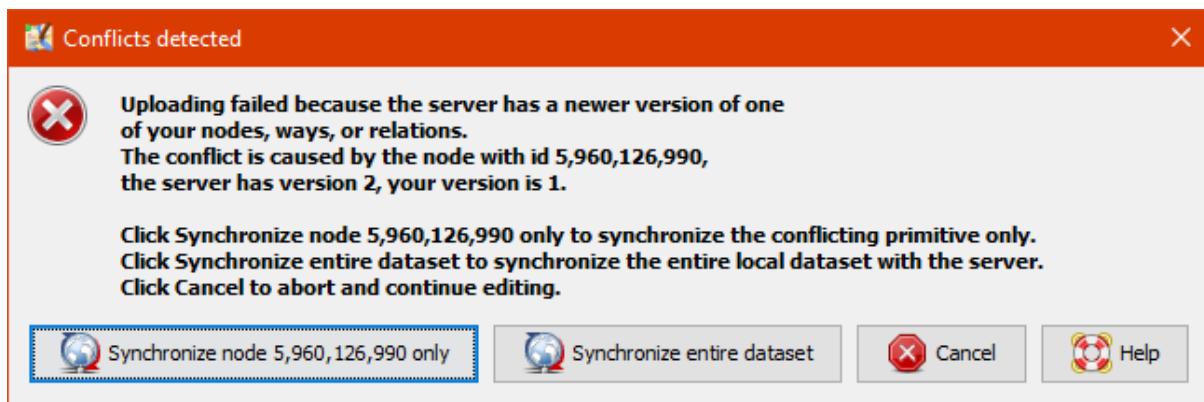
## Objectives:

- Participants can explain what is data conflict on OpenStreetMap
- Participants knowing about types of conflict in JOSM
- Participants can fix data conflicts using JOSM
- Participants know to avoid data conflict in JOSM

When you are uploading your changes in JOSM, some contributors might also do editing in your area. This might occur data conflict in your uploading process. Therefore, in this module, you will learn about data conflict in OpenStreetMap, types of conflict, and how to fix it using JOSM.

## I. Data Conflict on OpenStreetMap

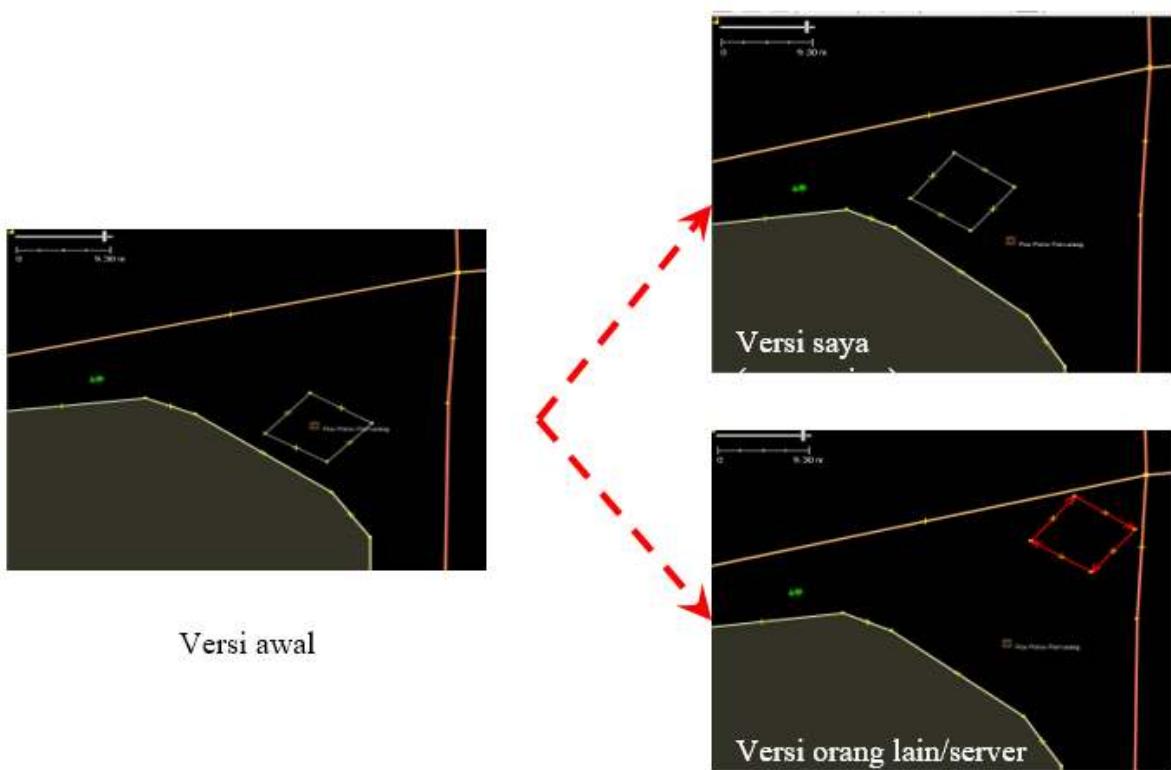
When you have edited your changes and were uploading them in JOSM (learn more about this in [Using JOSM](#) module), maybe you ever received a message like this:



Example of Conflict Detection Window in JOSM

The picture above shows data conflict in OSM. Why that could possibly happen? This conflict happens because when you edit your data in JOSM, you edit the same data/object(s) with the other contributor in the same time. Thus, the other contributor have uploaded the changes first and have received by OSM server. After that, you also want to upload the same data/object(s) with your own changes. Therefore, your changes will automatically rejected by the server because it causes confusion.

You will face with data conflict when you do changes in JOSM such as editing, adding, or delet some objects in OpenStreetMap, while the other contributor also do the same thing on the objects. The other contributor has uploaded their changes slightly before you. Therefore, when you try to upload your changes, it causes confusion for the OSM Server because it does not know which changes is correct and can be saved. If this happens, then the data conflict need to be fixed before you can continue to upload your changes into OSM server.



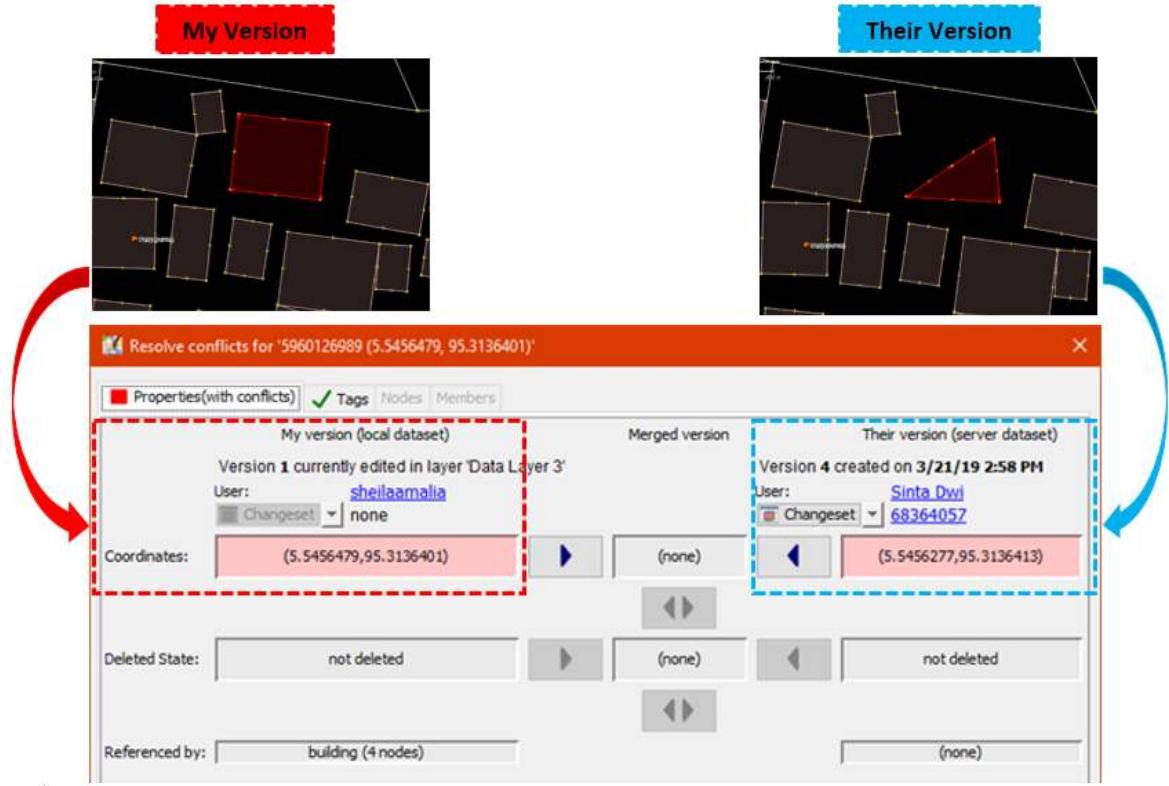
#### Example why conflict happens in JOSM

The picture above is example of conflict that could happen because of different position with the object between your version (my version) and version of the other contributor / have received by server (their version). To resolve this conflict, you have to choose one version between them (look chapter III. Fixing Data Conflict in JOSM).

## II. Types of Data Conflict in JOSM

### 1. Conflict of Properties

Conflict of properties happens when an object(s) has been moved or deleted so one or more of its node has different location/position than the other version.

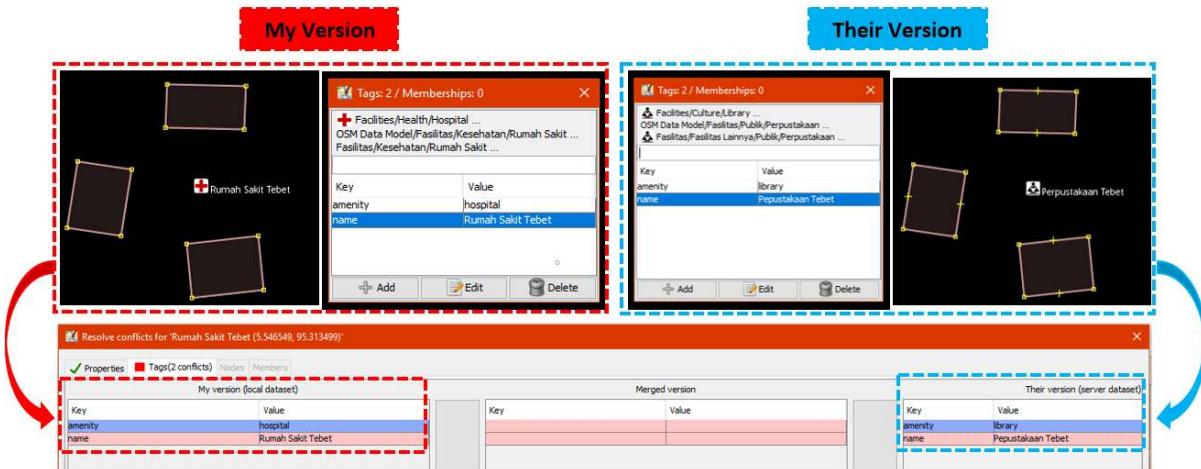


### Conflict Property Window

The picture above is an example of conflict of properties in JOSM. As can be seen in the picture, in My Version the object has square shape and in the other version (their version) one of the node is deleted then change its shape become triangle. To fixed this, you need to choose which version that correct based on the location of the different nodes in both version.

## 2. Conflict of Tag

Conflict of tag happens because there are different information (tag) on the object that has been edited by two or more contributors. The information could be deleted or changed on the other version.

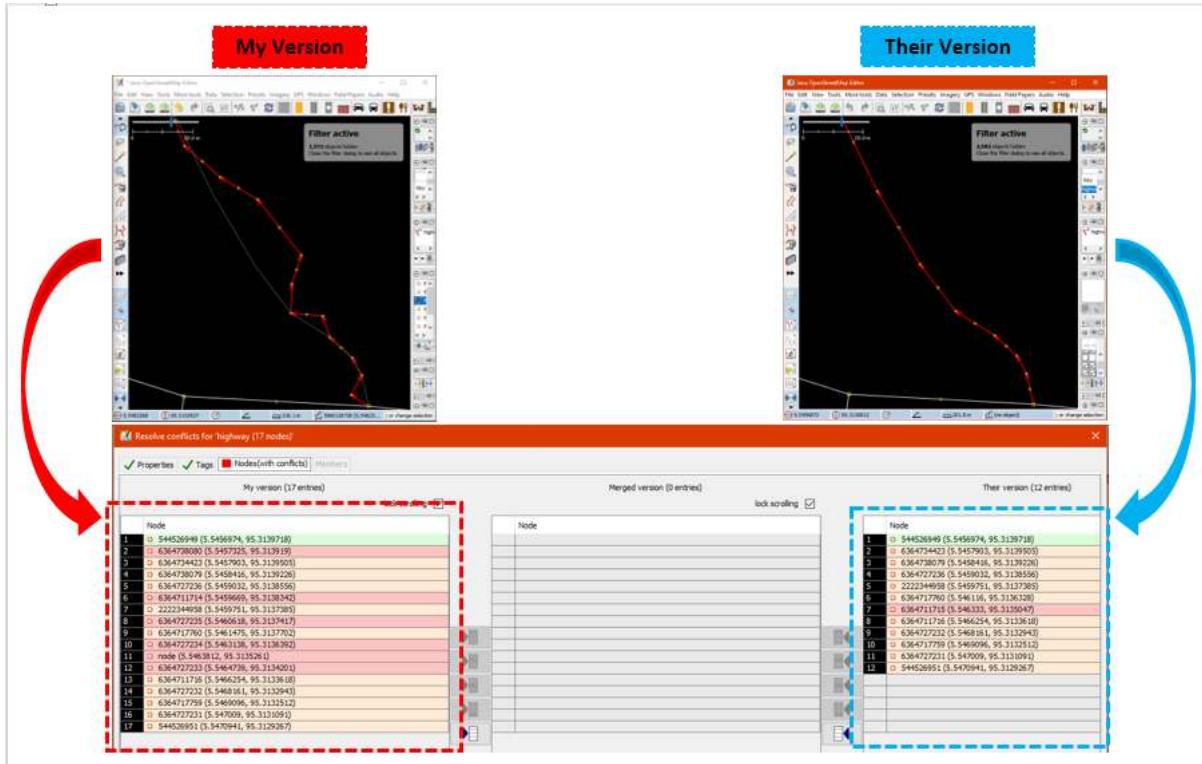


### Conflict of Tag in JOSM

The picture above shows differences between two versions on the same object in JOSM. **My version** has Rumah Sakit tag (*amenity = hospital*) with its name value is Rumah Sakit Tebet Raya while the other version (**Their version**) has tag klinik (*amenity = clinic*) with name RS Tebet Timur. You have to choose one of them that you think has correct information to fix it before upload it to the server.

### 3. Conflict of Node

This conflict happens when there are differences order of the nodes in a way or closedway object(s) which have been removed or moved on one of the versions and has been uploaded to the OSM server.

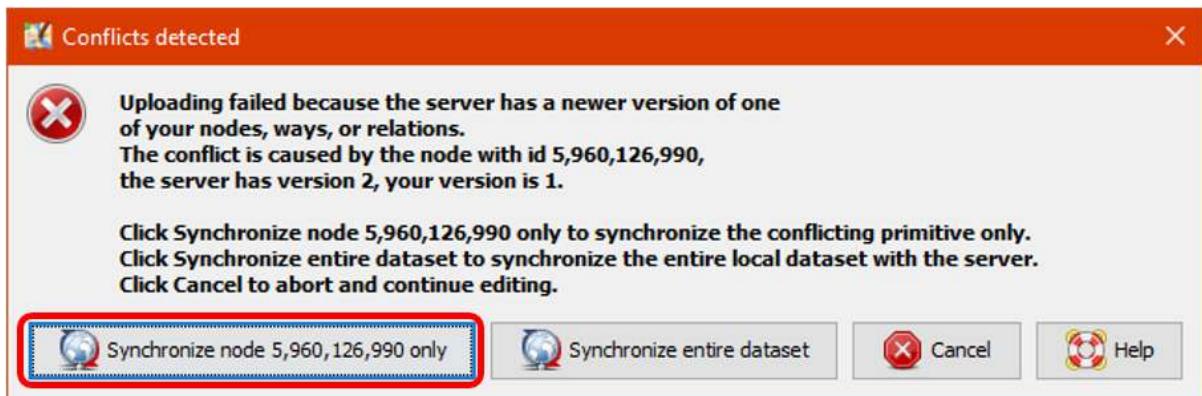


Conflict of Nodes in JOSM

### III. Fix Conflict Data in JOSM

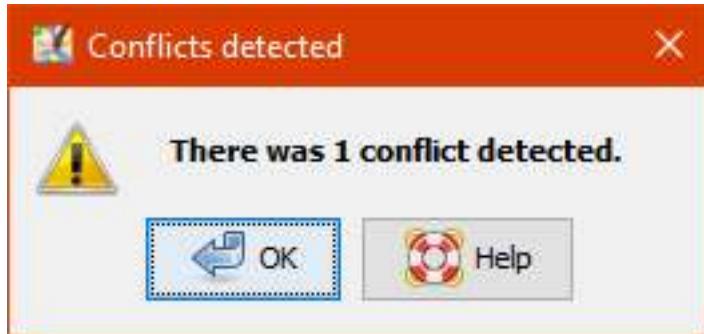
Fixing conflict data in JOSM is quite simple, even though most OSM contributors would have some confusion to do it. Generally, every data conflict fixing in JOSM asks you to choose the correct changes between your version and the other version that have uploaded to the server (their version). You have to choose whether to **keep your version** or delete you version and **use their version**. Steps to fix conflict data in JOSM as follows:

- When the conflict window appears, you might be only want to select the **Synchronize node 5,960,126 only** option. However, this option will only fix conflict in one certain nodes. Instead, you should choose **Synchronize entire dataset** option so you can resolve all conflict nodes in one time.



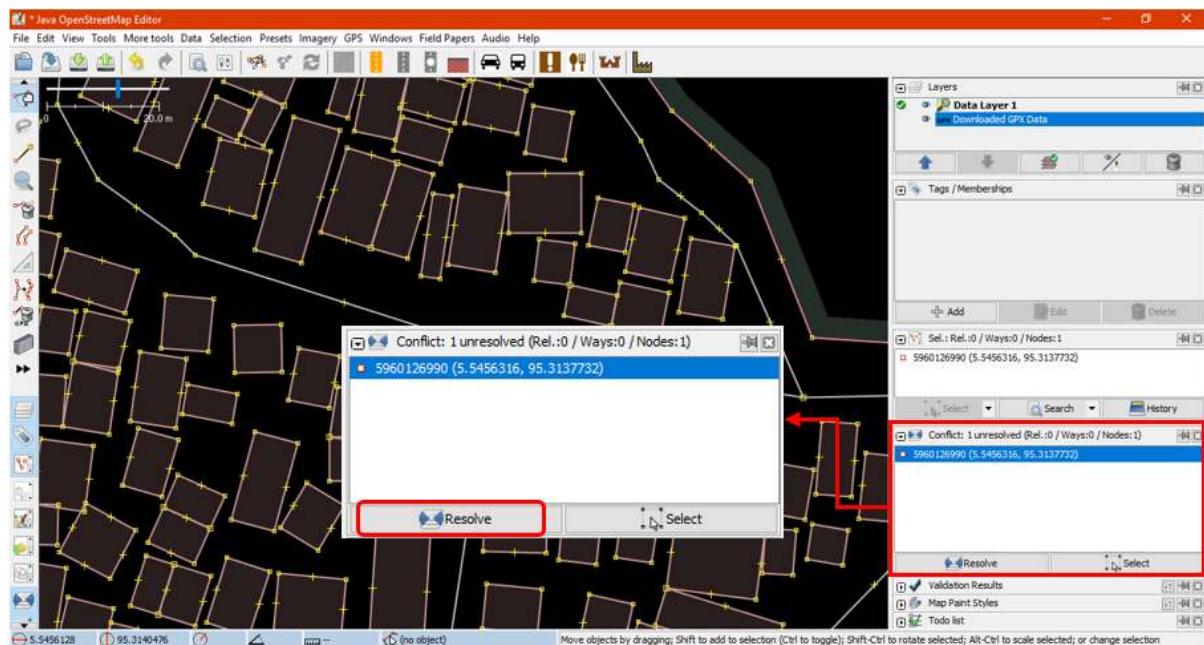
Conflict Detection Window in JOSM

- After that, JOSM will show how many conflicts that has been detected, Click **OK**.



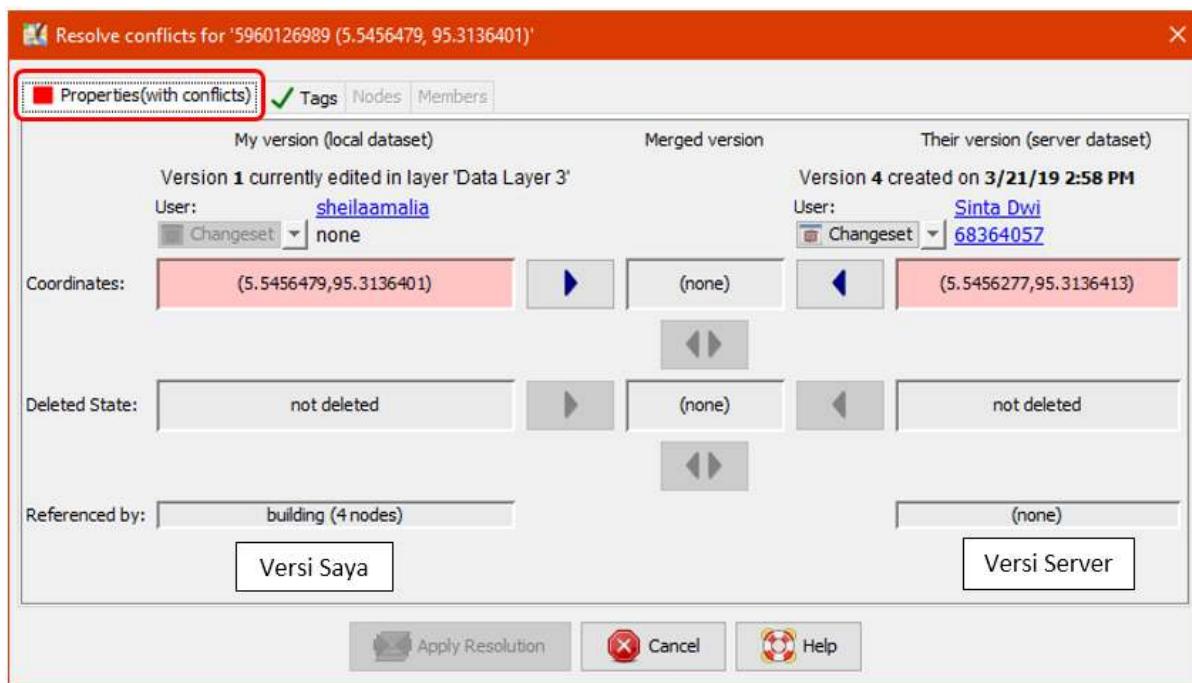
Number of detected conflict

- There is a list of conflicts in **Conflict** panel at bottom right corner in your JOSM. You can choose which conflict you want to fix and click **Resolve**.



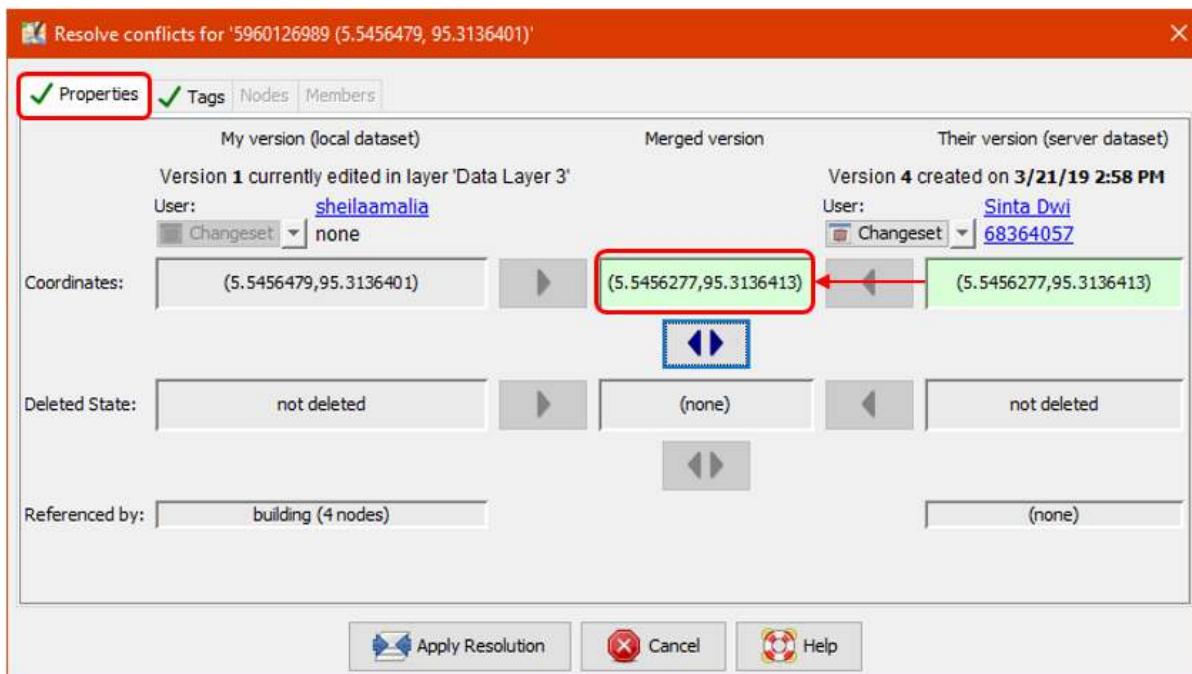
Conflict panel to fix detected conflict

- When you have click the **Resolve** button, the window will appears and shows detail about detected conflict. The message about conflict might be looks complicated but it actually has simple instruction. You will know about what type of conflict do you have by looking at symbol. Therefore, the conflict in this example was caused by different coordinate location and position of object. You can look at a list of changed or moved coordinate as shown in picture below. Thus, conflict in this example was caused by one changed node.



#### A Window to Resolve Conflict

- You only can resolve one conflicts at one time. You can choose which correct version between your version or their version in the server. If you sure that your version is the correct one (you edit / add the object based on your field survey mapping or you already know the object personally), then choose **My Version (local dataset)**. However, if you are not sure about your version and think that the other version more convincing then you can choose **Their version (server dataset)**. Click blue arrow symbol in the version that you choose. If the conflict has been fixed then the symbol will be going turn to green check mark



#### Choose one of the versions to resolve data conflict

- After you have select the right version, you have to make sure the color of conflict box has been changed from pink to green. This means you have successfully fixed the conflict.

Konflik terjadi

Coordinates:	(5.5456479,95.3136401)	▶	(none)	◀	(5.5456277,95.3136413)
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Konflik telah diselesaikan

Coordinates:	(5.5456479,95.3136401)	▶	(5.5456277,95.3136413)	◀	(5.5456277,95.3136413)
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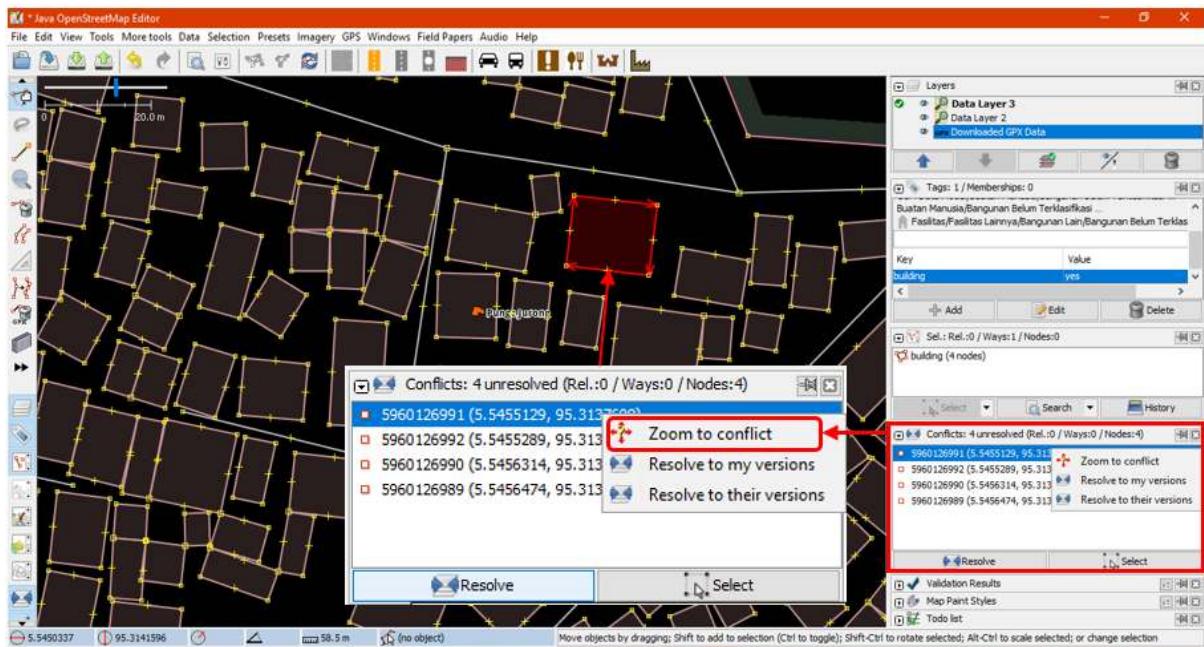
Difference color between original conflict and resolved conflict

- Then click **Apply Resolution** as shown in the picture above. After you have finished all of your conflict, you can start to upload your OSM changes.



Resolved conflict window

- In window menu, you can activate **Conflicts**  window. This window shows total number of conflict on all of your data when you click the **Resolve** button. You also can use another way by right click on one of the conflict and choose **Resolve to my versions** or **Resolve to their versions**. To find the object you can right click and click **Zoom to Conflict**. This will be very useful if you have many conflicts and need to check and fix them one by one.



Window of list conflict on JOSM\_

Note : You can not upload your changes until you have resolved all of your conflict and list of conflict in the conflict window has empty. Keep in mind, you need to be careful when resolving the conflict and need to check it one by one to make sure everything is correct as it should.

#### IV. Avoiding Data Conflict in JOSM

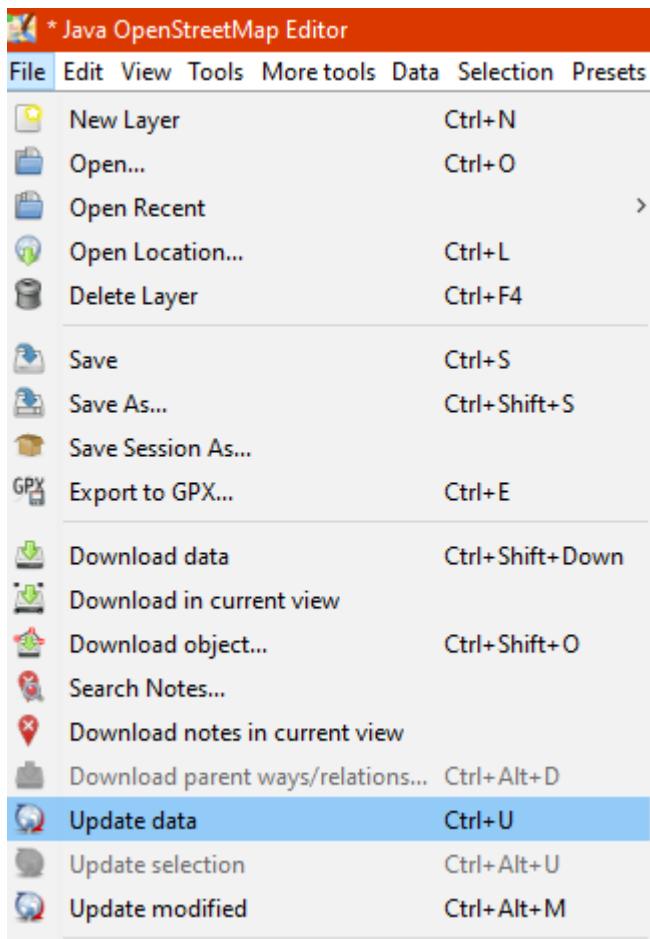
You can do some things to avoid conflict when uploading your data into OSM server, as follows:

##### 1. Upload your changes continuously

- To minimize conflict, you can upload your changes continuously. For instance, if you mapped 100 buildings but does not have a good internet connection, you should upload your changes for every 20 buildings or every 15 minutes. The reason for this is because the conflict would have bigger possibility to occur if you upload when it is finished. The longer you waiting to upload the more possibility the data could possibly have edited and uploaded to the server by other contributors. Therefore, the probability of conflict for your edit will increase.
- If you want to save your OSM data and upload it later, you can update your OSM data first before you upload it. This should be done so you can get the latest OSM data from the server before you upload it. You can do that by click **File** → **Update data** or **Update Modified** then waiting until the updating process is finished. After that, you can upload your changes with **Upload data** options



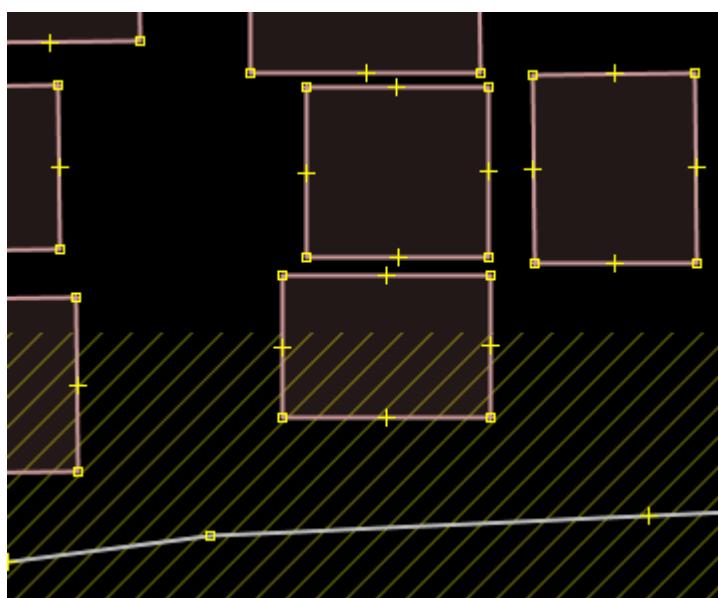
*File* menu or just click  icon on *menu bar*.



Update data options in file menu

## 2. Edit Only in Downloaded Area

You can do mapping in specific area to minimize risk of conflict with avoid editing objects outside your downloaded area in JOSM. This can prevent two or more users editing in same area. Notice that diagonal lines around your downloaded area is an area you need to avoid to edit in JOSM.



Downloaded Area (black) dan Outside Downloaded Area (diagonal lines)

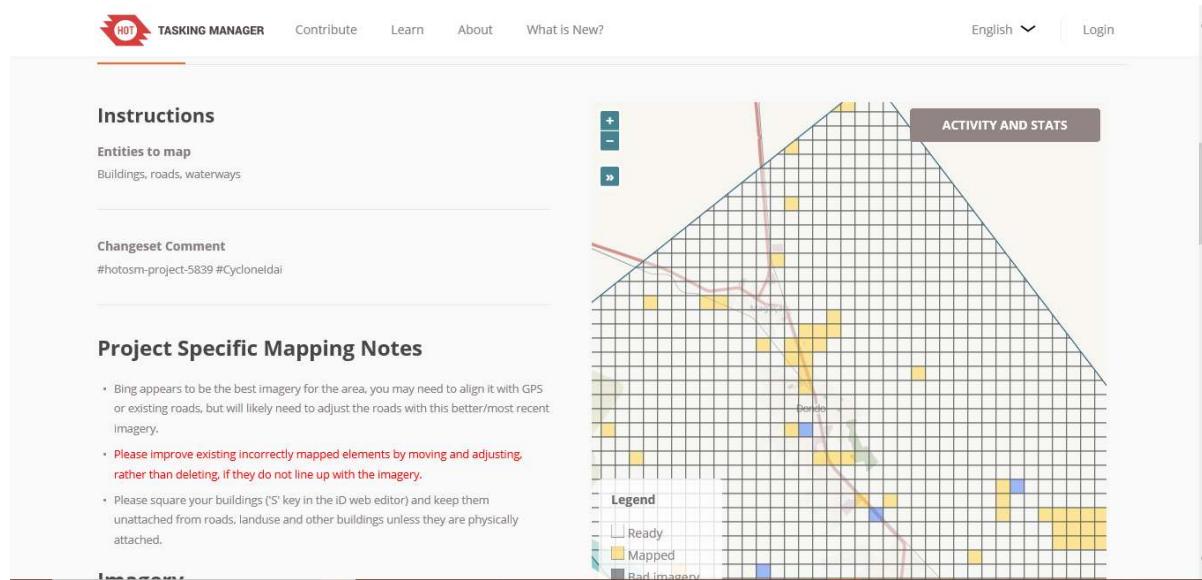
After you download the data, your editing area is only area inside which does not have diagonal lines.

The area outside your editing area most likely currently editing or have been edited by other contributors. Avoid edit in the area will reduce the risk of getting conflict in your data.

### 3. Using *Tasking Manager*

If you want to do collaborative mapping, you can use *Tasking Manager*. It will help you to divide your mapping area into task grids. Thus, you can choose your mapping area grid easily without worry getting same area with other OSM contributors because once you select certain grid, it will be locked and cannot choose by other contributors.

Any mapping volunteer in the area can choose one grid that they want and after finish they can mark the grid as completed mapped. This will allow a lot of people to map certain area in same time without getting worried to get conflict. You can read how to use *Tasking Manager* in [Using Tasking Manager](#) module.



The screenshot shows the Tasking Manager interface at [tasks.openstreetmap.id](https://tasks.openstreetmap.id). The interface has a header with the HOT logo, 'TASKING MANAGER', and links for 'Contribute', 'Learn', 'About', and 'What is New?'. On the right, there are language and login options. The main area is divided into sections: 'Instructions' (Entities to map: Buildings, roads, waterways), 'Changeset Comment' (#hotosm-project-5839 #CycloneIdai), and 'Project Specific Mapping Notes'. The notes include instructions for mapping buildings and roads. To the right is a large map of an area with a grid overlay, showing various features like roads and buildings. A legend on the left of the map defines colors for 'Ready' (green), 'Mapped' (yellow), and 'Bad imagery' (grey). The top right of the map area is labeled 'ACTIVITY AND STATS'.

Tasking Manager Interface ([tasks.openstreetmap.id](https://tasks.openstreetmap.id))

### Summary

If you have followed and finished to practice all the steps in this chapter, You have successfully understand about data conflict in JOSM and how to fix it. Moreover, you also have learned about types of conflict and how to avoid them in JOSM. Congratulations!