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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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"Partners"

— title: OpenStreetMap Data Integration to InAWARE weight: 1 —

#### Objectives:

- Knowing to create an account in InAWARE
- Knowing Add OpenStreetMap Data into InAWARE

The main goal of HOT-PDC InAWARE Mapping Project is to complete and provide spatial open data for public so it can be used for any disaster management sector by National Government (BNPB) and Local Disaster Management Agency (BPBD) in InAWARE, a platform made by Pacific Disaster Center (PDC), an institution from *University of Hawaii*. A complete explanation about InAWARE can be seen in PDC modules. This module will only explain about how OpenStreetMap data can be added and used into InAWARE.

### I. Create and Access InAWARE Account

InAWARE limit its access only to specific users such as National Disaster Management Agency (BNPB), Local Disaster Management Agency (BPBD), humanitarian worker and disaster expert / practitioner. This policy is to maintain and ensure InAWARE critical information and content access still clear and without any intervention during disaster management activities. You can send a request to create InAWARE account with these steps:

- Access InAWARE at [inaware.bnrb.go.id/](http://inaware.bnrb.go.id/)
- Click Request InAWARE Access in *login* page.

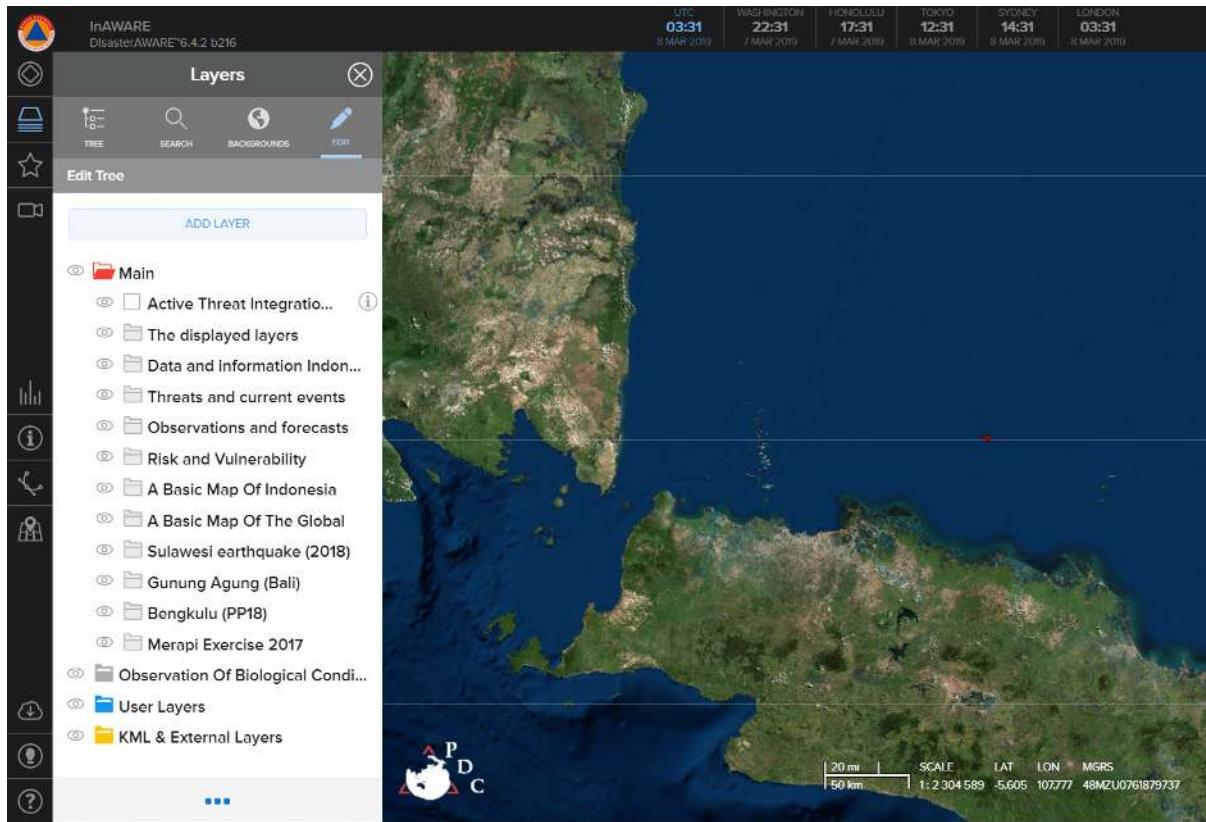
The process would take about 24 hours before your request being approved. It also depends on BNPB as approval of the request. When your account has been made, it will be sent to you by *e-mail*.

- Please *login* into system

### II. Adding OpenStreetMap Data into InAWARE

After you know about InAWARE and the steps to create an account, you will learn about how to add your field survey data that have been uploaded on OpenStreetMap into InAWARE. Data spatial format which can be used in InAWARE is **GeoJSON**. You can see **Converting Shapefile to GeoJSON** module. These are steps how to add OpenStreetMap data into InAWARE:

- Please click **Layers** menu in InAWARE
- Click **Edit** and select **Add Layer**



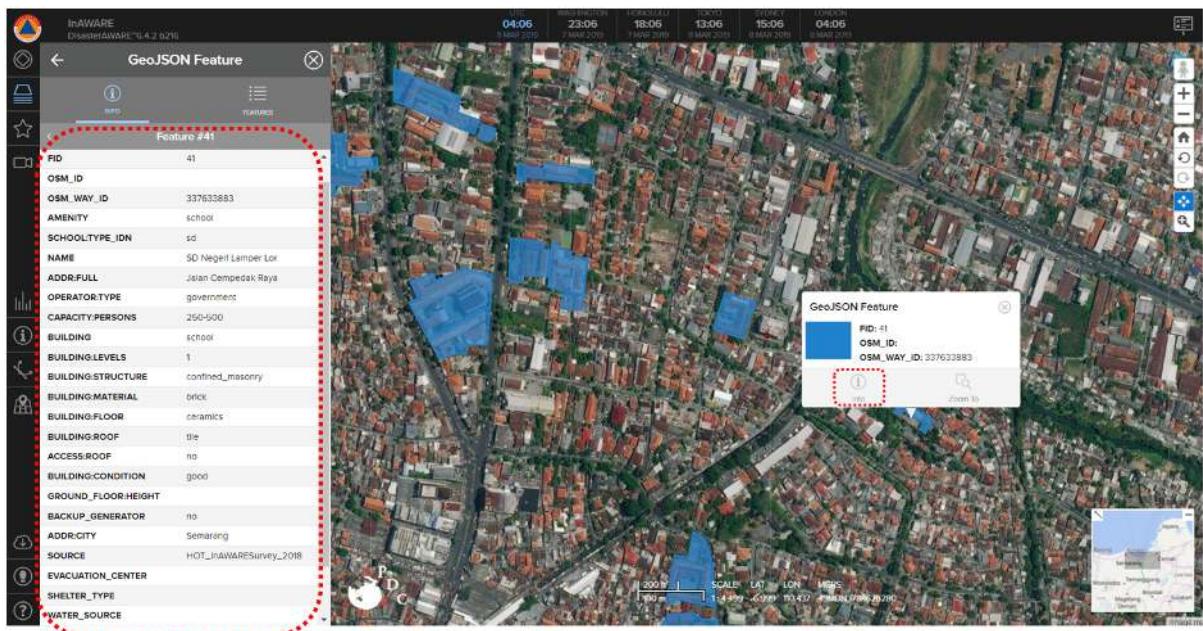
### Add OpenStreetMap data as a New Layer

- Select **File** and click **Please Choose the File**
- Search and find your OpenStreetMap Data that has been converted into GeoJSON format
- Your OSM data layer will appear in InAware and placed into **KML & External Layers** folder with name **GeoJSON Feature**



### OpenStreetMap Data Layer in InAware

- You will see information of each feature / object from your OpenStreetMap data. You can select and click on the feature that you want to know its information and choose **info** option.



OpenStreetMap Feature Information in InWARE

## SUMMARY

Congratulations! You have understand about InWARE and how to add you field survey data into it. For more advanced analysis, you can overlay others layer with your OpenStreetMap data in InWARE. You can look at PDC modules that provided by *Pacific Disaster Center* (PDC) for more information about InWARE.

# Quality Assurance Concept

## Learning Objectives:

- Understanding the definition of quality assurance
- Understanding the meaning of data quality assurance in OpenStreetMap

*OpenStreetMap* (OSM) is a free and open source map. OSM has a lot of data and information about various types of objects that exist on the surface of the earth. The data is collected and entered by OSM users spread all over the world. The variety of data entered and collected by OSM users often results in the quality of the data being different from one another and the lack of understanding of OSM users regarding data quality also affects the results of data available in OSM. Therefore, every *OpenStreetMap* user should not only add data, but also participate in maintaining data quality. In this discussion, you will learn what quality assurance is and the approach mechanism used to show how to maintain and improve the quality of OpenStreetMap data.

## I. Definition of Data Quality Assurance

When you talk about data that comes to your mind it might be a series of related information about an event, object or phenomenon collected from a particular source. The more data available, the more need to checking the quality of the data before it can be processed. This aims to make the data to be processed free from *noise* or dirty data. Dirty data is data whose value shows an unnatural value compared to other data.

Data quality assurance is an activity to check the condition of the data in terms of accuracy, consistency, completeness, clarity, and anomalies. By paying attention to these aspects, a data can be said to be good if all aspects are met.

## II. Quality Assurance Mechanisms

Since its launch in 2004 by *Steve Coast*, OSM has become an alternative and even the first choice for communities to complete spatial data in the areas they want. The ease, completeness, and flexibility of OSM allows the data available in OSM to be often reused for various purposes such as business, technology, social, even for humanitarian and disaster activities. This causes an increase in the amount of data available in OSM and will certainly affect the quality of the data itself. With its free and open nature, maintaining the quality of OSM data is very important so that later the use of OSM data for various needs especially those involving community interests such as humanity and disaster can be done in quality.

According to the book "*Assuring the quality of volunteered geographic information*" written by Goodchild and Li (2012), data quality assurance in participatory mapping activities can be done in broad terms with 3 mechanisms, namely:

### 1. Participatory Quality Assurance

Added by Surowiecki in his book entitled "*The Wisdom of Crowds*" (2004) the mechanisms of **data quality assurance** in manner a **participatory** has several characteristics and advantages such as:

- multiple users can generate a collective agreement on a fault data found. This usually happens like misinformation or types of objects mapped in an area. Users who map the area can produce mutual agreement so that there are no more misinformation of the objects to be mapped.
- Some observations and experiences of an individual can strengthen the validity of observations and experiences of other individuals so as to reduce the risk of misunderstanding of a particular object.

- Together they can validate and check the quality of data and errors in certain areas so as to save time, energy and costs in conducting data quality assurance activities.

This participatory quality assurance example has been carried out by the *Humanitarian OpenStreetMap Team* in collaboration with the *Resilience Network Initiative* (RNI) mapping the Purwodinatan Village, Central Semarang District, Semarang City. This activity involves elements of the community and is assisted by local students and surrounding committees in conducting mapping to inputting data mapped into *OpenStreetMap*.

## 2. Social Quality Assurance

Bit different but still related to quality assurance mechanisms in a participatory, **Social Quality Assurance** emphasizes the quality of the individual to do so. The more often a person validates and corrects the errors that exist in the data, then he will be more trusted to be able to guarantee data quality. Thus, someone who has a good reputation will be trusted to lead others to carry out quality assurance activities in an activity or project. In addition, social quality assurance can be carried out by forming a *working group* that becomes a media to notify and update activities related to data quality assurance. This can accelerate data quality assurance activities and make effective communication among members.

One example of this social quality assurance activity is that which has been carried out by the *OpenStreetMap Foundation* where they create several *working groups* that each group has a different discussion theme. For the quality of OpenStreetMap data discussed in the data discussion group (*Data Working Group*) where in the group discussed various matters related to the data in *OpenStreetMap* such as data licensing, data vandalism, disputes about data, as well as helping in determining usage policies for OpenStreetMap data. This data discussion group consists of members *OpenStreetMap foundation* who are contribute to *OpenStreetMap* and also some users who are recommended by members who are on the *OpenStreetMap foundation* itself. The activities from *Data Working Group* can be see by visit the wiki page for *Data Working Group*<sup>1</sup> and if you want to join to discuss, you can contact their members at data@osmfoundation.org.

## 3. Geographic Quality Assurance

The latest mechanism for **ensuring data quality is by geography**. This mechanism uses a geographic theory approach. Not all users can and may do quality assurance using geographic mechanisms. Only those who truly understand the geographic theory related to spatial data analysis such as *Spatial neighbors and auto-correlation (Moran Statistics)*, *Inferential Statistics and Analysis of Variance (ANOVA)*, and others. Therefore this mechanism is rarely used in participatory mapping activities, especially in *OpenStreetMap*. For example the documentation of data quality *OpenStreetMap* based on the geography approach in Indonesia was made by the Department of Geodesy and Geomatic Engineering, Faculty of Engineering, Gadjah Mada University in 2012, this documentation they sample data *OpenStreetMap* in several cities such as Jakarta, Surabaya, Bandung, Yogyakarta, Padang, and Dompu. These cities have been held mapping activities *OpenStreetMap* from 2011 to 2012 ranging from social mapping activities in the province of West Nusa Tenggara especially Dompu organized by ACCESS and the *Humanitarian OpenStreetMap Team* (HOT) to *Scenario Development for Contingency Planning (SD4CP)* conducted by *Humanitarian OpenStreetMap Team* (HOT) with *Australia Indonesia for Disaster Reduction (AIFDR)* and the National Disaster Management Agency (BNPB). Documentation on the quality of the data can be downloaded at: [http://openstreetmap.id/docs/Final\\_Report-OSM\\_Evaluation\\_in\\_Indonesia\\_2012.pdf](http://openstreetmap.id/docs/Final_Report-OSM_Evaluation_in_Indonesia_2012.pdf).

## III. Data Quality Assurance in OpenStreetMap

The data quality assurance mechanism that has been described can be applied to the *OpenStreetMap* data quality assurance. Please note that quality assurance activities on *OpenStreetMap* are the responsibility of all users. Therefore, *OpenStreetMap* already has several technical guidelines in carrying out

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<sup>1</sup><https://www.markdownguide.org/basic-syntax>

these activities using the three mechanisms that have been described. There are 2 types of tools used in conducting data quality assurance in *OpenStreetMap*, namely:

- Data Monitoring *OpenStreetMap*
- Tool for Error Detection in *OpenStreetMap*

**Data monitoring** tool is a tool that can be used to **view quality data** *OpenStreetMap* that you have created or data *OpenStreetMap* that is around the area of the mapping activity that you are doing. **The error detection tool** will help **show errors** contained in **data** *OpenStreetMap* so it will be easier to find data errors than having to search one by one manually. Some of these tools are made by users who develop *OpenStreetMap* according to their needs. You will also learn some errors in data *OpenStreetMap* and tools related to data quality assurance in *OpenStreetMap*.

## SUMMARY

Now you must already understand what a data quality assurance, data quality assurance mechanisms, and ensuring the quality of data in *OpenStreetMap*. With the guarantee of data quality in *OpenStreetMap*, data quality in *OpenStreetMap* can be maintained and of course the results of data *OpenStreetMap* can be used by everyone.

# Using Map Campaigner to Manage Mapping Campaign

## Learning Objectives:

- Knowing and understanding how to work with *Map Campaigners*
- Operating *Map Campaigners* to create mapping activities
- Operate *Map Campaigners* to monitor mapping activities

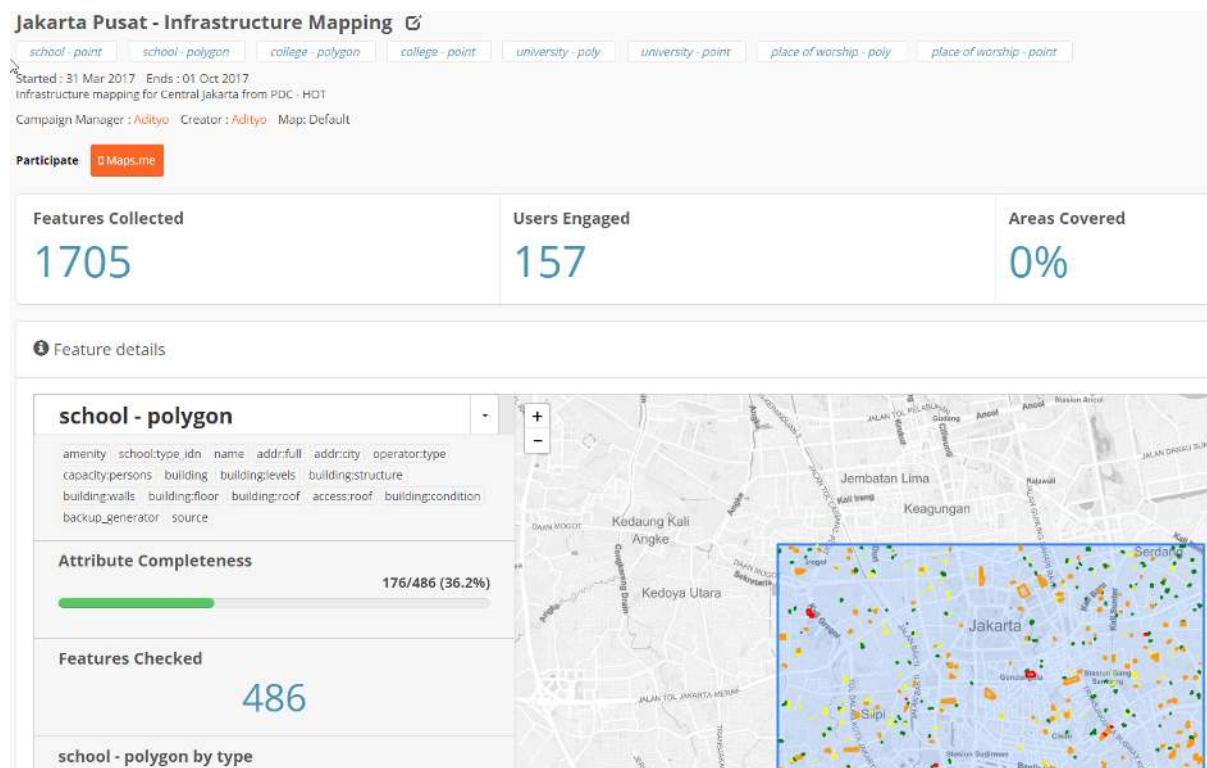
In implementing a mapping project you often need a report regarding the progress of the activity in a statistical data about how many objects have been mapped in the activity. There are several tools that can be used to obtain statistical data. One of the tools that we will learn today is *Map Campaigner*.

## I. What is a *Map Campaigner*?

*Map Campaigner* is a tool that is intended to gather all project managers and also surveyors into one platform. Project manager can arrange activities with specific types according to their needs. Each mapping activity created by the project manager can be specifically regulated regarding the data and objects collected then will be presented in each mapping project.

## II. Benefits and examples of using *Map Campaigner*

*Map Campaigner* aims to make it easier for project managers to monitor their mapping projects. For example here is a mapping activity carried out by the HOT team to map all places of worship, schools, universities and high schools in Central Jakarta. By using *Map Campaigner*, you can see how many total objects have been mapped in this project activity, then how many *OpenStreetMap* users are helping to participate in this mapping project, both voluntarily and incorporated into the mapping project team.



Example of using *Map Campaigner* for Central Jakarta

By using *Map Campaigner*, you can also find out how many objects that are complete by definition of tags or attributes needed. For example, in the picture above, it can be seen that from the activities of this mapping project successfully obtained 1,705 objects by reaching 157 users (both voluntary and

including surveyor team). *The Map Campaigner* also provides information on the completeness of all data collected, for example from 486 mapped school objects, only 36.2% of these school objects are completely mapped in terms of the information attributes needed for this mapping project.

*The Campaigner Map* also presents a quality assurance feature in terms of the completeness of the attributes of an object in OSM. With *Map Campaigner* you can see how many objects are still incomplete in terms of predetermined data attributes. You can download all of these objects and fix it using JOSM.

#### ⚠ Errors

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## 315

Status	Name	Date	Comment
error	<a href="#">way:120555908</a>	2017-07-13	Errors: building:floor not found, building:condition not found, backup_generator not found
error	<a href="#">way:120910939</a>	2017-05-17	Errors: backup_generator not found
warning	<a href="#">way:120983739</a>	2017-10-12	Warnings: SMA YAKE is all uppercase
error	<a href="#">way:122152155</a>	2017-05-31	Errors: access:roof not found, backup_generator not found
error	<a href="#">way:122211473</a>	2017-07-13	Errors: capacity:persons not found, building not found, building:levels not found, building:structure not found, building:walls building:condition not found, backup_generator not found
error	<a href="#">way:153303452</a>	2017-07-13	Errors: building:floor not found
error	<a href="#">way:155097158</a>	2017-05-23	Errors: school:type_idn not found, source not found
error	<a href="#">way:155097710</a>	2017-07-13	Errors: building:floor not found
error	<a href="#">way:155098024</a>	2017-07-13	Errors: addr:city not found, operator:type not found, building:floor not found, building:condition not found, backup_generator not found

Example of checking attributes by *Map Campaigner*

### III. Creating a New Mapping Project in the *Map Campaigner*

Until now you know what a *Map Campaigner* is and what are the benefits and examples of *Map Campaigners*. You might use *Map Campaigner* for your own mapping project. In order to create a new project, you must *log in* first with your *OpenStreetMap* account. After you have successfully *logged in* with your account, then you need to click on **Create Campaign** button. Next there are several steps after you have successfully *logged in* with *OpenStreetMap* account. After clicking **Create Campaign** button, you will be directed to project creation *campaign* page. On this page there are two stages: **managing basic information** and **organizing work areas**.

#### a. Organizing Basic Information for your Project *Campaign*

In this section, you will fill in basic information for your project. You must fill in some information on this page:

- **Project name.** In this section, you only need to fill in the name of the project that you are doing.
- **The duration of the project.** In this section, you will set the duration of the project in progress. You can provide a date in the past if the mapping project that you are doing is a mapping project that has already been completed.
- **Project Description.** In this section, you will fill in a description of the project activities.

- **Attributes /tags needed.** In this section you will provide the *OpenStreetMap* attributes needed during the mapping project. For *OpenStreetMap* attributes the required, you can refer to the Wikipedia page<sup>2</sup> <sup>3</sup> or to **Data Model OpenStreetMap** module. You can choose to use **YAML** (which you already learned in the module **Using YAML on HOT Export**) or with an easy version already provided on this site.

**Use predefined template from system**

MapCampaigner provides customizable or pre-loaded templates to help you create the types and tags for your campaigns. Our yaml verifies the elements of your types

There are three options to create types for your campaign:

1. Use a pre-loaded type
2. Fill a custom form
3. Use a yaml editor

**Note.** In the yaml editor, you can add more than one type.

**Type**

**Geometry Type**

**Tags**

**GUIDE :**

```

restaurant:
  feature: amenity
  tags:
    - amenity:
        - restaurant
        - fast-food
    - name
    - cuisine
  element_type: Point
shop:
  feature: amenity
  tags:
    - amenity:
        - shop
        - name
    - opening_hours
  element_type: Polygon

```

Put types in yaml format. The formats are:

- Whitespace is sensitive. Each child element must be indented below its parent element.
- The first parent, put **title** of custom type.
- The second one 2 key, which are feature and tags.
- **Feature** : This is specific feature of data for this type. For example: building, amenity, etc.
- To make it more specific, add pairing key=value in here. For example: building=school or building=school,university.
- **Tags** : The format is the list, put dash for every line. - Tag is the attribute that checked on the feature. For example : name. This will check "name" attribute is exist or not in the feature. - For specific tag, add new child for that tags (for example amenity). It will check attributes is restaurant or fast-food. - Can put second type (or more) by creating new parent
- **Element type**: Point, Line, Polygon

## Display when entering OSM attributes for Map Campaigner

)

### Note:

When entering tags / attributes in format YAML. There are a number of things to be aware of:

- \* Use of space is very sensitive here.
- \* One element consists of the main elements and supporting elements
- \* All elements under the main element (supporting elements) must be several spaces apart from the main element.
- \* The contents of the supporting elements = features, tags, & element\_type
- \* features are categories in OSM. For more details, you can see OSM wikipedia
- \* To be more specific, you can use sets key & value such as building = school or amenity = hospital
- \* tags are a collection of key & value that will be checked by the system. Please check wikipedia or [Indonesian Tagging Guidelines](https://wiki.openstreetmap.org/wiki/Id:Indonesian_Tagging_Guidelines)
- \* element\_type is the type of OSM object to be checked, such as point(point),line(line), or area(polygon)

- **Add another project manager (optional).** In this section you can add other OSM accounts as project *campaign* if the project that you are working on there is more than one project manager. The role of the project manager is that they can add new attributes to be calculated or change the

<sup>2</sup><https://www.markdownguide.org/basic-syntax>

<sup>3</sup>[https://wiki.openstreetmap.org/wiki/Id:Indonesian\\_Tagging\\_Guidelines](https://wiki.openstreetmap.org/wiki/Id:Indonesian_Tagging_Guidelines)

information that is in their project *campaign*.

The screenshot shows the 'Create Campaign' interface. Key fields highlighted include:

- Campaign name:** A red box surrounds the input field labeled 'Set your campaign name here'.
- Start Date** and **End Date**: A red box surrounds the date selection fields.
- Description:** A red box surrounds the text area for describing the campaign's purpose.
- Types:** A red box surrounds the 'Add type' button and the 'Set objects type based on OSM key & value' section.
- Managers:** A red box surrounds the 'Add another campaign manager based on OSM username' input field.
- Custom Basemap:** A red box surrounds the URL input field for custom basemaps.
- Submit/Update:** A red box surrounds the bottom right corner of the page.

Display on the basic information page

## b. Organizing Work for Campaign Project You

Once you have successfully set the basic information, the next step is you have to organize your project work area. In this section, there are two ways to organize your project work area.

The first way is to use the tools on the left side of the map. You can draw a box or draw freely using the tool. The thing to remember is that **the project campaign area should not exceed 315 km<sup>2</sup>**. If your mapping project has more area than mentioned, it is recommended to divide the mapping project area into several sections so that it can be created in the *Map Campaigner*.

The second way is to use administrative boundary data in format *GeoJSON*. Using this data, you can immediately see the work area of your project that has been divided into several sections.

After setting the project work area, you can specify which team is assigned to the predetermined project area. This team setting is optional and aims to make it easier to monitor the progress of your team.

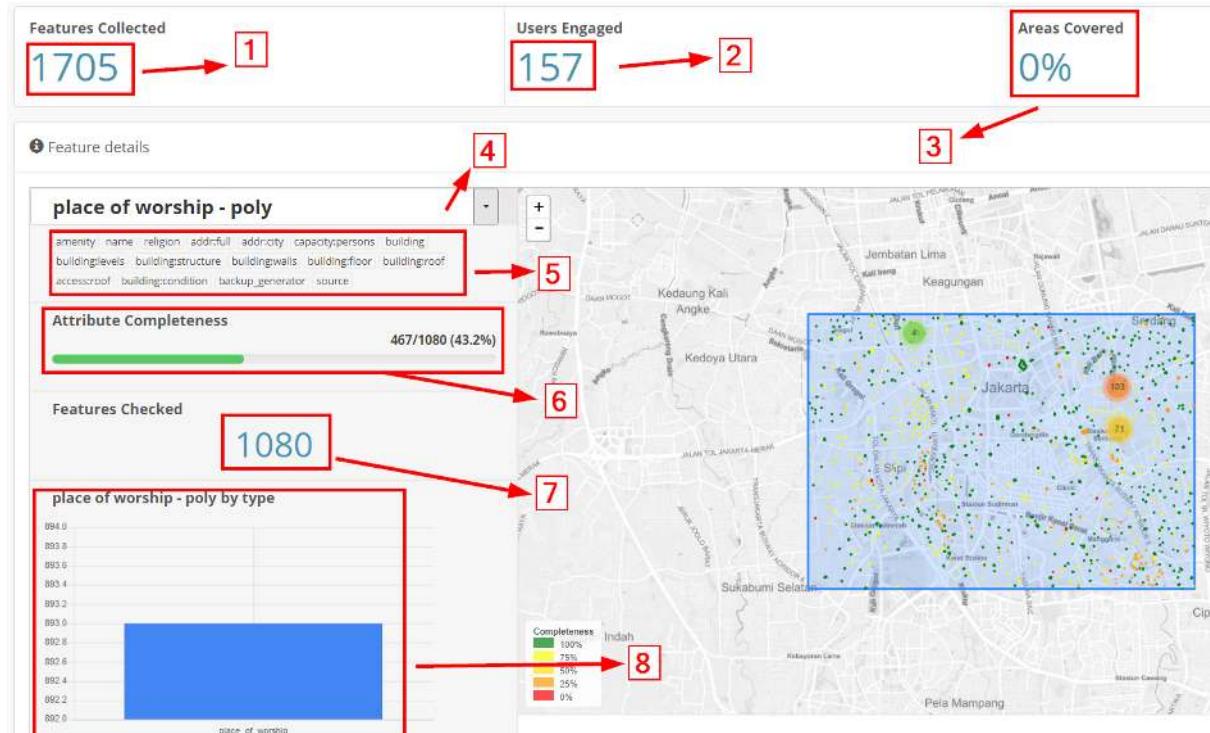
The screenshot shows the 'Work Area Settings' page. Key features highlighted include:

- Define Campaign Area:** A red box surrounds the 'Upload GeoJSON file' button.
- Map Tools:** A red box surrounds the drawing tools on the map, including a polygon tool and a bounding box tool.
- Area Size:** A red box surrounds the 'Area size : 49.07 km<sup>2</sup>' indicator.
- Label and Assign Campaign Areas (Optional):** A red box surrounds the text 'Draw polygon or box for define campaign area. You can also upload GeoJSON file'.
- Team Assignment:** A red box surrounds the 'TEAM' section where teams can be assigned.

Display on work area settings page

## IV. View Your Project Campaign Page

Having successfully made a campaign, you can go straight to the main page to see the project. When opening the mapping project, you will be presented with some information ranging from statistical data, a list of errors, and graphs of users who participated in the mapping.



Display page of Map Campaigner

1. **Feature collected.** This section explains how many total objects are collected in the work area.
2. **User engaged.** Explain how many OSM users are participating in helping to map either voluntarily or not.
3. **Area covered.** Explain what percentage of the area that has been completely mapped.
4. **Feature selection.** To select a predetermined OSM feature.
5. **Selected attribute.** Explain some OSM attributes that must be checked by the system to determine the completeness of its attributes.
6. **Attribute completeness.** Explain what percentage of complete OSM objects have the attributes as specified in the section **selected attribute**.
7. **Feature checked.** Explain the number of OSM objects that have been collected, specific to only one feature in accordance with the section **feature selection**.
8. **Graph.** Explain about the graph of the number of objects in detail

In addition to some of the above, there is also an **Errors** section which explains the list of objects that have not been completed in terms of OSM attributes. In addition you can also see the **User Engagement** section to see the list of OSM users who participated helped map the area along with the number of contributions from each OSM user.

## V. Fixing an Incomplete Objects

Using *Map Campaigner*, you can directly fix OSM objects that are incomplete in terms of their data attributes. To fix it there are two ways.

- First is to fix OSM objects one by one by selecting the object id in the column **Name**. This way you will be directed to the *OpenStreetMap* webpage and then you can immediately change it using *JOSM* or *iD*.

- The second way is to click **Download** button at the bottom of *error* list. By using this, you will download *file.osm* and opened using JOSM. After the file has been downloaded successfully, you can immediately open it in JOSM to directly complete the attributes.

## SUMMARY

Congratulations! You have now successfully learned how to use the *Map Campaigner* for the purposes of your mapping project. By using *Map Campaigner* you will find it easier to find out how many objects have been successfully mapped easily and see which OSM objects do not have complete attributes that are suitable for your project.

# Creating and Managing Tasking Manager

## Objectives:

- Explain the functions of *Tasking Manager* in the context of participatory mapping
- Able to explain how to make *Tasking Manager*
- Able to explain how to manage existing *Tasking Manager*

You must already know how to use *tasking manager* to perform mapping activities together. When you use a tasking manager that doesn't suit the area you want, then you might want to make a tasking manager for your own area. In this module, you will learn how to make tasking manager. Making tasking manager requires the person responsible for the tasking, so that the resulting OSM data has good data quality. Also this is because the initial tasking manager was made for mapping needs as a disaster response in an area.

## I. What is a The Tasking Manager

### a. Definition of a *Tasking Manager*

*Tasking Manager* is a tool specifically created for mapping collaborative and participatory. *The Tasking Manager* allows you to map in an area together with other OSM users by dividing the mapping in the targeted area. The aim of the *Tasking Manager* is to divide the mapping work into several different grids/ boxes so that everyone can choose a grid/box to be done. In addition, the *Tasking Manager* can also make it easier for you to monitor the progress of mapping so you can find out which areas still need to be mapped and which areas have been mapped.

Imagine if you want to map in a certain area where you have to map together with 20 other people. If there is no division of tasks and mapping area, there will be a possibility that some people will map in the same area. With the *Tasking Manager*, things like this can be avoided and mapping work will be completed more quickly and effectively.

### b. The example of the use of the *Tasking Manager*

*Tasking Manager* first used was under a response when the Typhoon Haiyan disaster occurred in the Philippines on November 8, 2013. Mapping using the *Tasking Manager* was conducted in Tacloban City, one of the cities that was severely affected when the disaster occurred. Within 24 hours after the project was created in *Tasking Manager*, as many as 10,000 buildings had been mapped or around 25% of the total number of buildings in Tacloban City. All of this mapping was carried out by 33 volunteers.



"The condition of the building before and after being mapped with the Tasking Manager"

The condition of the building before and after being mapped with the Tasking Manager

In Indonesia, the Tasking Manager also use to respond when a disaster occurred. One example is when the earthquake and tsunami struck in the Sunda Strait in December 2018. Within a month, all the affected area were mapped by 60 people.

[OSM Tasking Manager](#)

#361 - Tsunami Selat Sunda

Description Instructions Contribute Activity Stats

Korban Tsunami di Selat Sunda Terus Bertambah: 222 Orang Meninggal Dunia, 843 Orang Luka-Luka dan 28 Orang Hilang

Jumlah korban dan kerusakan akibat tsunami yang menerjang wilayah pantai di Selat Sunda terus bertambah. Data sementara yang berhasil dihimpu Posko BNPB hingga Minggu 23/12/2018 pukul 16.00 WIB tercatat 222 orang meninggal dunia, 843 orang luka-luka dan 28 orang hilang.

Kerusakan material meliputi 556 unit rumah rusak, 9 unit hotel rusak berat, 60 warung kuliner rusak, 350 kapal dan perahu rusak. Tidak ada korban warga negara asing. Semua warga Indonesia. Korban dan kerusakan ini meliputi di 4 kabupaten terdampak yaitu di Kabupaten Pandeglang, Serang, Lampung Selatan dan Tanggamus.

Jumlah ini diperkirakan masih akan terus bertambah karena belum semua korban berhasil dievakuasi, belum semua Puskesmas melaporkan korban, dan belum semua lokasi dapat data keseluruhan. Kondisi ini menyebabkan data akan berubah.

Dari total 222 orang meninggal dunia, 843 orang luka-luka dan 30 orang hilang terdapat di:

Kabupaten Pandeglang tercatat 164 orang meninggal dunia, 624 orang luka-luka, 2 orang hilang. Kerusakan fisik meliputi 446 rumah rusak, 9 hotel rusak, 60 warung rusak, 350 unit kapal dan perahu rusak, dan 73 kendaraan rusak. Daerah yang terdampak di 10 kecamatan. Lokasi yang banyak ditemukan korban adalah di Hotel Mutuara Carita Cottage, Hotel Tanjung Lesung dan Kampung Samboho.

Banyak korban adalah wisatawan dan masyarakat setempat. Daerah wisata sepanjang pantai dari Pantai Tanjung Lesung, Pantai Sumur, Pantai Teluk Lada, Pantai Panimbang dan Pantai Carita sedang banyak wisatawan berlalu yang

"The Tasking Manager was created as a disaster response in the Sunda Strait"

The Tasking Manager was created as a disaster response in the Sunda Strait

## II. Makes New Project

To create new tasking in tasking manager, you must first have access as a project manager. If you do not have access, then you can request the access by sending e-mail to [team.id@hotosm.org](mailto:team.id@hotosm.org) for a *tasking manager* specific to Indonesia or [mapper-support@hotosm.org](mailto:mapper-support@hotosm.org) for global *tasking manager*. After you have managed to get access to tasking, you can look at the top right of the tasking front page and click *Create New Project* button.

"How to make a new project in the tasking manager"

How to make a new project in the tasking manager

There are several steps that must be done when creating new task:

#### a. Define the project area

**Step 1: Define Area = set your task area** After you press **Create New Project**, you will be directed to the first setup page, which is to set the area of your mapping project. There are two ways to set the mapping of the project area:

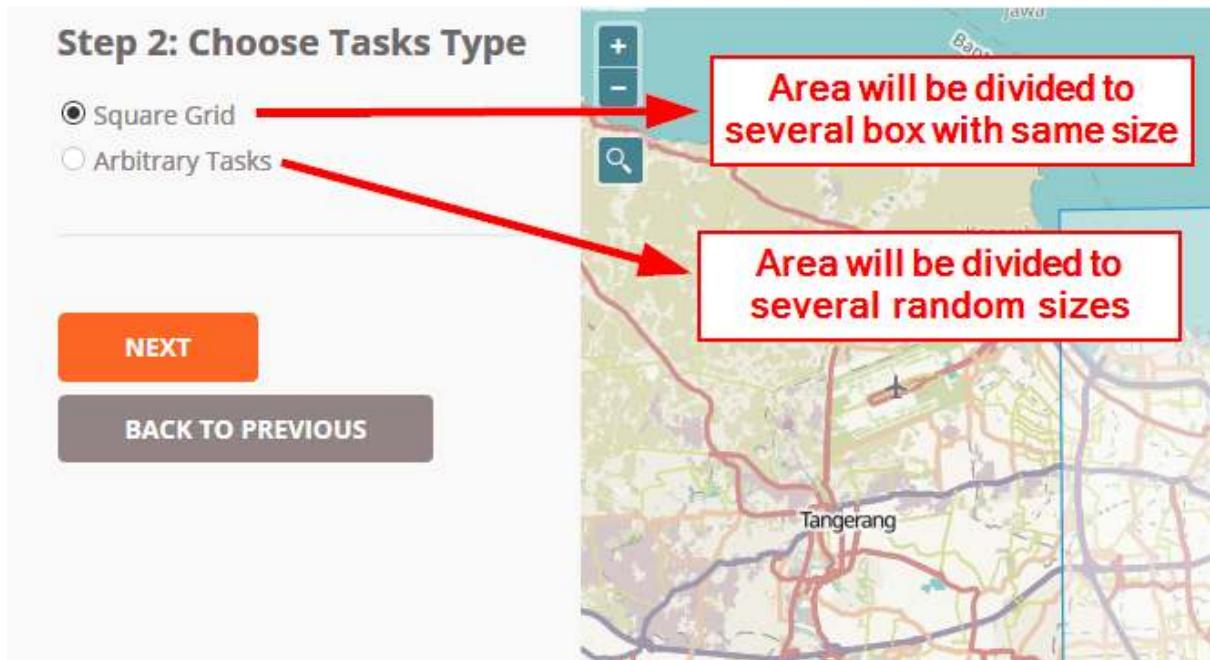
- **Draw**= with freely draw the area of interest
- **Import**= using spatial data format such as *GeoJSON, KML, OSM or SHP compressed in zip*.

Click **Next** when you have finished managing your work area.

"Options for setting work area"

Options for setting work area

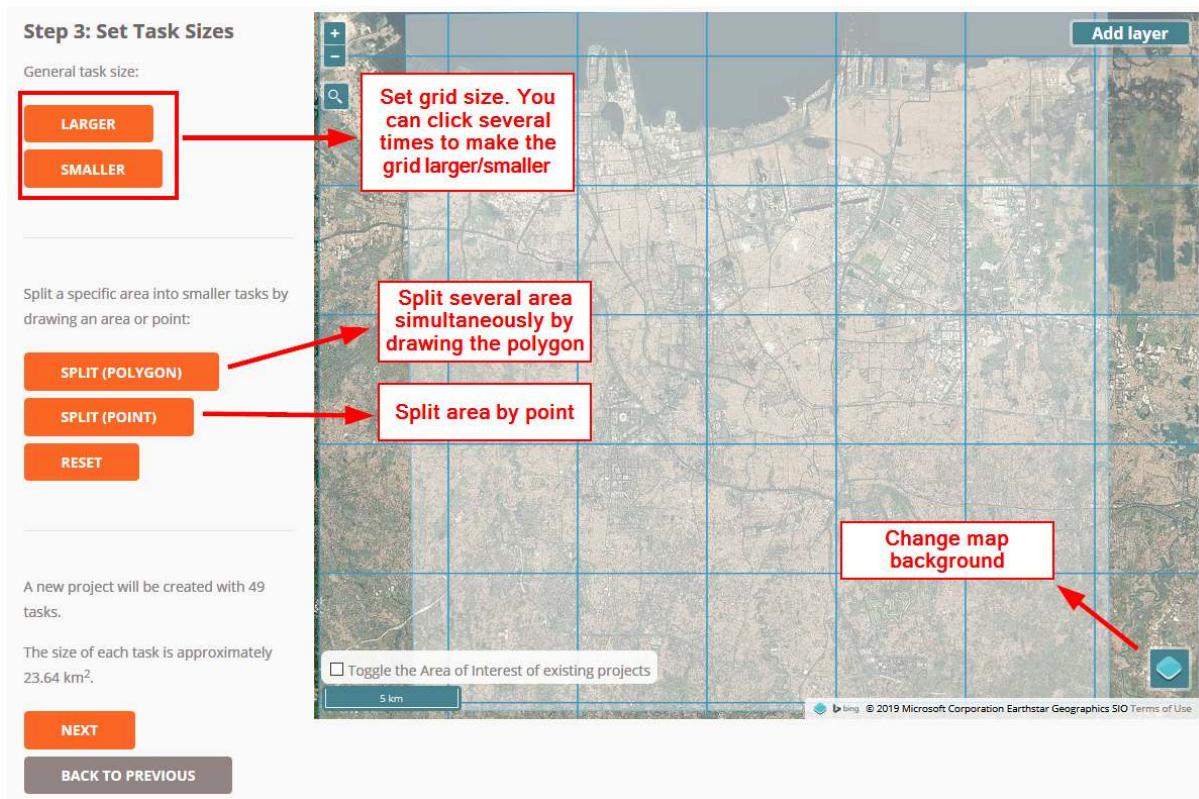
**Step 2: Choose Tasks Step = adjust the type of division for mapping area** After you have set up the work area, the next stage is that you are asked to set up the form of division of your work area. There are two types of division of work areas: square (**square grid**) and free (**Arbitrary Tasks**). If you choose the shape of the box, your work area will be divided into several square boxes of the same size. Meanwhile if you choose the free form. Your work area will be divided into several random sizes. Click **Next** to go to the next stage.



"Options set the task type"

Options set the task type

**Step 3: Set Task Sizes = Set size of the box** At this step, you will set the size of the grid. It is assumed that in the previous step you chose to divide the work area into boxes and at this step you will determine the number of boxes in the area that you specify. The bigger the size of the work box, the less the number of task area. However, this also means that mapping volunteers who participate in mapping your area may get a very large size of the mapping area and vice versa.



"Description of tools at step 3"

Description of tools at step three

Note:

A few tips in determining the size of the task size, you certainly want to make a work box that is n

**Step 4: Trim Project = Cutting grid boxes that are not needed** After you set the size of the grid, in the next step you will be asked whether you want to cut the grid specific to your project area or not. By using this feature, you can delete a grid that is outside the task area and leaves only a grid that matches the boundary area of your area of interest.

#### Step 4: Trim Project

Trim the task grid to the Area of Interest (optional). You can keep task squares complete, or clip them to the AOI. This could take some time.

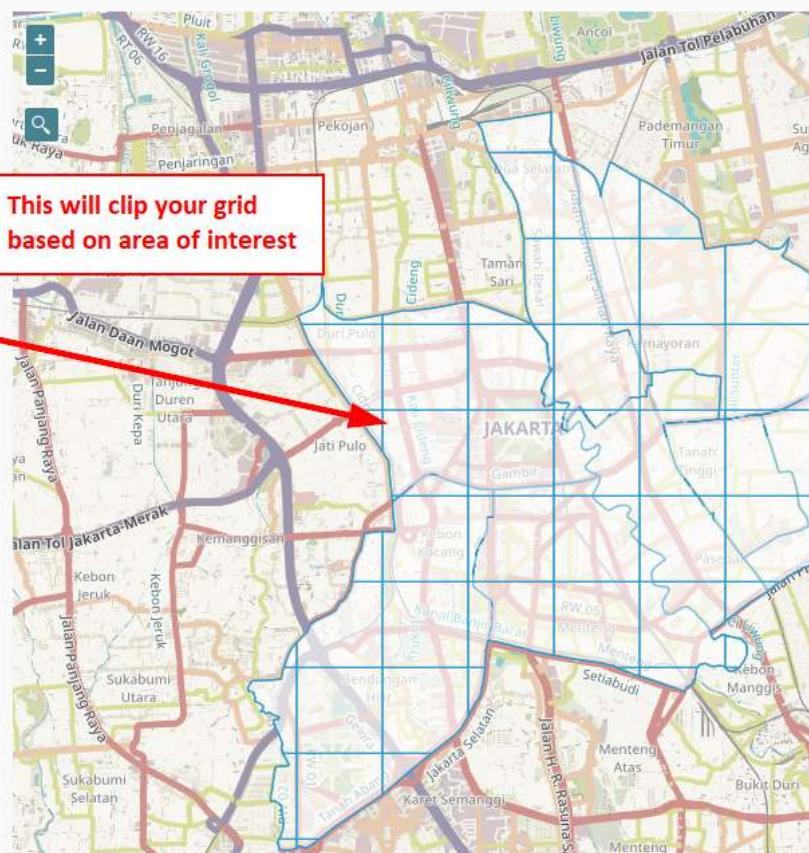
Clip tasks to Area of Interest

**TRIM**

This will clip your grid based on area of interest

**NEXT**

**BACK TO PREVIOUS**



"Using the trim to cut the work area"

Using the trim to cut the work area

**Step 5: Review = Give the project name** The next step is that you give a name to your mapping project. At this step you should give a name that is easy to find by other users. In this section there is also a description of the number of grids / boxes that you will work on, as shown below, there are 56 grids /boxes. Click **Create** to make your *tasking manager*.

#### Step 5: Review

Project has 56 tasks.

**Number of tasks**

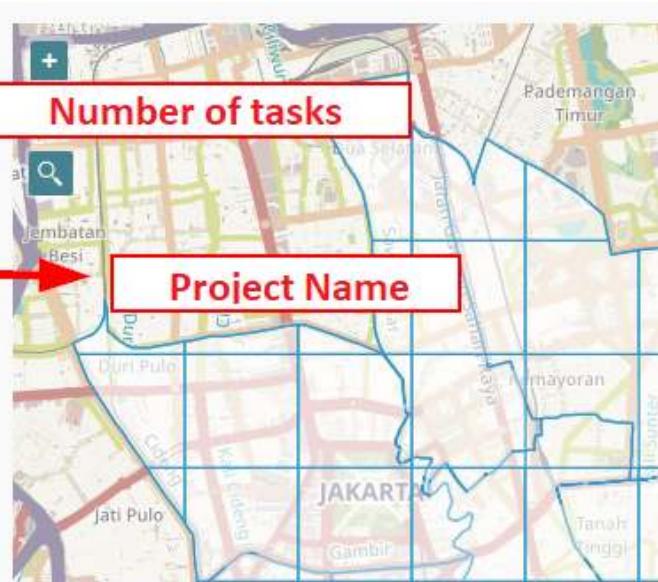
Project name

Pemetaan wilayah Jakpus

**Project Name**

**CREATE**

**BACK TO PREVIOUS**



"The final stage before the project is made"

The final stage before the project is made

## b. Setting Project Descriptions

After completing the project, you will be directed to additional settings where you will enter project descriptions, instructions, priority areas, etc. You must enter the project description and data mapped instructions, while others are optional.

- **Description**= Provide a project description

There are a number of things you do in this section.

1. You will set the status of your *tasking*(*Draft*, *Published*, *Archived*).

1. *Draft*is the default setting when the project was first created. If a project is \_tasking \_still drafted, mapping volunteers will not be able to help map your tasking.
2. *Published* means your project \_tasking \_has been published so that other people can see and help map your \_tasking \_your.
3. *Archived* means your tasking project has been archived because it's finished or there is a new tasking project with the same area.

Select **Published** so that volunteers and your team can see your *task*.

2. You will set priorities of your *tasking*. In the *tasking manager*, you will be given three priority choices, such as urgent, high, medium, and low where each level has different meanings. You can set your tasking to an *urgent level* if the project *tasking* created by you aims to be mapped immediately like mapping responses when a disaster occurs so your tasking project will be displayed at the top of the *tasking* list. Set priority to *high* if your mapping is the mapping for disaster response but the disaster has passed the emergency response phase. Set priority to *medium* if your mapping project is not too urgent to map but is included in the scope of mapping for disaster. Set priority to *low* if your project activities are not urgent and not an activities for disaster mapping.
3. You will set a summary (**Short description**) and a full description of your *tasking manager*. In providing a summary (*short description*) and a description for your tasking, there is a choice of languages from English (EN) and Indonesian (ID). The choice of language will appear when the users change the language of *tasking manager* to the language they want. If you want to enter Indonesian only, select **ID** as a language choice and then fill in the brief description in format *markdown*. *Markdown* is the same format as *html* with simpler writing. For writing guidelines with *markdown*, you can see it on the *Markdown Guide*<sup>4</sup>.

---

<sup>4</sup><https://www.markdownguide.org/basic-syntax>

IN THIS AREA

Description *	Status
	Draft
Instructions *	<b>Set your project status</b>
Metadata	
Priority areas	Priority
Imagery	Medium
Permissions	<b>Set your project priority</b>
Settings	
Actions	

Name of the project \*

AR CS DA DE EN ES FA\_IR FI FR HU GL ID IT JA LT MG NB NL\_NL PL PT PT\_BR RU SI SL  
TA UK VI ZH\_TW

Depok - Mapping [Test]

Short description \*

AR CS DA DE EN ES FA\_IR FI FR HU GL ID IT JA LT MG NB NL\_NL PL PT PT\_BR RU SI SL  
TA UK VI ZH\_TW

**Fill the description by markdown format**

Tip: You can use Markdown. (HTML is not allowed)

PREVIEW

Description \*

AR CS DA DE EN ES FA\_IR FI FR HU GL ID IT JA LT MG NB NL\_NL PL PT PT\_BR RU SI SL  
TA UK VI ZH\_TW

"Explanation for the Section Description of Your Mapping Project"

#### Explanation for the Section Description of Your Mapping Project

- **Instructions**= Provide mapping instructions

In this section you will provide information about objects that should be mapped to the *Tasking Manager* that you have created.

1. In the section **Entities to map**, you can describe what objects you need from this project *tasking*. Suppose you need data on road, building and river networks. So in this section, you can describe these objects.
2. In the section **Changeset comment**, you can set the default changeset comments that will appear automatically when users upload their edits to *OpenStreetMap*.
3. In the section **Detailed Instruction**, You can enter mapping instructions in detail. This explanation is very helpful for volunteers who want to contribute to your tasking project but do not have experience in mapping either the *Tasking Manager* or *OpenStreetMap*. You can provide detailed instructions in this section.

**IN THIS AREA**

Description *	Entities to map landuse, buildings, roads
Instructions *	The list of entities to map.
Metadata	<b>set objects to map</b>
Priority areas	
Imagery	
Permissions	
Settings	
Actions	

Changeset comment  
#hotosm-project-5728

Default comments added to uploaded changeset comment field. Users should also be encouraged to add text describing what they mapped. Example: #hotosm-project-470 #missingmaps Buildings mapping. Hashtags are sometimes used for analysis later on. #osm, #osmdata, #osmfix, #osmfixer, #group, #event for example.

**Default changeset comment when user uploaded OSM data**

Detailed Instructions \*

AR CS DA DE EN ES FA\_IR FI FR HU GL ID IT JA LT MG NB NL\_NL PL PT PT\_BR RU SI SL  
TA UK VI ZH\_TW

"TDisplay in the instruction section"

Display in the instruction section

- **Metadata** = Set project metadata (optional)

#### 1. Mapper Level

In this section, you can set the difficulty of the mapping project and arrange it based on your own perceptions. For example, if the mapping area is a densely populated residential area with poor satellite imagery and the data needs to be mapped are public building data, you can adjust the level of difficulty in mapping the area such as beginner, intermediate, or advanced.

#### 2. Type (s) of Mapping

You can identify objects that will be mapped on your tasking project by checking the list of objects in the **Type (s) of Mapping** section.

#### 3. Organization Tag

In this section you can write your organization tag to make it easier to find *tasking* project in the search column.

#### 4. Campaign Tag

Just like an *organization tag* in this section you can add *tags* that match your mapping project to make searching easier.

IN THIS AREA

Metadata and tags are used to allow users to find projects to work on and group projects.

**Description \***

**Mapper Level** → **Set your mapper level**

**BEGINNER**    **INTERMEDIATE**    **ADVANCED**

**Instructions \***

**Priority areas**

Setting the level will help the mappers find suitable projects to work on. You can enforce the level required for mapping in the permissions section.

**Metadata**

**Imagery**

**Permissions**

**Settings**

**Actions**

**Type(s) of mapping**

- Roads
- Buildings
- Waterways
- Landuse
- Other

→ **Set mapped objects**

**Organisation Tag** → **Set organization tag**

Only one organisation tag is allowed.

choose from existing tags or create a new one

**Campaign Tag** → **Set campaign tag**

Only one campaign tag is allowed.

choose from existing tags or create a new one

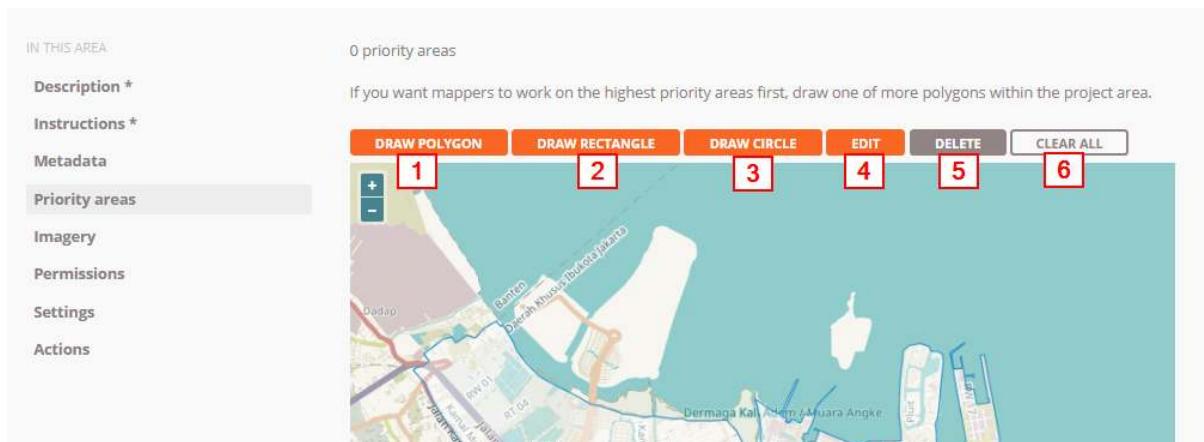
“Display metadata page”

Display metadata page

- **Priority Areas** = Set priority area (optional)

In this menu you can draw priority areas for your \_taski\_ng in several ways:

1. Draw area using **DRAW POLYGON**
2. Draw a box-shaped area using **DRAW RECTANGLE**
3. Draw a circle using **DRAW CIRCLE**
4. Change the priority area that has been drawn using **EDIT**
5. Delete the priority area by using **DELETE**, and
6. Delete all priority areas by using **CLEAR ALL**



“Priority Areas page display”

## Priority Areas page display

- **Imagery** = Provides additional satellite imagery (optional)

If you have additional satellite imagery in the TMS (*Tile Map Service*) format. You can enter the \_url \_in this section. Besides that you also need to set a license from the satellite image you are using. You must ensure that the satellite imagery you use has a license that can be used for mapping in OpenStreetMap.

IN THIS AREA

Description \*

Instructions \*

Metadata

Priority areas

Imagery

Permissions

Settings

Actions

URL to service Set TMS url for Satellite Imagery

Note: follow this format for TMS URLs: tms[22]:http://hiu-maps.net/hot/1.0.0/kathmandu\_flipped/{zoom}/{x}/{y}.png

Required license Define license for satellite imagery

-- no license --

## "Imagery page view"

### Imagery page view

- **Permissions** = Set project permission level (optional)

In this section you can manage your project tasking only accessible to users with skill levels from beginner to advanced level. By activating the feature **Mapper Level**, your tasking project can only be done by users with the level you have specified.

If you activate the **Level Validator**, the user who can access your tasking to do data validation is a user with a level *validator*.

If you activate **Private Project** then your tasking will only be accessible by the user whose name (user OSM) you have specified before. Other people outside the set name cannot see the tasking made by you.

IN THIS AREA

Description \*

Instructions \*

Metadata

Priority areas

Imagery

Permissions

Settings

Actions

Mapper Level

Only mappers with level BEGINNER or higher can contribute to this project. If checked, only users with the listed mapper role can contribute. Go to the Metadata panel to define the skill level.

Activate this if you want your tasking can only be accessed by users who have a predetermined level of experience in "Metadata" section

Validator Level

Only Validators can validate on this project. If checked, only users with the Validator role will be able to validate or invalidate tasks.

Activate this if you want your tasking can only be accessed by users who have experience as a validator

Private Project

Private means that only the given list of users below can access this project. Allowed Users list the user must first login to this instance of OSM Tasking Manager.

Activate this so that your tasking can only be accessed by users specified below

Allowed users on private project

Type a username ADD USER

“Display page Permissions”

Display page Permissions

After completion with additional settings. You can save your tasking project by clicking **SAVE CHANGES** at the bottom.



“Click the button to

save the modified tasking project”

Click the button to save the modified tasking project

### III. Tasking Project Management

#### a. Changing Instructions and Descriptions

If you want to add a few sentences of new instructions or want to change the description of your project as the mapping progresses in your *tasking*, you can choose **Edit Project** on your tasking page. After that you can immediately change the description and instructions for your tasking.



“Click EDIT PROJECT to change the description of your tasking project”

Click EDIT PROJECT to change the description of your tasking project

#### b. Validation

As your tasking progresses and the data increases in the area you are working on, some volunteers may be unfamiliar with digitizing with OSM so you need validation activities to improve the data quality. For more details, you can read **Data Quality Assurance with Tasking Manager**. Please click button **Validate** to switch to the validation page for your tasking project.

Instructions    Map    **Validate**    Questions and Comments

**Validation**

Find a task for validation through one of the options below.

Option 1: Select a task by clicking on the map

Option 2: **VALIDATE A RANDOM TASK**

Option 3: **SELECT AREA BY DRAWING A POLYGON**  
**START VALIDATING**

Option 4: **RESELECT TASKS LOCKED FOR VALIDATION**

Option 5: Select by user below

CONTRIBUTOR	LEVEL	#	REGISTERED	LAST VALIDATION	LOCK
Yudha Sidikoro	Advanced	6	2 years ago	3 months ago	<a href="#">Start</a>

"Tasking manager validation page"

Tasking manager validation page

There are 5 options on the validation page results in *tasking manager*: 1. Select the box on the map yourself. This way you can simply select the grid/box available on the map to start validation. 2. Choose boxes randomly. This way you will be helped to choose the box. 3. Choose a box by drawing a *polygon*. By using this feature. You can choose several boxes to validate by drawing a *polygon* or area. 4. Select the box that has been locked before. If you have already got the box validated but don't remember choosing the box, you can use this feature. By clicking this button, you will be directed to the previously selected box. 5. Choose according to username. You can also validate a box by choosing based on the name of the participating user to map it on your tasking project.

#### c. Changing Priority Areas.

You can specify priority areas to map first. The trick is to click **Edit Project** first and after that you go to **Priority areas**. Change and add your priority area using the method described in the previous section.

#### d. Some Action Features in *Tasking Manager*.

In your *tasking manager* management menu, there are several action buttons: \* Send a message to the contributors to your tasking project. By using the button **\_Message All Contributors**. \_You can send messages that will be read by all contributors to your tasking project. This is certainly very useful if there are changes to the object being mapped or changes in priority areas. \* Manage all tasking simultaneously. There is a tool that you can use to manage all the tasks simultaneously. \* **Map All Tasks** used to indicate that all the boxes on your tasking have all been mapped. \* **Invalidate All Tasks**

used to cancel all the validated boxes \* **Validate All Tasks** used to validate all boxes that have been mapped \* **Reset All Bad Imagery Tasks** is used to reset all boxes that have information that the satellite image in the box cannot be used. \* Removing tasking projects. Using **Delete Project** button You can immediately delete your tasking project with a note that there are no contributors participating in your tasking. \* Reset the tasking project. With **Reset Tasks** button you will reset your tasking but can still keep a history of contributors who participated in mapping your tasking project. \* Duplicate tasking. With **Clone Project** button You can duplicate your tasking and create new tasking with the same description and work area as previous tasking. The different thing is your tasking will in status *Draft* and for the area to be mapped, the number of boxes and priority areas will not be duplicated so you have to make further arrangements.

**IN THIS AREA**

- Description \*
- Instructions \*
- Metadata
- Priority areas
- Imagery
- Permissions
- Settings
- Actions**

**Message all contributors**

**Send message to all contributors**

**Mapping, Validation and Invalidation**

Use this if for some reason you need to map, validate or invalidate all tasks in this project in a single step.

**Warning:** This cannot be undone.

**RESET ALL BAD IMAGERY TASKS**

**Delete project**

You can only delete projects with no contributions.

**Warning:** This cannot be undone.

**DELETE PROJECT**

**Reset tasks**

Reset all tasks in the project to ready to map, preserving history.

**Warning:** This cannot be undone.

**RESET TASKS**

**Clone project**

This will clone all descriptions, instructions, metadata etc. The Area of Interest, the tasks and the priority areas will not be cloned. You will have to redraw/import these. Your newly cloned project will be in draft status.

**COPY PROJECT**

**Change task status simultaneously**

**Delete task (only if there is no contributors)**

**Reset task (preserving contributor history)**

**Duplicate task with same description and area**

"Display of the features contained on the Action page"

Display of the features contained on the Action page

#### e. Archives the Tasking Project

If the tasking project is complete, you are advised to archive the tasking project that you have created. This aims to avoid contributors from mapping your\_tasking\_ that is. To archive a tasking project, click **Edit Project** and select **Description**. On the status menu, change from **Published** to **Archived**. Click **Save Changes** to save changes.

# Edit project: # 5728

IN THIS AREA

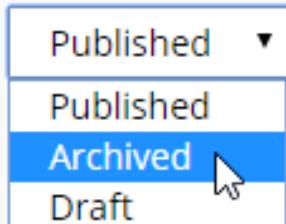
Description \*

Instructions \*

Metadata

Status

Published
Published
Archived
Draft



"Change project status from Published to Archived"

Change project status from Published to Archived

## SUMMARY

Congratulations! You have now successfully learned how to create and manage projects in *tasking managers*. By using *tasking manager*, your mapping project will become more organized. Things that must be considered, when you make a *tasking manager*, the project must be completed and considered not only the quantity of data but also the quality of the data.

— title: Download OSM Data using Export Tool weight: 1 —

### Objectives:

- To be able to explain the definition and function of Export Tools
- To be able to operate Export Tools

In this chapter, we can learn about how to download the OSM data that we have added and uploaded into OSM. The data can be used to analysis, customize with data symbology, create maps, and others depend on your necessary.

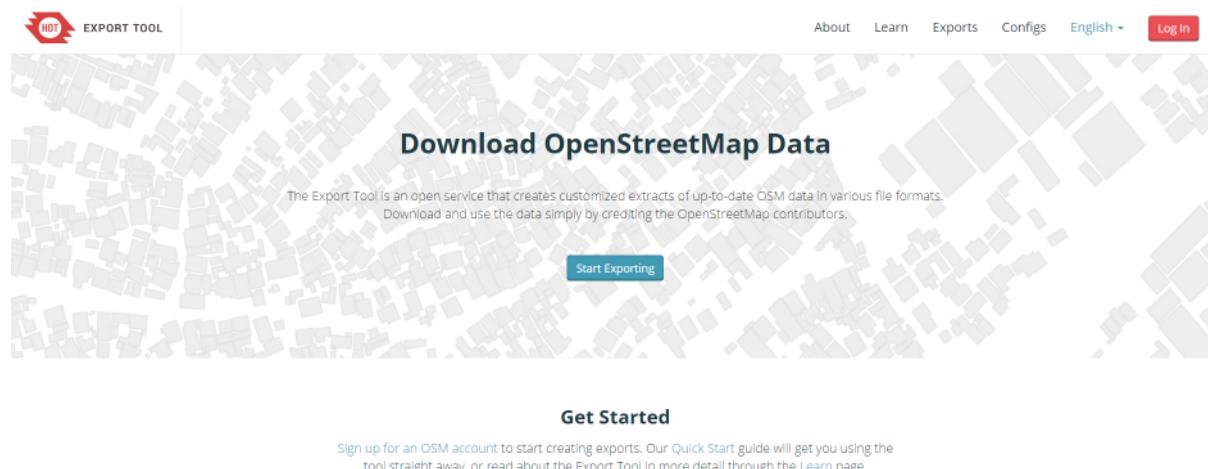
## I. Export Tool Concept

The Export Tool is an open service that creates customized extracts of up-to-date OSM data in various file formats, such as ESRI shapefiles (.shapefile), google KML (.kml), GeoPackage (.gpkg) dan MBTiles (.mbtiles). We can select the area and specific categories that we necessary. Download and use the data simply by crediting the **OpenStreetMap contributors**. Anyone can create a custom OpenStreetMap export with the Export Tool - just register an account. You can register with an OpenStreetMap account from OpenStreetMap.org and a valid email address.

## II. How to using Export Tool

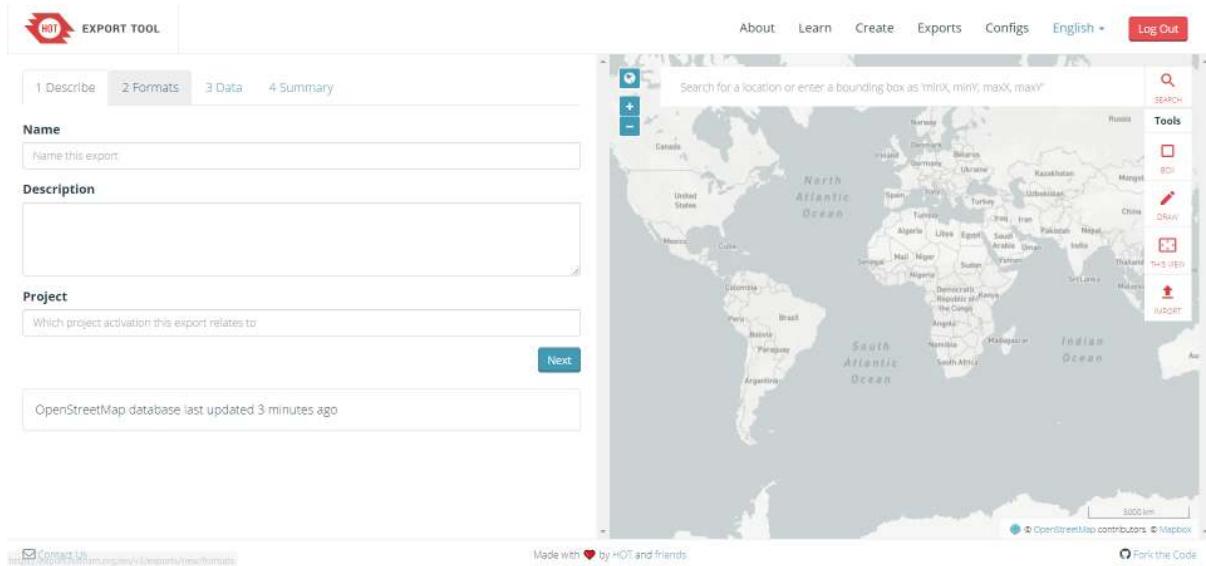
### a. Login with OSM account

- Open your browser, and type this link <https://export.hotosm.org>



### The interface of Export Tool

- The first we have login with your OSM account to using Export Tool. Click on **Login** in the right corner. The next click on 'Authorize access to your account' → **Grant Access**.
- To create a new project in Export Tool click on **Start Exporting**
- The Export Tool window will be displayed like the image below



## The fill from Export Tool

### b. Defining an area of interest

There are 5 ways to define an Area of Interest for your export:

- Bounding Box:** Use the “Box” tool to the right to click and drag a rectangle, or use the “Current View” tool to match the map’s viewport.

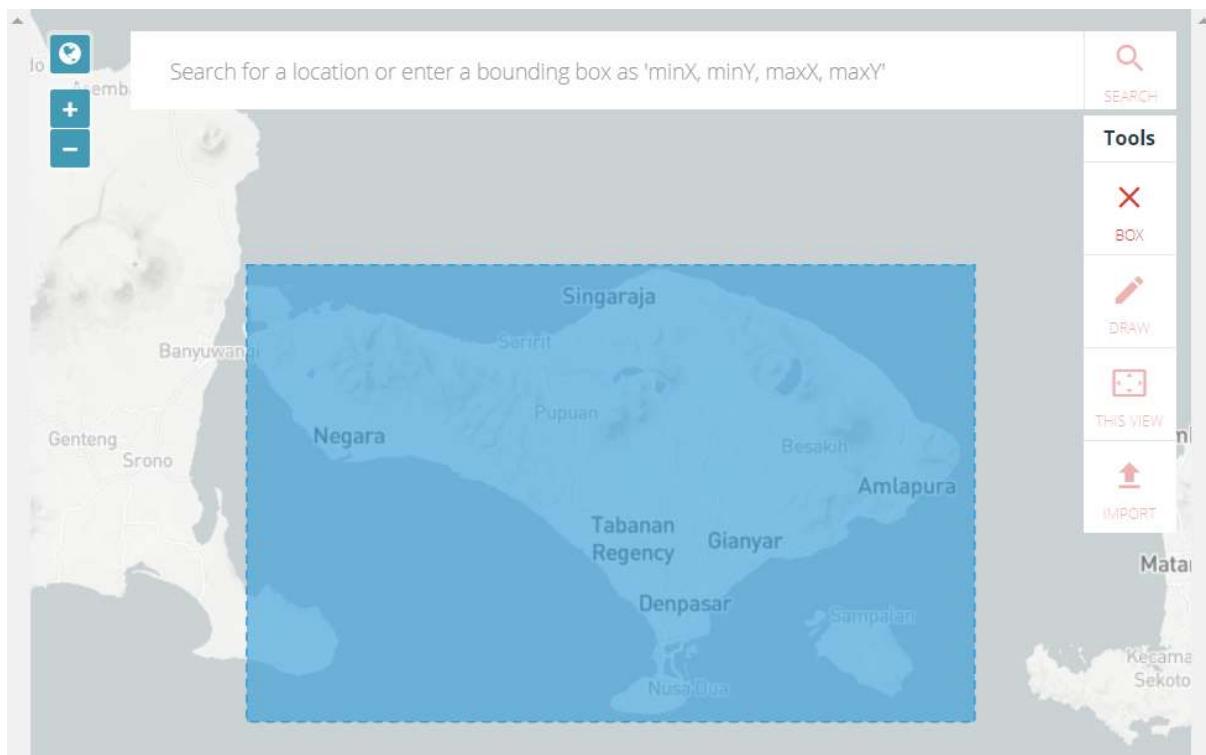


Figure 1: Bounding box

#### Bounding box

- Draw Polygon:** Draw a freeform polygon. This must be a simple (not multi-polygon).  
Manually edit
- Upload:** By uploading a GeoJSON polygon in WGS84 (geographic) coordinates. If you have not the GeoJSON data, you can refer to this chapter [Using GeoJSON](#).



Figure 2: Manually edit



Figure 3: Import the administrative boundary

Import the administrative boundary

4. **Search Bar:** input a minX,minY,maxX,maxY string into the search bar. This will define a rectangular area of interest.
5. **Current View:** Use “Current View” to match the map’s viewport.

The maximum extent of export on the Export Tool is determined by the density of OSM data in the defined area. **The bounding box of the area can contain at most 10,000,000 OSM nodes.** This limitation means that a 10,000 square kilometer box over a heavily mapped area like Western Europe or North America will likely be rejected, but an equal-sized box over a sparsely mapped area will be accepted by the Export Tool. If you need larger exports, please Contact Us or use an alternative resource such as downloads from Geofabrik or Mapzen.

#### c. Naming and Describing your Export

- **Name (required):** choose a short, descriptive name.
- **Description:** a long text body, perhaps describing what relevant features the export includes.
- **Project:** Helps to group together exports particular to a project, e.g. “PDC InAWARE Indonesia”

#### d. Choosing File Format

- Check at least one file format to export. To learn more about each individual format, read the documentation: [Export Formats](#)



**File Formats** See [Learn \(Export Formats\)](#) for details on each file format.

- Shapefile `.shp`
- GeoPackage `.gPKG`
- Garmin `.img`
- Google Earth `.kml`
- OSM `.pbf`
- MAPS.ME `.mwm`
- OsmAnd `.obf`
- MBTiles `.mbtiles`

Spatial data

#### e. Choosing Map Features

- For your first time using the export tool, it’s recommended to use the Tag Tree, which curates a set of filters and tags for common map features. As an example, check the box “Buildings and Transportation → Roads” to create an export of all building geometries, as well as related data such as name and address keys.



1 Describe    2 Formats

3 Data

4 Summary

Tag Tree

Configs

YAML

Search for a feature type...

Clear

**Buildings**

- Building Names and Geometries
- Addresses
- Materials and Condition

**Commercial**

**Communication**

**Education**

**Emergency**

Select the object in export Tool

**f. Downloading your File**

- The last step is the Summary Menu that will be displayed about the projects. Click the **Create Export** to starting the process

1 Describe

2 Formats

3 Data

4 Summary

**Name:** Buildings and roads, Bali Update

**Description:** untuk upload data OSM ke geonode BNPB

**Project:** Mapathon Gunung Agung

**Export Formats:**

- Shapefile  .shp

Buffer AOI - expand an uploaded boundary by 0.02 degrees

Publish this Export

Bundle for POSM

**Create Export**

**Menu Summary**

- After you submit your export using **Create Export**, you will be redirected to the **Export Detail Page**, which shows a list of **Export Runs**. You will see the first run at the top of the page. It will be in one of the following states:

**Submitted:** The export is waiting to be processed. This should be brief, depending on the server load.

**Running:** The export is waiting to be processed. City-sized regions should be a few minutes - larger regions can take upwards of 20 minutes, depending on the density of OSM data.

**Completed:** Your export files are available for download. Each export format has a separate download link for its ZIP archive.

The screenshot shows the HOT Export Tool interface. At the top, there are navigation links: About, Learn, Create, Exports (which is highlighted with a red oval), Configs, English, and Log Out. Below the navigation is a search bar with a placeholder 'Name, description, event, or username'. Underneath the search bar are two input fields for 'Date Range' (Start date and End date) and a 'Search' button. A checkbox labeled 'Show all Exports' is also present. To the right of the search area is a world map with various countries labeled. The map includes labels for oceans (North Atlantic Ocean, South Atlantic Ocean, Indian Ocean, Pacific Ocean) and some countries. At the bottom of the map, it says 'Made with ❤ by HOT and friends.' and 'Fork the Code'.

## Menu Exports

- If the status will be **COMPLETED**, we can download the data with a click on **buildings\_and-roads-bali-update.shp.zip** and save in your directory.

The image displays two separate export run details pages from the HOT Export Tool.

**Export #8806f58b-6df8-431a-8abe-79b57f8a3297:**

Description:	calculate
Project:	TM Gunung Agung
Area:	12491 sq km
Created at:	Wednesday, November 1st 2017, 2:59 pm
Created by:	DewiSulistioningrum
Published:	Yes
Export formats:	Shapefile (.shp)
OSM Analytics:	<a href="#">View this area</a>

**Run #c9d64616-0c05-4e0e-a58a-d369511f5e98:**

Status:	COMPLETED
Started:	Wednesday, November 1st 2017, 2:59 pm
Finished:	Wednesday, November 1st 2017, 3:02 pm
Duration:	3 minutes
Shapefile (.shp)	<a href="#">buildings-and-roads-bali-update_shp.zip</a> (29.8 MB)

## Completed Process

### SUMMARY

We have learned about how to download the OSM data using Export Tool. We can open the data in the mapping software as for example QGIS ([www.qgis.org](http://www.qgis.org)). You also can use the data to calculate the quantities of infrastructures.

— title: The Mapping Methodology with OpenStreetMap weight: 1 —

### Objectives:

- To be able to explain how to create a timeline for mapping activity
- To be able to explain how to create a folder for each team mapping
- To be able to explain how to divide the survey area based on the administrative boundary
- To be able to explain how to create team mapping effectively

Planning a mapping project requires an appropriate and efficient survey methodology to achieve the target and purpose. Indicators that need to be considered in making survey methodologies include: survey area, number of team mapping, number of objects collected, and project funding. If the area is larger and the number of objects collected is increasing, the funding of the project will also increase.

The mapping project will be carried out by a team mapping divided into 3 (three) roles:

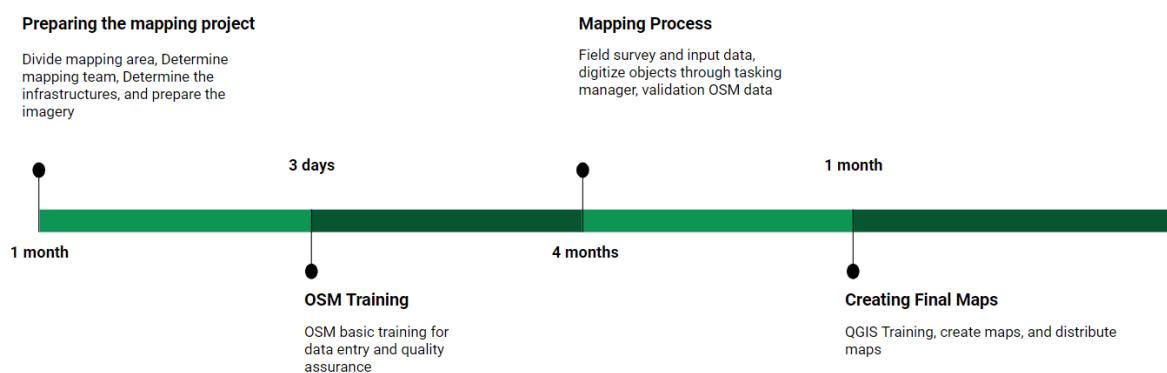
- Mapping Supervisor = organize, manage and supervise mapping projects, prepare equipment field surveys, create a report the survey progress, and check the quality and the quantity of data that validated by Quality Assurance
- Quality Assurance = Validate the quality and the quantity of data from data entry and manage a team of data entry
- Data Entry = Collect the object from field survey and entry the data to OSM. Also, digitize the buildings and roads

## I. Create a Framework for Mapping Activity

We will create a framework for a mapping project that integrates with indicators. The framework can reference in the implementation of the mapping project that will be monitored by Mapping Supervisor and Quality Assurance. These are the guideline of the framework:

- Preparing the mapping projects
- Determine the team mapping of data entry and quality assurance
- OSM Training to team mapping
- Mapping process and mapathon activity
- QGIS Training for the staff mapping
- Creating the final maps

An example, this image below is arranged as a framework for mapping in Semarang City. Semarang City has 373,8 km<sup>2</sup> area with 16 data entry and 4 quality assurance. The infrastructures were collected 58 categories consists of roads, rivers, embankment, and public facilities. The mapping project has finished for 6 months.



### The mapping framework

#### a. OSM and QGIS Training for Team Mapping

The training to explain about mapping methodology, using tools of field survey, and creating final maps. These are training material that you have to prepare before starting the project:

- OSM Basic Training for Data Entry and Quality Assurance

The training was held for three days with the purpose to use tools of field survey and how to :

1. Getting started with OSM
2. Using JOSM
3. Using Tools Field Survey
4. Field Survey Mapping
5. Using Tasking Manager
6. Adding OSM Data using JOSM
7. Creating the administrative boundary using JOSM
8. Download OSM Data with Export Tool

- Quality Data Training for Quality Assurance

The training was held for two days that the purpose of validated OSM data by results data entry.

1. Validation OSM Data using JOSM
2. Validation OSM Data using Tasking Manager

- QGIS Training for Data Entry and Quality Assurance

The training was held for one day that the purpose to create the final maps. The training material in lists below:

1. Download dan Install QGIS
2. Preparing the data
3. Create Final Map Using Map Composer

### b. Preparing the Mapathon Activity

A mapathon is a coordinated mapping event using a Tasking Manager. The public is invited to make online map improvements in their local area to improve coverage and to help disaster risk assessment and energy management. Mapathons use an online site for storing map data, for example, OpenStreetMap. A mapathon is organized by a respective organization or a non-profit organization or local government.

Mapathons are often held inside (armchair mapping) in a room with strong Wi-Fi for simultaneous access, assisted by satellite imagery. We can collaborate with local universities to conduct the mapathon. We are usually conducting the mapathon in three days, involve one-day training and two days mapping.

## II. Create a Timeline for Mapping Activity

Mapping timeline is different from the framework, in this section you will be focused on manage and oversee the implementation of a field survey. In outline, mapping timeline divide into three-part:

### a. Before Field Survey

In this part, the mapping supervisor has to prepare survey equipment. The survey equipment consists of GPS, smartphone, and maps. Each smartphone will be installed by open source android application, there are ODK Collect, OpenMapKit (OMK), and OSMTrackers. The lists task of mapping activities before field survey that mapping supervisor do:

- Create the MBTiles with base map imagery
- Create maps with administrative boundary
- Create guideline to mapping activity

Example Table for monitoring the mapping activities before field survey

No	Timeline	Data Entry	Total of Villages	Village Name	Total RW	MBTiles	Maps (imagery)	Maps (OSM)
1	Feb - Mar	A	Candisari 3 100% Dipetakan	Candi Jatingaleh	11 10	v v	v v	v v

No	Timeline	Data Entry	Total of Municipal Villages	Village Name	Total RW	MBTiles	Maps (imagery)	Maps (OSM)
2	Feb - Mar	B	100% Divalidasi	Jomblang	10	v	v	v
			Banyumanik	Sumurbot	5	v	v	v
			100% Dipetakan	Ngesrep	11	v	v	v
			100% Divalidasi	Gedawang	0	v	v	v

\*Filled by Mapping Supervisor

### b. Mapping

Every mapping staff has a role in the implementation field survey. There are parts of roles:

- Data Entry = prepare the smartphone, collect the objects, input the survey data, and upload in OSM, digitize buildings and roads, and create the final maps.
- Quality Assurance = ensure and manage the quality of data uploaded by data entry, monitory mapping activity in field, and manage the mapping strategy with data entry.
- Mapping Supervisor = ensure the quality and quantity of survey data, monitory whole implementation the mapping activity adjusted to timeline.

Example Table on Mapping Process

		clear file mbtiles manager	Getting Survey Boundary Infrastructure			Shelters	Upload track	Send form	Objects	RW	Shelters and Route	Validation
v	v	1,5-6 Mar 2018	12 Feb 2018	v	v	x	v	v	v	v	v	26 Mar 2018
v	v	8,12-14 Mar 2018	12 Mar 2018	v	v	x	v	v	v	v	v	14, 19 Feb 2018
v	v											27-28 Mar 2018

### c. After Mapping Activity

If the mapping activities have finished, mapping supervisor and quality assurance have to ensure whole the survey data will be uploaded into OSM and validated. The next step is to create and prepare final maps for feedback to the government that involved in the mapping process.

Example of the table after mapping activity

Validate the admin boundary	Data Quantity	Data Quality	Print and Distribute the final maps
v	v	v	v
v	v	v	v
v	v	v	v

You can download the complete table in this link <https://tinyurl.com/timeline-pemetaan>

### III. Save and Share the Survey Data

We need the folder directory to save and share the data that folder will be organized and easy to share. The results of the mapping project are spatial data uploaded in OpenStreetMap. The data can be downloaded and saved in other format spatial data with your necessary.

We can upload and publish the data using Google Drive because everyone has a Gmail account and we usually use Google Drive in working. There is the example folder that we can use to save the data:

Example Folder in Google Drive

Folder Name	Description
Timeline	Framework and table of the timeline the mapping activity
Training	Training agenda and training material
Staff Mapping	Profile of staff mapping (data entry, quality assurance, and mapping supervisor)
Data Survey	The results of mapping consist of OMK Data, ODK Collect Data, GPS Tracks, and final data
Documentation	Photos and videos of mapping activity
Maps	Maps of survey, progress, final results
Report	The monthly report to mapping activities
Data Quality	The results of calculating the data quality
Data Quantity	The results of calculating the data quantity
OMK Equipment	MBTiles of base map imagery

The digital data will be uploaded in each folder according to the mapping process so that we get the backup data and avoid losing the data.

 ATLAS SMG	me	17 Dec 2018	me	—
 Data	me	27 Nov 2017	me	—
 Maps	me	27 Nov 2017	me	—
 Meeting	me	14 Feb 2018	me	—
 OMK Data for Survey	me	8 Mar 2018	me	—
 Photos	me	27 Nov 2017	me	—
 Reporting	me	27 Nov 2017	me	—
 Survey Data	me	27 Nov 2017	me	—

The folder in Google Drive

### IV. Divide the Area Survey based on the Administrative Boundary

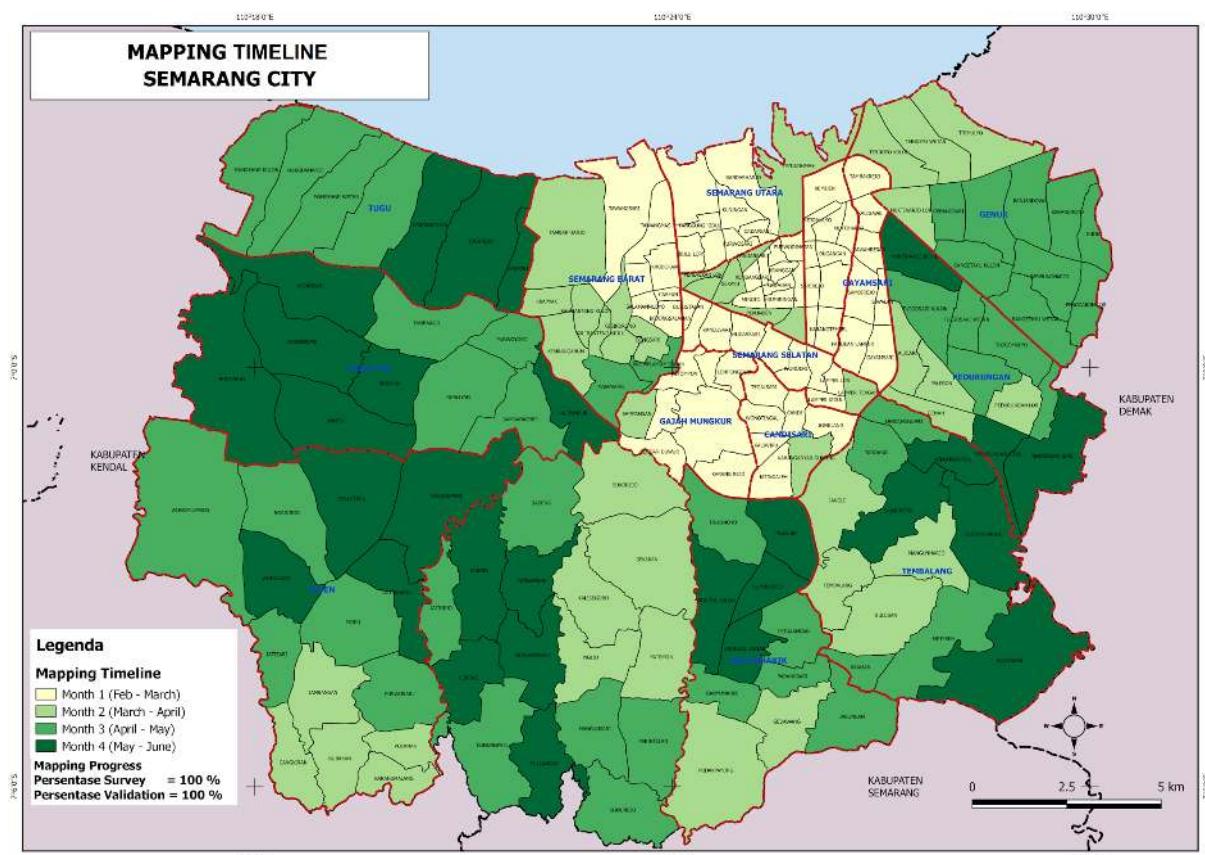
We will determine the factors that affect in divide the area survey it was related to characteristics area. The characteristics are an area, topography, and land use. We can divide the area based on village-level the administrative boundary. In the next step, we can start the analysis to divide the area by identifying the characteristics of the village-level.

In this case, mapping in Semarang City has 373,8 km<sup>2</sup> area in 16 sub-districts and 177 villages. Semarang City has a unique topography, it is a hill in South Semarang and coastal area in North Semarang. The North area is the central government, business, and residential area. While the south Semarang is the development of residential, education, and farmland. Therefore, the north Semarang has many infrastructures and a high density than the south Semarang area.

The analysis topography can affect route the field survey because each region has obstacles area. The other factor is the weather on the implementation field survey, rain season can be a challenge in flood areas. If heavy rain, we can directive the data entry to survey in a location not flood affected or they can digitize buildings and roads in the office.

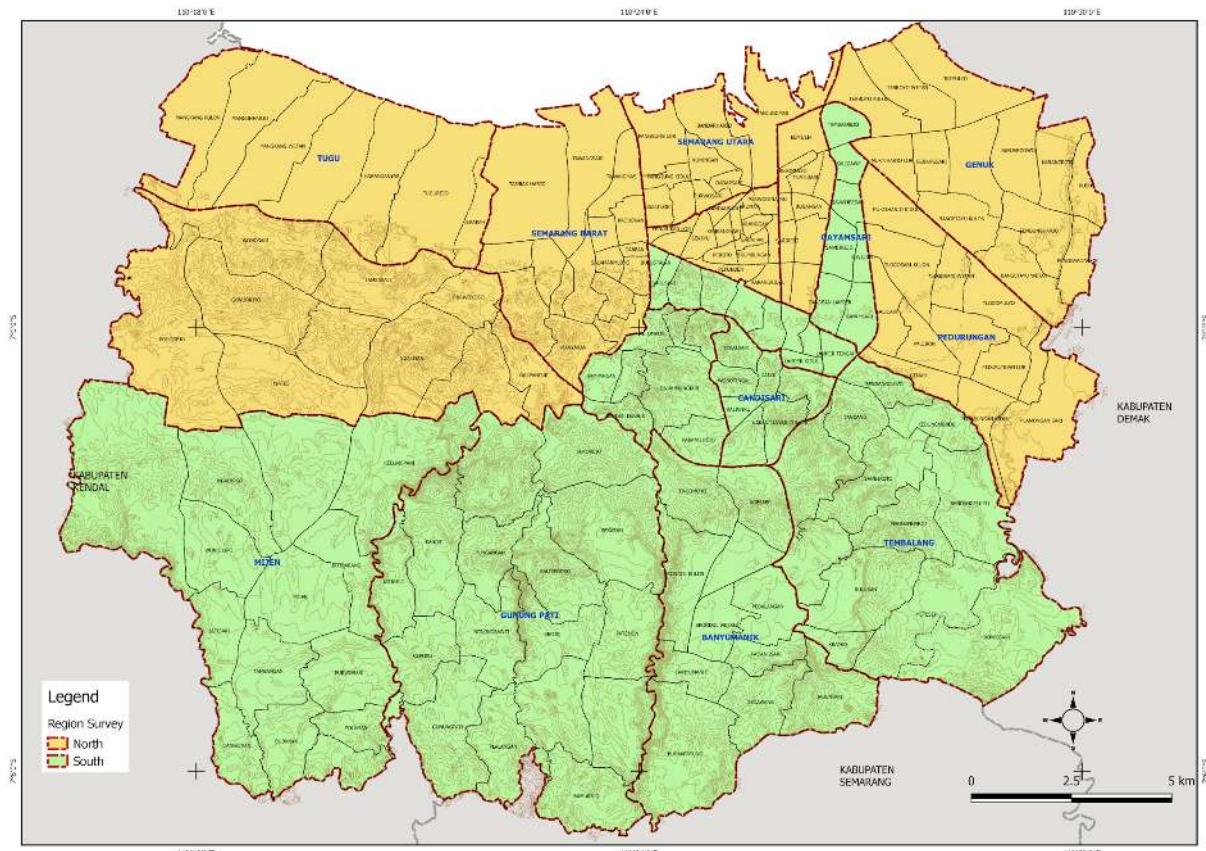
If we already know about the factors that impact the mapping timeline, we can divide the area survey based on the administrative boundary. For example, one sub-district can be finished in a month by one team data entry. Based on the analysis, the mapping project in Semarang City has finished in four-month with 16 data entry.

We can start the mapping area with nearby form the office because it is easy to coordinate between data entry and quality assurance about field survey. If data entry found the problem in the field likely problem with their smartphone or permission letter in the village office, they can ask the quality assurance or back to the office and resolve the problem with the team.



#### Mapping Timeline in Semarang City

In the map below, we can divide the area into two sections based on characteristics area, so that we need two mapping supervisor to manage and monitor the mapping activities



### Divide Area in Mapping Project

Example Table of Divide Area Survey

Timeline	Sub-District	Mapping Supervisor North	Mapping Supervisor South
Stage 1 (1,5 Months)	Near from the office less distance 20 km	Semarang Barat Semarang Tengah Semarang Timur Semarang Utara Ngaliyan	Candisari Semarang Selatan Gayamsari Gajah Mungkur Banyumanik
Stage 2 (2,5 Months)	The distance more than 20 km from the office	Pedurungan Tugu Genuk	Tembalang Mijen Gunung Pati

### V. Create Team Mapping

We will choose the team data entry based on their knowledge about the area, it is a strategy to quickly in the understanding survey area. We can give the list question about the area in the recruitment process data entry.



#### Team Mapping

Example table of Team Mapping based on Survey Area

Mapping Supervisor	Quality Assurance	Data Entry	Sub-districts	Village	Total Villages
Mapping Supervisor 1	QA1	DE1	Candisari	7	21
		DE2	Mijen	14	
		DE3	Semarang Selatan	10	
	QA2	DE4	Banyumanik	11	
		DE5	Gayamsari	7	23
		DE6	Gunung Pati	16	
		DE7	Gajah Mungkur	8	20
		DE8	Tembalang	12	

Mapping Supervisor	Quality Assurance	Data Entry	Sub-districts	Village	Total Villages
Mapping Supervisor 2	QA3	DE9	Semarang Barat	16	23
		DE10	Tugu	7	
		DE11	Semarang Tengah	15	25
		DE12	Ngaliyan	10	
		DE13	Semarang Timur	10	23
	QA4	DE14	Genuk	13	
		DE15	Semarang Utara	9	21
		DE16	Pedurungan	12	

## SUMMARY

If you can follow the instructions whole the process in this chapter, you have succeeded in creating the planning of mapping projects, create the methodology, divide the area, and create the team mapping. You can implement this process into your mapping project. If we can create appropriate methodology in the mapping project, you can reach the best results in good qualities and quantities of data.

# 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.

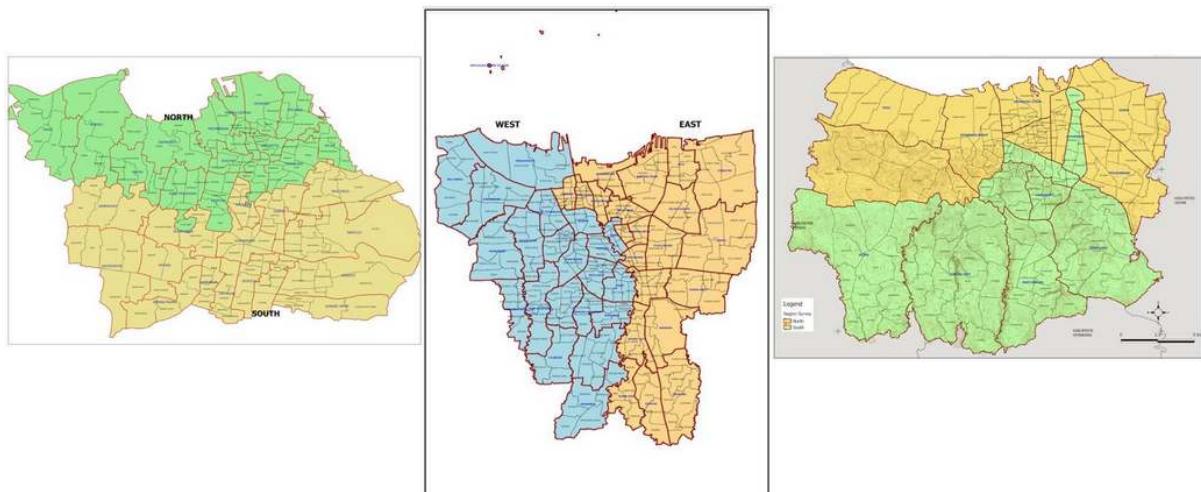
## I. Data Collection Preparation

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.

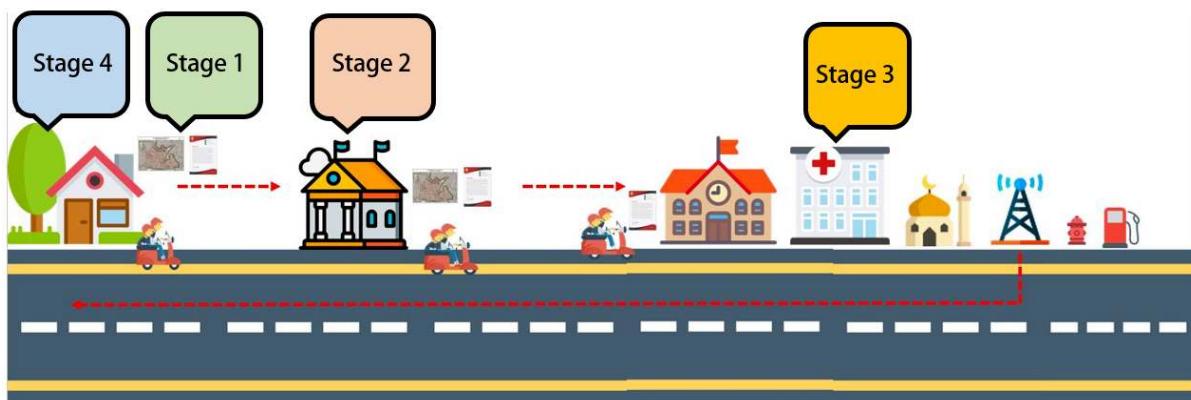
Generally, the purpose to determine priority mapping objects based on need of the local government is to make sure the output of this mapping can be used for them and also local people and communities. Thus, it will make the output become more sustainable.

- **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.

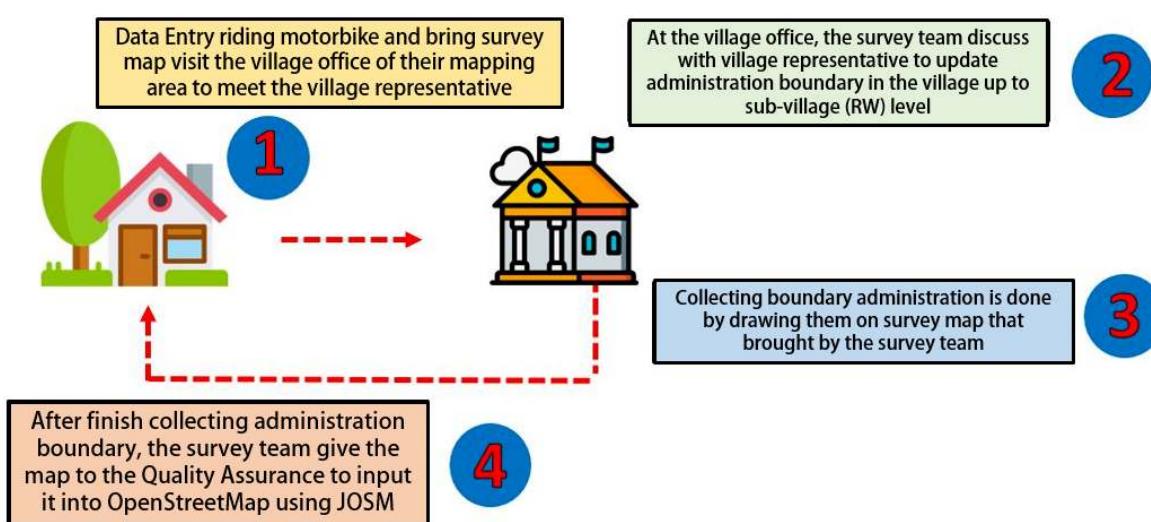
- *OpenMapKit (OMK)*

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*.

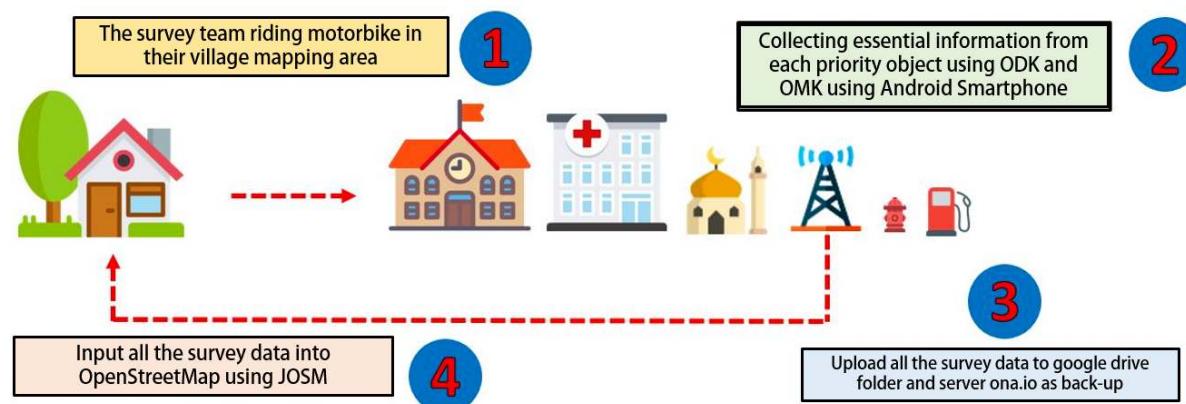
Collecting administration boundary need communication skill and personal approach to village representative and local people. Generally, collecting administration boundary is done by coming to the village office with bring survey map and discuss it with village representative up to sub-village (RW) boundary.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

# Introduction to OpenStreetMap

## Objectives:

- To be able to explain what OpenStreetMap is
- To be able to explain the history of OpenStreetMap
- To be able to explain the benefits of using OpenStreetMap
- To be able to explain the use of OpenStreetMap
- To be able to explain the basic concept of map and OpenStreetMap

Nowadays a lot of people use digital map, but only a few use open source digital map. Open source digital map is totally free and editable. One of open source digital maps is OpenStreetMap. In this module, you will learn all about OpenStreetMap.

## I. What is OpenStreetMap?

OpenStreetMap or OSM is a free, open and editable digital map of the whole world. Since OpenStreetMap is a digital map, anyone can access it anywhere freely. OpenStreetMap data is licensed under ODbL, whereas the cartography of the map tiles is under CC-BY-SA. This enables its user to copy, distribute, transmit and adapt OpenStreetMap data, as long as credit given to OpenStreetMap and its contributors by citing “**© OpenStreetMap contributors**”. Sharing data is very useful especially for unreachable data. Using OpenStreetMap, you can share spatial data where the data created by other users and other users can also use the data you created. OpenStreetMap also enables its users to create a new product made from OpenStreetMap data and also enables users to modify the data.

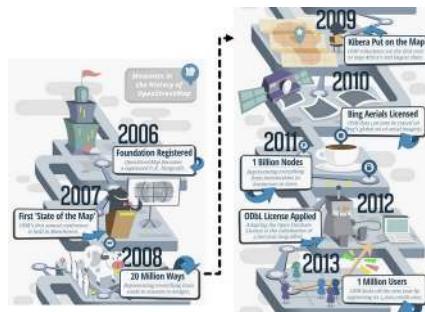


OpenStreetMap Logo

## II. OpenStreetMap History

OpenStreetMap is founded by Steve Coast in 2004. Steve initially focused on mapping UK since spatial data from Ordnance Survey is not distributed widely and freely. Then Steve and some other people founded OpenStreetMap so that all the people in the world could create a digital map for their communities and store it in a common database. In 2006, OpenStreetMap becomes a registered UK nonprofit organization. In 2007, OpenStreetMap's first annual conference called "State of the Map" is held in Manchester. In 2008, 20 million ways representing everything from roads to streams to hedges were mapped in OpenStreetMap.

In 2009, OpenStreetMap volunteers put Kibera, the second largest slum in Africa, in OpenStreetMap. In 2010, Bing satellite imagery can be used for OpenStreetMap mapping reference. In 2011, one billion nodes representing everything from intersections to trees were mapped in OpenStreetMap. 2011 is also the year when OpenStreetMap was first introduced in Indonesia. In 2012, ODbL applied to OpenStreetMap which enables OpenStreetMap users to share or to adapt OpenStreetMap data. In 2013, OpenStreetMap users reached one million. Up until now, OpenStreetMap has more than five millions registered users around the globe.



## OpenStreetMap History

### III. Why OpenStreetMap?

The reasons why OpenStreetMap is the best choice:

- OpenStreetMap is free and open so you won't be charged anything to use it. A lot of spatial data providers charge a great amount of money to obtain spatial data from them. OpenStreetMap can be your alternative free of charge source. With OpenStreetMap, you do not need to depend on government agency/institution or other spatial data providers to obtain spatial data.
- OpenStreetMap data is richer and more update. This is possible because every OpenStreetMap user can add, edit or delete OpenStreetMap data anywhere anytime. For example, there is a restaurant that is no longer exists, but it is still mapped on OpenStreetMap. You, as an OpenStreetMap user, can easily delete the restaurant mapped on OpenStreetMap since it is no longer exists. In some big cities, the OpenStreetMap data tends to be richer than remote small cities because there is no users mapping it. So, data availability and data update depend on OpenStreetMap users.
- OpenStreetMap comes in handy. OpenStreetMap provides a lot of tutorials for new users. OpenStreetMap's user friendly interface makes mapping experience easy even for those who do not have geography/mapping background.
- OpenStreetMap map can be modified as needed. All OpenStreetMap data can be used and modified for your needs. For example, you want to make a tourist objects map in your area, you can download OpenStreetMap data and make a tourist objects map out of it.

### IV. The Use of OpenStreetMap

There are so many examples of the use of OpenStreetMap. You can complete the information of the map and create a map of a familiar area. You can make a detailed map since every user is able to do survey individually on the targeted area. Here is one example of Bodeh Hamlet map in Yogyakarta made by one of OpenStreetMap users who lives there.



Map made in OpenStreetMap

OpenStreetMap data is also used by one of Android Developers to make an offline map and navigation mobile app called Maps.me. This app uses OpenStreetMap data which should be downloaded first then the OpenStreetMap data can be used offline for navigation.



Maps.me

OpenStreetMap can also be used to make a disaster-related map. OpenStreetMap is often used as tools to map disaster area then the data will be used for damage assessment. OpenStreetMap is often

used mapping platform for disaster response since OpenStreetMap really suits for participatory mapping. OpenStreetMap data can be used for evacuation route planning as well as evacuation center, but OpenStreetMap data should be processed first using GIS software.

## V. The Basic Concept of Map and OpenStreetMap

### 1. Paper Map Concept

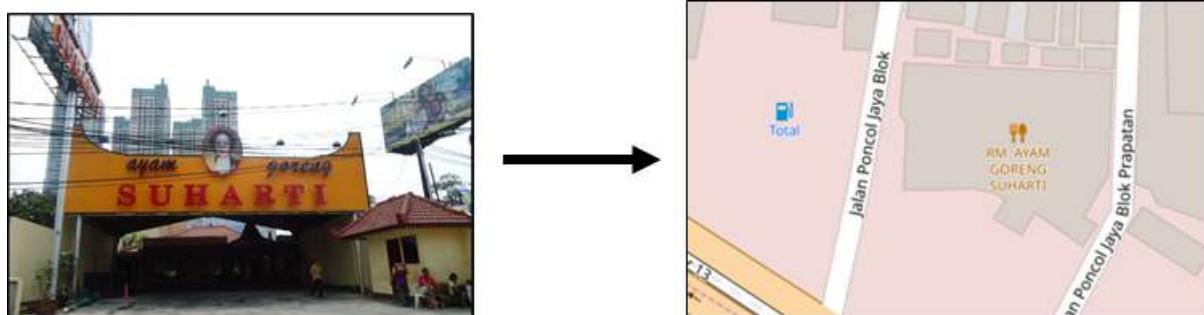
Map is an effective tool to deliver information. Map can represent information better than words especially information regarding location. Answering several questions will be more effective by map visualization, such as "Where is elementary school 01 located?" or "Where is the nearest hospital?". When this kind of questions come up, it is easier to answer it by drawing it in a piece of paper as a paper map. Roads usually drawn as lines and buildings usually drawn as a rectangle. However, different people may have different drawing style depends on who draws the map.

### 2. Why Digital Map?

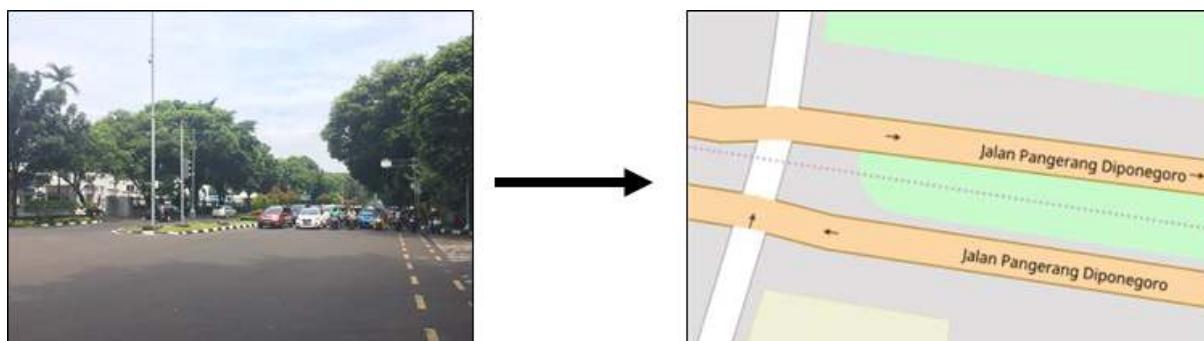
Paper map is really hard to share since may be it is the only copy you have, or if there are more than one copy, other people may not be able to interpret what the creator means since not everyone has the same drawing sense. Paper map is also easily damaged by water and needs special storage so that the map is not damaged or lost. This is why map is better stored in a digital form so that people can easily access it. Using computer, map data can be easily understood, stored and shared. Digital map enables you to do map symbology as desired. Digital map makes adding unlimited information to the mapped objects possible. It's different with paper map, you can only put a limited number of information since paper map has a very limited space. Most importantly, when mapping using computer, the mapped objects will have coordinates (latitude and longitude), locating precisely where the objects are on earth.

### 3. Digital Map Component

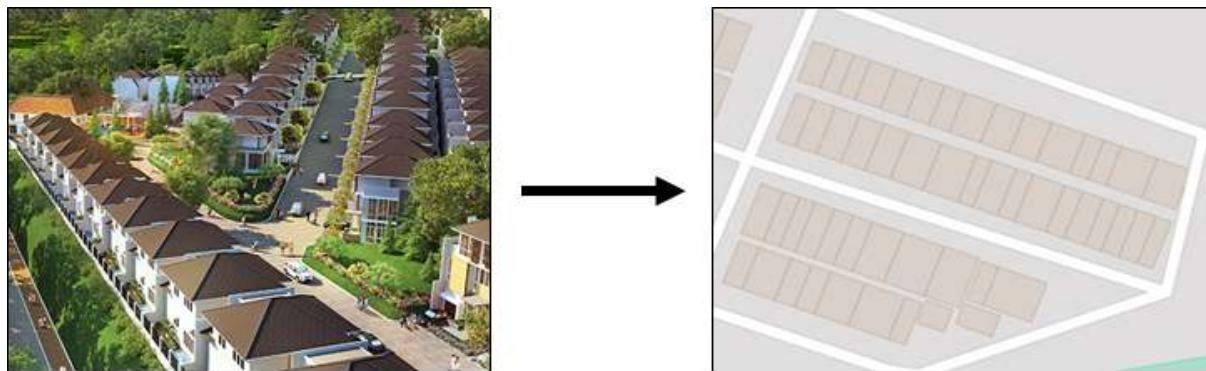
The objects that you map will be represented by point/node, line/way or polygon, depends on the object's type. Point of interests such as restaurant, fire hydrant and bank are usually represented by point/node. Line/way is usually used to represent linear objects such as roads, river and railway. Line/way is actually an ordered list of nodes that connect to each other. Polygon is used to represent area such as building, lake or land use. Polygon is a closed way whose last node is also the first node.



Point symbology for point object on OpenStreetMap



Line symbology for line object on OpenStreetMap



Polygon symbology for polygon object on OpenStreetMap

### SUMMARY

If you can comprehend and follow through all the explanation above, then you are able to explain what OpenStreetMap is, explain OpenStreetMap history and explain the benefits of using OpenStreetMap. You are also able to explain the use of OpenStreetMap and explain the basic concept of map and OpenStreetMap.

# Getting started with OpenStreetMap

## Objective:

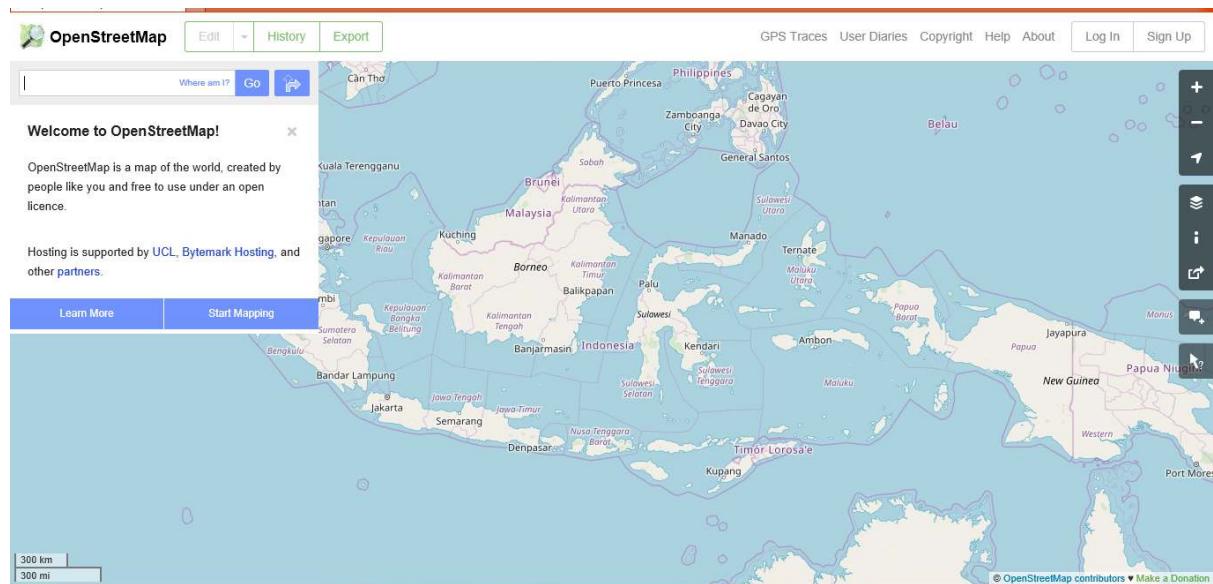
- To be able to operate and navigate the OpenStreetMap website
- To be able to see object information in OpenStreetMap
- To be able to create share link in OpenStreetMap
- To be able to save images from OpenStreetMap
- To be able to create user account in OpenStreetMap
- To be able to understand the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

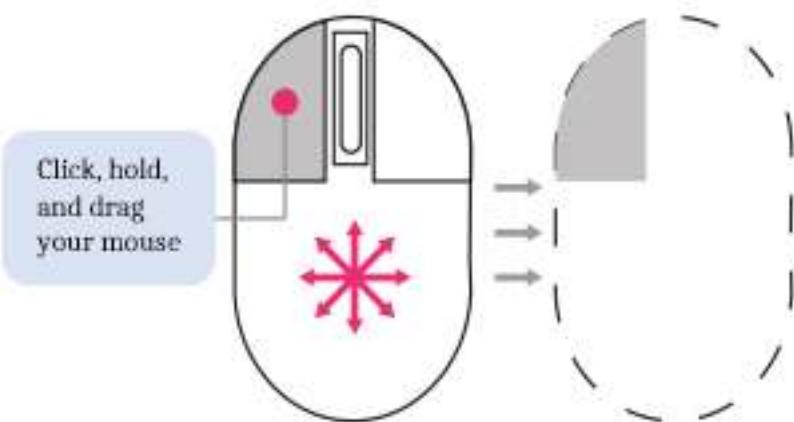


OpenStreetMap website ([openstreetmap.org](http://openstreetmap.org))

## II. Navigate the map

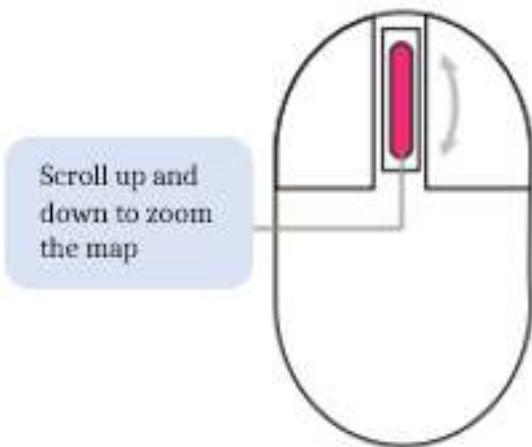
In the main view of the OpenStreetMap website, you will see a large map in it. You must be able to navigate the map so you can go to a location that you want. Here are the ways to navigate the map on OpenStreetMap:

- 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.



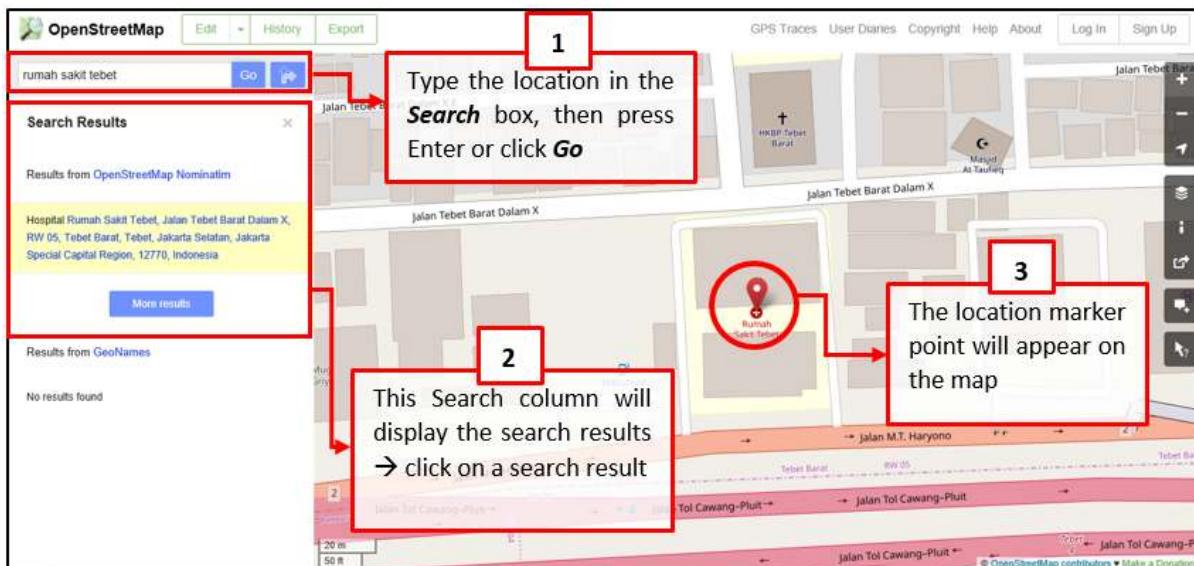
#### How to drag the map view

- 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.



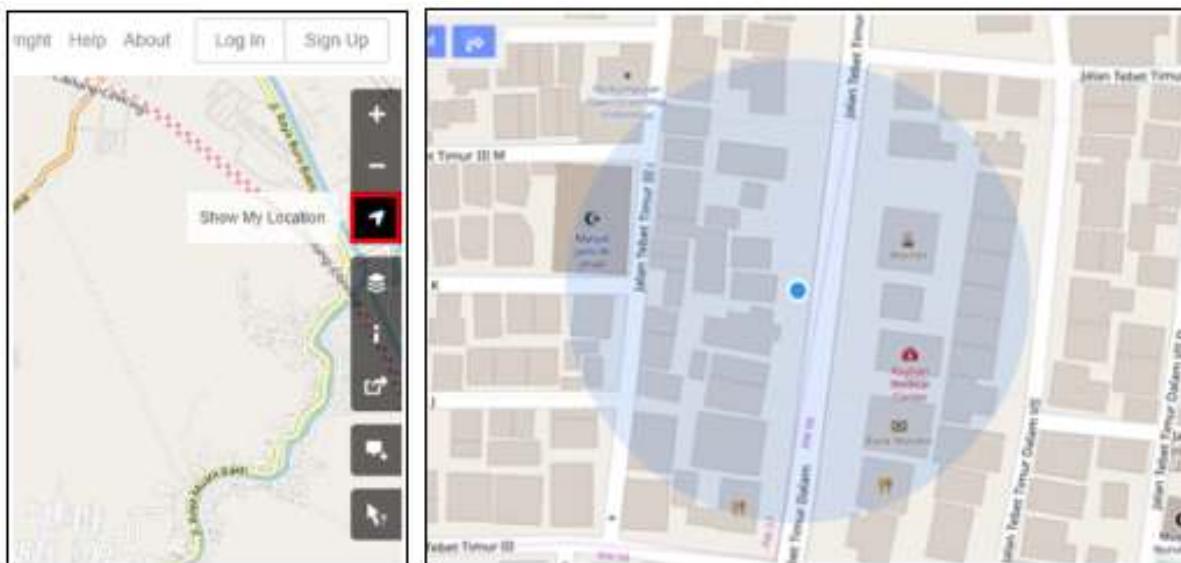
#### How to zoom in and out the map view

- 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.

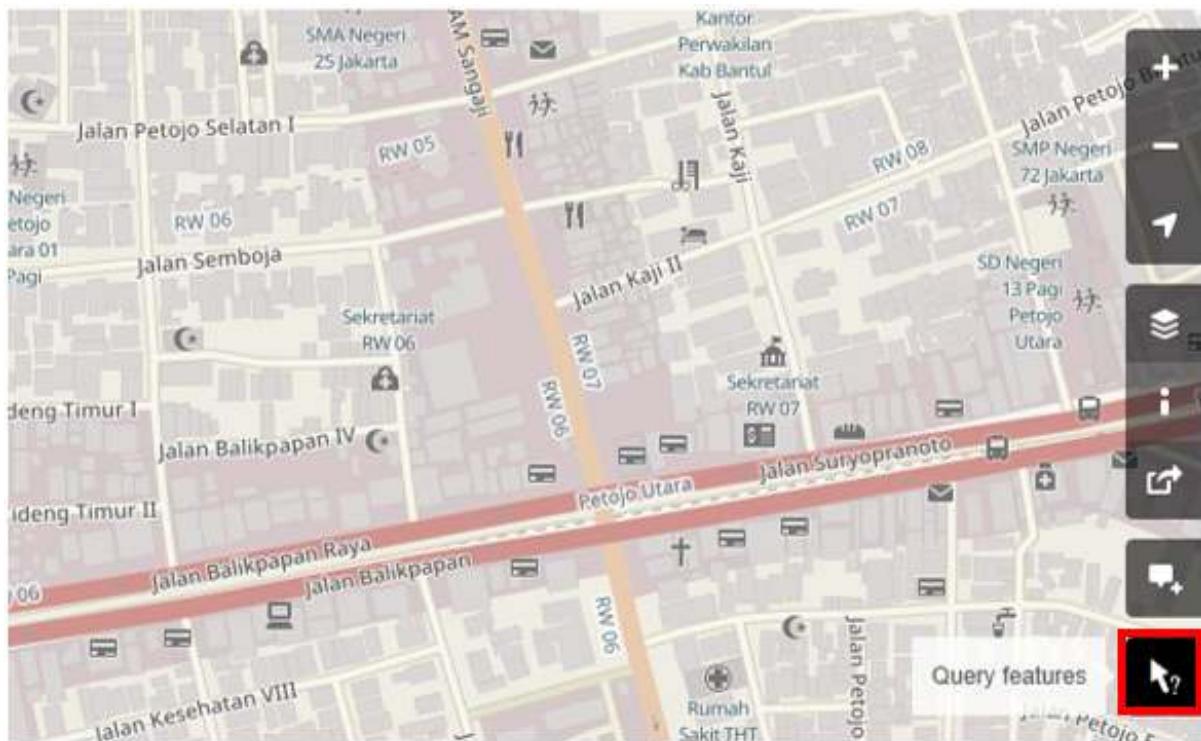


### Humanitarian Layer

## 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

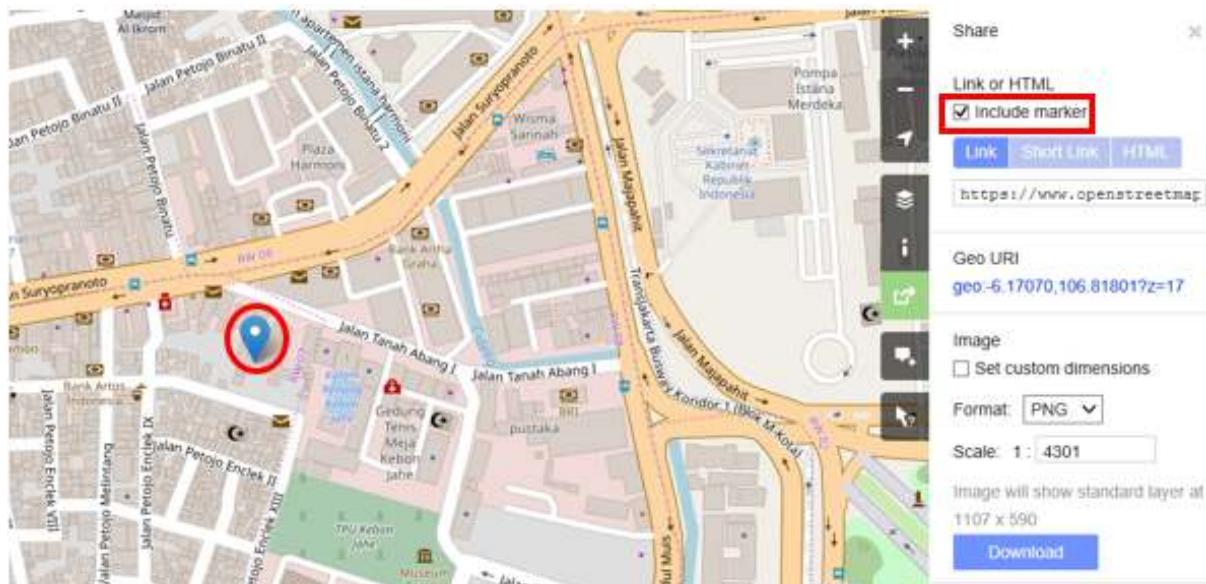
© OpenStreetMap contributors. Tiles style by Humanitarian OpenStreetMap Team hosted by OpenStreetMap France

## Query Features result

### V. Share with link in OpenStreetMap

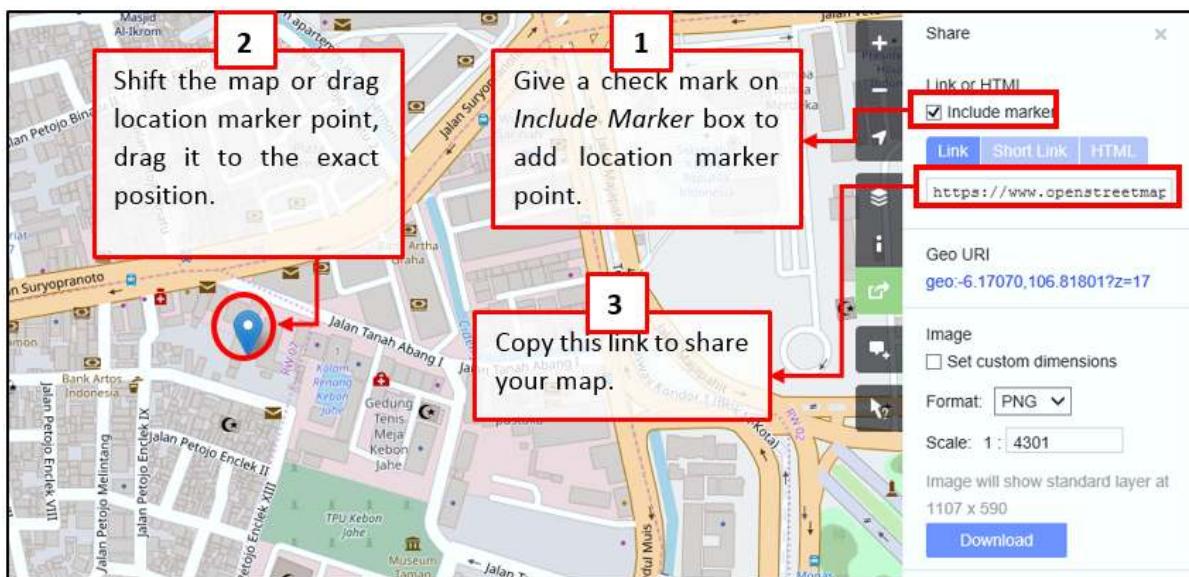
You can share links of your OpenStreetMap maps to others for various purposes, such as sharing the location of your current position with your colleagues and so on. To be able to share OpenStreetMap maps, the steps are as follows:

- 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.

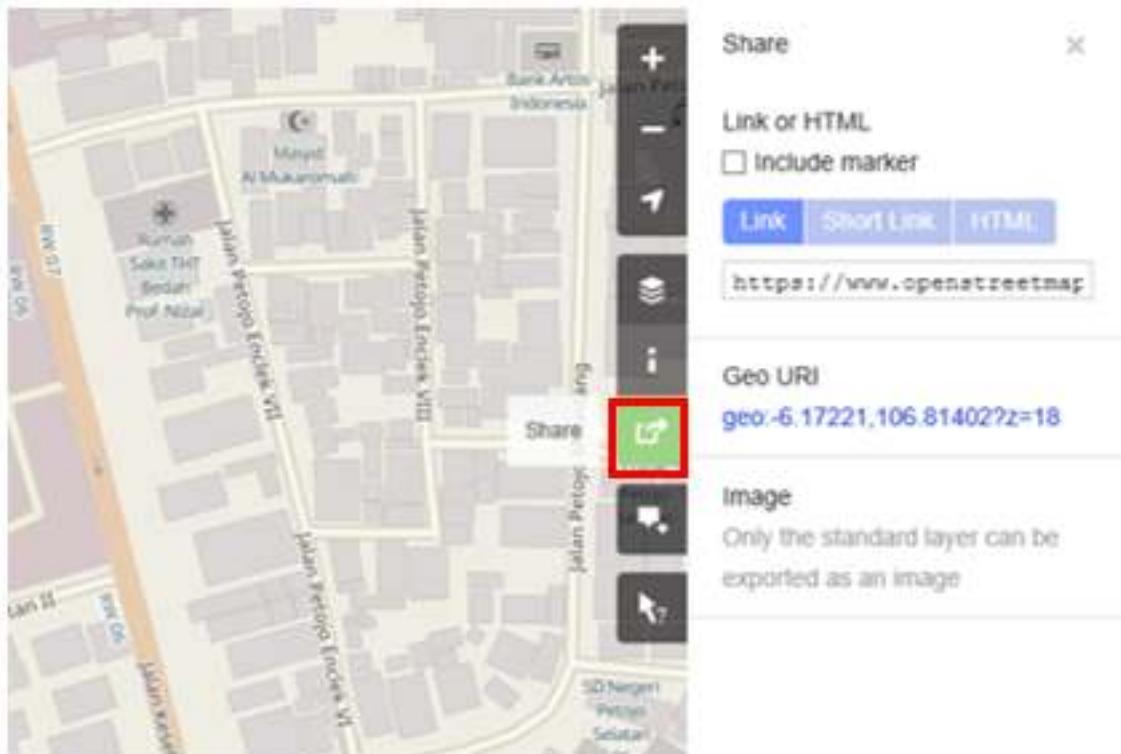


Share the link of the map in OpenStreetMap

## 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.

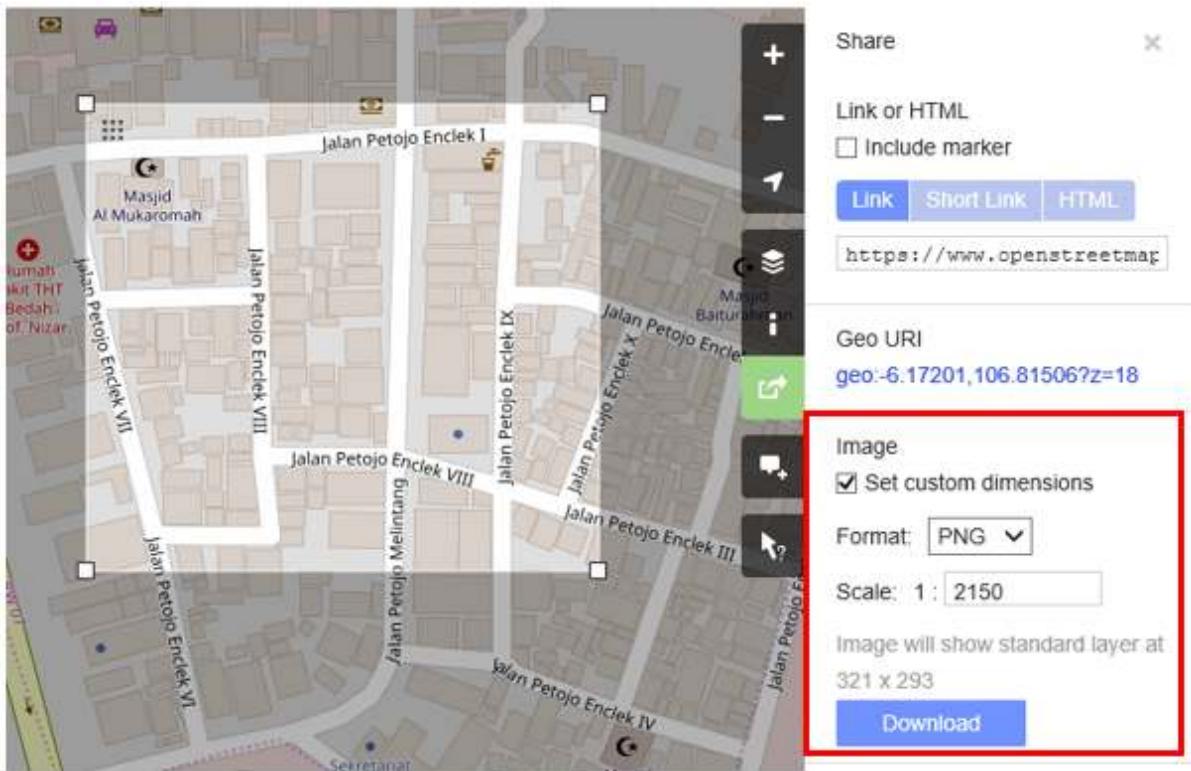


Image section to export the map

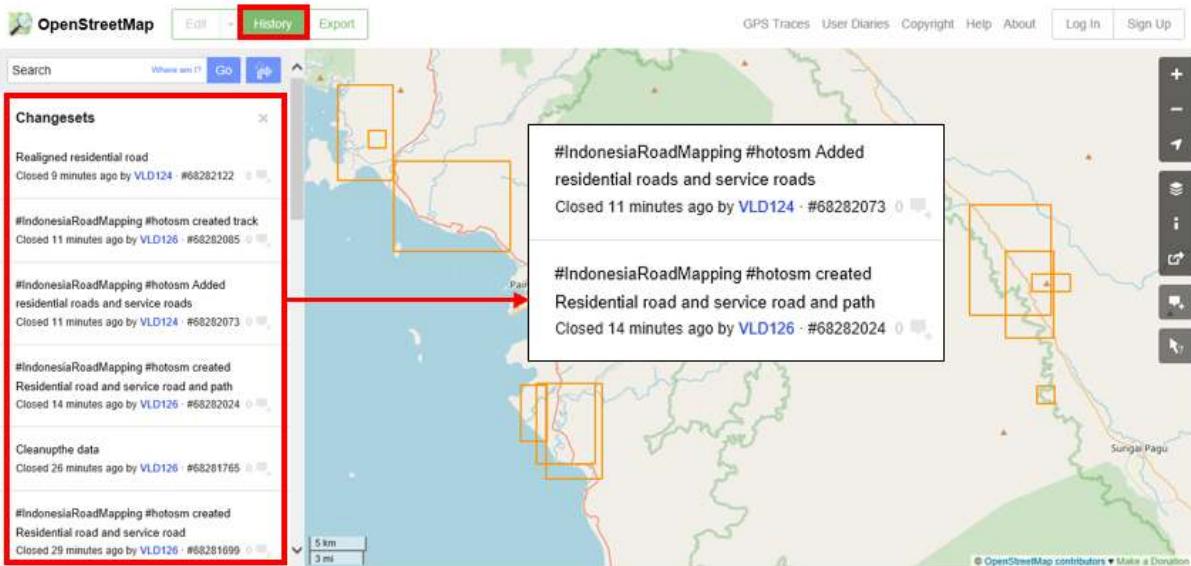
## VII. See the editing history in OpenStreetMap

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:

- 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.
- Upload time information.
- OSM username.
- 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.

**Changeset: 68284024**

#IndonesiaRoadMapping #otosm created residential road and unclassified road  
Closed about 3 hours ago by VLD126

**Tags**

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

**Discussion**  
[Log in to join the discussion](#)

**Ways (1-20 of 42)**

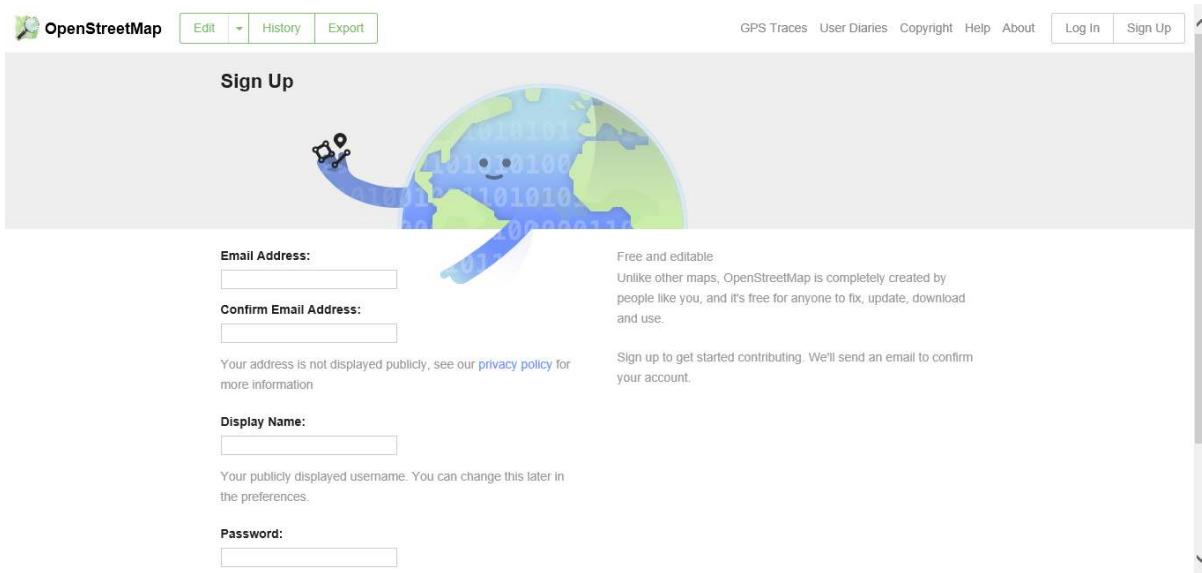
- Jalan Raya Air Haji - Painan (637842235, v3)
  - 677819421, v1
  - 677819420, v1
  - 677819419, v1

### 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:

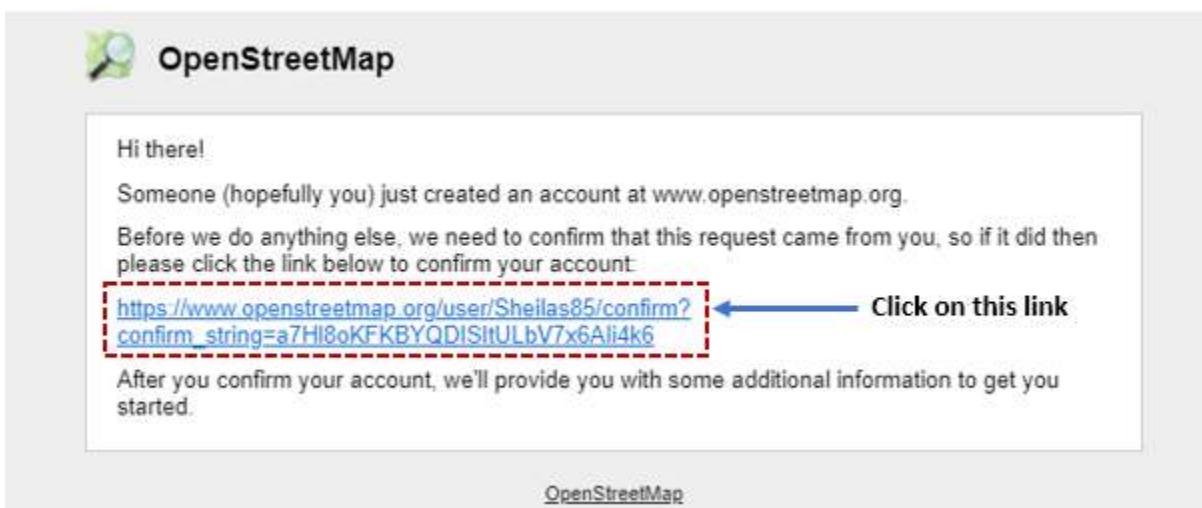


### Sign up page

- 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.

## IX. 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

Figure 4: The example of object attributes

### 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
Physical		
3D	<code> {{Template:Map_Features:3D}}</code>	The basic version (generic).
Aerialway	<code> {{Template:Map_Features:aerialway}}</code>	The basic version (generic).

Figure 5: Main page of Wiki Map Features and list of feature table

#### 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.

#### 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).

Figure 6: Indonesia Wiki OSM Tagging Guideline

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		

Figure 7: List of Indonesia object attributes

— 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?

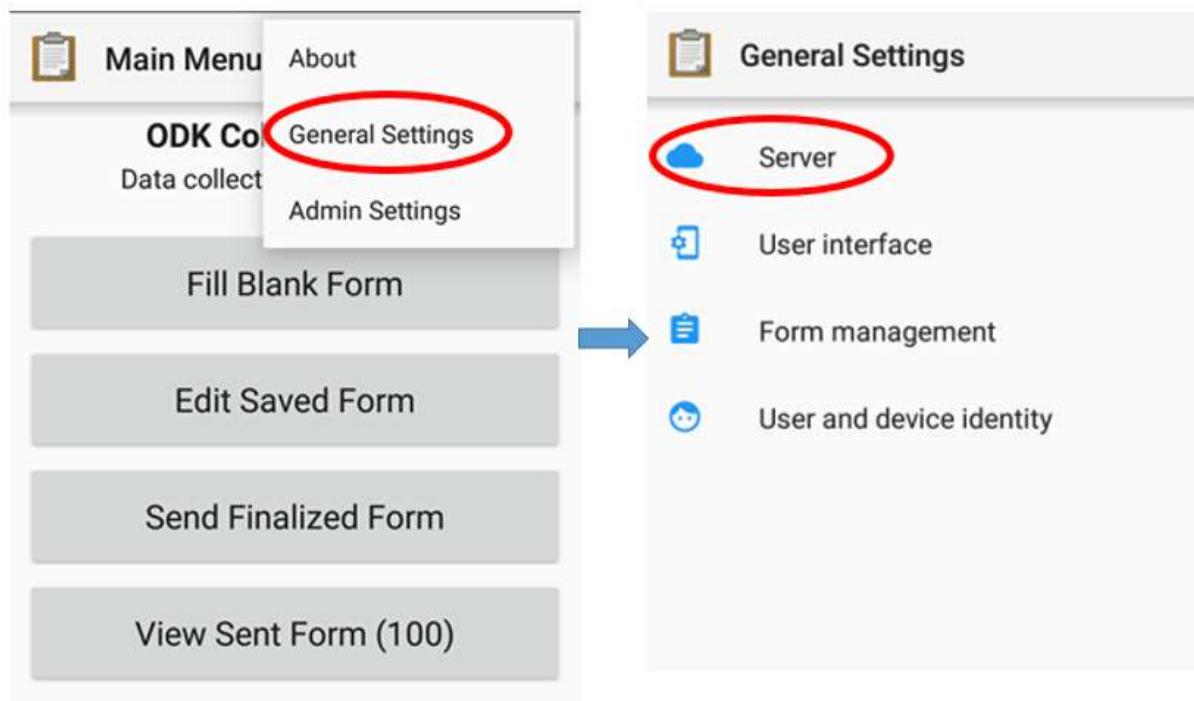
Open Data Kit Collect (ODK Collect) is a data collection application on Android. ODK Collect can replace form survey from paper to digital. Therefore, this application will help the mapping and data collection activities in the field which also allow to save the location and photo information at once.

## II. Initial Setup for ODK Collect

### 1. Set the URL Server

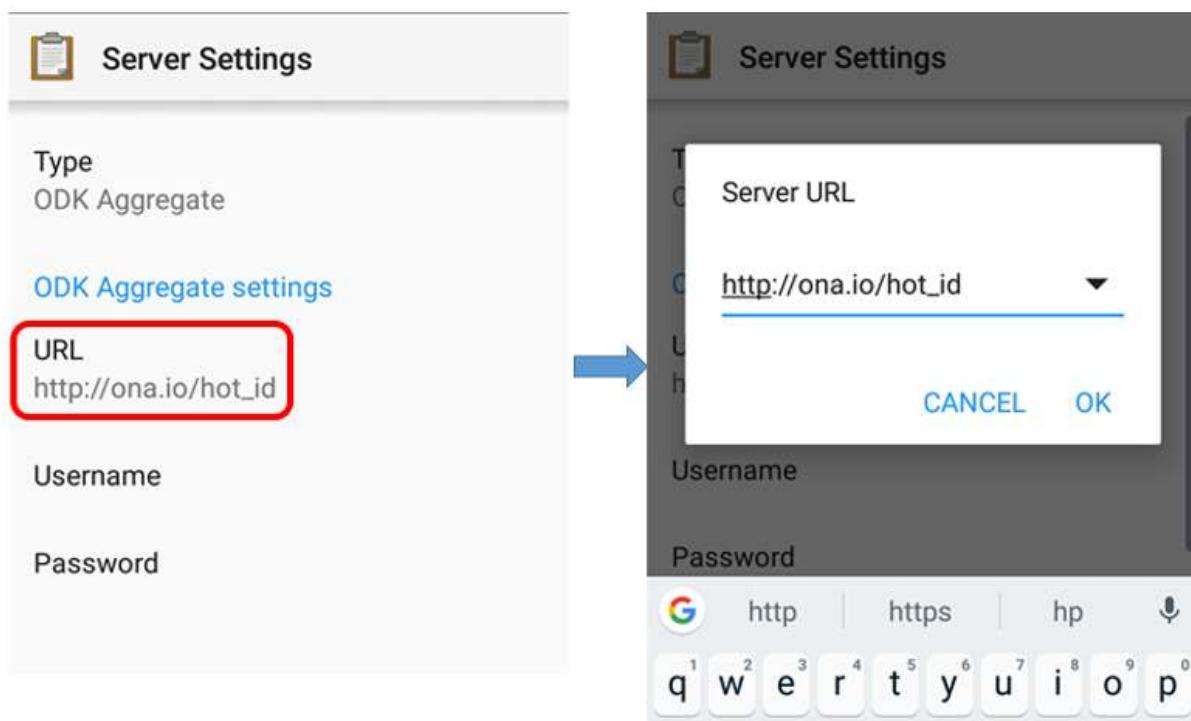
To take the form survey from the server for the first time, the user needs to set the URL server. There are the steps:

- 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**

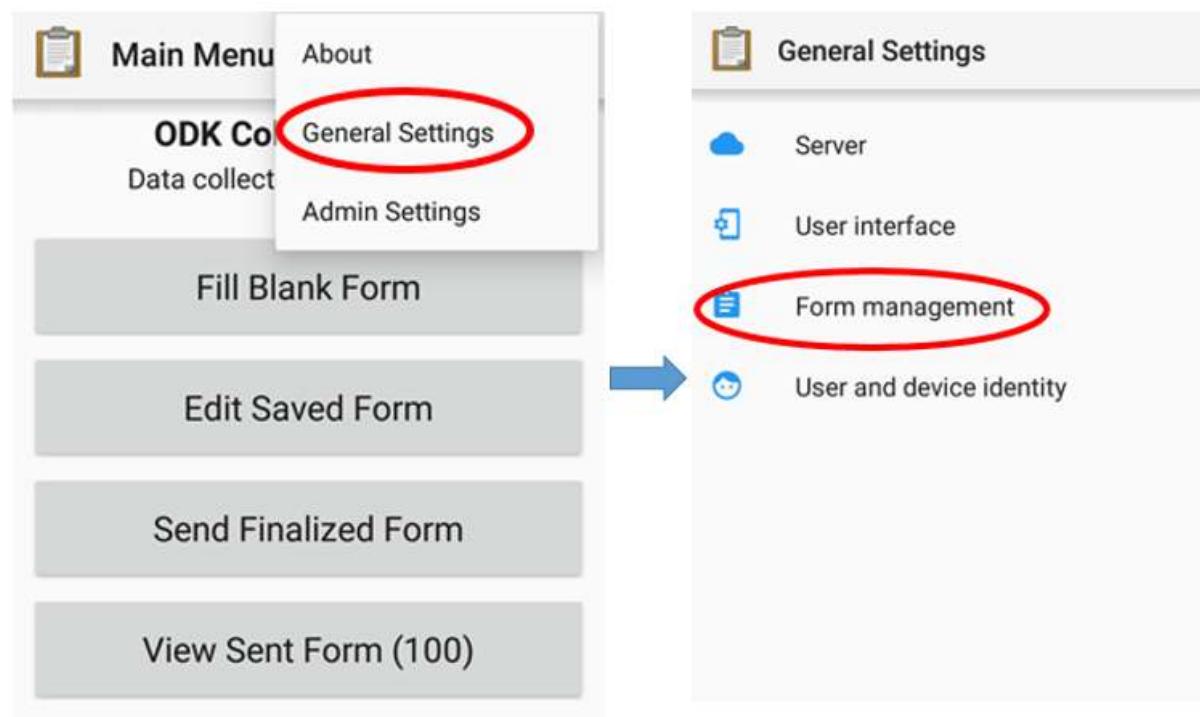


Step to fill the URL address in ODK Collect

## 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.

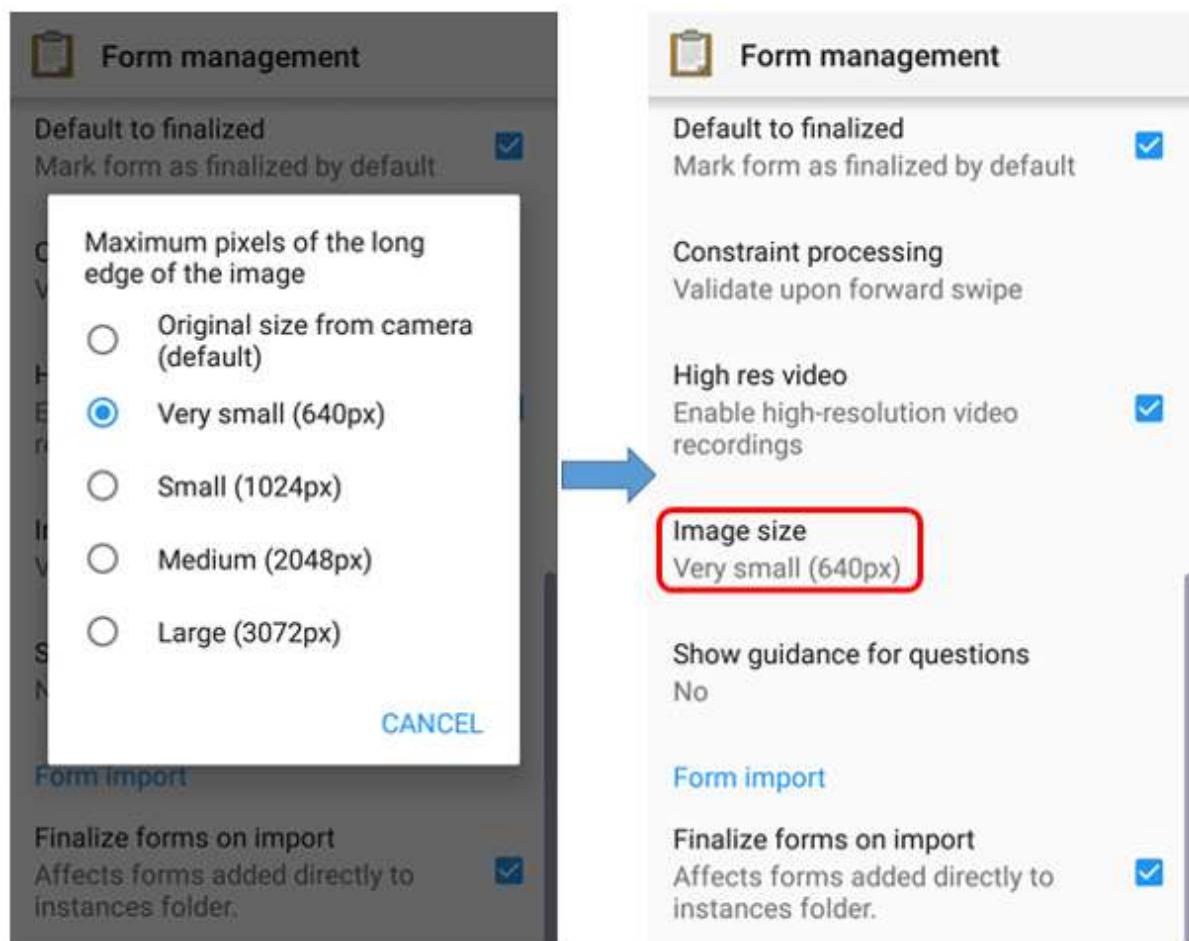


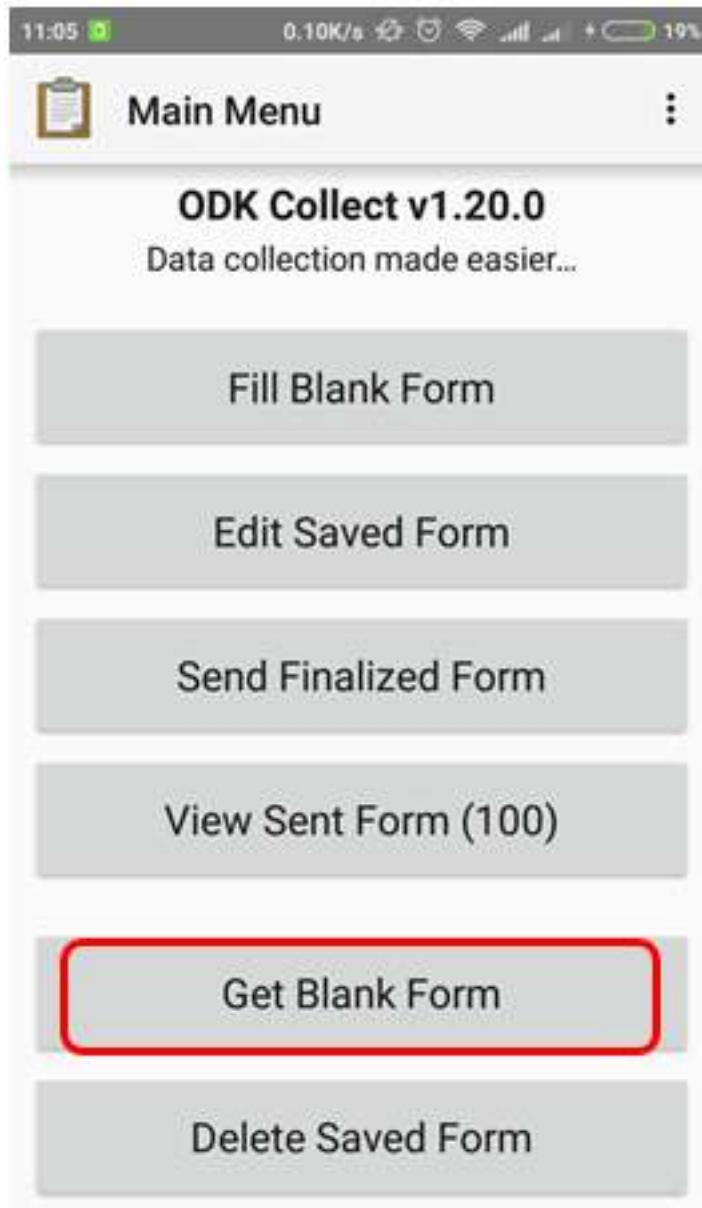
Image Size menu to set the image resolution

### III. ODK Collect basic operations

#### 1. How To Get a Blank Form Survey From Server

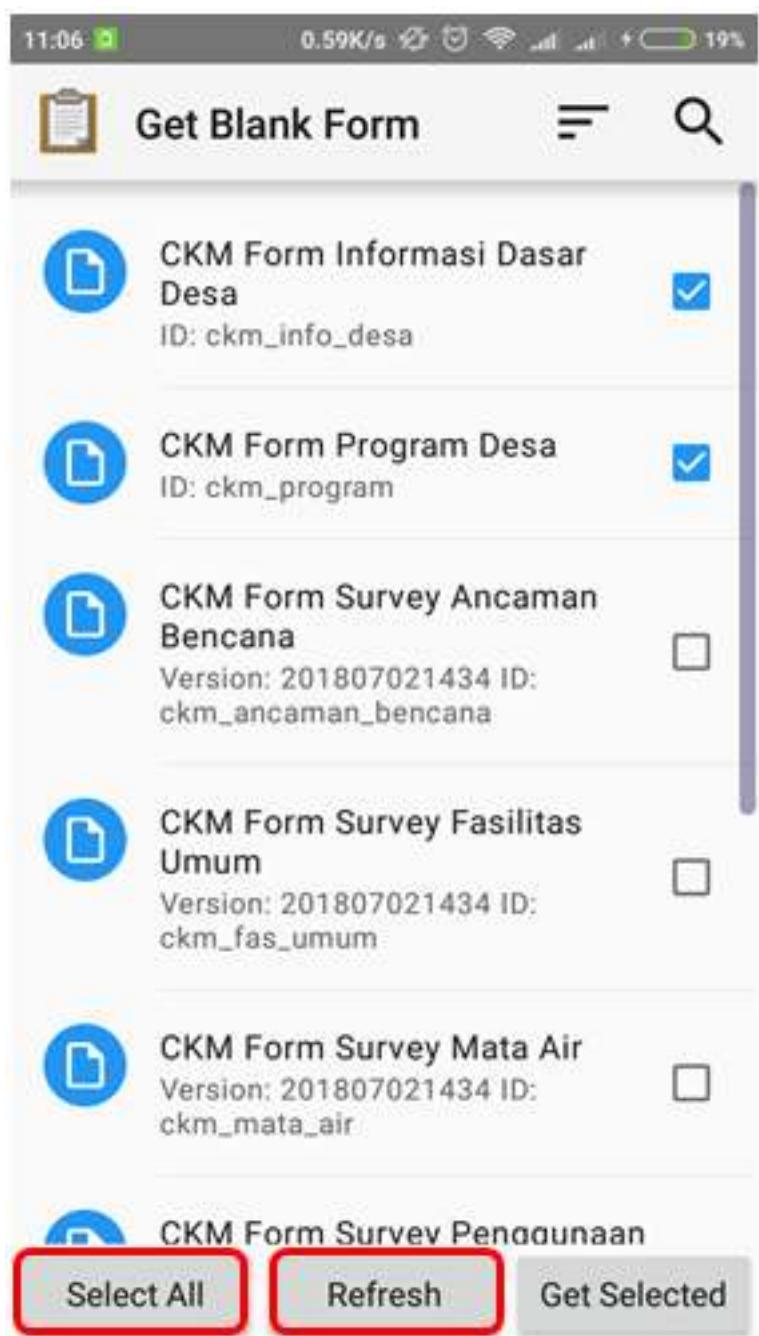
Before you fill-out the form survey that you made before, you need to download the blank survey form from specified server. For further explanation about create a survey form in ODK, you can learn in **Making Survey Form for ODK & OMK applications** module. You can follow this step to take a blank survey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

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



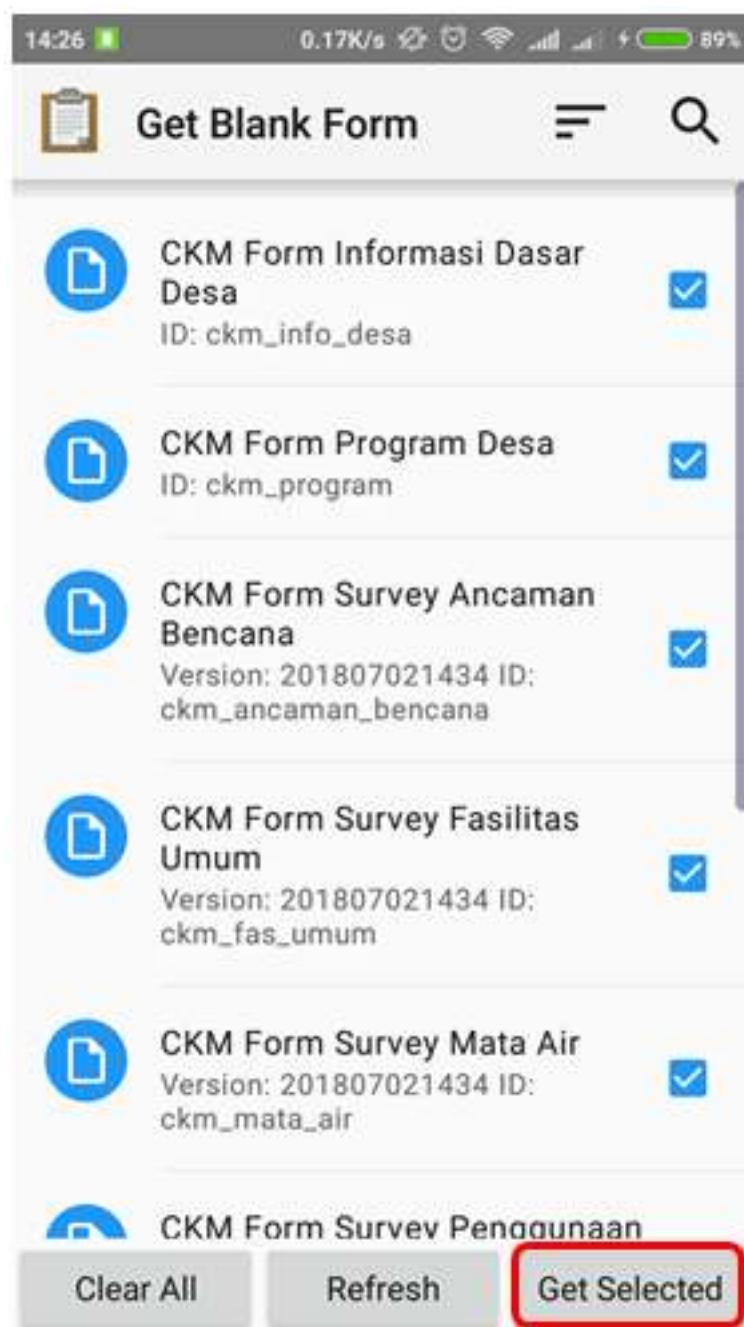
Get blank form options to take form on a server

- 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

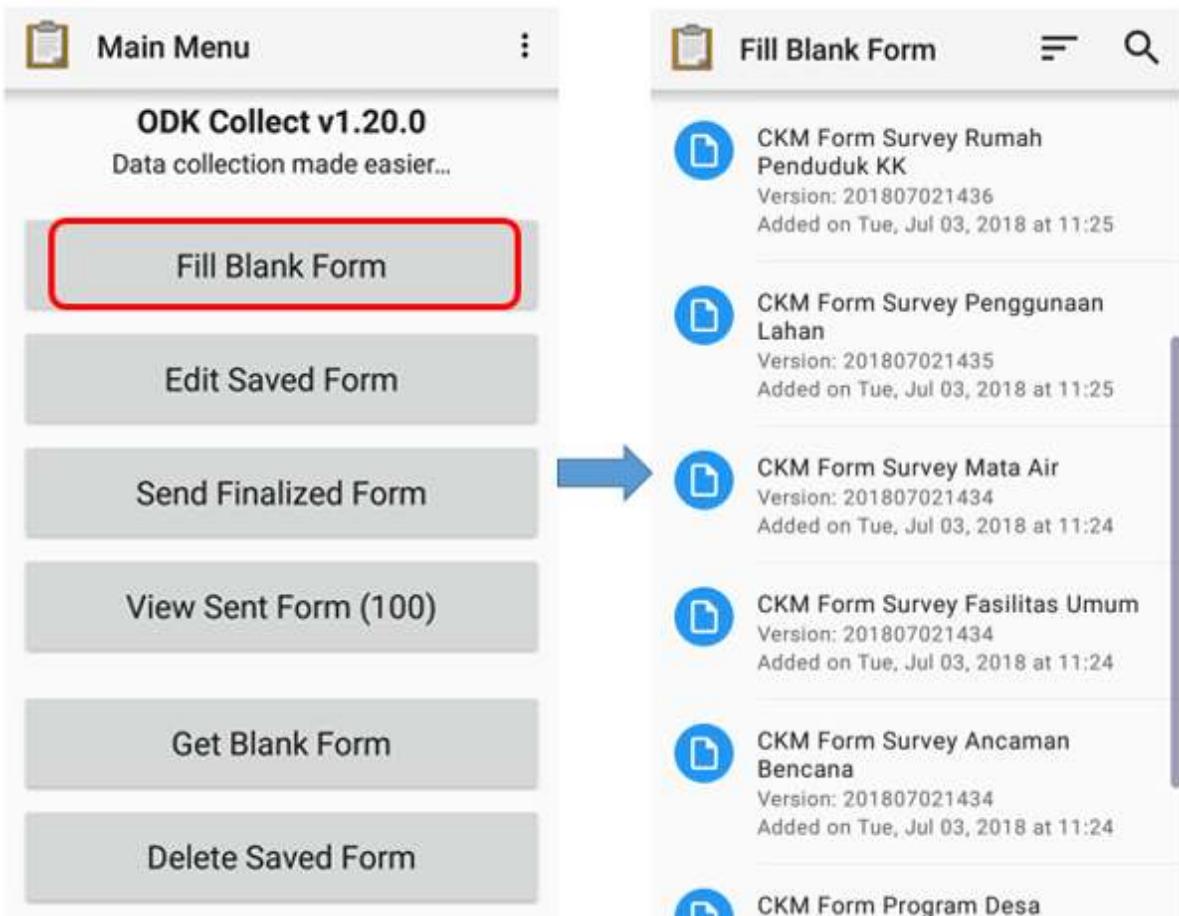
- After select the form, you can press **Get Selected** to download the selected form.



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.



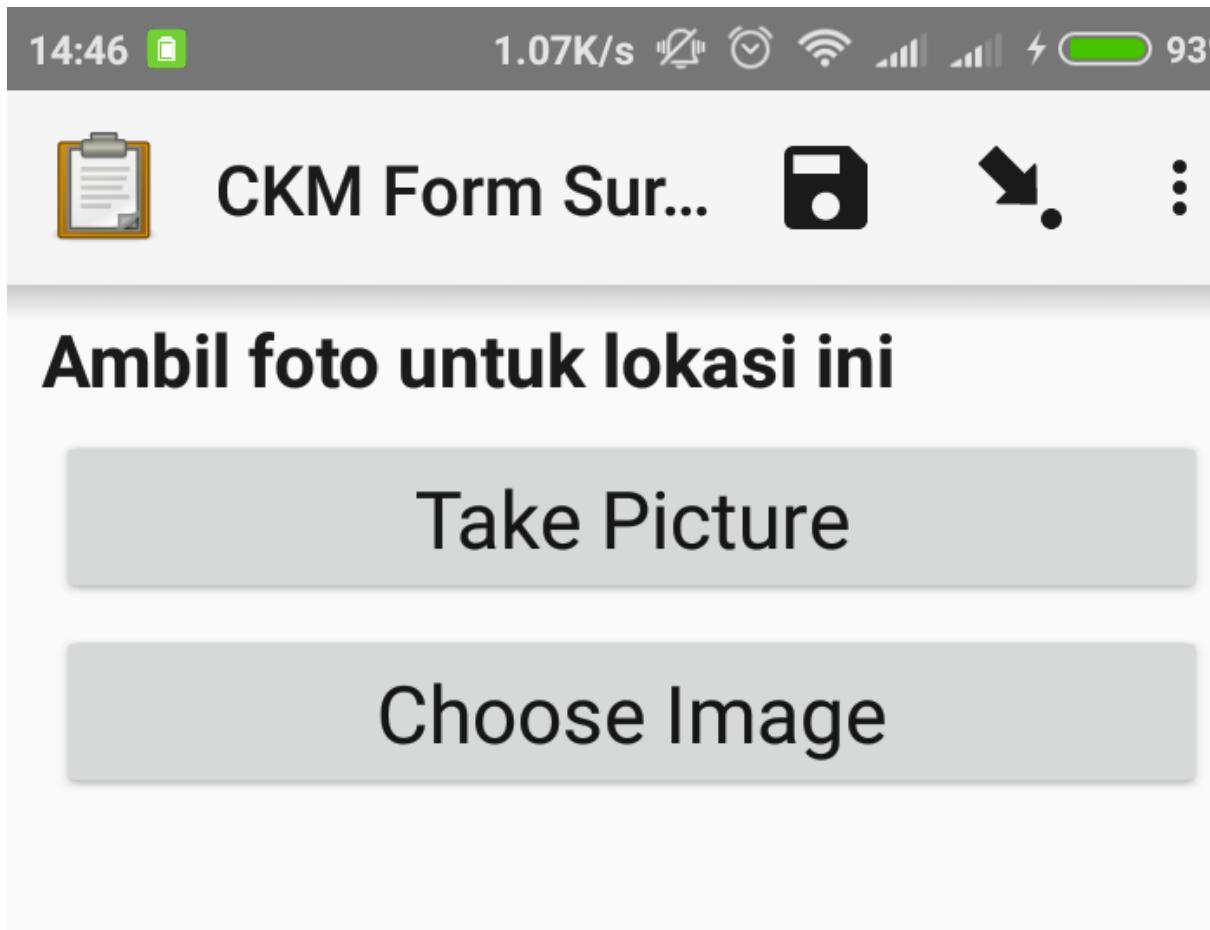
## \* Nomor PERANGKAT/ALAT GPS

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.

14:47

0.81K/s ☰ ⏱ ⌂ ⌂ ⌂ ⌂ ⌂ ⌂ 93%



## 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 'CKM Form Survey Fasilitas Umum'.

**Left Screenshot:**

- Top Bar:** CKM Form Survey Fasilitas Um...
- Fields:**
  - \* 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
  - Bottom Buttons:** Go To Start | Go To End

**Right Screenshot:**

- Top Bar:** CKM Form Sur... (with a red box around the save icon)
- Section:** Tipe Dinding
- Options:**
  - Bata
  - Kayu
  - Bambu
  - Seng

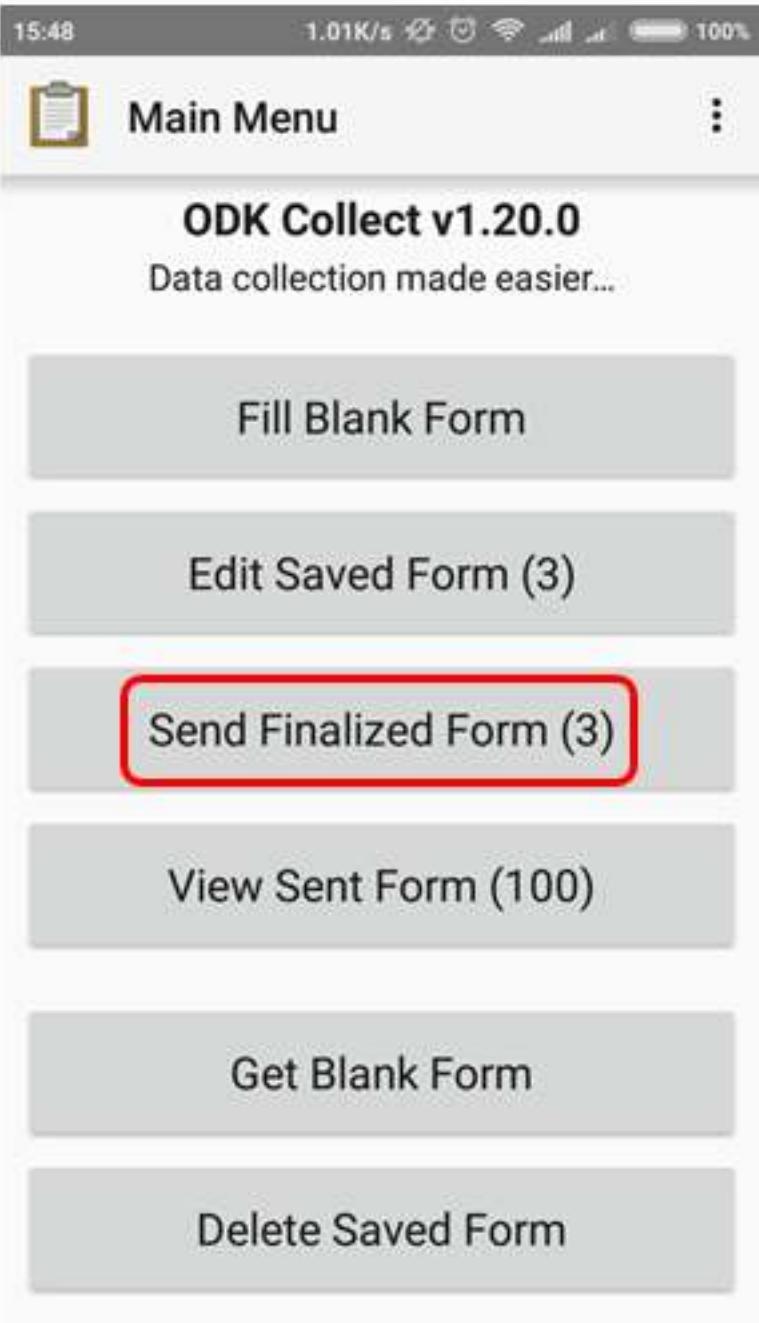
A large blue arrow points from the 'Nama Dusun' field in the left screenshot towards the right screenshot.

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

#### 4. Upload Survey Forms to Server

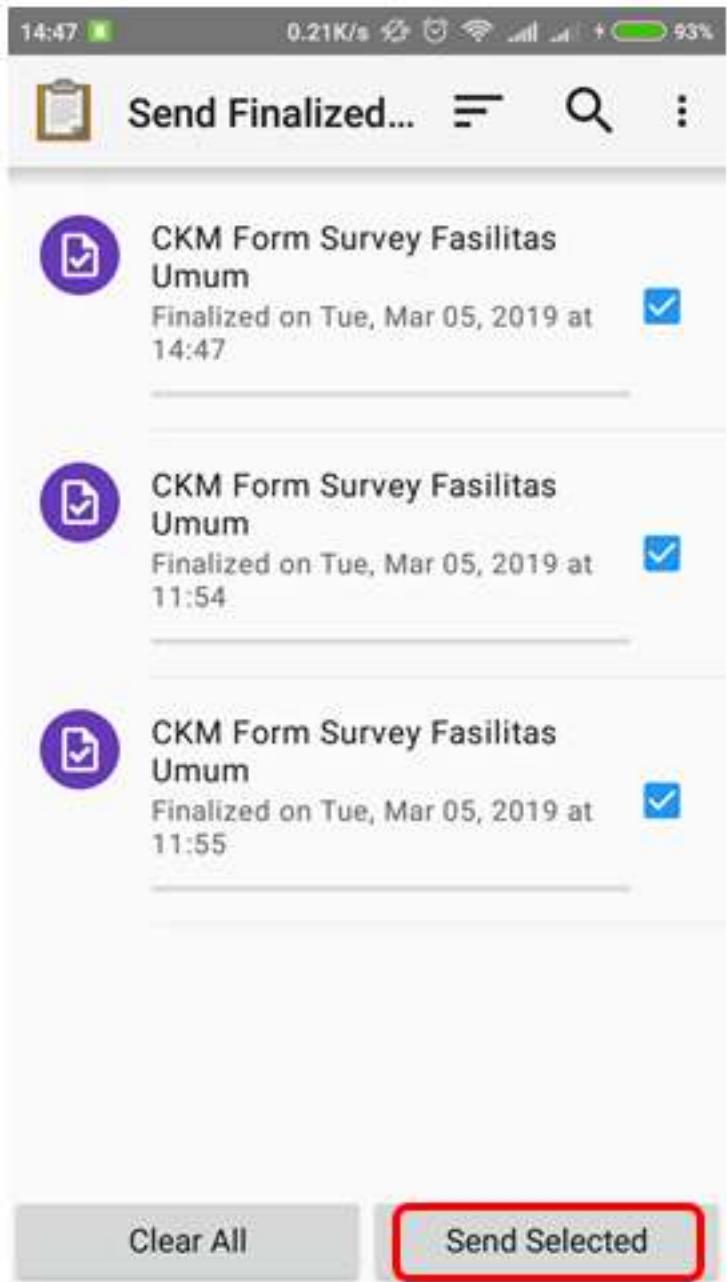
After you fill and save the form, the next step is upload form survey to server. You can follow this step to upload form to server:

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



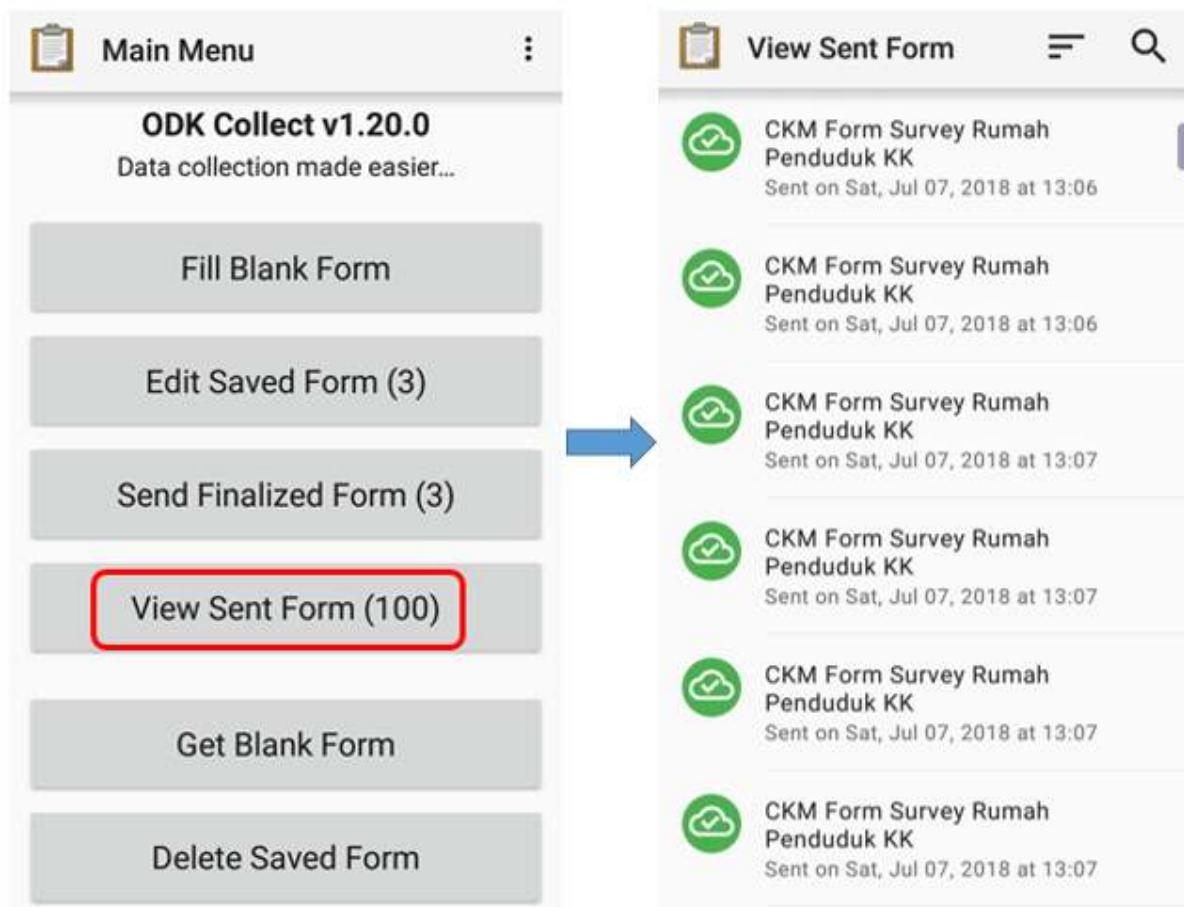
Send Finalized Form to upload a survey form to the server

- 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.



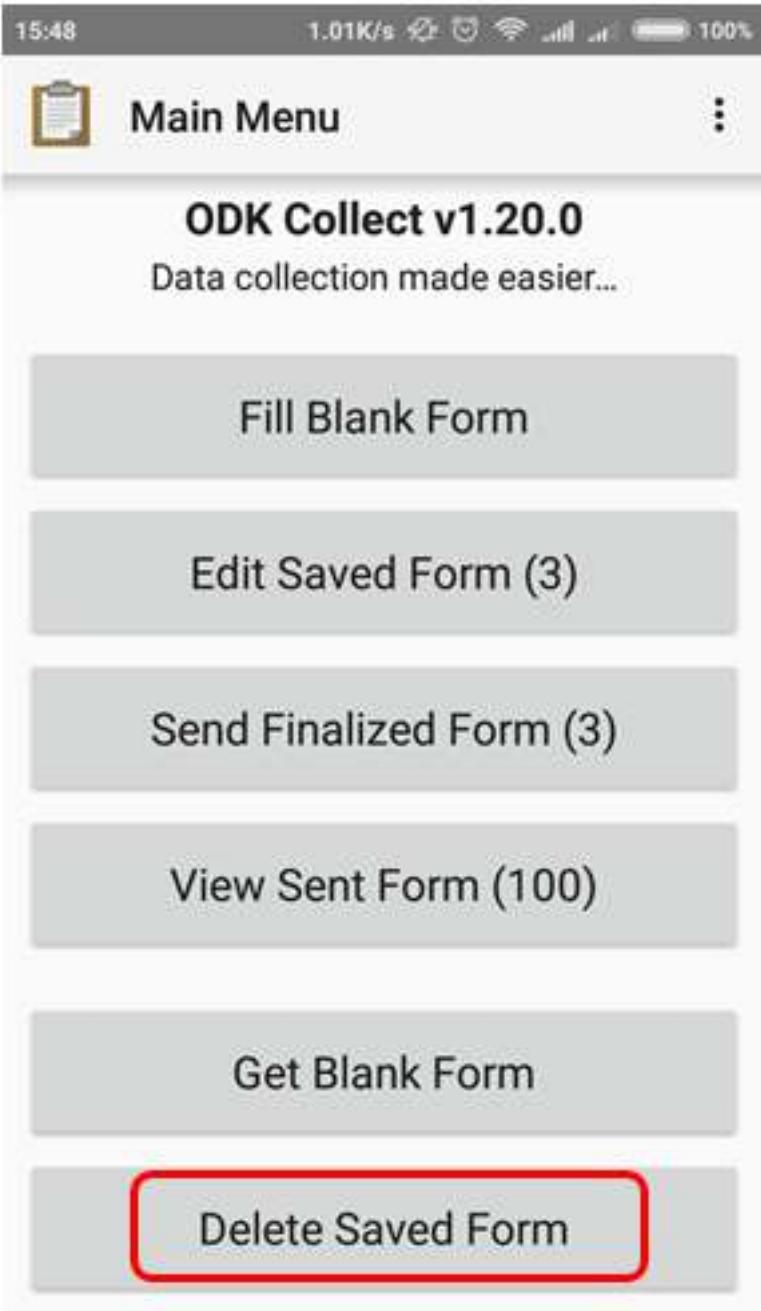
Survey forms that are ready to send in the Send Finalized Form

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



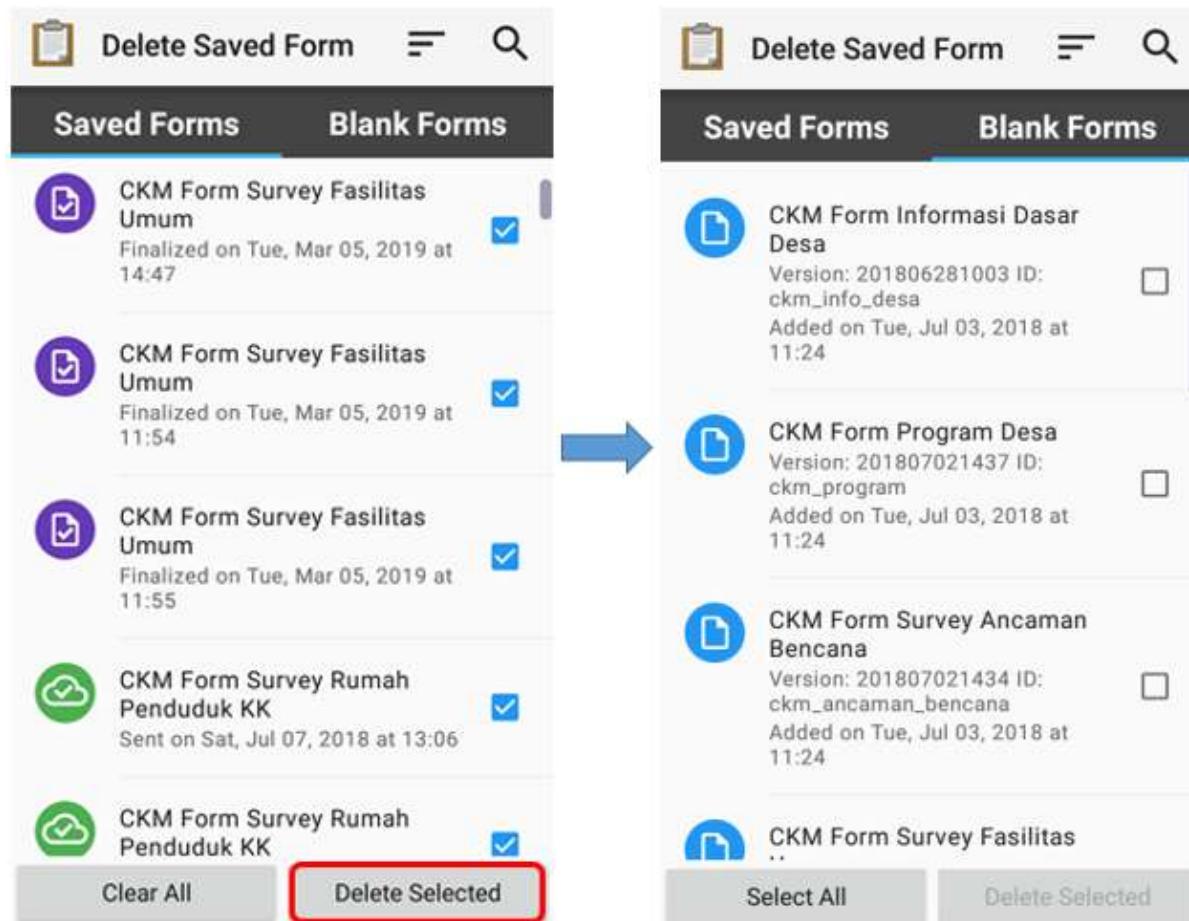
View Sent Form and survey form that have been successfully uploaded to the server

- 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](#)

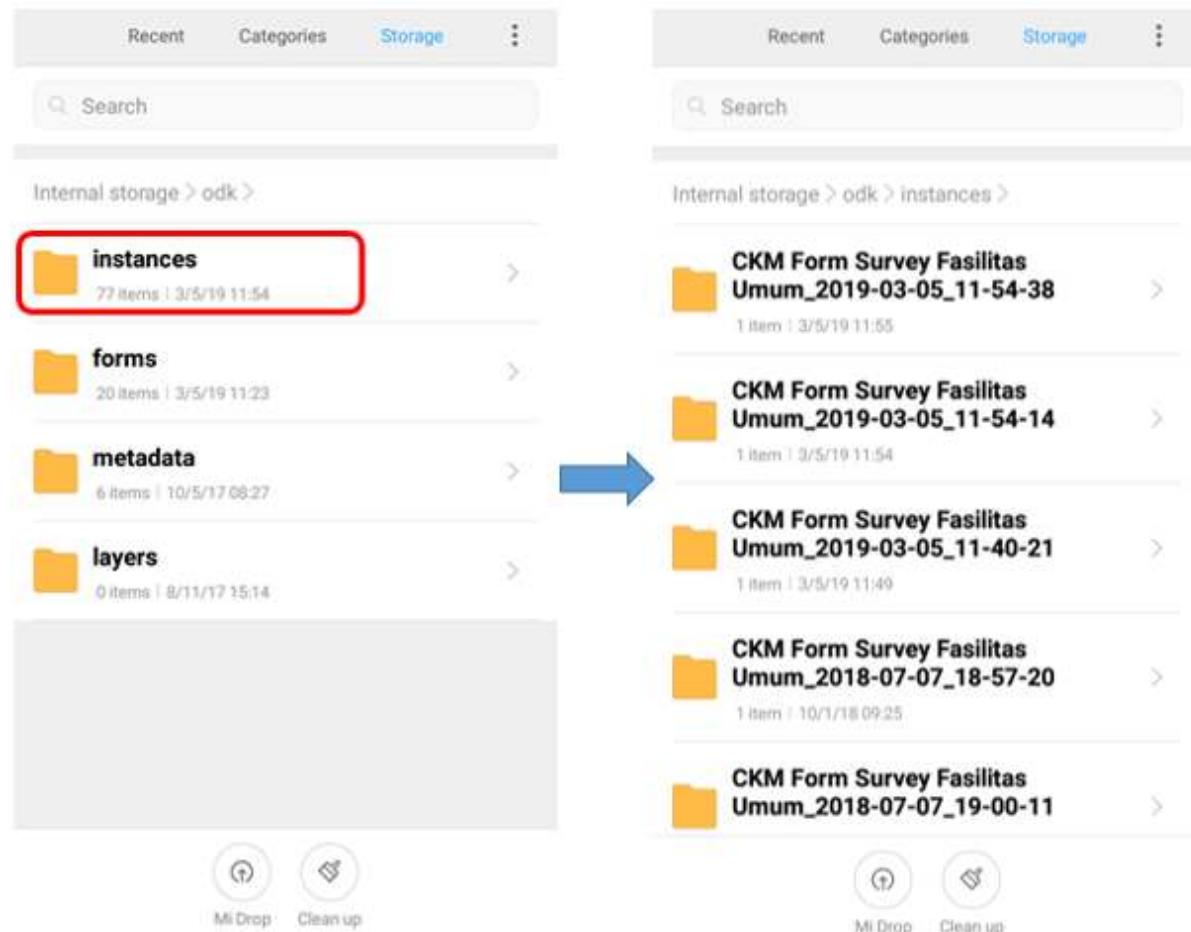
[Delete Selected](#)

Delete confirmation dialog box

## 5. Upload Survey Form to Google Drive

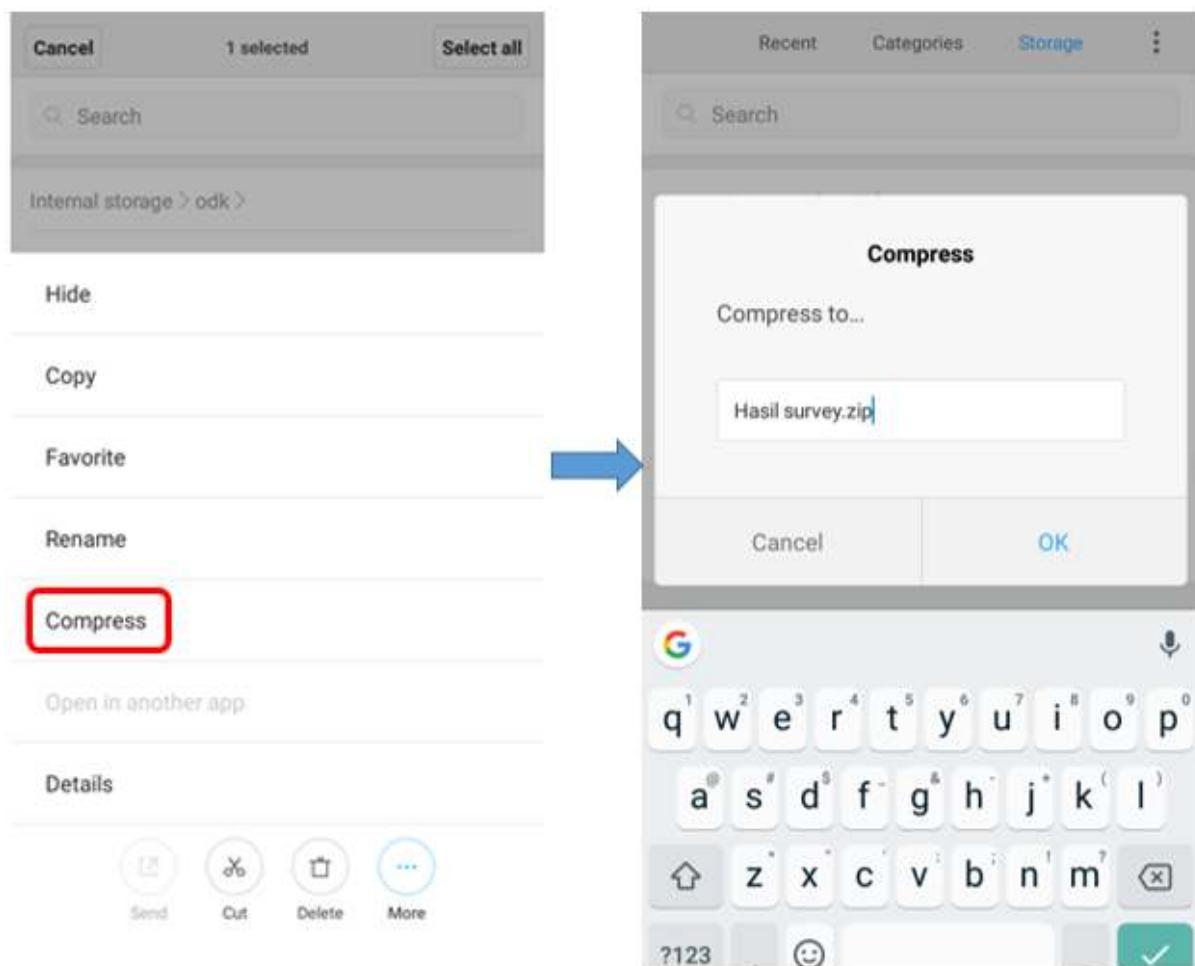
After you upload all the survey form to server, you need to save and upload the survey result file in .zip format in Google Drive folder that was created by your mapping supervisor. This is the step:

- 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.



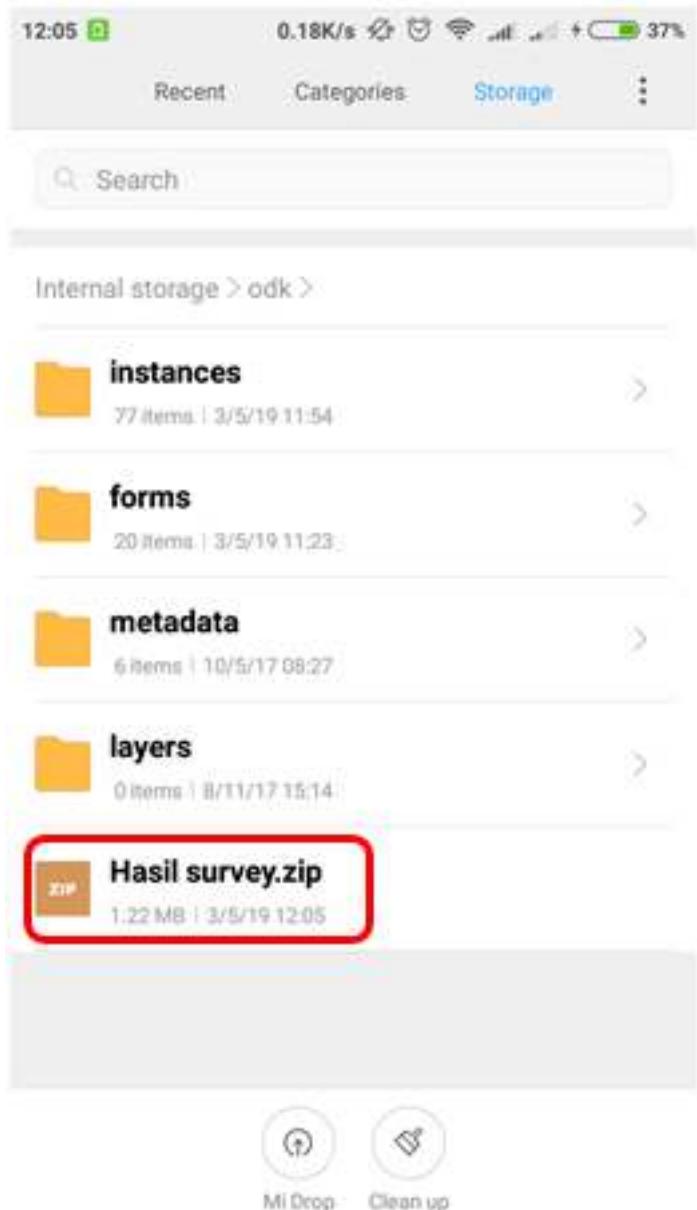
Instances folder in ODK folder and the survey result in instances folder

- 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.



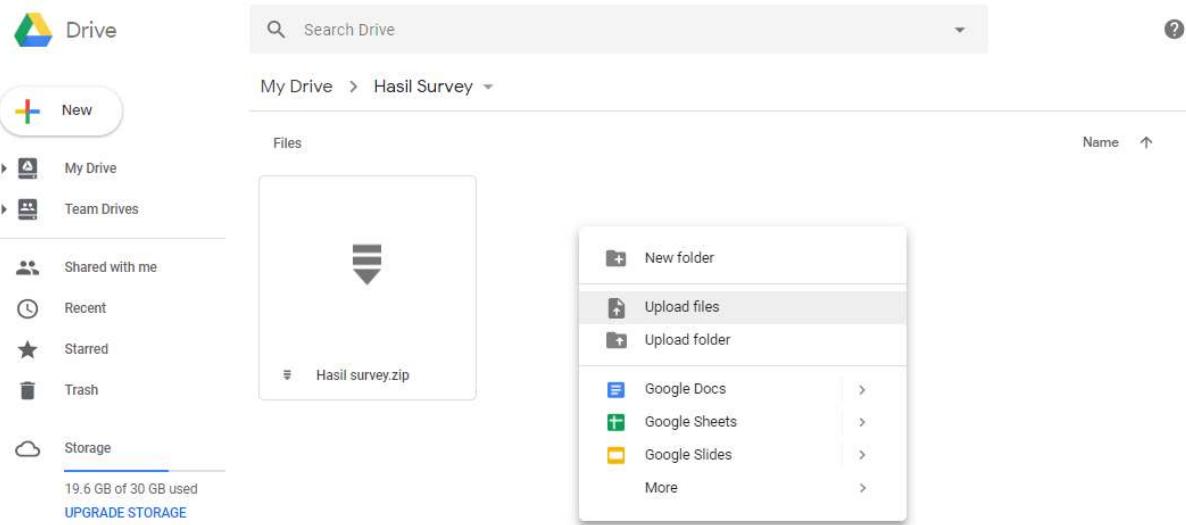
The step for convert to .zip format

- 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.

— title: OpenStreetMap Data Model weight: 2 —

### Objectives:

- Understanding Concept of *tag*, *key*, dan *value* in *OpenStreetMap*
- Knowing *OpenStreetMap* wiki page as a guideline for *key* and *value*
- Understanding Objects which can be mapped into *OpenStreetMap*
- Knowing and Understanding data model as a part of mapping preparation plan
- Checking specific *key* and *value* in *TagInfo* website

In this module, you will learn about *key* and *value* concept in *OpenStreetMap* (OSM) as well as data model in OSM objects. Knowing about data model will help you to prepare your mapping activity plan efficiently start from planning, field survey and input the field survey data. You also learn some websites which can help you to find specific information key and value that you need based on OpenStreetMap standard.

### I. Tag, Key, dan Value Concept

In *OpenStreetMap* there are 3 types of object. They are: *Nodes*, *Ways*, and *Polygon/Closedways*. Each type of data has information that can represent the object. That information called *Tag* which structured by *key* and *value*.

For instance, there is a school in your area. Therefore, the school should be **Tagged** as a school in *OpenStreetMap*. The school's tag has some details information that make the school being different from other schools. Those information such as name, address, building level, school type, etc. In *OpenStreetMap*, they are **Key** while each information of them called **Value**.

Example of School Tag:

name=SDN Kebon Manggis 11 Pagi

address= Jalan Slamet Riyadi II.

In the example above, “name and address” are **Key** while “SDN Kebon Manggis 11 Pagi and Jalan Slamet Riyadi II” are **Value**. See the image below to see the explanation in *OpenStreetMap* website:

The screenshot shows a map of a residential area with several buildings. A specific building is highlighted with an orange polygon and labeled "SD Negeri 01 Pagi Kebon Manggis". To the left of the map is a detailed view of the building's tags. The tags are listed in a table with two columns: "Key" and "Value".

Tags	Key	Value
access:roof	no	
addr:city	DKI Jakarta	
addr:full	Jalan Slamet Riyadi II	
	No. 7B Kebon Manggis	
amenity	school	
backup_generator	no	
building	school	
building:condition	good	
building:levels	3	
building:roof	concrete	
building:structure	confined_masonry	
building:walls	brick	

## Key and value of an object on OpenStreetMap

As you can see on the picture above, key and value always written in english according to the OpenStreetMap standard. You do not need to remember all key and value in OpenStreetMap because you can find them in wikipedia *OpenStreetMap* website which will be explained in this module.

## II. Wikipedia *OpenStreetMap* to see Key and Value

As a one of mapping participatory platform, OpenStreetMap has millions of contributors all around the globe. Therefore to produce and ensure a good quality data and information in OpenStreetMap, the contributors together established rules and standardization guidelines and put into one open-source platform site called wikipedia.

### a. Global Wikipedia *OpenStreetMap*

Further explanation and list of key and value in OpenStreetMap have been made and put into specific OSM wikipedia page called *Map Feature*. In this page, you can search and find any key and value that used in OpenStreetMap globally. To access this page please visit at: [https://wiki.openstreetmap.org/wiki/Map\\_Features](https://wiki.openstreetmap.org/wiki/Map_Features)

The screenshot shows the Wikipedia page for 'Map Features'. At the top, there's a navigation bar with links for 'Page', 'Discussion', 'Read', 'View source', 'View history', and a search bar. Below the header, there's a section titled 'Map Features' with a brief introduction about how OpenStreetMap uses tags for features like roads and buildings. A 'Contents' sidebar lists categories such as Primary features, Secondary features, and Tertiary features. The main content area contains a table with 11 rows, each representing a different type of amenity:

Key	Value	Element	Comment	carto-Rendering	Photo
amenity	bar	<input checked="" type="checkbox"/>	Bar is a purpose-built commercial establishment that sells alcoholic drinks to be consumed on the premises. They are characterised by a noisy and vibrant atmosphere, similar to a party and usually don't sell food. See also the description of the tag <code>amenity=pub bar restaurant</code> for a distinction between these.		
amenity	bbq	<input checked="" type="checkbox"/>	BBQ or Barbecue is a permanently built grill for cooking food, which is most typically used outdoors by the public. For example these may be found in city parks or at beaches. Use the tag <code>fuel+=</code> to specify the source of heating, such as <code>fuel=wood electric charcoal</code> . For mapping nearby table and chairs, see also the tag <code>tourism=picnic_site</code> . For mapping campfires and firepits, instead use the tag <code>leisure=freepit</code> .		
amenity	biergarten	<input checked="" type="checkbox"/>	Biergarten or beer garden is an open-air area where alcoholic beverages along with food is prepared and served. See also the description of the tags <code>amenity=pub bar restaurant</code> . A biergarten can commonly be found attached to a beer hall, pub, bar, or restaurant. In this case, you can use <code>biergarten=yes</code> additional to <code>amenity=pub bar restaurant</code> .		
amenity	cafe	<input checked="" type="checkbox"/>	Cafe is generally an informal place that offers casual meals and beverages; typically, the focus is on coffee or tea. Also known as a coffeehouse/shop, bistro or sidewalk cafe. The kind of food served may be mapped with the tags <code>cuisine+=</code> and <code>diet+=</code> . See also the tags <code>amenity=restaurant bar fast_food</code> .		
amenity	drinking_water	<input checked="" type="checkbox"/>	Drinking water is a place where humans can obtain potable water for consumption. Typically, the water is used for only drinking. Also known as a drinking fountain or bubbler.		
amenity	fast_food	<input checked="" type="checkbox"/>	Fast food restaurant (see also <code>amenity=restaurant</code> ). The kind of food served can be tagged with <code>cuisine+=</code> and <code>diet+=</code> .		
amenity	food_court	<input checked="" type="checkbox"/>	An area with several different restaurant food counters and a shared eating area. Commonly found in malls, airports, etc.		
amenity	ice_cream	<input checked="" type="checkbox"/>	Ice cream shop or ice cream parlour. A place that sells ice cream and frozen yoghurt over the counter		
amenity	pub	<input checked="" type="checkbox"/>	A place selling beer and other alcoholic drinks; may also provide food or accommodation (UK). See description of <code>amenity=bar</code> and <code>amenity=pub</code> for distinction between bar and pub.		
amenity	restaurant	<input checked="" type="checkbox"/>	Restaurant (not fast food, see <code>amenity=fast_food</code> ). The kind of food served can be tagged with <code>cuisine+=</code> and <code>diet+=</code> .		

## Interface of Map Features Website Page

Every key and value in this page is absolute and has been standard information for any object that you

want to map in OpenStreetMap and cannot be changed or modified as you want. Therefore, this page is a guideline for all OSM contributors all over the world to find any information about their mapping object in OpenStreetMap.

### b. Indonesia OpenStreetMap Wikipedia

Number of OSM Contributors in Indonesia has been increasing in recent years. As one of biggest OSM contributors in the world, Indonesia OSM contributors need a guideline about key and value information especially particular information for objects in Indonesia. However, they are usually difficult to find a tag that match with the mapping object. There are so many information in the Map Feature page yet sadly most of them are unneeded or unnecessary for objects in Indonesia. Moreover, object's name in Map Feature often can not be recognized by OSM contributors in Indonesia because it is using global name while Indonesia using local name. Therefore, Humanitarian *OpenStreetMap* Team (HOT) Indonesia made another page in OSM wikipedia that shows specific information about key and value mapping objects in Indonesia as a guideline for Indonesia OSM contributors.

Main difference between *Map Features* and Indonesia OSM Wikipedia page is list of the mapping objects. While Map Features shows all information for mapping objects all over the world, Indonesia OSM Wikipedia only showing information about objects in Indonesia and some of them do not available in the map feature. For instance, schools in Indonesia have various information including types of school start usually called SD (elementary school), SMP (junior high school) and SMA (senior high school). Health facilities also has various type depending of its type such as Rumah Sakit (Hospital), Puskesmas ( hospital in village level) , Posyandu (hospital in rural area). These information are essential in Indonesia therefore they have been placed in Indonesia OpenStreetMap Wikipedia page. Another example is you only can find name kiosk as a name and key of small store in Map Feature while the name is not familiar and known by most of Indonesian in Indonesia OpenStreetMap Wikipedia page this small store has been given a local name called "warung" even though still has key=kiosk for its tag in OpenStreetMap.

You can see list of objects information in Indonesia OpenStreetMap Wikipedia page by click this link:  
[https://wiki.openstreetmap.org/wiki/Id:Indonesian\\_Tagging\\_Guidelines](https://wiki.openstreetmap.org/wiki/Id:Indonesian_Tagging_Guidelines)

Wiki

Page Discussion

## PDC InaWARE Indonesia Project Tagging Guidelines

Main Page  
The map  
Map Features  
Contributors  
Help  
Bugs  
Stats  
Donations  
Recent changes  
  
Tools  
What links here  
Related changes  
Special pages  
Printable version  
Permanent link  
Page information  
Edit this page

Contents [note]

- 1 Administrative Boundary
- 2 Critical Facilities
  - 2.1 Finance
  - 2.2 Communication
  - 2.3 Transportation
  - 2.4 Water Supply Systems
  - 2.5 Electrical Power Systems
  - 2.6 Fuel Storage
  - 2.7 Public Institutions
  - 2.8 Sport Facilities
  - 2.9 Health Facilities
  - 2.10 Emergency Services
  - 2.11 Government Establishments
  - 2.12 Required Key and Value for Any Building Objects for Critical Facilities
- 3 Roads, Railway and Waterway

### Administrative Boundary

There are 4 administrative boundary that has been mapped (add and/or update) during this project.

No.	Object Name	Object Type	Description	Key	Value	OSM Rendering
1.	City/Regency Boundary		A Boundary for City/Regency areas	admin_level	5	
2.	Municipality Boundary		A boundary for Municipality areas	admin_level	6	
3.	Village Boundary		A boundary for Village areas	admin_level	7	

### Public Institution

No.	Object Name	Object Type	Description	Key	Value	OSM Rendering	Sample Picture
1.	Kindergarten		Place for kids to learn (5-6 years old)	amenity	kindergarten		
2.	Sekolah Dasar (SD) / Madrasah Ibtidaiyah (MI)		Elementary School	• amenity • schooltype_idn	• school • sd		
3.	Sekolah Menengah Pertama (SMP) / Madrasah Tsanawiyah (MTs)		Junior High School	• amenity • schooltype_idn	• school • smp		
4.	Sekolah Menengah Atas (SMA) / Madrasah Aliyah (MA)		Senior High School	• amenity • schooltype_idn	• school • sma		
5.	College		A place for further education, usually a post-secondary education institution	amenity	college		
6.	University		An educational institution designed for instruction, examination, or both, of students in many branches of advanced learning	amenity	university		
7.	Mosque / Masjid		Place of worship for muslim	• amenity • religion	• place_of_worship • muslim	G	
8.	Church / Capel		Place of worship for christian	• amenity • religion	• place_of_worship • christian	T	

Page of Indonesia OpenStreetMap Wikipedia Page

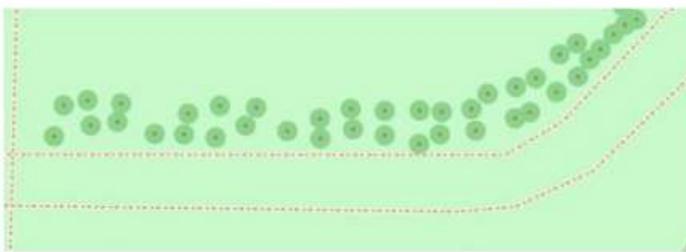
### III. Mapping Objects in *OpenStreetMap*

#### a. Data types in *OpenStreetMap*

In this module, you have been explained about data types in OpenStreetMap: point (*Nodes*), line (*Ways*) and area (*Polygon/Relation*). These are further explanation of each data type in OpenStreetMap.

- **Point (*Nodes*)**

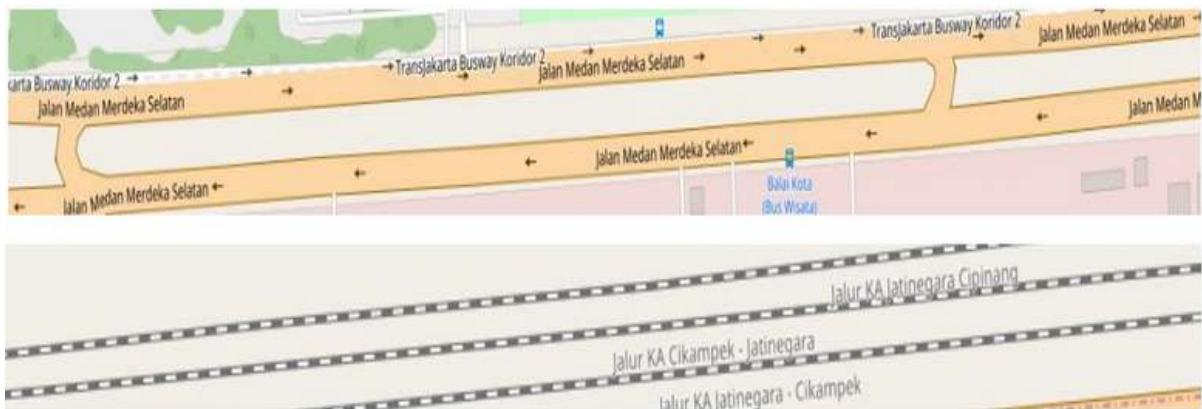
Point usually being used to represent position or location of certain object. For instance, objects which drawn as a point (*nodes*) in OpenStreetMap such as traffic light, gas station or restaurant in a mall or shopping center.



#### Example of Points in OpenStreetMap

- **Line (Ways)**

Line is an object that is formed by sequence of points (*nodes*) which connect one to another. Some objects which usually drawn as a line in OpenStreetMap such as road, river, railway and administration boundary.



#### Example of lines in OpenStreetMap

- **Area (Polygon)**

Area is formed by sequence of lines (*ways*) which connect one to another. Some objects in OpenStreetMap such as building, park, land use and lake are drawn as area.



Example of area (polygon) in OpenStreetMap

#### b. Mapping Objects in HOT-PDC Project

In *OpenStreetMap*, you can map any object on earth surface as long as it is real and permanent. Real means that the object has physical form and can be seen such as building and roads whereas non-real object such as high level or population density. Permanent means the object has specific location and not moving in particular time.

Choosing what objects that we want to map in OpenStreetMap depends on the purposes of the mapping project itself. In HOT-PDC InAWARE, the purpose is to collecting critical infrastructures which can be used for disaster management. These are list of objects that has been mapped into OpenStreetMap in HOT-PDC InAWARE project:

##### 1. Economic Facilities

- Traditional Market
- Supermarket
- Bank

##### 2. Education Facilities

- University
- College
- School (SD, SMP, SMA)
- Kindergarten

##### 3. Health Facilities

- Hospital
- Clinic

##### 4. Communication

- Communication Tower

## 5. Emergency Service

- Police Office
- Fire Station
- Evacuation Center
- Hydrant

## 6. Government

- Government Office (Governor, Mayor, District, Sub-district, village and sub-village office)
- Embassy
- Government Institution (Ministry)

## 7. Electricity

- Power tower
- Power substation
- Power Plant

## 8. Transportation

- Airport
- Bus Station
- Train Station
- Harbour / Dock

## 9. Public Facilities

- Place of Worship (Mosque, Church, Temple)
- Sport Facility (Sport Center, Stadium, Sports Field)
- Public Spaces

## 10. Water

- Water Tower
- Water Gate
- Pump House
- Embankment
- River
- Lake / Dam

## 11. Gas Station

## 12. Administration Boundary

- City / District Boundary
- Sub-district boundary
- Village boundary
- Sub-village boundary

## 13. Road Network

## IV. Data Mapping Model in *OpenStreetMap*

Data model is a compilation of some information for an object where consisted from key and value in OpenStreetMap. A data model does not have a standard for what information that should be put in an object. The model should be followed the purposes of mapping project. For instance, if you want to map school in your area and you need information of **school name**, **address**, **school type**, **school operator**, and **building level** then your data model should be like this:

### School Tag Information Table

key	(possible) values
amenity	school

key	(possible) values
building	school
school:type_idn	sd [SD/MI (Elementary School)], smp [SMP/MTs (Junior High School)], sma [SMA/SMK/MA (Senior High School)]
name	(building name)
addr:full	(address)
operator:type	government, private, community
building:levels	(number of building floor)

amenity=school is a compulsory tag for the school information. *Key* and *value* in this tag are main information that identify the object as a school.

building=school is a tag that show the school has its own building. Some schools are located in another building such as government office area therefore if that was the case then this tag is unnecessary.

#### a. HOT-PDC InAWARE Data Model

The purpose of HOT-PDC InAWARE mapping project is to gather information of critical infrastructures in context of disaster management. Therefore, you need to create data model that can help the survey team to collect the information in the field and upload them into OpenStreetMap. These are data model for each priority object in HOT-PDC InAWARE mapping project:

##### Color Information:

- Blue color means the *key* and *value* are compulsory for the object.
- Red color means the *key* and *value* are information for building of the object. This tag /information only collected if the object has its own building. Otherwise, the tag is unnecessary.
- Black color means the *key* and *value* **should be** added regardless the object has its own building or not.

#### 1. Economic Facilities

- Table of Traditional Market Data Model

key	possible values
amenity	marketplace
building	marketplace
name	(traditional market name)
addr:full	(address)
addr:city	(mapping city)
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018

- Table of Supermarket Data Model

key	possible values
amenity	supermarket

key	possible values
building	supermarket
name	(supermarket name)
addr:full	(address)
addr:city	(mapping city)
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018

- Table of Bank Data Model

key	possible values
amenity	bank
building	bank
name	(bank name)
addr:full	(address)
addr:city	(mapping city)
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018

## 2. Education Facilities

- Table of University Data Model

key	possible values
amenity	university
building	university
name	(university name)
addr:full	(address)
addr:city	(mapping city)
operator:type	government, private, community
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame

key	possible values
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018
evacuation_center	yes, no
shelter_type	tent, building
water_source	water_works, manual_pump, powered_pump
kitchen:facilities	yes, no
toilet:facilities	yes, no
toilets:number	(number of toilets)

- Table of College Data Model

key	possible values
amenity	college
building	college
name	(college name)
addr:full	(address)
addr:city	(mapping city)
operator:type	government, private, community
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018
evacuation_center	yes, no
shelter_type	tent, building
water_source	water_works, manual_pump, powered_pump
kitchen:facilities	yes, no
toilet:facilities	yes, no
toilets:number	(number of toilets)

- Table of School Data Model (SD, SMP, SMA)

key	possible values
school:type_idn	sd (Elementary School)], smp (Junior High School)], sma (Senior High School)
amenity	school
building	school
name	(school name)
addr:full	(address)

key	possible values
addr:city	(mapping city)
operator:type	government, private, community
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018
evacuation_center	yes, no
shelter_type	tent, building
water_source	water_works, manual_pump, powered_pump
kitchen:facilities	yes, no
toilet:facilities	yes, no
toilets:number	(number of toilets)

- Table of Kindergarten Data Model

key	possible values
amenity	kindergarten
building (Early education / Play group / Kindergarten)	school
name	(kindergarten name)
addr:full	(address)
addr:city	(mapping city)
operator:type	government, private, community
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018

### 3. Health Facilities

- Table of Hospital Data Model

key	possible values
amenity	hospital
building	hospital
name	(hospital name)

key	possible values
addr:full	(address)
addr:city	(mapping city)
operator:type	government, private, community
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018
evacuation_center	yes, no
shelter_type	tent, building
water_source	water_works, manual_pump, powered_pump
kitchen:facilities	yes, no
toilet:facilities	yes, no
toilets:number	(number of toilets)

- Table of Clinic Data Model

key	possible values
amenity	clinic
building	clinic
name	(clinic name)
addr:full	(address)
addr:city	(mapping city)
operator:type	government, private, community
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018
evacuation_center	yes, no
shelter_type	tent, building
water_source	water_works, manual_pump, powered_pump
kitchen:facilities	yes, no
toilet:facilities	yes, no
toilets:number	(number of toilets)

#### 4. Communication

key	possible values
man_made	tower
tower:type	communication
name	(tower name)
height	(tower height in meter unit)
operator	Telkomsel, Indosat, XL, Tri, Smartfren
communication:mobile	yes, no
communication:radio	yes, no
addr:city	(mapping city)
source	HOT_InAWARESurvey_2018

## 5. Emergency Services

- Table of Police Office Data Model

key	possible values
amenity	police
building	police
name	(police office name)
addr:full	(address)
addr:city	(mapping city)
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018

- Table of Fire Station Data Model

key	possible values
amenity	fire_station
building	fire_station
name	(fire station name)
addr:full	(address)
addr:city	(mapping city)
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no

key	possible values
source	HOT_InAWARESurvey_2018

- Table of Hydrant Data Model

key	possible values
emergency	fire_hydrant
fire_hydrant:type	underground, pillar, wall, pond
name	(hydrant name)
operator	(operator name)
addr:city	(mapping city)
source	HOT_InAWARESurvey_2018

## 6. Government

- Table of Government Office Data Model Model (Governor, Mayor, District, Sub-district, village and sub-village office)

key	possible values
office	government
building	governor_office, townhall, subdistrict_office, village_office, community_group_office
admin_level	4 (for governor office), 5 (for townhall), 6 (for subdistrict office), 7 (for village office), 9 (for community group office)
name	(government office name)
addr:full	(address)
addr:city	(mapping city)
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018
evacuation_center	yes, no
shelter_type	tent, building
water_source	water_works, manual_pump, powered_pump
kitchen:facilities	yes, no
toilet:facilities	yes, no
toilets:number	(number of toilets)

- Table of Government Institution Data Model (Ministry)

key	possible values
office	government
building	government_office
name	(government institution name)

key	possible values
addr:full	(address)
addr:city	(mapping city)
admin_level	4 (provincial level), 5 (city level), 6 (subdistrict level), 7 (village level)
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018

## 7. Electricity

- Table of Power Tower Data Model

key	possible values
power	tower
name	(tower name)
addr:city	(mapping city)
operator	PT Perusahaan Listrik Negara
source	HOT_InAWARESurvey_2018

- Table of Power Sub Station Data Model

key	possible values
power	substation
substation	transmission, distribution
building	power_substation
name	(power substation name)
addr:city	(mapping city)
rating	(user defined)
operator	PT Perusahaan Listrik Negara
source	HOT_InAWARESurvey_2018

- Table of Power Plant Data Model

key	possible values
power	plant
building	power_plant
name	(power plant name)
operator	(power plant operator)
addr:city	(mapping city)
addr:full	(address)
source	HOT_InAWARESurvey_2018

## 8. Transportation

- Table of Airport Data Model

key	possible values
amenity	aerodrome
building	aerodrome
name	(airport name)
addr:full	(address)
addr:city	(mapping city)
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
backup_generator	yes, no
source	HOT_InAWARESurvey_2018

- Table of Bus Station Data Model

key	possible values
amenity	bus_station
name	(bus station name)
addr:full	(address)
addr:city	(mapping city)
source	HOT_InAWARESurvey_2018

- Table of Train Station Data Model

key	possible values
amenity	station
name	(train station name)
ele	(train station's height above sea level)
operator	PT Kereta Api Indonesia
addr:full	(address)
addr:city	(mapping city)
source	HOT_InAWARESurvey_2018

- Table of Harbour / Dock Data Model

key	possible values
amenity	ferry_terminal
building	ferry_terminal
name	(ferry terminal name)
addr:full	(address)
addr:city	(mapping city)
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass

key	possible values
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
backup_generator	yes, no
source	HOT_InAWARESurvey_2018

## 9. Public Facilities

- Table of Place of Worship Data Model

key	possible values
amenity	place_of_worship
religion	muslim, christian, hindu, buddhist, confucian
name	(place of worhsip name)
addr:full	(address)
addr:city	(mapping city)
building	mosque, church, temple
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018
evacuation_center	yes, no
shelter_type	tent, building
water_source	water_works, manual_pump, powered_pump
kitchen:facilities	yes, no
toilet:facilities	yes, no
toilets:number	(number of toilets)

- Table of Sport Facilities (Sports Center,Sport Field, Stadium)

key	possible values
leisure	stadium, sports_centre, pitch
building	stadium, sports_centre, yes (futsal field)
name	(sport facility name)
addr:full	(address)
addr:city	(mapping city)
sport	soccer,futsal,basketball,badminton,tennis,volleyball,swimming,athl baseball,cycling, multi
capacity:persons	<50, 50-100, 100-250, 250-500, >500
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics

key	possible values
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018
evacuation_center	yes, no
shelter_type	tent, building
water_source	water_works, manual_pump, powered_pump
kitchen:facilities	yes, no
toilet:facilities	yes, no
toilets:number	(number of toilets)

- Table of Park Data Model

key	possible values
leisure	park
name	(park name)
addr:full	(address)
addr:city	(mapping city)
source	HOT_InAWARESurvey_2018
evacuation_center	yes, no
shelter_type	tent, building
water_source	water_works, manual_pump, powered_pump
kitchen:facilities	yes, no
toilet:facilities	yes, no
toilets:number	(number of toilets)

## 10. Waterway Facilities

- Table of Water Tower Data Model

key	possible values
man_made	water_tower
name	(water tower name)
operator	(water tower operator)
addr:city	(mapping city)
source	HOT_InAWARESurvey_2018

- Table of Flood Gate Data Model

key	possible values
waterway	floodgate
name	(flood gate name)
operator	(flood gate operator)
floodgate:unit	(number of floodgate)
elevation	(flood gate's height above sea level)
condition	good, poor
addr:city	(mapping city)
source	HOT_InAWARESurvey_2018

- Tabel Model Data Rumah Pompa

key	possible values
man_made	pumping_station
building	pumping_station
name	(pumping station name)
addr:full	(address)
addr:city	(mapping city)
operator	(operator name)
pump:unit	(number of pumping station)
elevation	(pumping station's height above sea level)
capacity:persons	(pump's capacity (l/s))
building:levels	(number of building floor)
building:structure	confined_masonry , steel_frame , wood_frame , bamboo_frame
building:material	brick , concrete , wood , bamboo , glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building: condition	poor, good
ground_floor:height	(building base floor height from the road (meter unit))
backup_generator	yes, no
source	HOT_InAWARESurvey_2018

- Table of Embankment Data Model

key	possible values
man_made	embankment
name	(embankment name)
material	concrete, stone, soil, sand
source	HOT_InAWARESurvey_2018

- Table of River Data Model

key	possible values
waterway	river, riverbank, canal
name	(river)
width	(river width)
source	HOT_InAWARESurvey_2018

- Table of Reservoir Data Model

key	possible values
landuse	reservoir
name	(reservoir/lake name)
operator	(operator name)
addr:city	(mapping city)
source	HOT_InAWARESurvey_2018

## 11. Gas Station

- Table of Gas Station Data Model

key	possible values
amenity	fuel

key	possible values
name	(gas station name)
addr:full	(address)
addr:city	(mapping city)
operator	(PT Pertamina, Shell, etc)
source	HOT_InAWARESurvey_2018

## 12. Administration Boundary

key	possible values
type	boundary
boundary	administrative
name	(boundary name)
admin_level	4 (Province), 5 (City / District), 6 (Sub-district), 7 (Village), 8 (Hamlet), 9 (Sub-village), 10 (Sub-sub village)
is_in:province	(province name)
is_in:city (city) / is_in:town (district)	(city/subdistrict name)
is_in:municipality	(sub-district name)
is_in:village	(village name)
is_in:RW	(sub village name)
flood_prone *only for sub village relation	yes, no
landslide_prone *only for sub village relation	yes, no
source	HOT_InAWARESurvey_2018

## 13. Road Network

key	possible values
highway	motorway, trunk, primary, secondary, tertiary, service, residential, pedestrian, path, living_street, track
name	(street name)
layer	5,4,3,2,1,-1,-2,-3,-4,-5
width	(road width)
lanes	(number of road lanes)
surface	asphalt, concrete, metal, wood, grass, ground, gravel, mud, sand, paving_stones
smoothness	good, intermediate, bad, impassable
motorcycle	yes, no
oneway	yes, no
ref	(reference)
source	HOT_InAWARESurvey_2018

### b. Data Type in *OpenStreetMap* Based on Object

After knowing data model based on object tag in OpenStreetMap particularly in HOT-PDC InAWARE Project, you also need to know data type based on the object itself. The table below shows you what type of data for each object that you can add into OpenStreetMap:

#### Color Information:

- Green Color means the object **allowed** to be mapped in that data type.
- Red Color means the object **not allowed** and **prohibited** to be mapped in that data type.

Table of Object and Its Data Type in *OpenStreetMap*

No	Infrastructure	Object	Data Type			
			Point (Nodes)	Polygon (Building)	Polygon (Area)	Line (Ways)
1		Traditional Market				
2	Economic Facilities	Supermarket				
3		Bank				
4		University				
5	Education Facilities	College				
6		School				
7		Kindergarten				
8	Health Facilities	Hospital				
9		Small Hospital, Clinic				
10	Communication	Communication Tower				
11		Police Office				
12	Emergency Services	Fire Station				
13		Hydrant				
14	Government	Government Office (Governor, Town Hall, Sub District, Village, Sub Village)				
15		Government Institution (Ministry)				
16		Power Tower				
17	Electricity	Power Sub Station				
18		Power Plant				
19		Airport				
20	Transportation	Bus Station				
21		Train Station				
22		Harbour / Dock				
23		Place of Worship (Mosque, Church, Temple)				
24	Public Facilities	Sport Facilities (Stadium, Sports Field, Sport Center)				
25		Park				
26		Gas Station				
27		Water Tower				
28		Water Gate				
29		Pump House				
30	Water	Embankment				
31		River				
32		Lake / Dam				
33	Administration Boundary	Administration Boundary (City, Sub-District, Village, Sub-Village)				
34	Road Network	Road Network				

Figure 8: Object Data Type Table

## V. Search key and value in Tag Info Website

On previous subchapter, you have been explained about a guideline to see key and value in OpenStreetMap using *Map Features* and Indonesia OpenStreetMap Wikipedia page. However, there are certain key and value that do not explained in the page especially detail and specific information of certain object. For instance, for **building capacity** or **building floor material**. To see the information (*tag*) you can visit a website called tag info: <https://taginfo.openstreetmap.org/>

The screenshot shows the Tag Info website interface. At the top, there's a navigation bar with links for KEYS, TAGS, RELATIONS, PROJECTS, REPORTS, and ABOUT. A search bar is located at the top right with a placeholder 'Date from: 2019-02-19 00:58 UTC'. Below the navigation, there are several sections:

- KEYS:** A list of popular keys such as `building`, `highway`, `name`, `source`, etc. A red dashed box highlights this section.
- TAGS:** A list of common tags such as `building=yes`, `highway=residential`, etc.
- RELATION TYPES:** A list of relation types such as `multipolygon`, `route`, `boundary`, etc.
- SOME POPULAR KEYS:** A large, colorful word cloud centered around the word `building`, containing many other tags like `highway`, `name`, `source`, `amenity`, `place`, `construction`, etc.
- REPORTS:** Describes how tag data is used from different angles, often bringing data from multiple sources.
- ABOUT:** Provides information about the taginfo project, including its purpose and how it collects data.
- INTERNATIONAL:** Information about international taginfo sites.

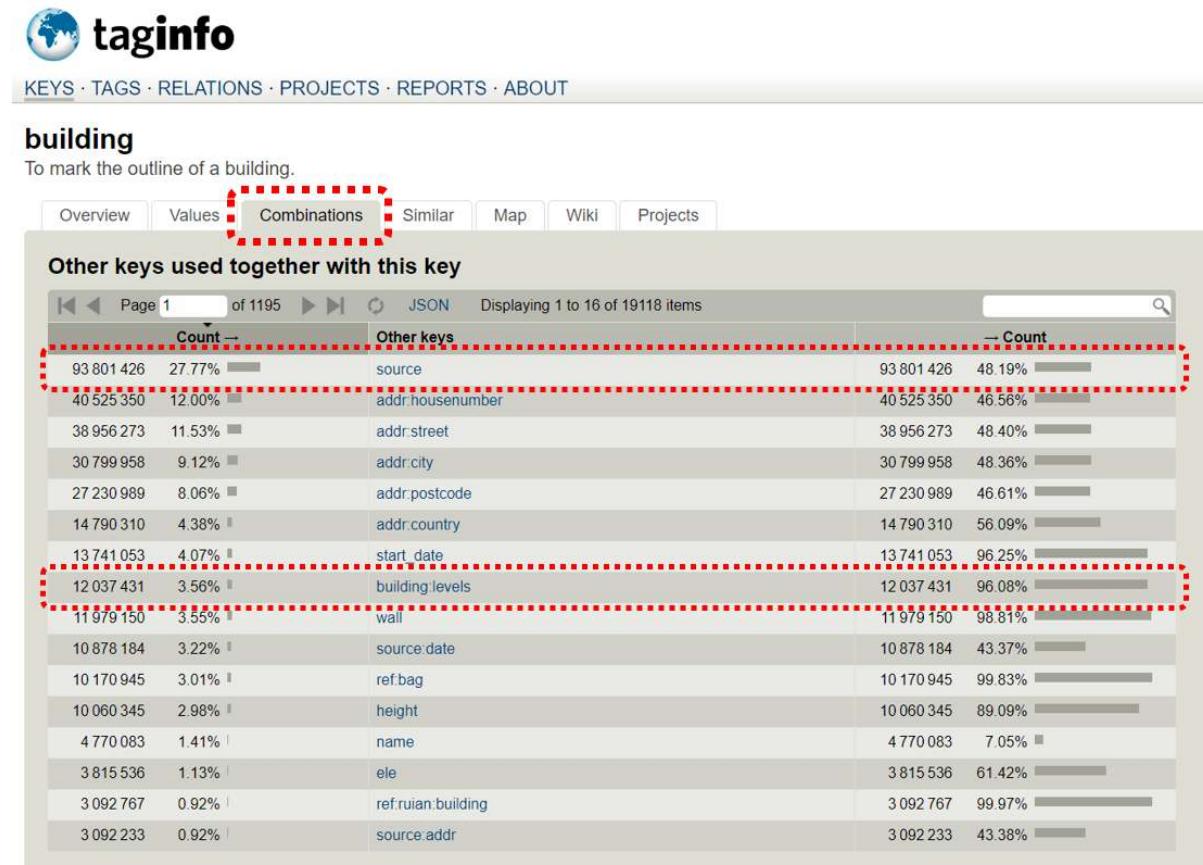
At the bottom left, there's a link to 'See all keys...' and 'See most common tags...'. At the bottom right, there's a link to 'See all reports...' and 'Sources - Download - API - Help - See other taginfo sites...'. A note at the bottom center says '→ OpenStreetMap - Data © OSM contributors (ODbL)'.

## Tag Info Website Interface

The picture above shows **KEYS** column where showing some most searched keys by OpenStreetMap contributor such as *building*, *highway*, *name*, *source*, etc. Moreover, you also can see combination between certain key and value (tag) which quite common such as *building=yes* and *highway=residential*

TAGS colom or you can search your key manually in search box at the top right corner on the website page.

For example, if you want to search information about **how to put your mapping activity as a source of the object or Level of Certain Building**, you can click building option in Keys colom and you will see this:



### Example Combination of tag and value in Tag Info

You can choose *Combinations* tab and you will see some combinations for *building* key that commonly used by *OpenStreetMap* contributor. For instance, if you are looking for information about source of building and building level, you can use **source** and **building:levels**. Moreover, you can see another combination for key and value related to building. You can see how often the key have been used in OpenStreetMap by look at *Count* colom. The bigger the number means the key more often and commonly used by OpenStreetMap contributors all over the world.

Notes : key and value in OpenStreetMap HAVE TO BE WRITTEN in English key and value in OpenStreetMap HAVE TO BE WRITTEN in lower case Information interface can be set to show in Bahasa Indonesia on JOSM by editing / make special presets Make new presets will be explained in other module called Making OpenStreetMap Presets

### SUMMARY

Congratulation! You have learned about data model in *OpenStreetMap* . This material is important and really to be understand by OpenStreetMap contributors so you can do your mapping based on international standard from OpenStreetMap community guidelines. Moreover, you also have known about certain websites which can help you to find the information (tag) for you mapping objects such as OSM wiki *Map Feature* Indonesia, OpenStreetMap Wikipedia page, and *Tag Info*.

# Using Tasking Manager

## Objectives:

- Using functions of tasking manager for participatory mapping
- Operating tasking manager for mapping

As an alternative for open source mapping platform, OpenStreetMap allows everyone to do mapping anytime, anywhere. The problem is, what if you want to do mapping along with the other mapper on the same time? Tasking Manager allows you to divide an area of mapping so everyone can do mapping together. In this module, you will learn more detail about Tasking Manager and how to mapping using Tasking Manager.

## I. What is Tasking Manager?

### 1. The Definition of Tasking Manager

Tasking manager is a tool created specifically for participatory mapping. With Tasking Manager, you can simply do mapping together with the other on the same location, but with different area of mapping. Tasking manager can split the mapping area into separate grid or square. You can also use tasking manager to see your mapping progress, which are still need to map or which area is fully mapped.

Now let's think about this. Imagine if you want to create a mapping project in a specific area where you need to do the project together with another 20 mapper. If you're not using tasking manager, there is a possibility of conflict between other mapper or between the data. With tasking manager, you can avoid the conflict and make the mapping project more fast and efficient.

### 2. The example of Tasking Manager

Tasking manager used as a response when Haiyan typhoon occurred in the Philippines on November 8, 2013. Mapping area located in Tacloban city as one of the most severely damaged when the disaster happened. Within 24 hours after the tasking manager project was created. 10.000 buildings added or around 25% of the building amount in Tacloban City. This mapping project was carried out by 33 volunteers.



“image\_tooltip”

Density of the building before and after mapping using Tasking Manager

Tasking manager are also used in Indonesia as a response when disaster happened. One of the examples is when the earthquake and tsunami struck in the Sunda Strait in December 2018. Within a month, all affected areas were mapped by 60 volunteers.

OSM Tasking Manager

About Indonesia [login to OpenStreetMap](#)

#361 - Tsunami Selat Sunda

Description Instructions Contribute Activity Stats

Korban Tsunami di Selat Sunda Terus Bertambah: 222 Orang Meninggal Dunia, 843 Orang Luka-Luka dan 28 Orang Hilang

Jumlah korban dan kerusakan akibat tsunami yang menerjang wilayah pantai di Selat Sunda terus bertambah. Data sementara yang berhasil dihimpun Posko BNBP hingga Minggu 23/12/2018 pukul 16.00 WIB tercatat 222 orang meninggal dunia, 843 orang luka-luka dan 28 orang hilang.

Kerusakan material meliputi 556 unit rumah rusak, 9 unit hotel rusak berat, 60 warung kuliner rusak, 350 kapal dan perahu rusak. Tidak ada korban warga negara asing. Semua warga Indonesia. Korban dan kerusakan ini meliputi di 4 kabupaten terdampak yaitu di Kabupaten Pandeglang, Serang, Lampung Selatan dan Tanggamus.

Jumlah ini diperkirakan masih akan bertambah karena belum semua korban berhasil dievakuasi, belum semua Puskesmas melaporkan korban, dan belum semua lokasi dapat didata keseluruhan. Kondisi ini menyebabkan data akan berubah.

Dari total 222 orang meninggal dunia, 843 orang luka-luka dan 30 orang hilang terdapat di:

Kabupaten Pandeglang tercatat 164 orang meninggal dunia, 624 orang luka-luka, 2 orang hilang. Kerusakan fisik meliputi 446 rumah rusak, 9 hotel rusak, 60 warung rusak, 350 unit kapal dan perahu rusak, dan 73 kendaraan rusak. Daerah yang terdampak di 10 kecamatan. Lokasi yang banyak ditemukan korban adalah di Hotel Mutiara Carita Cottage, Hotel Tanjung Lesung dan Kampung Sambo.

Banyak korban adalah wisatawan dan masyarakat setempat. Daerah wisata sepanjang pantai dari Pantai Tanjung Lesung, Pantai Sumur, Pantai Teluk Lada, Pantai Panimbang dan Pantai Carita sedang banyak wisatawan berlibur yang

Leaflet | Map data © OpenStreetMap contributors

"image\_tooltip"

Tasking Manager as a response of earthquake and tsunami on Sunda Strait

## II. Starting Tasking Manager

You can open the tasking manager on <https://tasks.hotosm.org/>. You should see the website looks exactly like the picture:

[TASKING MANAGER](#) [Contribute](#) [Learn](#) [About](#) [What is New?](#) English [Login](#)

**Map a Task for People in Need**

Join coordinated humanitarian mapping projects by taking a task and mapping a part of the world in OpenStreetMap, the free and editable map of the world. Communities, organizations and governments worldwide have access to these maps to address local development challenges and aid disaster response. You can join thousands of others to map OpenStreetMap and support these communities in need.

[START MAPPING](#)

**31** Mappers Online    **1,805,734** Tasks Mapped    **156,169** Total Mappers

"image\_tooltip"

Tasking Manager home page

On the main page, you can see several menu. If you want to change the language, you can choose the down-arrow button on the left side of the **Login** button. You can choose **Learn** button on the top side If you want to learn more detail about tasking manager.

[TASKING MANAGER](#) [Contribute](#) [Learn](#) [About](#) [What is New?](#) English [Adhitya Dido](#)

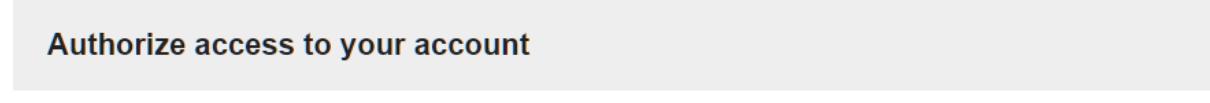
"image\_tooltip"

You can change the language using button on your right side and Learn on your left side

Before you can start using Tasking Manager, there are a few things you need to know:

## 1. Login to Tasking Manager

You need to login with your OSM account. Choose **Login** button on the top right side of your screen, then write your OpenStreetMap account. On **Authorize access to your account** option, give checkmark on **read your user preferences**, then select **Grant Access**. Please check on the image for more detail:



The application **Tasking Manager 3 - Prod** is requesting access to your account, **Adhitya Dido**. Please check whether you would like the application to have the following capabilities. You may choose as many or as few as you like.

Allow the client application to:

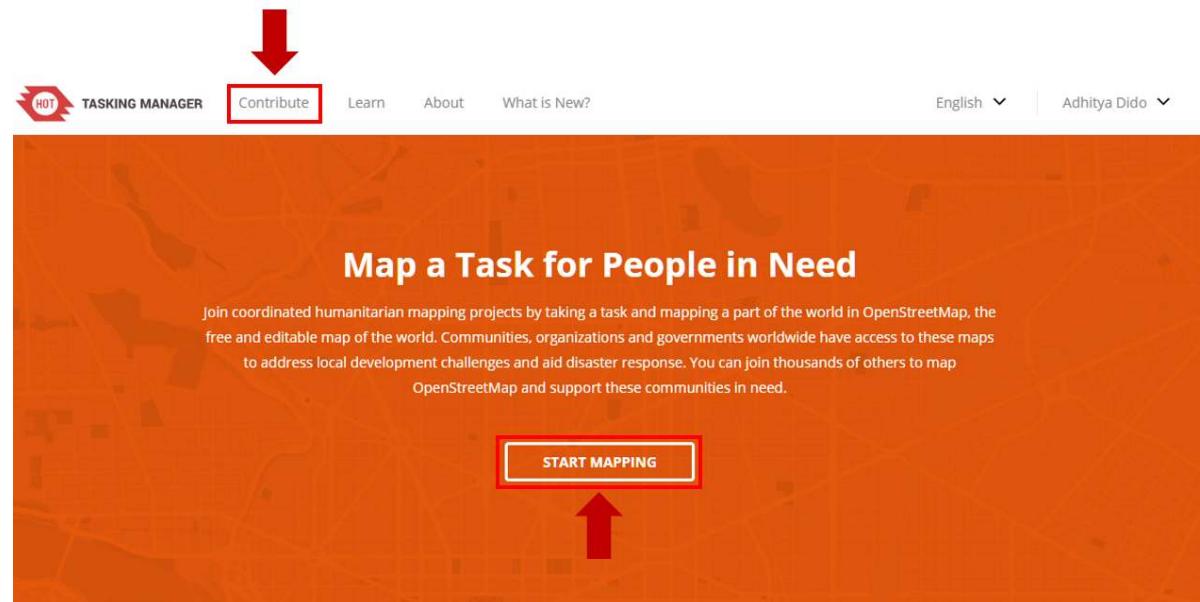
read your user preferences.

**Grant Access**

"image\_tooltip"

You must allow JOSM to read your user preferences

You will directed to the Tasking Manager homepage after you login with your OSM account. If you see your OSM account name, then you are successfully login to Tasking Manager. Choose **Start Mapping** or **Contribute** on the left side of the screen if you want to start mapping immediately.

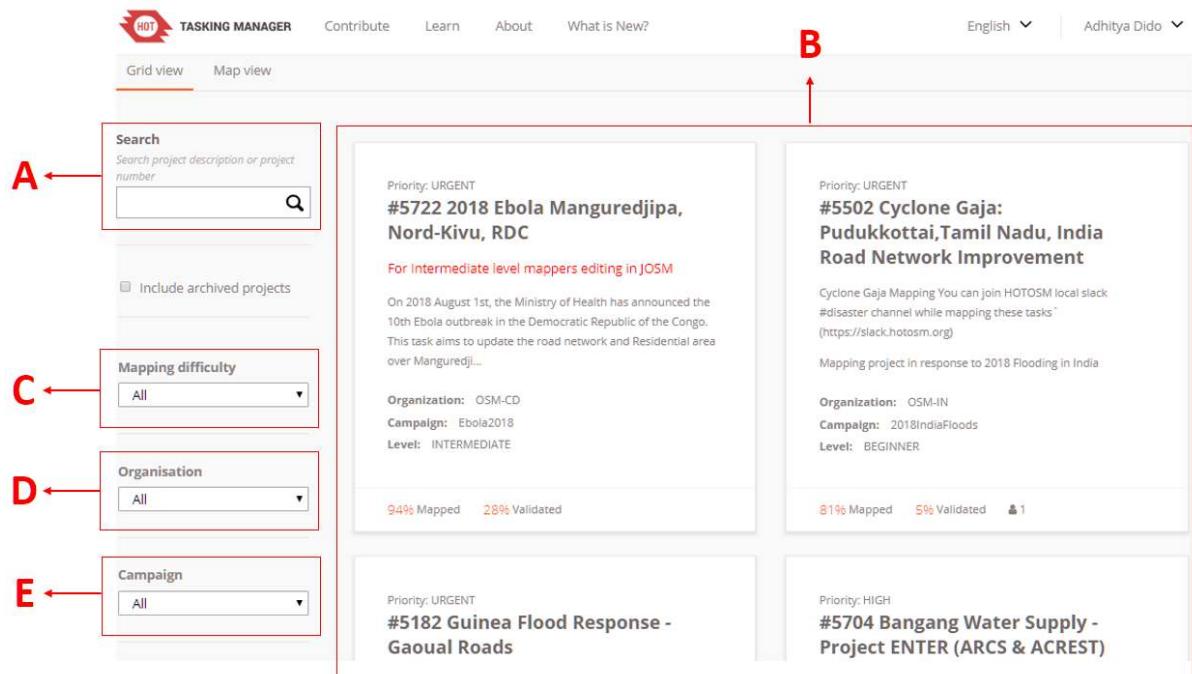


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Contribute and Start Mapping button on Tasking Manager page

## 2. Searching Project on Tasking Manager search box

On this page, you will see two different view, Grid View and Map View. on the Grid View, there are few things you should notice, like:



"image\_tooltip"

You can change the setting on the Grid View layout

- **Search**

On the search box, you can search your tasking manager project using certain keyword like sub-village, village, province, or by project name.

- **Project**

On this part, you can see list of the tasking manager project created before.

- **Mapping Difficulty**

On this section, you can set your own mapping difficulty level of your project. There are 3 different levels: beginner, intermediate, and advance. If you want to see all the project, choose All.

- **Organization**

You can choose the creator of the project like American Red Cross, Missing Maps, HOTOSM, or HOT Indonesia.

- **Campaign**

You can also find your tasking manager project based on certain campaign. For example, you can choose project for Malaria Elimination.

You can change the layout from Grid View to Map View. On the Grid View, you can see list of the project on grid/square layout. If you choose Map View, you can see the world map with blue dots on the top of the map.

The screenshot shows two views of the Tasking Manager interface side-by-side. On the left, under 'Grid view', there are two cards for disaster relief projects:

- #5833 Cyclone Idai: Mutare rural (ward 22), Zimbabwe - Roads, Waterways**  
Priority: URGENT  
Organization: Médecins Sans Frontières  
Campaign: Missing Maps  
Level: BEGINNER  
Status: 61% Mapped, 1% Validated
- #5826 Cyclone Idai: Nicoadala, Mozambique Buildings**  
Priority: URGENT  
Organization: HOT  
Campaign: Cyclone Idai  
Level: BEGINNER  
Status: 100% Mapped, 67% Validated

On the right, under 'Map view', a world map displays numerous tasking manager projects as colored dots (blue, green, yellow, red) representing priority levels. A red arrow points from the 'Grid view' header to the 'Map view' header.

"image\_tooltip"

You can change the layout from Grid View to Map View using this button

After you change your layout into Map View, the page will be like this:



"image\_tooltip"

Map View on Tasking Manager

You can use the plus and minus button on the left side of the map to change your zoom level. When the zoom level is upgraded, there will be a bunch of tasking manager project marked with coloured dots. Each different colors represent the priority of project from urgent to low.

## Legend

- Urgent → Mendesak dan butuh diselesaikan secepatnya
- High → Prioritas tinggi dan butuh diselesaikan dengan cepat
- Medium → Prioritas sedang namun tetap perlu diselesaikan
- Low → Prioritas rendah dan tidak mendesak

“image\_tooltip”

If you want to search project, you can set your layout into the Grid View and move your pointer to the search box. In this module, we will try to search tasking manager project using keyword ‘Penjaringan’, and then press **Enter**. You can leave other configuration empty like mapping difficulty, organization, and campaign.

The screenshot shows the Tasking Manager search interface. At the top, there are two view options: 'Grid view' (selected) and 'Map view'. Below this is a search bar with the placeholder 'Search project description or project number' and a search input field containing 'penjaringan'. There is also a checkbox for 'Include archived projects' which is unchecked. On the left, there are dropdown menus for 'Mapping difficulty' (set to 'All') and 'Organisation' (set to 'All'). On the right, the search results are displayed for the project '#781 INSIST II ( Integrated Services for Infrastructure and Sanitation Technology ) II - Kelurahan Penjaringan'. The project details include: Priority: MEDIUM, Organization: N/A, Campaign: N/A, Level: BEGINNER. At the bottom right of the result card, it shows '12% Mapped' and '6% Validated'.

“image\_tooltip”

Result for tasking manager’s project with keyword of ‘penjaringan’

Tasking manager will show list of all projects that contain the keyword ‘Penjaringan’. Choose the project on the top right corner labeled with ‘#781 - INSIST II ( Integrated Services for Infrastructure and Sanitation Technology ) II - Kelurahan Penjaringan’.

### 3. Get to know about Tasking Manager Layout and Display

When you select one project, you will see the project page like this:

MEDIUM

0 - Active Mappers

## #781 - INSIST II ( Integrated Services for Infrastructure and Sanitation Technology ) II - Kelurahan Penjaringan

### Those who are involved in this project :

IKEA Indonesia    Mercycorps Indonesia    Local Government    Private sector    Community

### Project description:

Improve and develop sanitation technologies, user friendly, highly contextualized, and can be produced with cost-effective

Improve products and services demands for the sanitation service in the village (Kelurahan Penjaringan)

Facilitate the role of stakeholders (investors , the government and community) to the solution of sanitation ( technology and services) for the population of the target desired

Status:	PUBLISHED	Created by:	Adityo
Last updated:	3 months ago	Difficulty:	BEGINNER
Priority:	MEDIUM	Type(s) of mapping:	
Organisation:	N/A	Campaign:	N/A
Mapper level required:	No	Validator role required:	No

"image\_tooltip"

Tasking manager #781 INSIST - Kelurahan Penjaringan (Penjaringan District)

This page shows you the information about tasking manager project we selected before. On the Project description, you can read the mapping background. Below the description, you can see more detail about the project, from priority level, organisation, creator name, difficulty, and list of objects needed to be mapped. If you want to create your own tasking manager project, you can read the guide on the [Creating and Managing Tasking Manager](#).

Instructions    Map    Validate    Questions and Comments

---

### Instructions

Entities to map  
highway (primary, secondary, tertiary, unclassified), landuse (residential, farmland), shelter (temporary, permanent), building, essential building (hospital, school, public building), etc

---

Changeset Comment:  
#hotosm-task-781

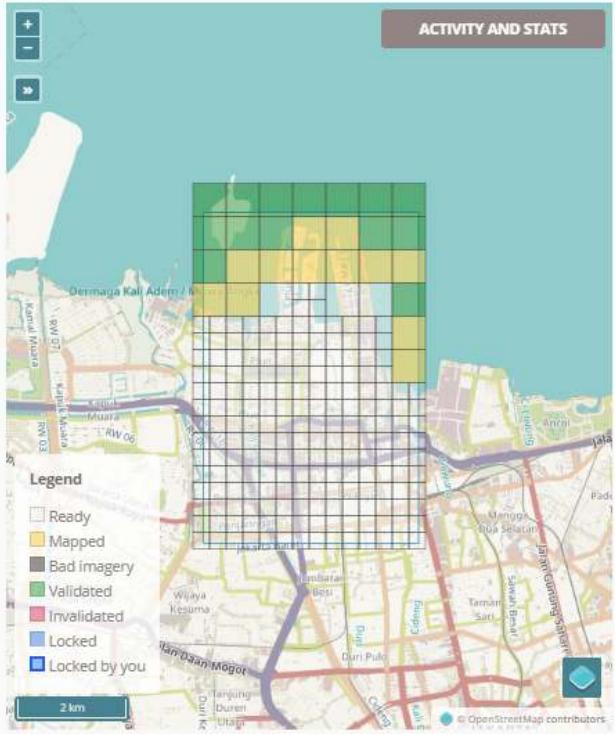
---

How to contribute?

1. Pick a square
- 2: If there is nothing map, you can mark task as done
3. If you see buildings, landuse, and roads that haven't been traced, help tracing them
4. Upload, don't forget to put changeset comment as described, and put "Bing" under source, mark task as done
5. If you're not done, unlock task
6. Pick another square and repeat from step-2

Ready to get started?  
Contribute by mapping or validating work that has already been done.

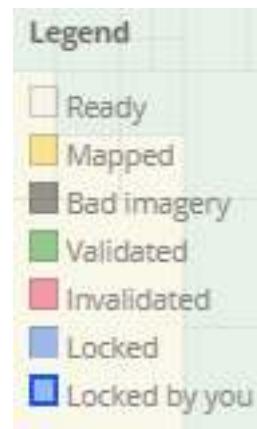
**MAP**    **VALIDATE**



“image\_tooltip”

#### Tasking Manager’s project layout

Under the description box, you can see the map on the right side and view information on the left side. If you see on the map field, you can see different grid/square with different color. Those colors represent:



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- **Ready**

Shows that you can map the grid selected

- **Mapped**

Grid marked with yellow color shows you that the grid has already been mapped

- **Bad Imagery**

Grey-blackish colored grid marked as an area with bad imagery

- **Validated**

Green colored grid shows that the grid has been validated

- **Invalidated**

Grid marked with red color shows that the grid need to be re-checked before you can do validation again

- **Locked**

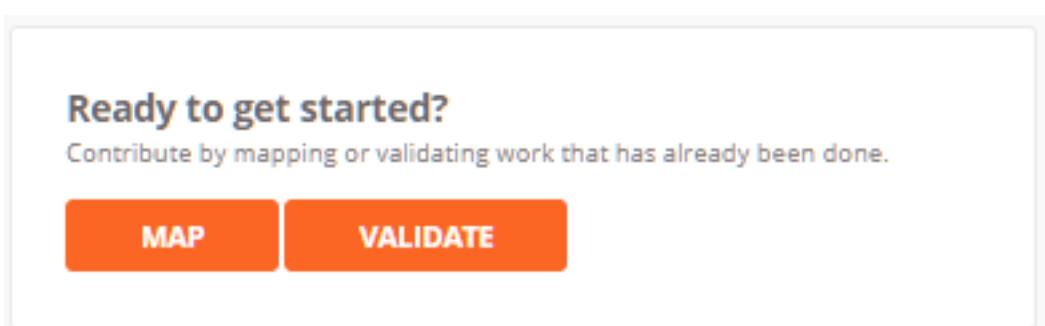
Grey colored grid shows that the square has been selected by another user

- **Locked by you**

Grid with blue outline colored shows that this grid is being selected by you

#### 4. Contribute on Tasking Manager Project

You can contribute in tasking manager in two different ways, digitizing and validating. To start contributing and do the mapping, please follow these steps below:



- Select **Map** button.  
“image\_tooltip”

- Next, you need to select one grid/square you will work on. You can straightly choose one grid/square on the project or by using **Select a Random Task** button.

## Choose a task

Choose a task for mapping:

Option 1: Select a task by clicking on the map

Option 2: **SELECT A RANDOM TASK**

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You can change the basemap so you can see which area covered by cloud.

! [alt\_text] (en/images/02-HOT-Tasking-Manager/02-Penggunaan-Tasking-Manager/0217\_mengganti\_citra\_p

If you find area covered by the cloud, please select \*\*Mark as Bad Imagery\*\* button. If you see the

! [alt\_text] (en/images/02-HOT-Tasking-Manager/02-Penggunaan-Tasking-Manager/0218\_mark\_as\_bad\_imagery.

- After you select your grid, press **Start Mapping**.

! [alt\_text] (en/images/02-HOT-Tasking-Manager/02-Penggunaan-Tasking-Manager/0219\_Start\_mapping.png "i

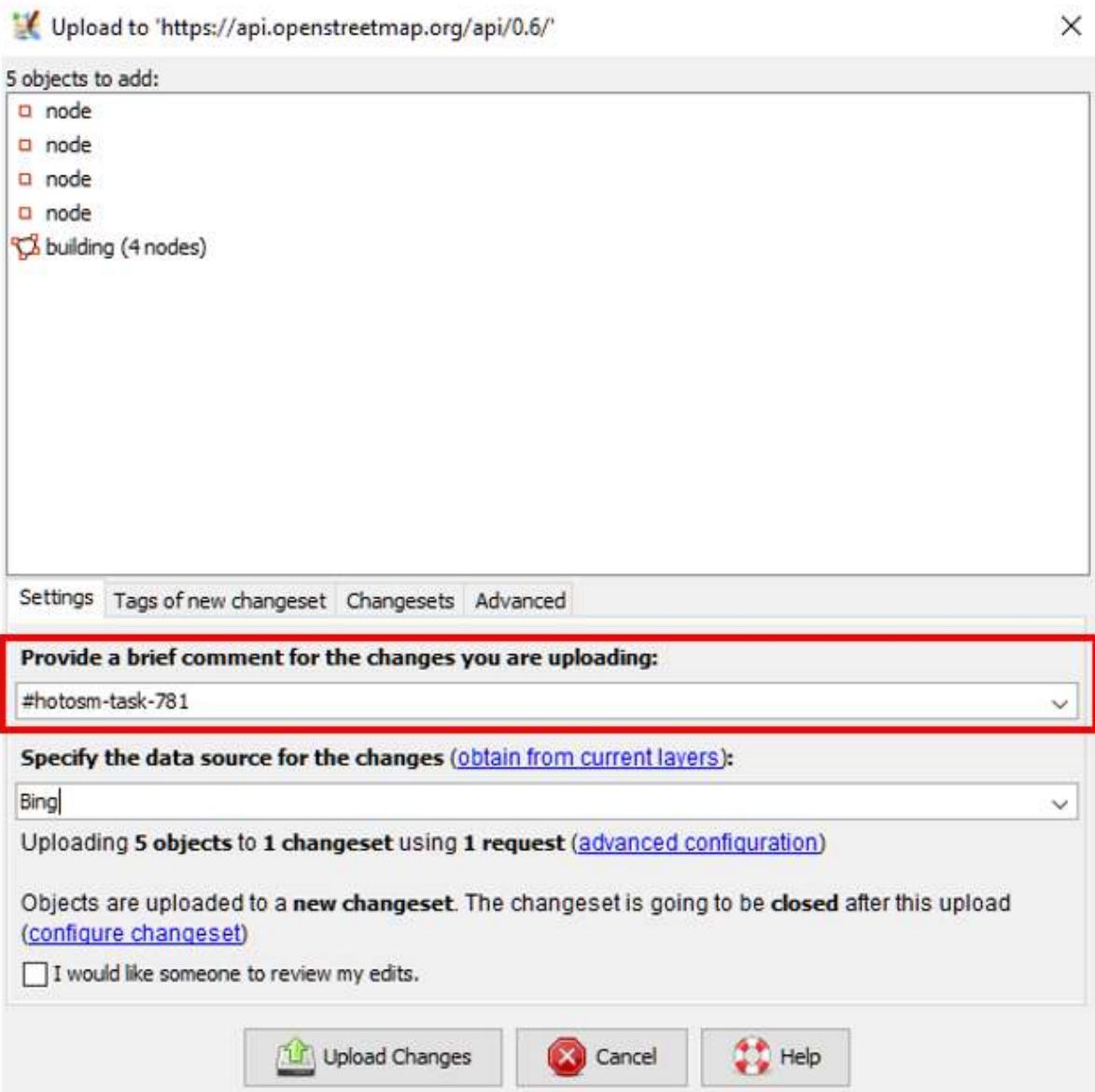
- Select JOSM as your default mapping editor, then select **Start Editor**. Make sure that you have already open your JOSM before.

! [alt\_text] (en/images/02-HOT-Tasking-Manager/02-Penggunaan-Tasking-Manager/0220\_start\_editor.png "im

- Tasking manager will automatically download OSM data. You can map the area using JOSM and satellite imagery based on information given by the project. If you want to learn more detail about how to mapping using JOSM, please go to the **Using JOSM Module**. Map all the objects inside the square/grid.

! [alt\_text] (en/images/02-HOT-Tasking-Manager/02-Penggunaan-Tasking-Manager/0221\_Data\_OSM\_yang\_telah  
<p align="center"><i>OSM data downloaded through tasking manager</i></p>

- Once you finished your mapping, don't forget to upload your result periodically. Don't forget to write down your comment when you upload the data. In the comment section, you can see default comment number similar to the tasking manager project. Please write your own comment after those numbers.



"image\_tooltip"

Comment section when you upload your JOSM data

- After you upload your data to OpenStreetMap, please go back to the tasking manager page. You can add your comment about changes happen. After finished mapping all objects, select **Mark as Completely Mapped**. But, if you haven't finished your area, choose **Stop Mapping** and continue your work later or let the other contributor to finish the area.

Can't finish but need to stop mapping? Or have you completely mapped the area? Leave a comment and select one of the options below that matches your editing status.

menambahkan bangunan dan jalan |

3 //

4970 characters remaining

Tip: You can use Markdown. (HTML is not allowed)

PREVIEW

menambahkan bangunan dan jalan

© STOP MAPPING

✓ MARK AS COMPLETELY MAPPED

“image\_tooltip”

Adding comment on tasking manager grid

## 5. Things you need to know when you selected your area

There are few things you need to know when you choose a tasking manager project.

- You only have 120 minutes to do your mapping

When you select one grid/square, you will own the grid/square for 120 minutes or 2 hours. Make sure

! [alt\_text] (en/images/02-HOT-Tasking-Manager/02-Penggunaan-Tasking-Manager/0224\_Pemberitahuan\_batas\_

<i>Notification of remaining time limit of your tasking manager's grid</i></p>

- Don't forget to unlock your square/grid

After you have finished your mapping, don't forget to click \*\*Stop Mapping\*\* if you haven't finished

! [alt\_text] (en/images/02-HOT-Tasking-Manager/02-Penggunaan-Tasking-Manager/0225\_Tombol\_Stop\_Mapping\_

<i>You can use Stop Mapping button if you haven't finished your grid</i></p>

- Do not map area outside tasking area

! [alt\_text] (en/images/02-HOT-Tasking-Manager/02-Penggunaan-Tasking-Manager/0226\_Area\_yang\_terarsir\_

<i>You can't do mapping on the shredded area</i></p>

When your square/grid already shown in JOSM, you can see there is two different area on the map, the

- Special treatment for object located between the square boundary

Mostly when we mapping the area using tasking manager, you will see many objects located in between



"image\_tooltip"

Object located on the border of tasking manager grid

If you find those kind of object, you can draw the object slightly cross the boundary of your square. You need to draw the object like this especially for highway to give guidance for another user to continue your object.

## SUMMARY

Now you have learned the definition of tasking manager. Tasking manager is a tool that can be used to do the participatory and collaborative mapping with another user. When there is an area needed to be mapped quickly, tasking manager can help you to do so. Hopefully when you do mapping using tasking manager, your project will finish quicker and well organized.

# Creating Presets

## Objectives:

- To be able to comprehend presets concept on OpenStreetMap
- To be able to comprehend XML format to create presets on OpenStreetMap
- To be able to create a customized presets on OpenStreetMap
- To be able to comprehend presets elements

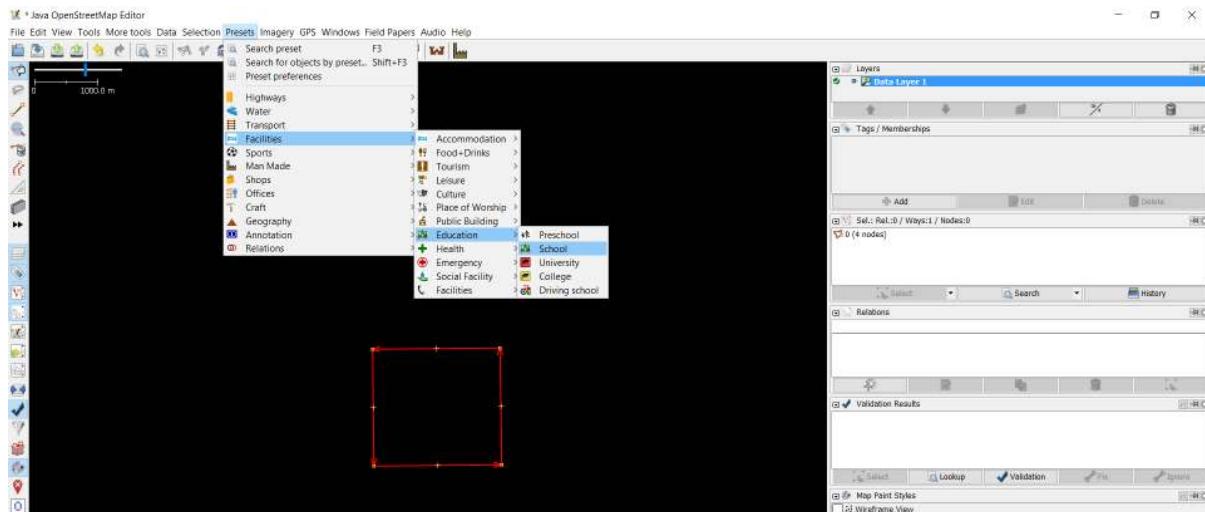
As explained before, OpenStreetMap is a free, open, participatory map of the whole world. This means that the use of OpenStreetMap can be very distinctive. The more distinct the mapping objectives are, the more diverse the information are. The needs of various information made OpenStreetMap user come to an agreement to standardize the information added into OpenStreetMap. This standardized information is called Tag. To learn more about Tag, please refer to [OpenStreetMap Model Data](#) module.

From the standardized information agreed by OpenStreetMap contributors, platforms are made to help users finding the right tag such as Map Features wikipedia page, Indonesian OSM Objects Reference, and Tag Info. OpenStreetMap community then made a series of fields on Java OpenStreetMap (JOSM) to add general information to the mapped objects to help OpenStreetMap contributors easily add information as needed. This series of information is called presets.

## I. OpenStreetMap Presets Concept

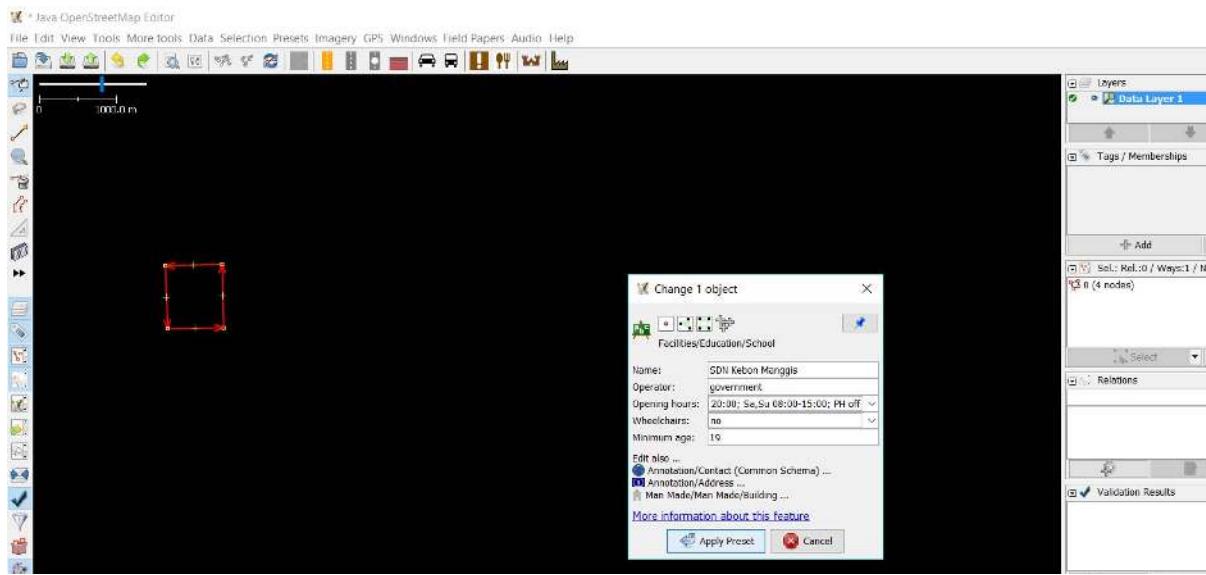
### What is Presets?

Presets is information represented by at least one Tag, a combination of particular key dan value, helping OSM users to map objects on OpenStreetMap using JOSM or iD Editor.



### Presets on JOSM

Picture above is an example of adding presets for a school object. If you want to add more detailed information for that school object, your JOSM will look like this:



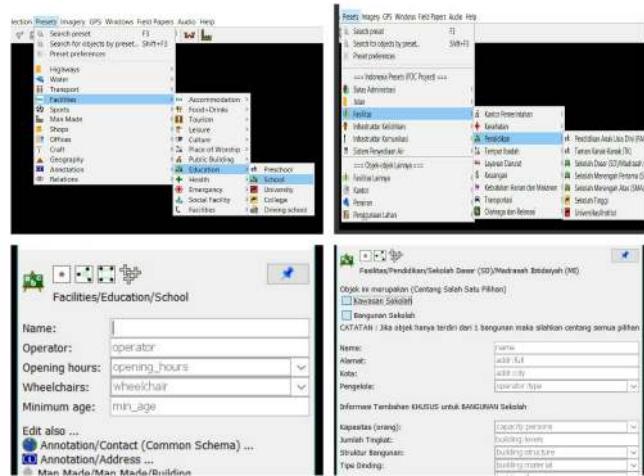
## Adding presets on JOSM

### Customizing Preset on JOSM

As explained before, OpenStreetMap community already made general presets that will be available by default when installing JOSM. However, presets provided on JOSM runs short of information specifically for Indonesian OpenStreetMap user:

- Information field for particular objects is lacking and is not suitable for specific mapping activity
- Information field available most often is not used for Indonesian object
- Choices for the information is limited and is not as needed for mapping activity in Indonesia
- Presets label is presented in English, making it quite difficult to add information for Indonesian
- Some of the objects available on default presets do not exist in Indonesia

To solve these problems, you can create customized presets based on your needs. By creating your own presets, you can customize the information you want to add to the objects and the language used for your presets presentation.



Default presets on JOSM (left) and customize presets (right)

## II. Using XML for Creating Presets

Before creating presets, you should learn about the markup language used for creating presets first. Customized presets for JOSM is created using Extensible Markup Language or XML format. XML file contains elements, elements can contain sub-elements and sub-elements can contain sub-sub-elements.

```

<group name="Kesehatan" icon="presets/health/hospital.svg">
  <item name="Xlink" icon="presets/health/clinic.svg" type="node,closedway" preset_name_label="true">
    <spans/>
    <key key="amenity" value="clinic" />
    <text key="name" text="Nama" />
    <text key="addr:full" text="Alamat" />
    <text key="addr:city" text="Kota" />
    <combo key="operator:type" text="Panggola" values="government,private,community" display_values="Pemerintah,Swasta,Komunitas/Masyarakat" />
    <combo key="building" text="Apakah ini Bangunan?" values="clinic,no" display_values="Ya,Tidak" />
    <spans/>
    <label text="Informasi Tambahan untuk Bangunan" />
    <spans/>
    <combo key="capacity:persons" text="Kapasitas (orang)" values="kurang dari 50,50-100,100-250,250-500,lebih dari 500" />
    <text key="building:levels" text="Jumlah Tingkat" />
    <combo key="building:structure" text="Struktur Bangunan" values="confined_masonry,steel_frame,wood_frame,bamboo:frame" display_values="Rangka beton bertulang,Rangka besi,Rangka kayu,Rangka bambu" />
    <combo key="building:material" text="Tipe Bindaing" values="brick,concrete,wood,bamboo,glass" display_values="Bata,Beton,Papan kayu,Bambu,Kaca" />
    <combo key="building:floors" text="Tipe Lantai" values="ground,wood,concrete,tile,ceramic,other" display_values="Tanah (ground),Papan kayu (wood),Plaster/Semen (concrete),Tegel (tile),Keramik (ceramic),Genteng (tile),Seng (tin),Asbes (asbestos),Beton (concrete)" />
    <combo key="access:driveway" text="Akses ke Atap" values="yes,no" display_values="Ada,Tidak Ada" />
    <combo key="building:condition" text="Kondisi Bangunan" values="poor,good" display_values="Buruk,Baik" />
    <text key="ground_floor:height" text="Ketinggian Pergelangan Lantai dengan Tanah" />
    <combo key="backup_generator" text="Generator Cadangan" values="yes,no" display_values="Ada,Tidak Ada" />
    <text key="source" text="Sumber Data" />
    <spans/>
    <combo key="evacuation_center" text="Lokasi Pengungsian" values="no,yes" display_values="Tidak,Ta" />
    <spans/>
    <label text="Informasi tambahan JIKA dijadikan Lokasi Pengungsian" />
    <spans/>
    <combo key="shelter:type" text="Jenis Tempat Pengungsian" values="tent,building" display_values="Tenda,Bangunan" />
    <combo key="water_source" text="Sumber Air Bersih Tempat Pengungsian" values="water_works,manual_pump,powered_pump" display_values="PDAM,Pompa Tangan,Mesin Pompa" />
    <combo key="kitchen_facilities" text="Dapur Untuk Pengungsian" values="yes,no" display_values="Ada,Tidak Ada" />
    <combo key="toilet:facilities" text="Toilet Tempat Pengungsian" values="yes,no" display_values="Ada,Tidak Ada" />
    <text key="toilet:etnumber" text="Jumlah Toilet Lekasi Pengungsian" />
  </item>
<item name="Puskesmas" icon="presets/health/clinic.svg" type="node,closedway" preset_name_label="true">
  <spans/>
  <key key="amenity" value="clinic" />
  <text key="name" text="Nama" />
  <text key="addr:full" text="Alamat" />
  <text key="addr:city" text="Kota" />
  <combo key="operator:type" text="Panggola" values="government,private,community" display_values="Pemerintah,Swasta,Komunitas/Masyarakat" />
  <combo key="building" text="Apakah ini Bangunan?" values="clinic,no" display_values="Ya,Tidak" />
</item>

```

### XML file on Notepad++

This is the hierarchy of XML elements that is used for creating presets:

#### XML: Root Element → Element and Sub-Element → Tag → Attribute

- Root element:** the outermost element of an XML file; root element defines information inside the XML file. Root element for presets: `<presets> ... element.. </presets>`
- Element:** everything (like information and tag) from (including) the element's start tag to (including) the element's end tag, for example `<item> ..tag.. </item>`, `<group> ..tag.. </group>`
- Tag:** information contained in element and sub-element. Information is filled with attribute. Tag is opened with `<>` and closed with `</>`, for example `<item> ..attribute </item>`
- Attribute:** Specific information in a tag, for example `landuse="orchard"`

This is an example of a presets XML file:



### XML file for Presets

## III. Creating Customized Presets

To be able to create your own presets, there are several things you need to prepare first. You need to install additional software to create XML file. One of the software to create XML file is **Notepad ++** which

can be downloaded at <https://notepad-plus-plus.org/download/v7.6.3.html>. After downloading it, install the software. You also need to learn about the principle of making OSM presets, like:

- The object type you want to map. As explained in **Data Model OpenStreetMap** module, that there are three types of mapped objects in OpenStreetMap: **point (nodes)**, **line (ways)**, and **area (closedway)**. For example, if the mapped object is road, then the object type you write on your presets is ways, not other type.
- The standardized key and value for mapped objects on OpenStreetMap. You can refer to Map Features on Wikipedia Page, OSM Indonesia Object Reference and Tag Info. To know more about key and value, please refer to **Data Model OpenStreetMap** module.
- Key dan value should be written in English, but for the presets label can be written in Bahasa.

### Presets Elements

If you have understood the principle of creating presets, you also need to learn about the elements of presets. Some of them are:

- Element **key key**

Structure : <key key="....." value="....." />

This is a mandatory key that defines main information for an object, even though other information is left empty. For example, if in your presets, you want to emphasize that the objects is a school, then insert this into your XML presets:

```
<key key="amenity" value="school"/>
```

Figure 9: Key key

- Element **text key**

Structure : <text key="....." text="....." />

This element defines object's information in form-filling format. This element is usually used to fill object's name and address. For example, if you want to add object's name and address information, insert this into your presets XML:

```
<text key="name" text="nama"/>
```

Figure 10: Text key

Additional word “text” in the example above defines the label displayed on your JOSM presets. The “text” part can be filled with the label you want to display, in this example the “text” part is filled with name in Bahasa Indonesia which is “nama”. This is the presets appearance of the example text key above:



Element text key on JOSM

- Element **combo key**

Structure : <combo key="....." text="....." values=".....,....." display\_values=".....,....." />

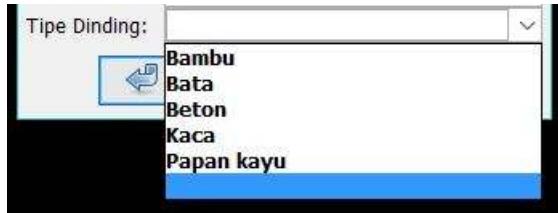
This element defines object's information in dropdown list format. This element is usually used for information like roof type or building materials type. If you want to collect such information, insert this in your XML presets:

```
<combo key="building:materials" text="Tipe Dinding" values="bamboo, brick, concrete, glass, wood" display_values="Bambu, Batu, Beton, Kaca, Papan Kayu" />
```

Figure 11: Combo key

Element shown above is used to add information about the building materials so that the used key is “building:materials”. The “text” is used for displayed label for the key, it can be in Bahasa Indonesia or any language you want.

The “value” is typed as “values” since there is more than one choice of information (tag’s value) for the dropdown list. The “display\_values” is used to display the label for the choices that can be written in Bahasa Indonesia. This picture is the presets appearance of the combo key example above:



Element combo key on JOSM

- **Element multiselect key**

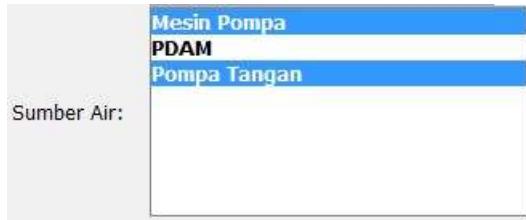
```
<multiselect key="....." text="....." values="....;....;....;...." display_values="...;...;...;..." />
```

This element defines object’s information in multiselect format. This element is kind of similar to combo key. The difference is you can choose more than one choices with this multiselect key. This element is usually used for information where more than one answer is possible such as water source of a building. This is how to use multiselect key in XML presets:

```
<multiselect key="water_source" text="Sumber Air" values="water_works;manual_pump;powered_pump" display_values="PDAM;Pompa Tangan;Mesin Pompa"/>
```

Figure 12: Multiselect key

The multiselect key structure is very similar with combo key structure. The differences are the key ‘multiselect’ is used instead of key ‘combo’ and the separator used in between values is semicolon (;) while key and value labels can be written in Bahasa Indonesia, using ‘text’ and ‘display\_values’. This picture is the presets appearance of multiselect key example above:



Element multiselect key on JOSM

- **Element check key**

```
<check key="....." text="....." value_on="yes" value_off="no" default="....." />
```

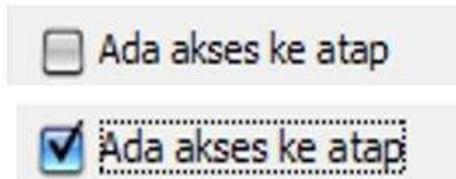
This element is used for information filling in checkbox format. This element is usually used for a yes-no information (closed question) such as roof access and one way road. If you want to add such information, you can insert this into your preset:

```
<check key="access:roof" text="Ada akses ke atap" value_on="yes" value_off="no" default="off" />
```

Figure 13: Check key

The check key structure uses value\_on and value\_off format. Each value (on/off) can be adjusted to each tag’s value for example value\_on has the value ‘yes’, when the information checkbox is checked and value\_off has the value ‘no’, when the information checkbox is unchecked. So, when a checkmark given in the checkbox, the key will have the value ‘yes’. However, when the checkbox is left unchecked, the information still will be added in Tags/Memberships Windows on JOSM and the information will have

the value ‘no’ since the default settings is ‘off’. This picture is the presets appearance of check key example before:



Elemen check key on JOSM

### Adding Icons for Presets

You can also add icons for your presets. Icons are used to represent the objects in the presets. Icons also make your preset look more interesting. To add icons for your presets, insert ‘icon=the path to your icon’ and data type in the element like the example below:

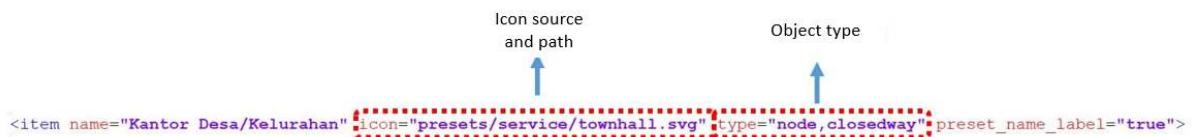


Figure 14: Icon path

If you want to use icon available on JOSM, you can see it at <https://josm.openstreetmap.de/browser/josm/trunk/images/presets>. You can use other set of icons you made or icons on your computer/laptop that you got from another source. However, when someone makes a copy of your preset or when you share the presets to others, the icon won’t show up since you use offline icon that’s only stored in your computer/laptop. Here is the example for offline icon path:

C:\Users\(\your computer/laptop name)\Desktop\icon presets\building.png

You can download HOT-PDC InAware presets as reference at [bit.ly/presetshotpdcid](http://bit.ly/presetshotpdcid)



Icon on JOSM Presets

### SUMMARY

Now you have learned how to create customized presets. Customized presets can be very helpful in collecting specific information for survey. It will be useful to learn presets creation to help in collecting specific information for survey. Using customized presets can also enrich the information of the mapped objects.

# Introduction to Java OpenStreetMap (JOSM)

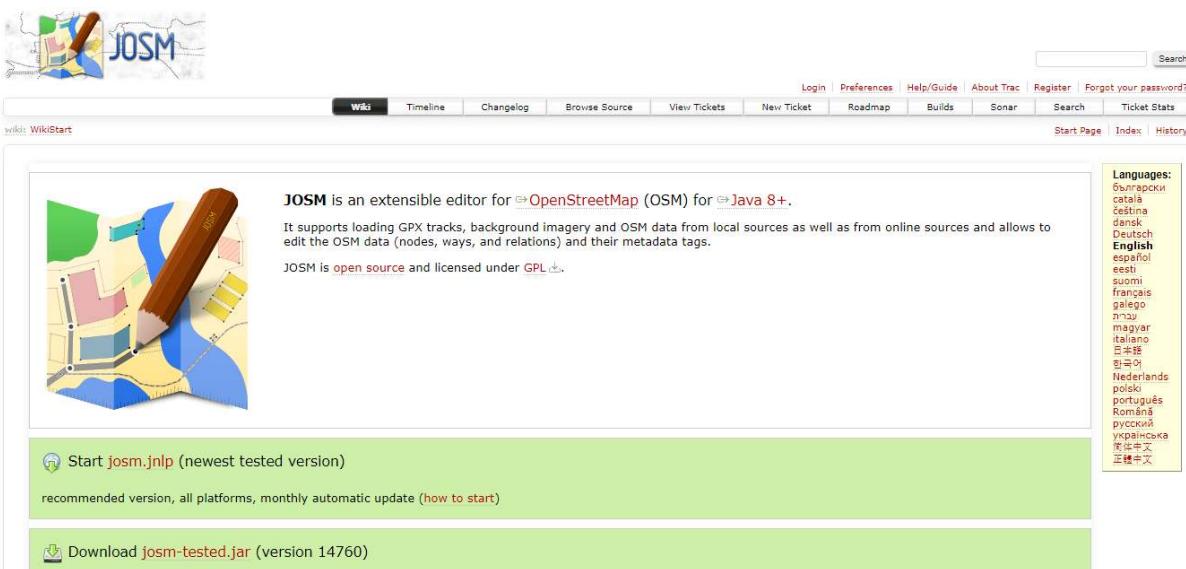
## Objectives:

- Understand how to download JOSM installation file
- Able to install JOSM
- Able to change JOSM settings
- Understand JOSM interface

Java OpenStreetMap (JOSM) is a OpenStreetMap desktop-based editor. JOSM allows you to edit the mapping data in offline mode for some time, so you don't always need to connect to the internet. It will certainly make it easier for everyone who works within limited internet connections. You only need an internet connection when downloading data from OpenStreetMap and when uploading data to OpenStreetMap server. In addition, this module will also learn how to change some settings in JOSM so that later you can use it. You will also learn and understand the parts of the interface in JOSM. By understanding the part of JOSM, at the end of this module you will get an understanding and some basic settings in JOSM.

## I. Download JOSM

If you have a copy of JOSM installation file on CD or flashdisk, you can go to next sub-module that is Installing JOSM. But if you don't have JOSM installation or if you want to have the latest version of JOSM, please open your **web browser** (you can use Firefox, Chrome, Opera, or Internet Explorer). In the address column at the top of the window, then type [josm.openstreetmap.de](http://josm.openstreetmap.de) then press **enter**. You can also find the JOSM site by typing the search word "JOSM" on the search engine. The JOSM website will look like below.



### JOSM site

Please choose the installation file based on your computer's operating system. If you are using a computer with operating Windows system operation, click **Windows JOSM Installer** to download JOSM. If you have another operating system, click on the link that matches your computer's operating system. Then you can download it. In this module we will assume you are using Windows, but the instructions are almost the same as other operating systems.

## II. Installing JOSM

After you successfully download JOSM, now you will install JOSM on your computer or laptop. Here are the steps:

- Find JOSM installation file on your computer. Double-click on the file to start the installation. Then a window will appear “Do you want to allow this app from an unknown publisher to make changes to your device?”, then click **Yes**.
- Then a window will appear to choose the language. This module will only discuss JOSM in English. If the language has been selected, please click **OK**.



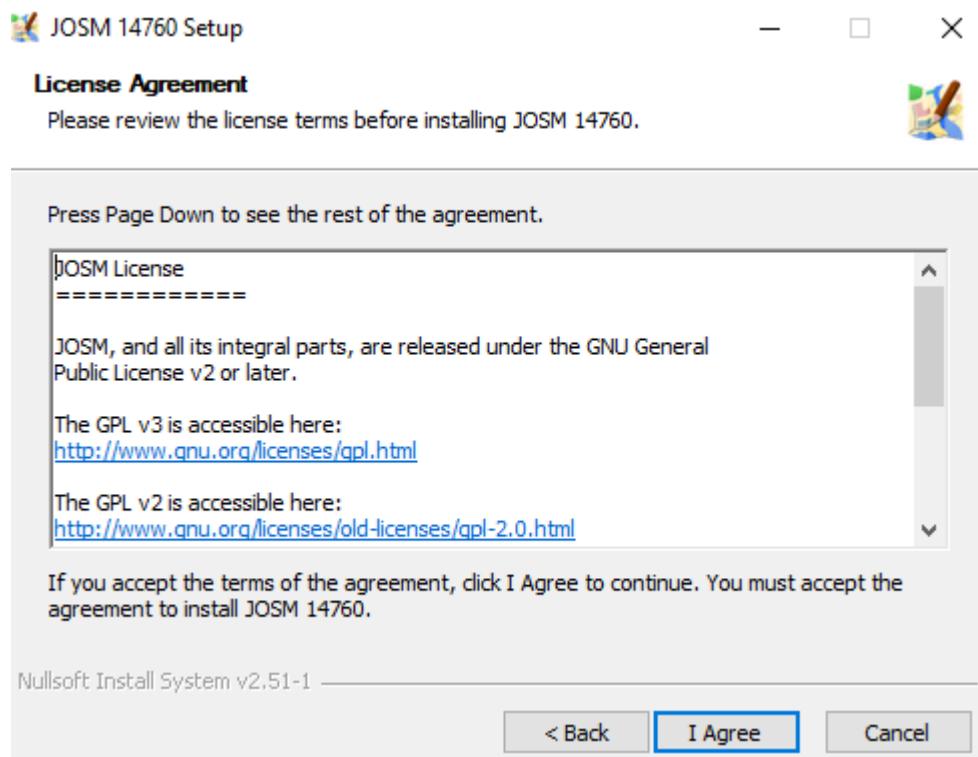
#### Installer language

- The next window will appear about the JOSM Setup Wizard. Click **Next**.



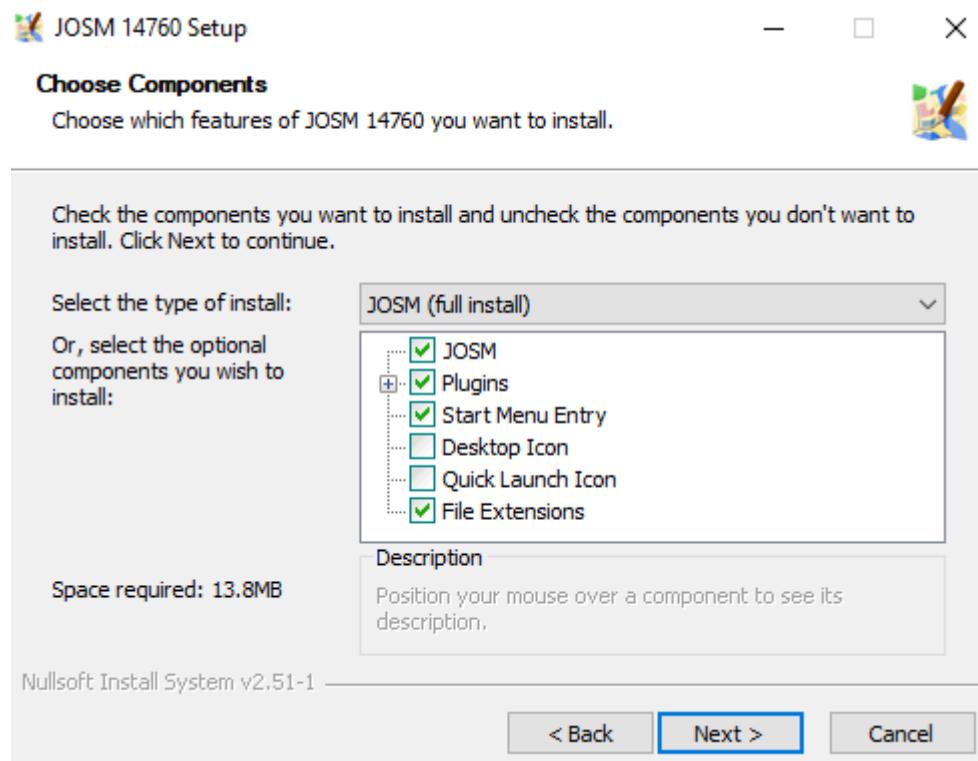
#### JOSM Setup Wizard

- License Agreement window will appear. Click **I Agree**.



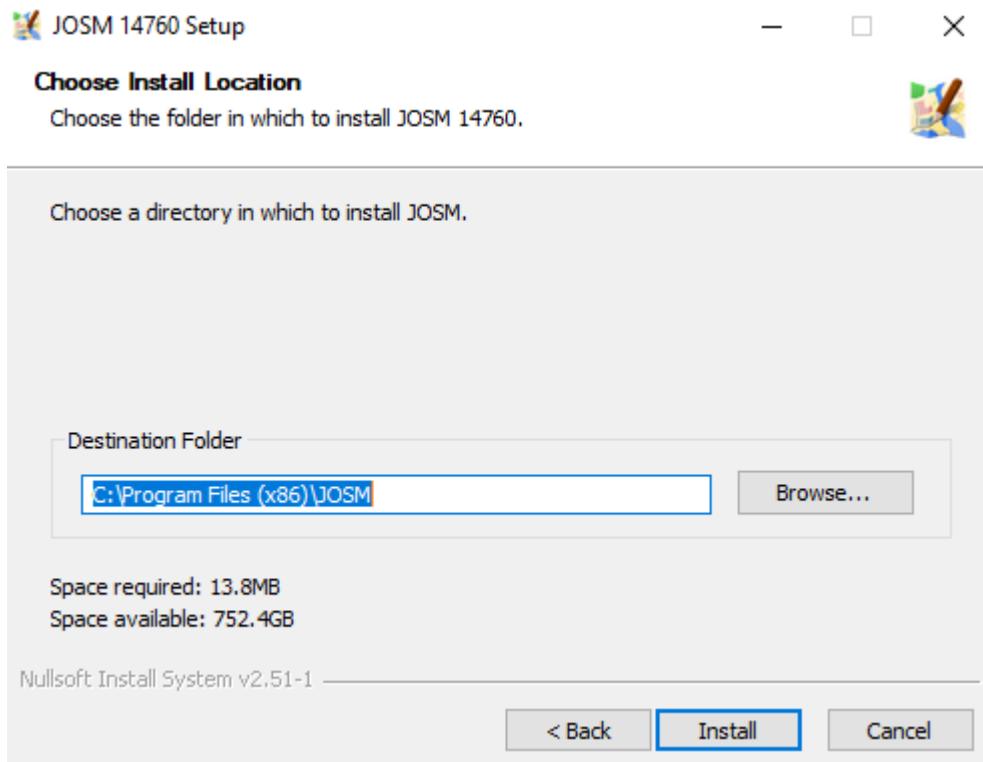
License Agreement window

- The window will appear **Choose Components**. Here you can choose whatever part of the JOSM you want to install. Then click **Next**.



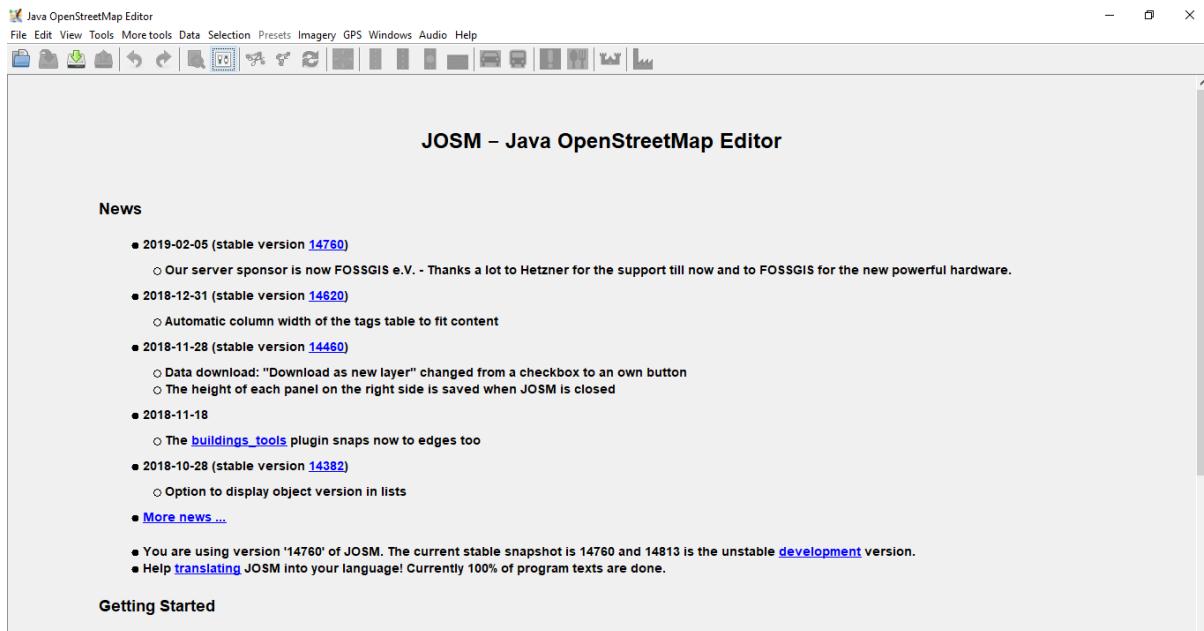
Choose components window

- Next, the window will appear **Choose Install Location**. Here you can choose the folder where you want to install JOSM. Then click **Install**.



Choose install location window

- When the installation is complete, click **Finish** to open JOSM for the first time. Then, when you want to start JOSM, you can do this by clicking on the Start Menu in the lower left corner of your computer, and clicking the JOSM program.
- When JOSM opens, it will look like this:



JOSM display

**Note:** You may have problems installing JOSM if Java is not already installed on your computer. If you have problems when installing in this section, try downloading and installing Java. You can download it here: <http://www.java.com/en/download/> You may see a window appear when you open JOSM, asking to update the software. You don't need to update it because the one you just downloaded is new software. Press the "Cancel" button. If you

don't want to see this message again, check the box below before pressing "Cancel". JOSM in this module is version 14760. The display may be different if you use another version of JOSM. JOSM yang digunakan dalam modul ini versi 14760. Tampilan mungkin berbeda jika Anda menggunakan JOSM versi yang lain.

### III. Changing Setting in JOSM

#### a. Changing Languages

There are so many setting that you can change in JOSM. One of them is the language. JOSM has been translated into various languages, and you can choose the language you want. There are the steps to change the language in JOSM:

- Go to Preferences, click **Edit → Preferences**.



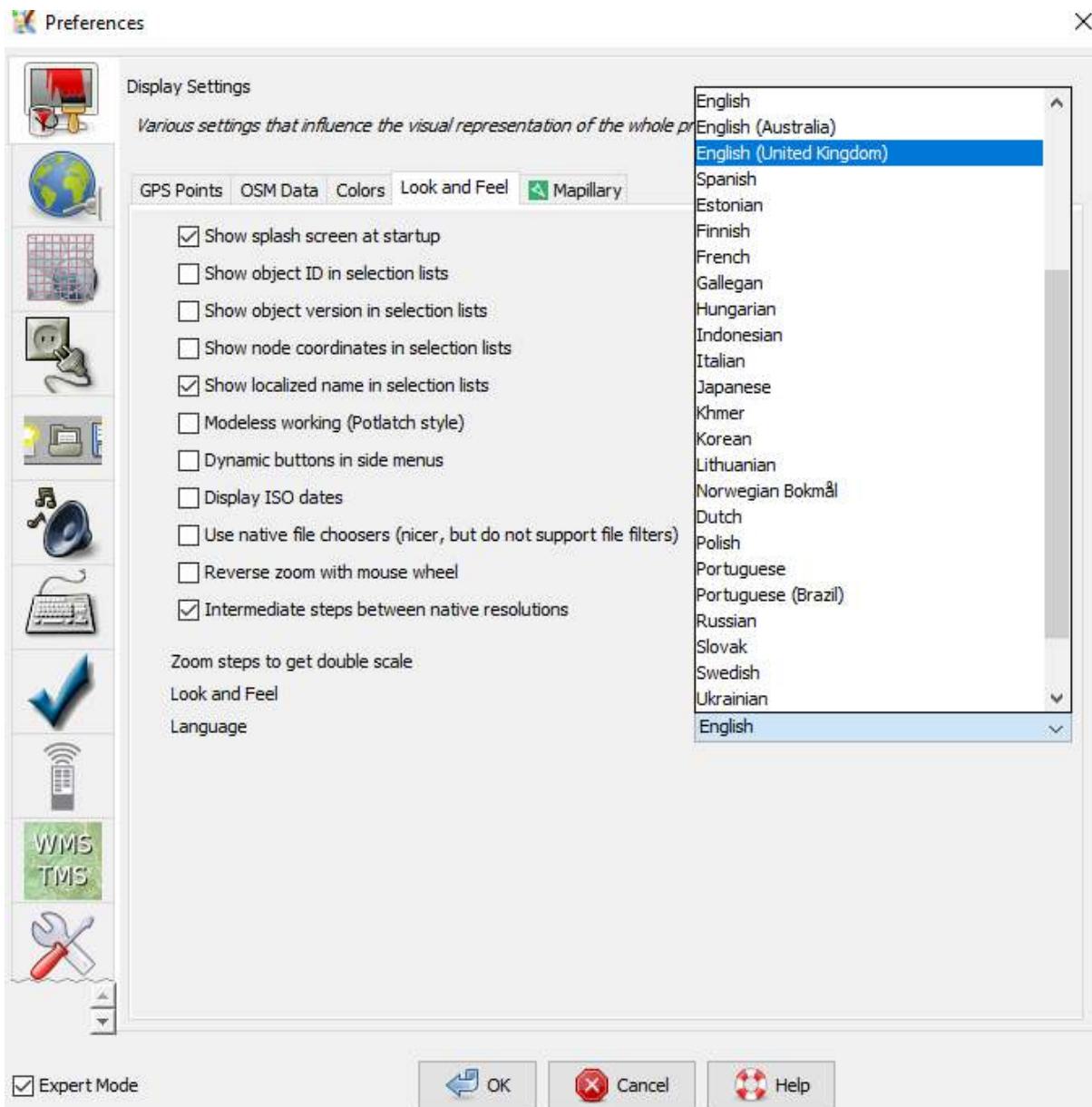
Preferences icon in JOSM

- On the left side, click **Display Setting** icon that looks like a can and paint brush.



Display setting icon

- At the top of the window, click the tab that says **Look and Feel**.
- Select the language you want in the list of choices that says **Language**. Click **OK** and then **restart** to change your JOSM language.



Display setting for change language

#### b. Setting Account

After changing the language, you must enter your OSM account name and password in JOSM. The aim is when you edit or add data on OSM map, the server will know that the edit was made by you. If you do not enter an account name, you can not upload the data that you have edited or added to the OSM map. There are the steps to enter your OSM account in JOSM:

- Go to Preferences window, click **Edit → Preferences**.



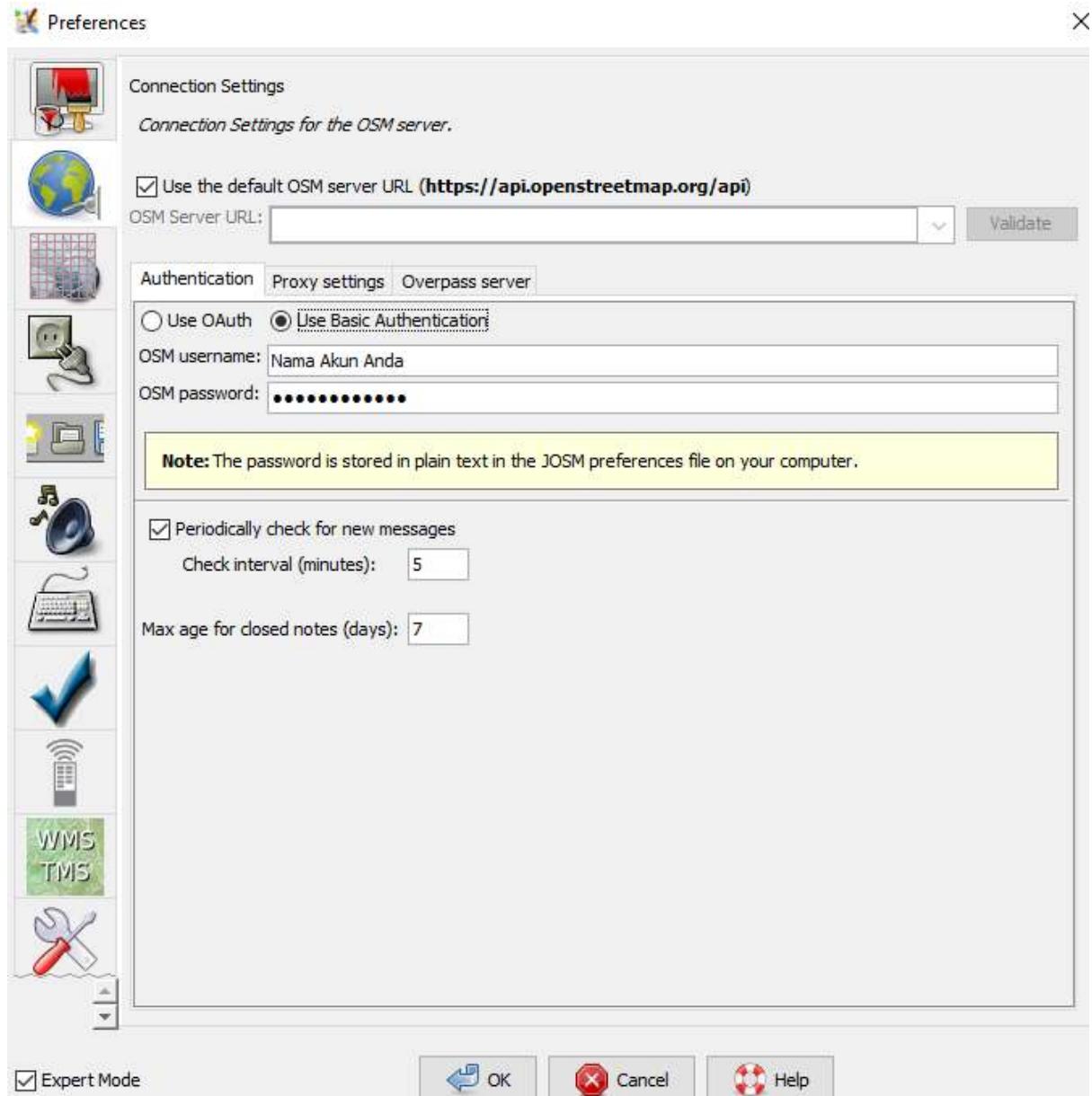
Preferences icon in JOSM

- On the left side, click **Connection Setting** icon that looks like a globe.



Icon connection setting

- Select Authentication → Use Basic Autentication.
- Enter your OSM account name and password.



Connection setting for enter you OSM account

- Click OK and **restart** your JOSM.

#### c. Adding Preset

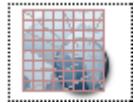
Now you have entered your OSM account. Next is setting to put preset in JOSM. Preset are files that can provide information about objects that you mapped on OpenStreetMap. For more detailed explanation of preset and how to make preset, you can see them in **Creating OpenStreetMap Preset** module. There are the steps to put preset in JOSM:

- Go to Preferences window, click **Edit → Preferences**.



Preferences icon in JOSM

- On the left side, click **Map Settings** icon that looks like a grid or boxes.

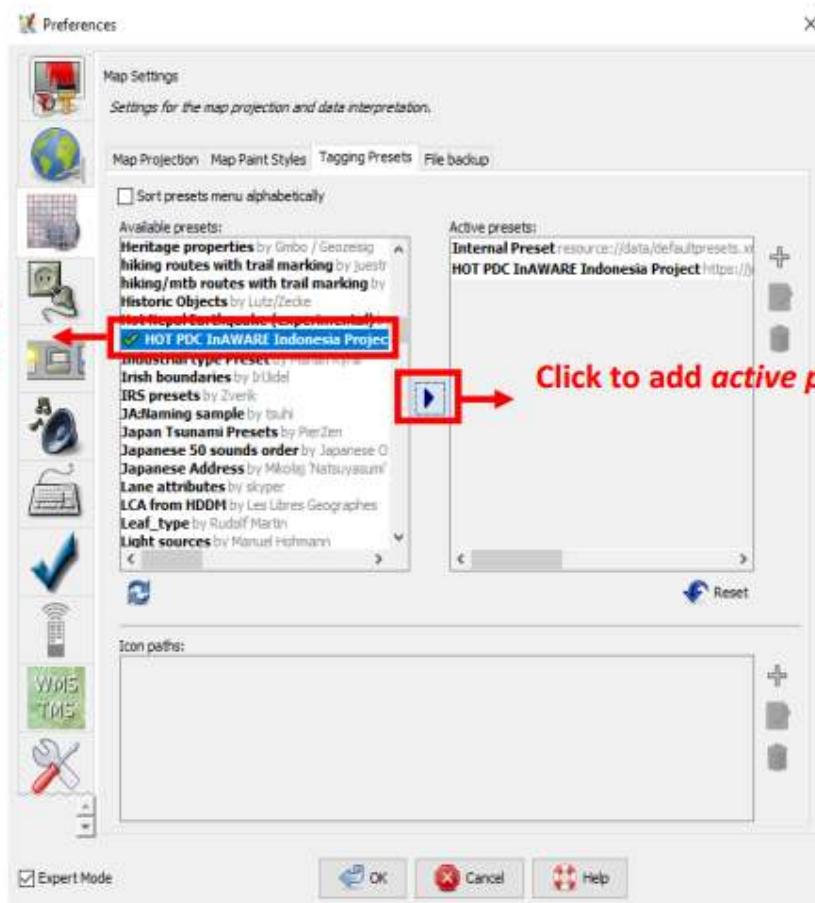


Map Setting icon

- Under Available Preset box search and select the preset named **HOT PDC InAware Indonesian Project**. Then click the blue arrow located to the right of the box.

**Choose preset HOT PDC InAware**

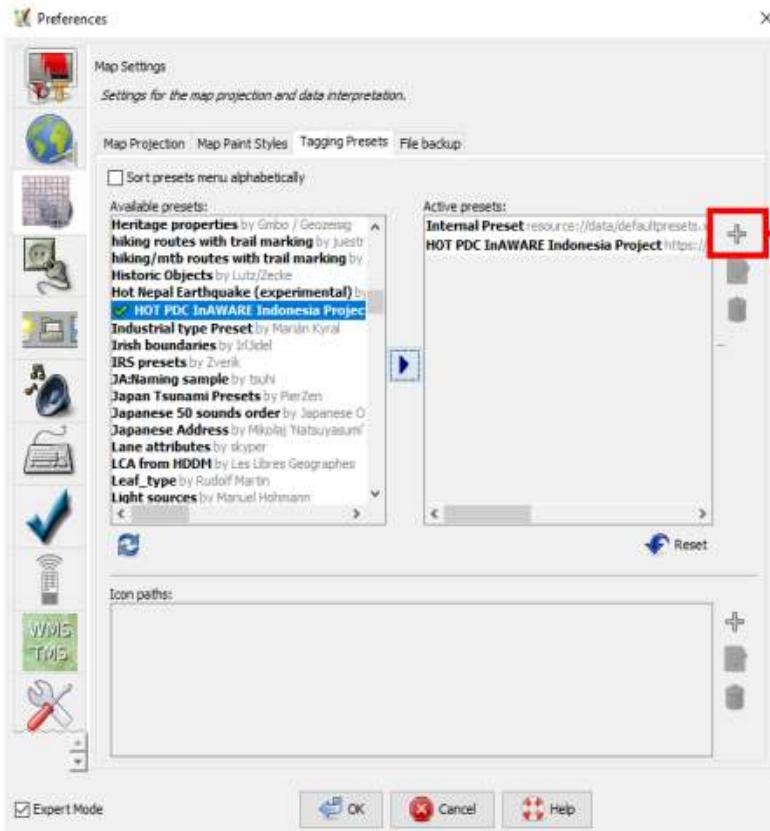
**Click to add active presets**



#### Add Preset

If you have your own file presets in your computer, you can add it by:

- Please click + sign next to the box active presets.



Plus (+) sign to add preset from computer

- Then click **Open a File** to search your presets file.



Open a File icon

- Click **Open** and then **OK**.

#### d. Adding Satellite Imagery

You will use satellite imagery when editing OSM maps. If your internet connection is stable when you open JOSM setting, then in section **Edit → Preferences → Imagery Preferences**, satellite images that are often used will automatically selected. If the internet connection has a trouble and when you see the imagery preferences section, there is no satellite image selected. You can try to restart JOSM and look again at imagery preferences section whether the satellite image has been selected or not. If still not selected, there are the steps to add imagery satellite in JOSM:

- Go to Preferences window, click **Edit → Preferences**.



Preferences icon in JOSM

- On the left side, click **Imagery Preferences** icon or that reads **WMS TMS**.



Imagery preferences icon

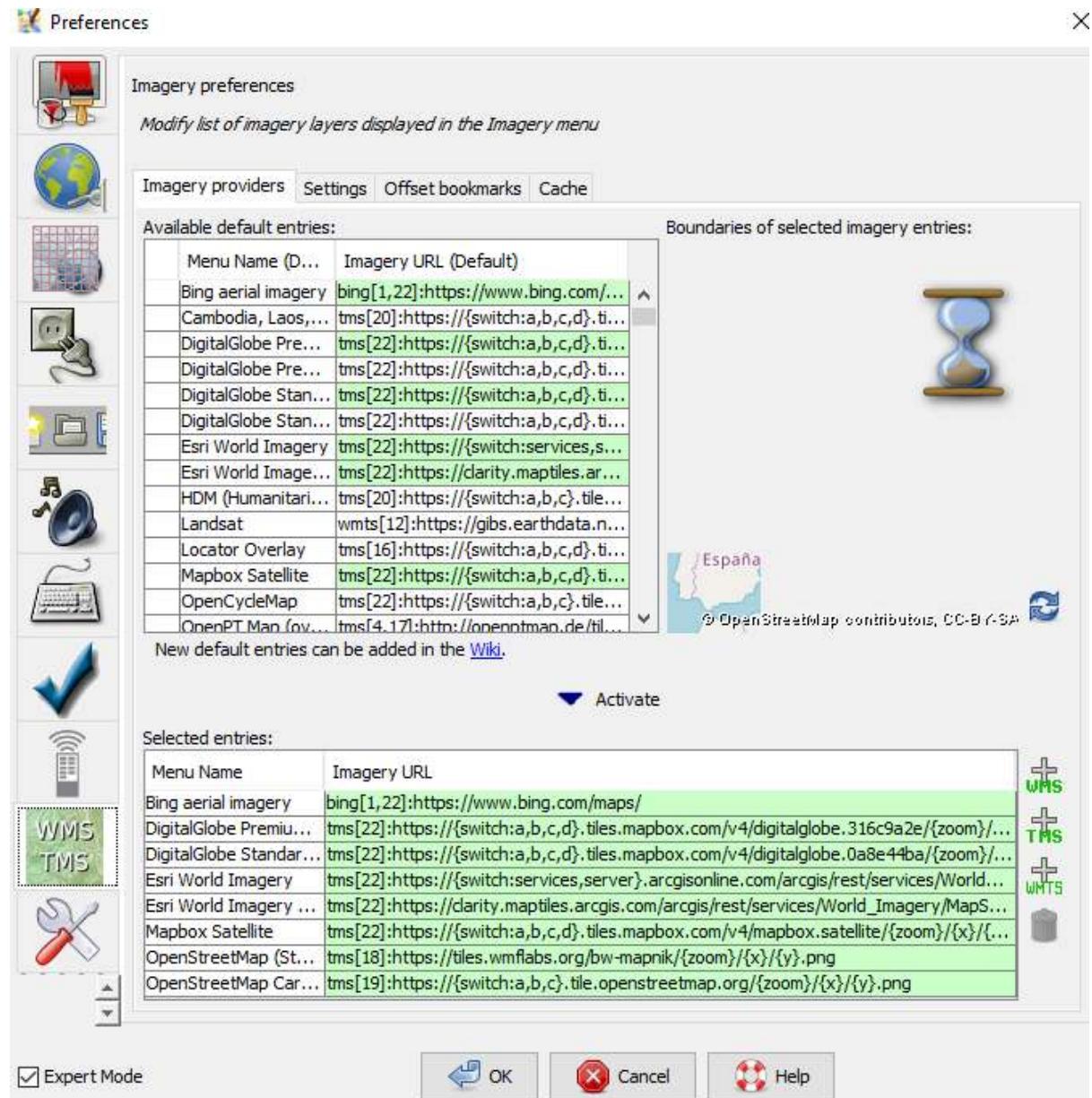
- Then click the satellite image that you want to choose (for example Bing, Digital Globe, Mapbox, and Esri) in Available default entries box.

- Then click **Activate** button under Available default entries box.



Activate button

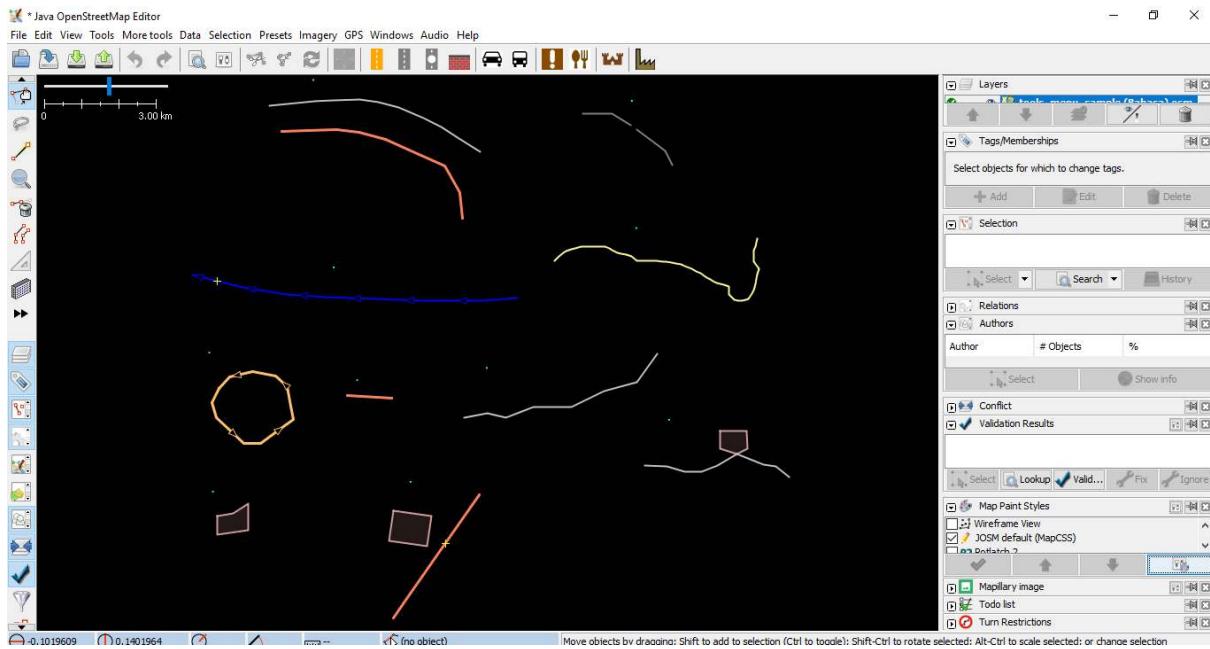
- Then you will see satellite imagery that you have previously selected already in **Selected Entries** box as shown below. Then click **OK** and JOSM will request to restart.



Selected satellite imagery

#### e. Set Display Image of the Object

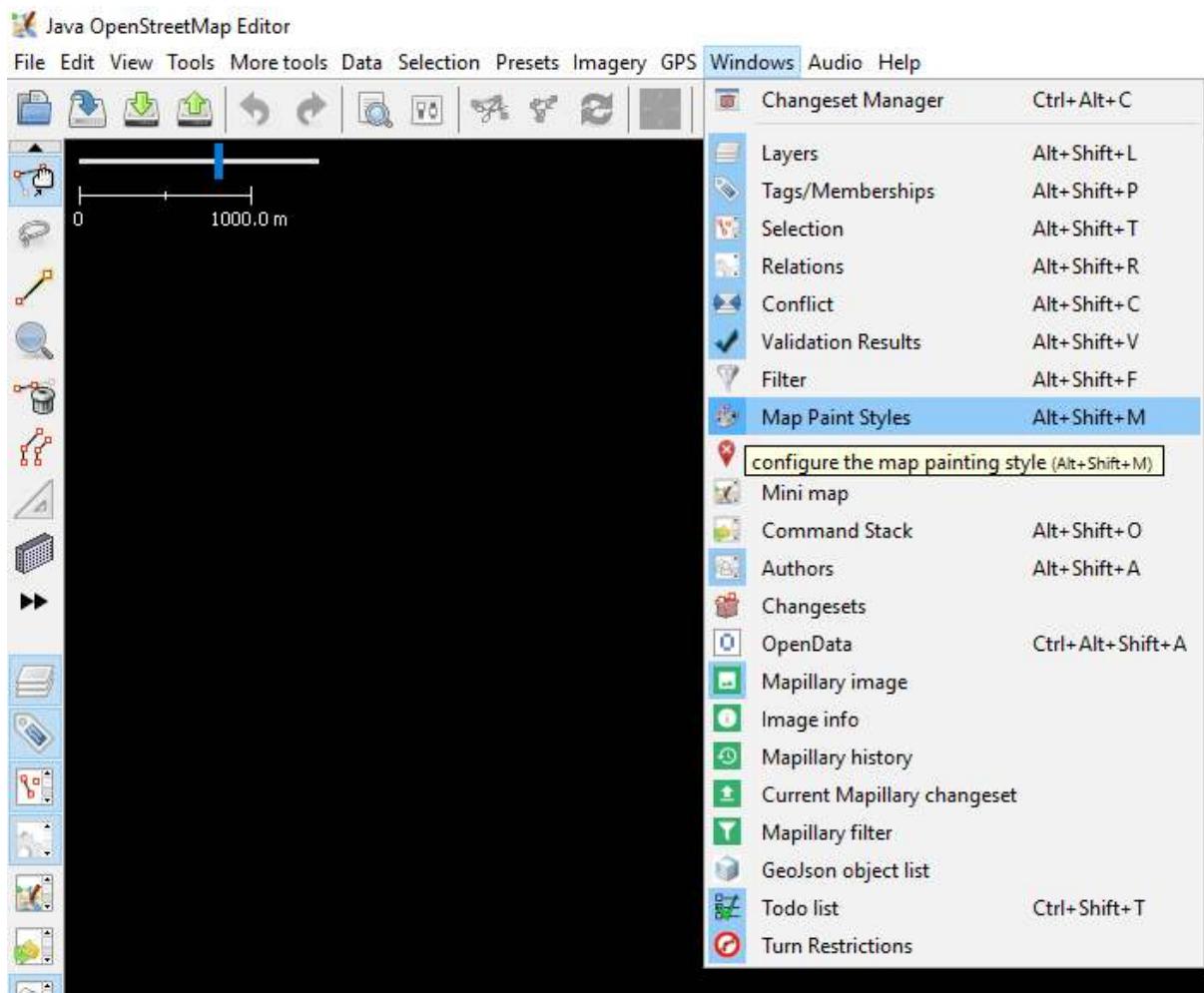
In the initial settings in JOSM, each OpenStreetMap object in JOSM does not show the points, labels, and icons like a picture shown below.



### JOSM display example

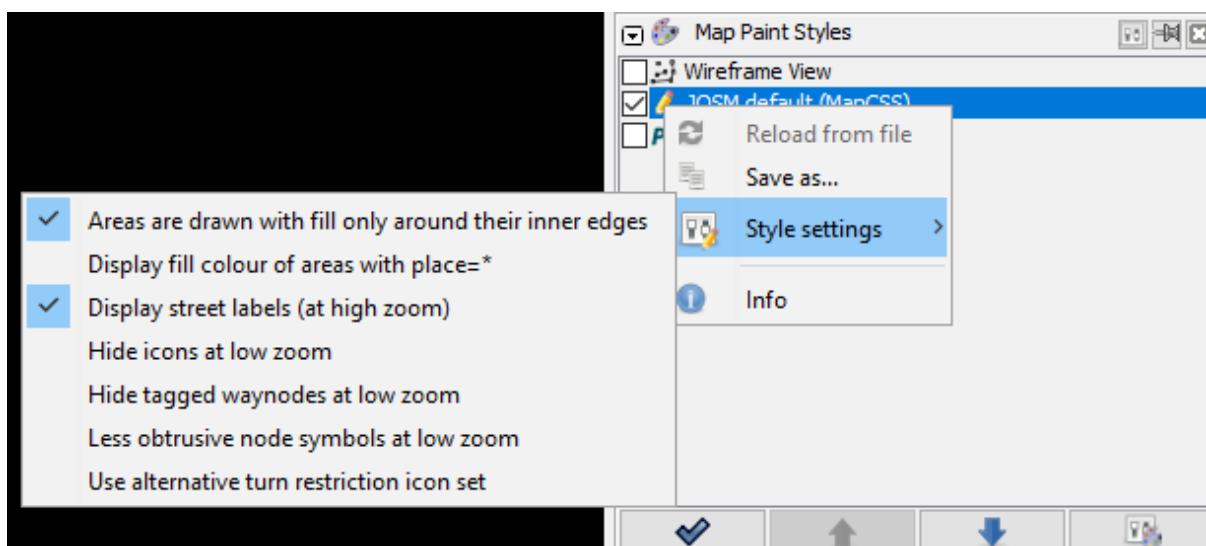
To show the points, labels, and icons, you should change the map style in your JOSM. there are the steps:

- Click **File → New Layer** to bring up the window in JOSM.
- On the right side of the JOSM window, look at **Map Paint Styles** box.
- If there is no Map Paint Styles window in your JOSM, please click Windows menu on the top of your JOSM, then click Map Paint Styles to activate the Map Paint Styles window.



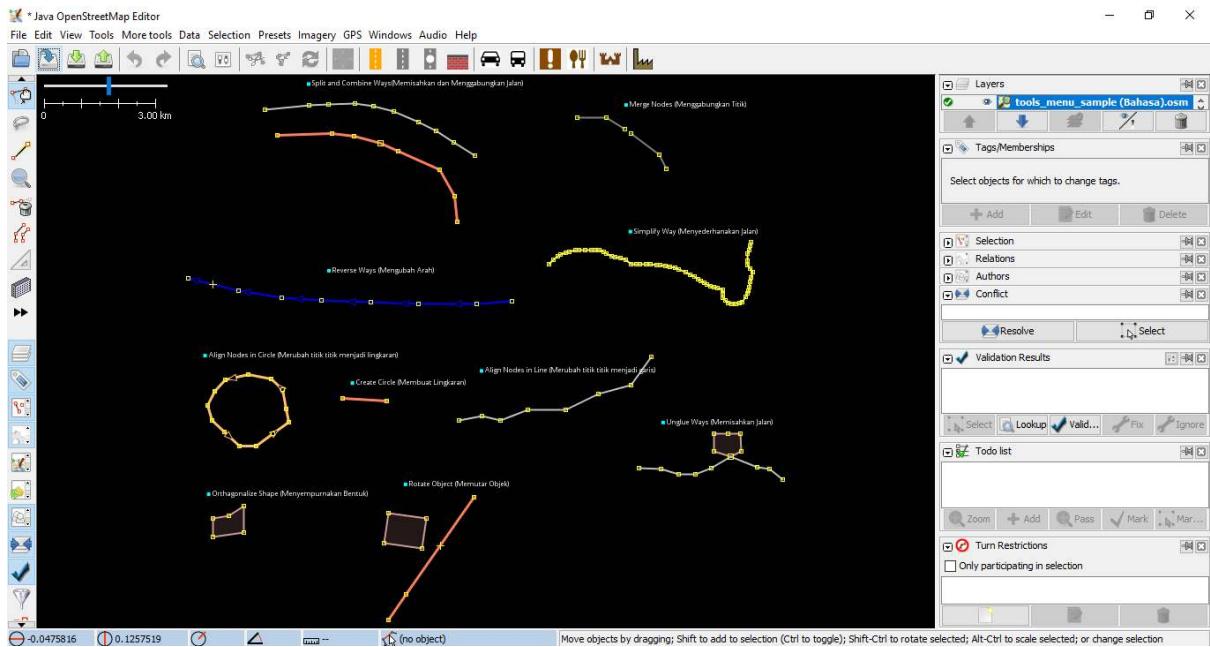
#### To activate Map Paint Styles

- After click, map paint styles window will shown on the right side of your JOSM.
- Right click on **JOSM default (Map CSS)** and choose Style Settings.
- Match it with the view below.



#### Map Paint Styles setting in JOSM

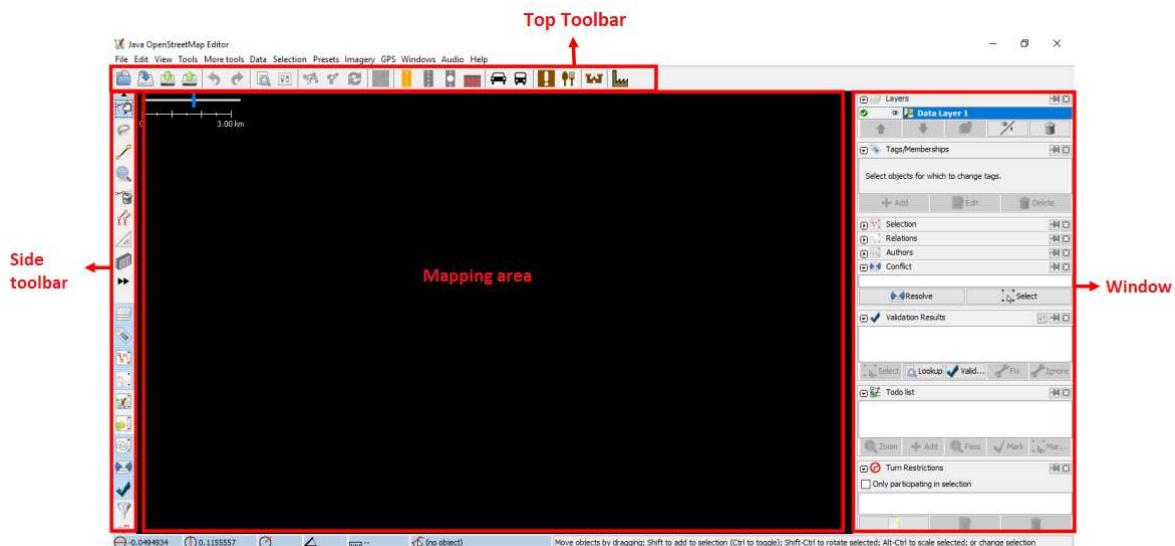
If you already set all settings like steps before, the display of your JOSM image will show the points, labels, and icons for object in OpenStreetMap like the picture below:



JOSM display after settings changed

#### IV. JOSM Interface

Now you have set some settings in JOSM. To make it easier for you to do editing, you need to look at some important parts of JOSM. To see JOSM interface, click on the menu **File → New Layer**. There are some parts on the interface in JOSM.



Parts of JOSM interface

In JOSM there are mapping area, toolbars, and windows. Mapping area is for view, edit, and add data OpenStreetMap. On the right side of JOSM, there is a series of window that have specific functions. Usually the first time you install JOSM, several windows will shown with default setting, such as Layers, Selections, Tags / Memberships, and Author.

- **Layers** window will show any layers that added to JOSM, such as satellite imagery, downloads OSM data, and so on.
- When you select an object, either a point, line, or polygon in the map area, it will be shown on **selections** window.

- Information about objects that will be shown in **Tags / Memberships** window.
- The name of the object creator will be shown in **author** window.

If you want to remove some windows, you can click the x in the right corner of the window you want to remove. If you want to add another window, you can activate it in **Windows** menu and once activated it will appear in windows on the right side of JOSM.

The left side toolbar on JOSM is window tools that contains several buttons for editing, such as **Select object** and **Draw nodes** button. Underneath are tools for **zoom and move map**, **delete nodes or way**, and **create areas**. For other toolbar, you can click the two right black arrow button. Then click the tool that you want and it will appear on the toolbar.



Two right black arrow button on JOSM

## SUMMARY

If you able to follow and practice all the steps in this module, you have successfully installed JOSM on your laptop or computer. In addition, you have also succeeded in learning and practicing how to do standard settings in JOSM to facilitate your work. In the next module you will learn how to add data in JOSM from beginner to advanced levels.

# Data Quality Assurance with Tasking Manager

## Objective:

- Understand data quality assurance by using tasking manager

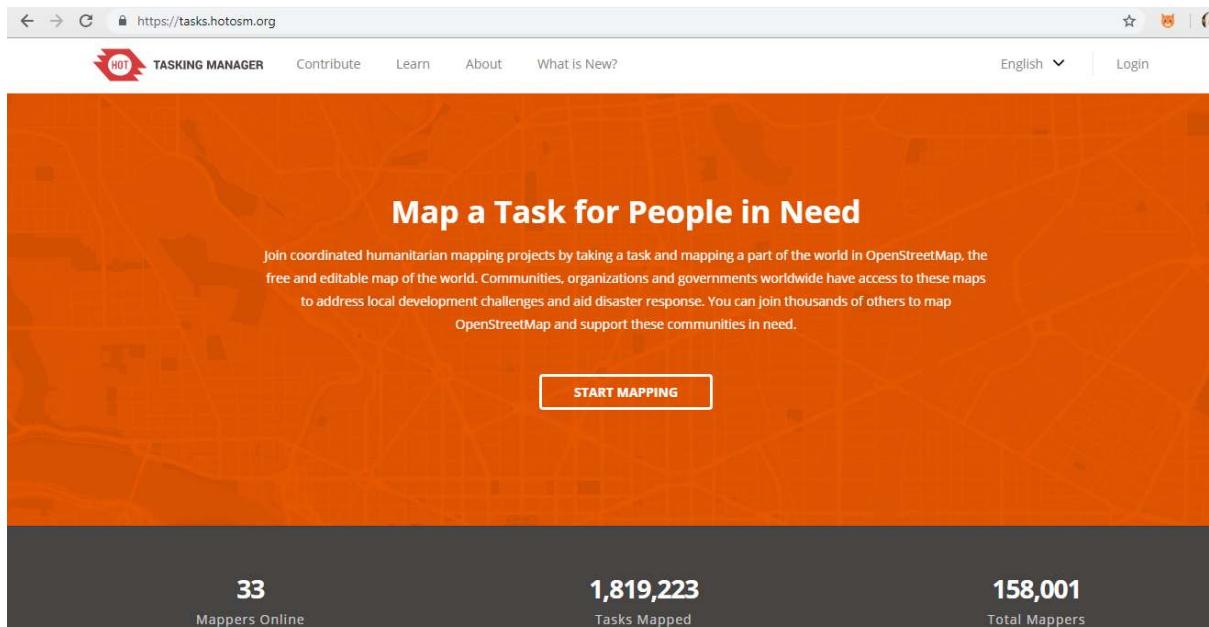
Previously you have edited OpenStreetMap data using tasking manager. Tasking manager make you easier to edit OpenStreetMap data without have to worry about conflict with other people because you are working in the same area. Beside for edit OpenStreetMap data, you can also validate using the tasking manager, so you and the others can do validation together at the same time.

## I. Data Quality Assurance using Tasking Manager

### a. Validation Project Area Tasking

How to validating using tasking manager is similarly with editing with tasking manager. This is the step how to validate using tasking manager:

- Open your web browser and please access to <https://tasks.hotosm.org/>.
- You will see the browser like the picture shown below:



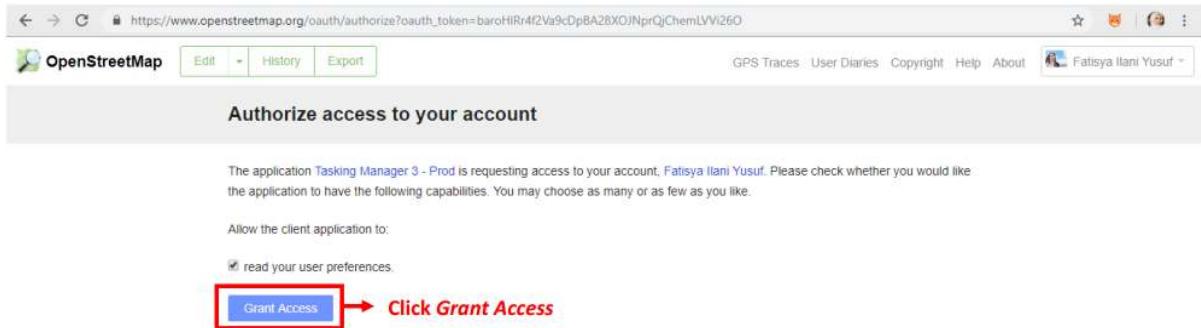
### Tasking manager appearance

- Please log in using your OpenStreetMap account by click **Login** button in the right corner.



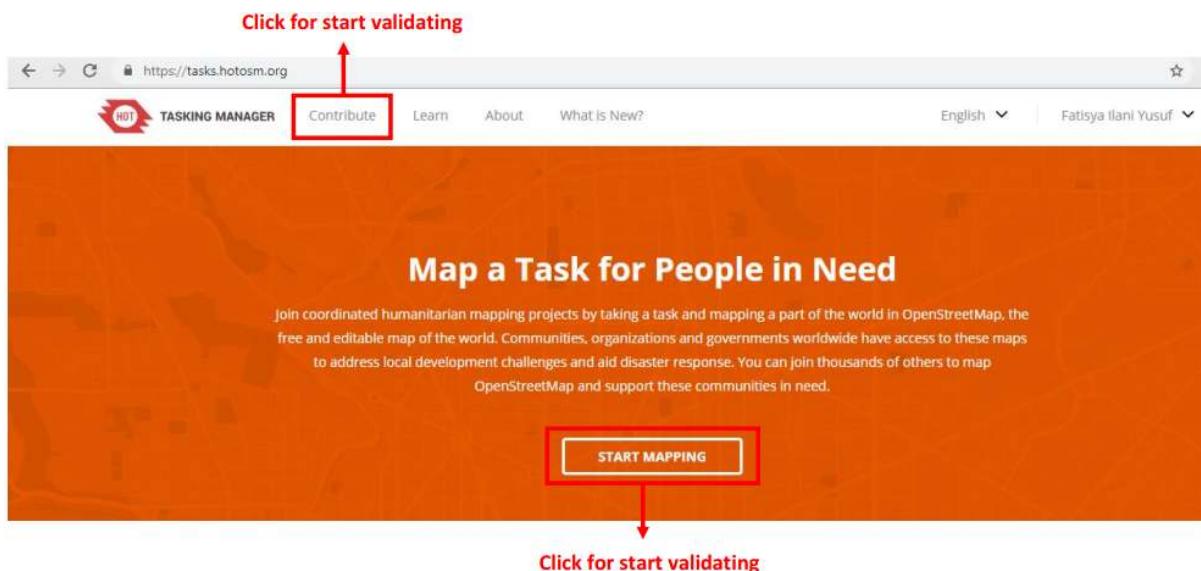
Login button on tasking manager

- You will be directed to OpenStreetMap site and click **Grant Access** to allow your account to be accessed by the tasking manager.



#### Grant Access your OSM account

- Then you have successfully logged in tasking manager. You can start validation by click **Contribute** or click **Start Mapping**.



#### Contribute and Start Mapping button to start validation

- Then your display will look like the image below.

## Contribute

Grid view   Map view

**Search**  
Search project description or project number  

Include archived projects  
 Include draft projects

**Mapping difficulty**

Priority: URGENT  
**#5792 Ayuda Venezuela 1: Barranquilla Buildings**

As the political situation in Venezuela continues to decline. HOT has Activated to help prepare for the influx of refugees into Colombia. Although this situation, and project, are urgent; this is very difficult mapping with no one immediately waiting...

Organization: HOT  
Campaign: AyudaVenezuela  
Level: ADVANCED

Priority: URGENT  
**#5500 Cyclone Gaja: Cuddalore,Tamil Nadu, India Road Network Improvement**

Cyclone Gaja Mapping You can join HOTOSM local slack #disaster channel while mapping these tasks' (<https://slack.hotosm.org>)

Mapping project in response to 2018 Flooding in India

Organization: OSM-IN  
Campaign: 2018IndiaFloods  
Level: BEGINNER

### Contribute display

- You can choose one of the many tasks that are available for validation. Or you can also search for the tasking you want to validate by typing the keyword in the **Search** column on the left side of tasking manager, then press **Enter**. You will see a list of tasks that are related to the keywords you were previously looking for. Please search and select the tasking that you want to validate.

Grid view   Map view

Type the keyword of your task that you want to find  

Include archived projects  
 Include draft projects

**Mapping difficulty**

Priority: HIGH  
**#4983 Missing Maps: Pandeglang, Banten, Indonesia**

Large-scale epidemics and pandemics pose a serious threat not only to global health security but also to countries, communities and individuals in their efforts to achieve resilience. The American Red Cross is supporting the International Federation...

Organization: American Red Cross  
Campaign: Missing Maps  
Level: BEGINNER

Tasking will appear based on the keyword you are looking for

### Example of search using entered keywords

- After you select the tasking that you want to validate, you will see a general explanation of the tasking

**HIGH**

0 - Active Mappers

## #4983 - Missing Maps: Pandeglang, Banten, Indonesia

Large-scale epidemics and pandemics pose a serious threat not only to global health security but also to countries, communities and individuals in their efforts to achieve resilience. Epidemics and pandemics affect all sectors, impacting routine health services, economic and food security, trade, education, civil order, communication, transportation, and many other areas of life. The threat of emerging infectious diseases, including those of zoonotic origin, and the increasing prevalence of diseases previously controlled by antimicrobials and vaccination efforts, is a cause for concern to the global health community. Communities play an important role in prevention, early detection and early response with regard to this threat.

The American Red Cross is supporting the International Federation of Red Cross and Red Crescent Societies (IFRC) with a new program focusing on open data advocacy, community mapping, and integrating data into data driven decision-making. Communities, in their understanding of local environments and social customs, play an important role in prevention, early detection and early response with regard to this threat.

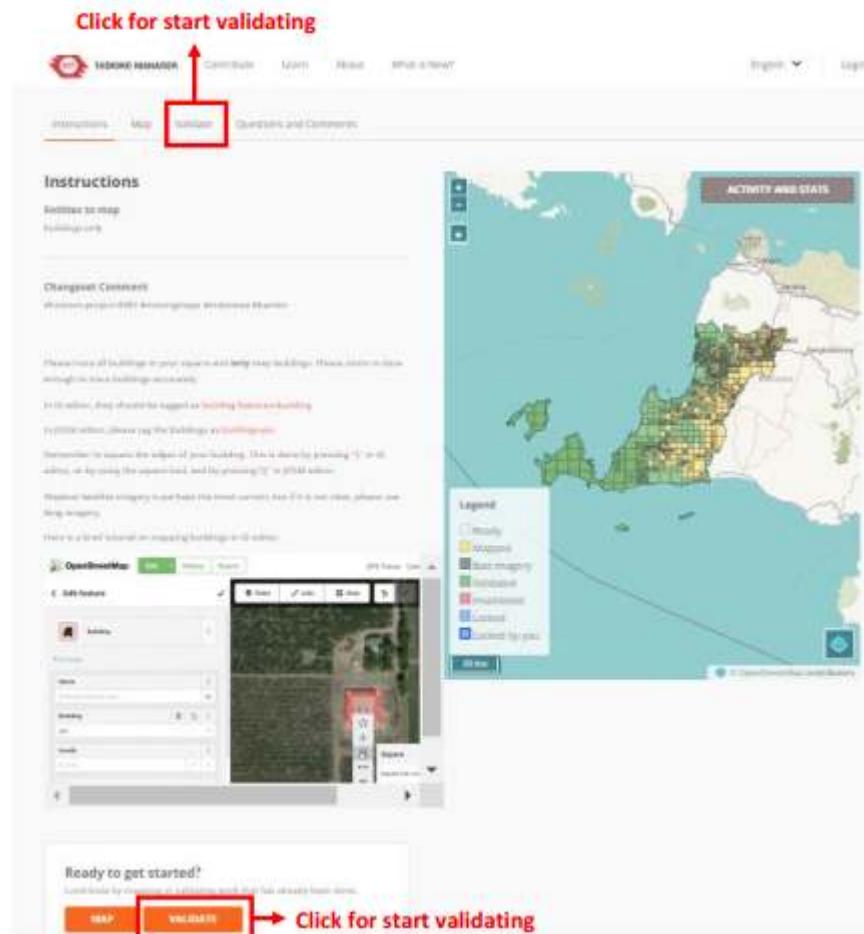
The Missing Maps project aims to map the most vulnerable places in the world (affected by humanitarian crises: disease epidemics, conflict, natural disasters, poverty, environmental crises). Building on HOT's disaster preparedness projects, the Missing Maps tasks facilitate pre-emptive mapping of priority countries to better facilitate disaster response, medical activities and resource allocation when crises occur.

Pandeglang, Banten, Indonesia

Status:	PUBLISHED	Created by:	edircksen
Last updated:	9 hours ago	Difficulty:	BEGINNER
Priority:	HIGH	Type(s) of mapping:	BUILDINGS
Organisation:	American Red Cross	Campaign:	Missing Maps
Mapper level required:	No	Validator role required:	No

### General information about the tasking

- If you scroll down, you will see the **Instructions**. Above the instructions there are four tabs, one of them is validate. You can start validation by click **Validate**. Besides by click validate, at the bottom there is a question box “Ready to get started?” with the Map and Validate options, please choose **Validate**.



#### Option to start validation

- For information, the box or grid that you will validate is the one that has been mapped or the orange color. When you have finished validating, the box you are working on will turn green.
- After you click **validate**, there are several options for choosing which box you want to choose. For those whose role as mapper or validator, there are only two choices, the first and the second choice, while the five choices can only be done by the project manager role. There are options:
  1. The first option is to choose one orange color box by yourself.
  2. The second option is let tasking select one orange box to be validated randomly.
  3. The third option is to select the area to be validated by drawing a polygon, and then tasking will automatically select several tasking boxes according to the area of the polygon you created, then click **start validating**.
  4. The fourth option can be chosen when you have locked one of the boxes, but you forget which box you have chosen. After you click option number four, tasking will automatically show the box you have chosen.
  5. The fifth option is to choose the tasking box based on the name of the contributor under the fifth option.

#### Options for selecting a validation box

- When you select the box you want to work around your box will turn yellow. You can start validation by click **Start Validating** box. If you want to change the box, you can click **Select Another Task**.

#### Display to start validation

- If you have already clicked **Start Validating**, the color of the box you selected will change to blue and yellow around the box. This indicates that you have activated the box to be validated. You can choose the tools you want to use for validation. You can use iD Editor, JOSM, Potlatch 2, and Field Papers. We recommend you to use JOSM when validating because JOSM has more features for editing.

Get started by choosing your editor of choice:

- JOSM
- ID Editor
- JOSM
- Potlatch 2
- Field Papers

Done editing? Leave a comment and select one of the options below that matches your editing status.

Leave a comment

5000 characters remaining

Tip: You can use Markdown. (HTML is not allowed)

**START EDITOR**

**PREVIEW**

**MARK AS VALID**

**MARK AS INVALID**

**STOP VALIDATING**

**ACTIVITY AND STATS**

**Legend**

- Ready
- Mapped
- Bad imagery
- Validated
- Invalidated
- Locked

### Choice of tools to do validation

- After you select JOSM as a tool for validation, you can immediately click Start Editor.

Get started by choosing your editor of choice:

- JOSM
- START EDITOR**
- Download this task as a gpx file to see its boundary.

Done editing? Leave a comment and select one of the options below that matches your editing status.

Leave a comment

5000 characters remaining

Tip: You can use Markdown. (HTML is not allowed)

**PREVIEW**

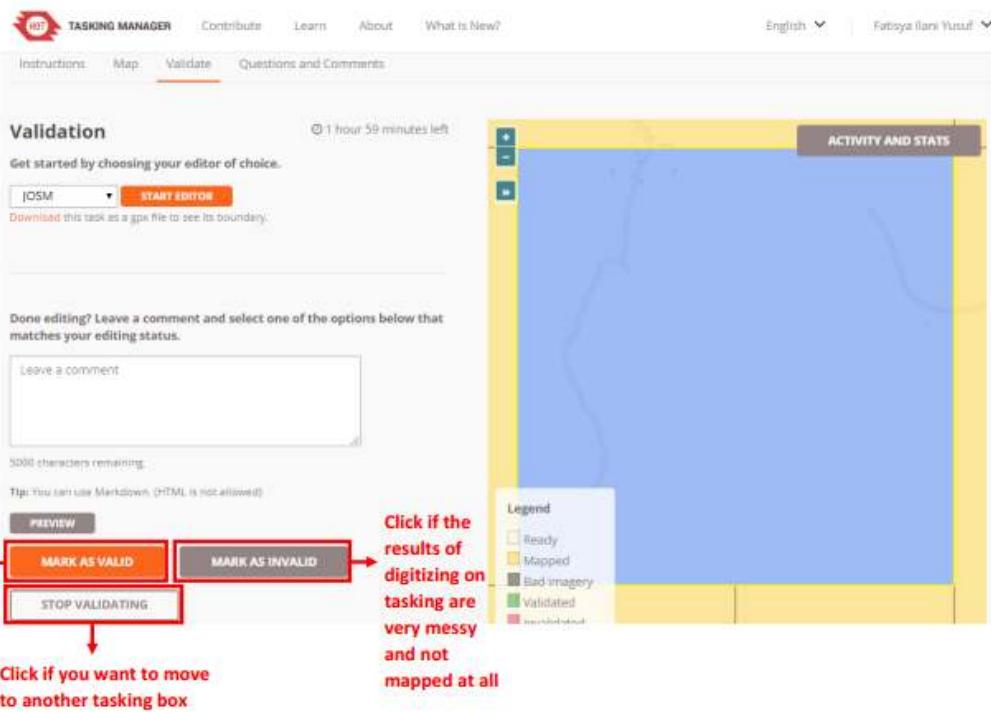
**ACTIVITY AND STATS**

**Legend**

- Ready

### Start editor button to start validation

- After you click Start Editor, JOSM will automatically download OpenStreetMap data based on the grid/ box you have chosen. To use JOSM as a validation tool, you can learn through **JOSM for Data Quality Calculation** module.
- Once you have finished doing validation in JOSM and all the objects have been mapped, please go back to the tasking manager web browser and click **Mark as Valid**. If the selected grid/box has not been mapped or there are still many objects that have not been properly mapped, you can click **Mark as Invalid**. You can also add comments on the reason for the box in Mark as Invalid, for example, many unmapped objects, so the next contributor who chooses the box knows the error. After you click Mark as Invalid, other contributors can rework or add data to the box that you have Mark as Invalid. If you want to change the tasking box to be validated, you can click **Stop Validating**, so other people can continue validating in the box.



#### Buttons to choose after validation

- If you click **Mark as Valid**, then the tasking box that you previously selected turns into **green**. If you click **Mark as Invalid**, then the tasking box you previously selected changes color to **pink**. If you click **Stop Validating**, then the tasking box that you previously selected changes back to **orange**.
- When you have done validating in one box tasking, you can do validation in another orange box. Please validate like the previous steps.

#### b. Things to Watch When Do Validation in Tasking Manager

When you do validation using tasking manager there are things to watch, that is the time limit for working on the box you have chosen. If you have started validation, there is a time limit for working on the tasking you selected at the top like the picture below:

The screenshot shows the OpenStreetMap Tasking Manager interface. On the left, there's a sidebar with options like 'Instructions', 'Map', 'Validate', and 'Questions and Comments'. Below that is a 'Validation' section with a message: 'Get started by choosing your editor of choice.' It includes a dropdown for 'JOSM' and a 'START EDITOR' button. A red box highlights the 'Time limit for validation' message: '1 hour 59 minutes left'. There's also a link to 'Download this task as a gpx file to see its boundary.' In the center, there's a map area with a blue outline. On the right, there's an 'ACTIVITY AND STATS' section with a legend:

Status	Color
Ready	Yellow
Mapped	Blue
Bad imagery	Dark Grey
Validated	Green
Uncontrolled terrain	Red

### Time limit for validation

The time limit for working on validation using this tasking manager is two hours. After passing two hours (120 minutes), the tasking manager will automatically unlock the tasking box you have selected. If you are validating and need more than two hours, you should click **Stop Validating** before the duration of the two hours runs out, then select **Start Editor** again. Then you can continue validation again.

### SUMMARY

You have learned and practiced how to validate using tasking manager. Validation using the tasking manager makes it easier for you to validate together with other people so the validation process can be completed faster. Next you will learn how to use JOSM to calculate data quality in OSM.

# 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*.



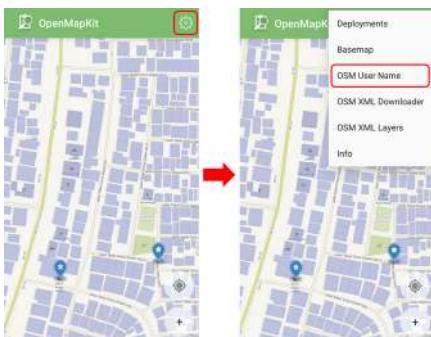
*OpenMapKit application on the Play Store*

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



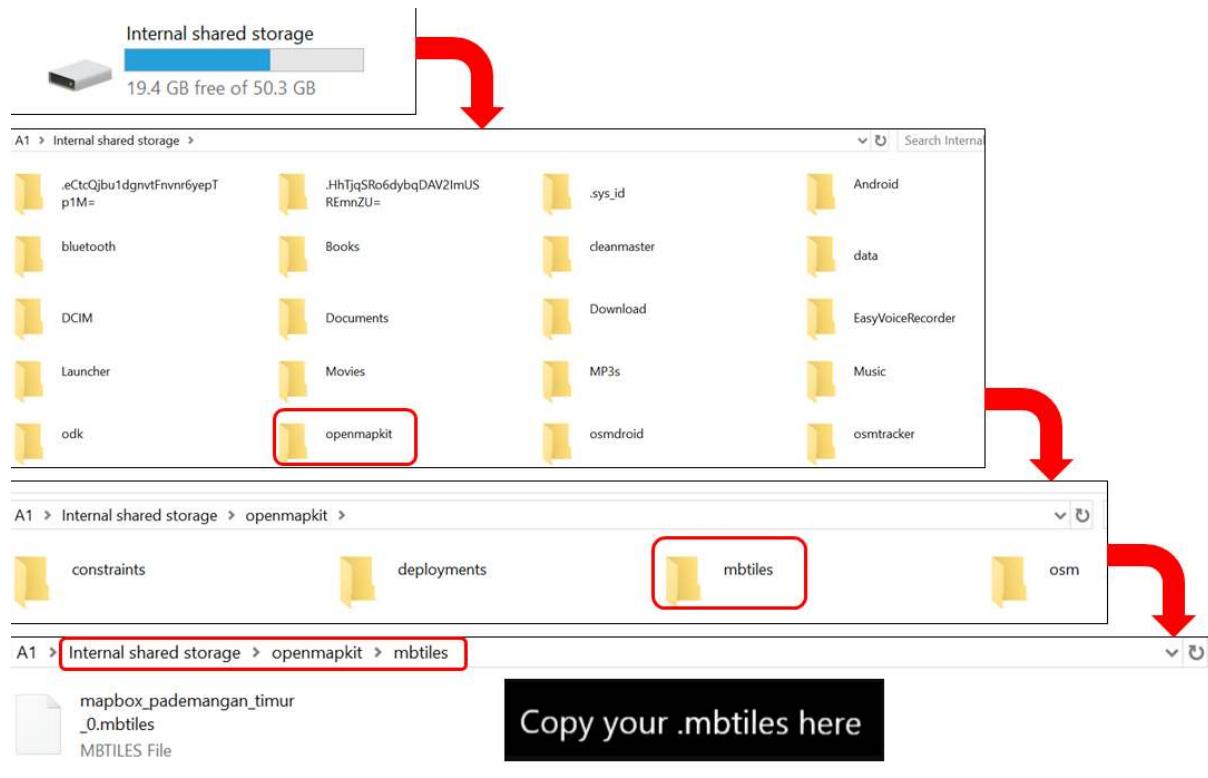
Display settings menu *OpenMapKit*

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

### III. Import the offline basemap for OpenMapKit

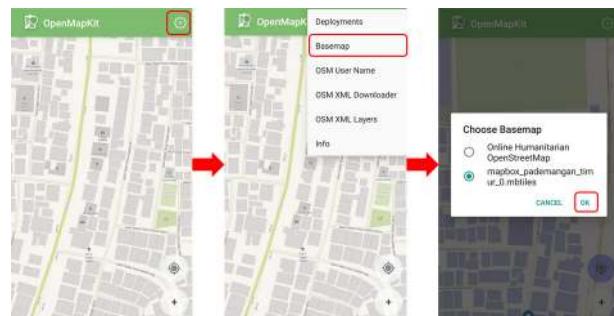
*OpenMapKit* provides an OSM map as a *basemap* that must be accessed using an internet connection. But don't worry, you can also enter offline basemap into *OpenMapKit* which is a map that can be opened without an internet connection. An offline basemap can make it easier for you to add information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

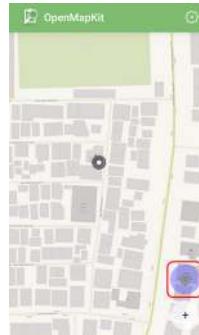


Figure 15: Navigate to the current location in OpenMapKit

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.



Figure 16: Building colors

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**.



Figure 17: OSM XML Downloader menu and OSM XML Layers menu

#### 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.

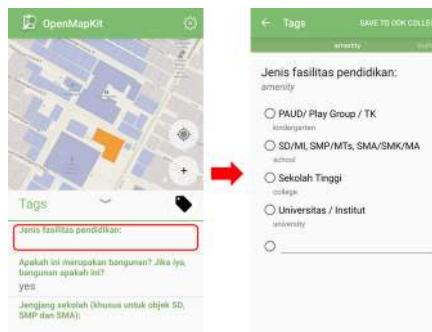


Figure 18: Fill out building information using a form from ODK Collect

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:

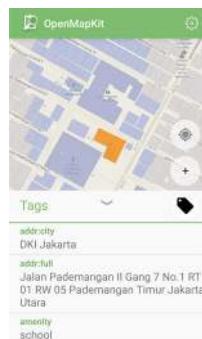


Figure 19: The building that has been filled in the information

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.

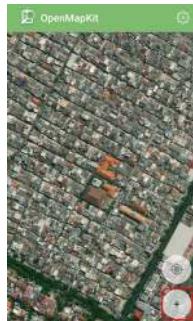


Figure 20: Add marker using plus icon

Add markers using the plus (+) icon

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



Figure 21: Add node button when adding a point

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*.

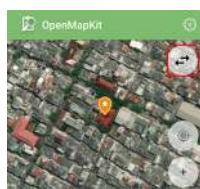


Figure 22: Swipe points that have been added

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

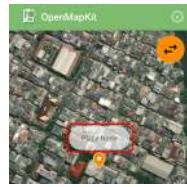


Figure 23: Place node button when shifting a point

- 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:

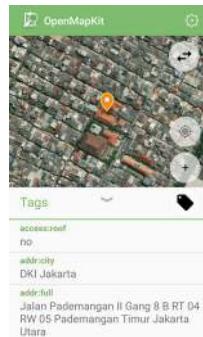


Figure 24: the point of objects already loaded with informations

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 collecting 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.

— title: Using YAML weight: 4 —

### Objectives:

- To be able to explain about YAML concept
- To be able to create YAML for export data in Export Tool
- To be able to demonstrate how to get OSM data in Export Tool using YAML

As explained before, we have learned how to create a customized presets on OpenStreetMap and determine the OpenStreetMap data model to use in the mapping process. In the chapter Using Export Tool, we found the result data attributes only show the attribute from the OSM format. Therefore, you can use YAML to download the OSM data with the specific attribute that will be the same with the OpenStreetMap data model.

## I. YAML Concept

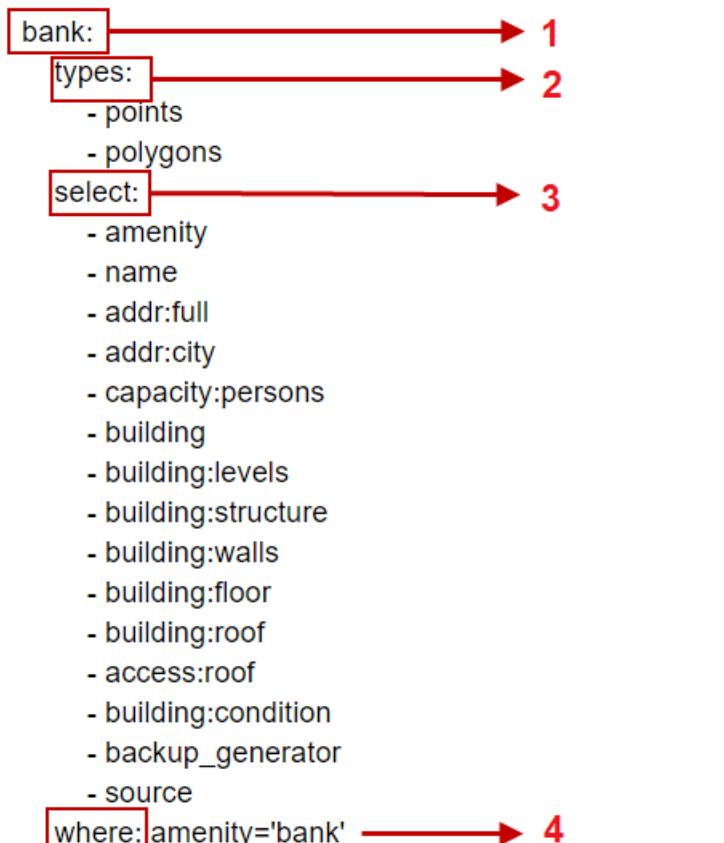
YAML (“YAML Ain’t Markup Language”) is a human-readable data serialization language. It is commonly used for configuration files, but could be used in many applications where data is being stored (e.g. debugging output) or transmitted (e.g. document headers). We can use to create data structures in YAML format according to tag (key and value) in the OpenStreetMap data model.

## II. Creating YAML to Data Filter in Export Tool

### a. YAML Structure Data

There are 4 sections to define a YAML structure:

1. Title = define the name of file
2. Types = define the name of mapping, consist of points, lines, and polygons
3. Select = define key from OSM data
4. Where = define key and value by OSM data to pull up the data



## YAML Structure for OSM data

### b. Requirements to Creating YAML Structures Data

There are some requirements that important to create the YAML structure:

- All formats are lowercase, Not allow the uppercase
- The position of the title has to put at the beginning of the document. Using the (\_) sign to separate the title, an example bank\_points
- The position of all formats are equal, an example in the image above

### c. Creating YAML

We will create the YAML structure form OpenStreetMap Data Model that you can open the chapter **OpenStreetMap data Model** to refer the lists of OSM data Models that the objects mapped in the project. There are steps to create the YAML:

- Open the lists OSM data model or you can create a table like below

Bank Tag Information Table

key	possible values
amenity	bank
building	bank
amenity	bank
name	fill the name of bank
addr:full	detail of address
capacity	<50, 50-100, 100-250, 250-500, >500
building:levels	number
building:structure	confined_masonry, steel_frame, wood_frame, bamboo_frame
building:walls	brick, concrete, wood, bamboo, glass
building:floor	ground, wood, cement, tekhel, ceramics
building:roof	tile, tin, asbestos, concrete
access:roof	yes, no
building:condition	poor, good
backup_generator	yes, no

- Open Notepad that already on your computer
- The first line, type the name of title, an example bank

bank:

- The second line, click enter + space four times and typing the **types:**, and click enter + space eight times + typing - **points/polygons/lines**, an example

```
types:  
  - points  
  - polygons
```

- Click enter on your keyboard and suitable the position with “types:”, and type **select:** → enter + space eight times and type the lists of the key in the Bank Tag Information Table.

```
select:  
  - amenity  
  - name  
  - addr:full  
  - addr:city  
  - capacity:persons  
  - building  
  - building:levels
```

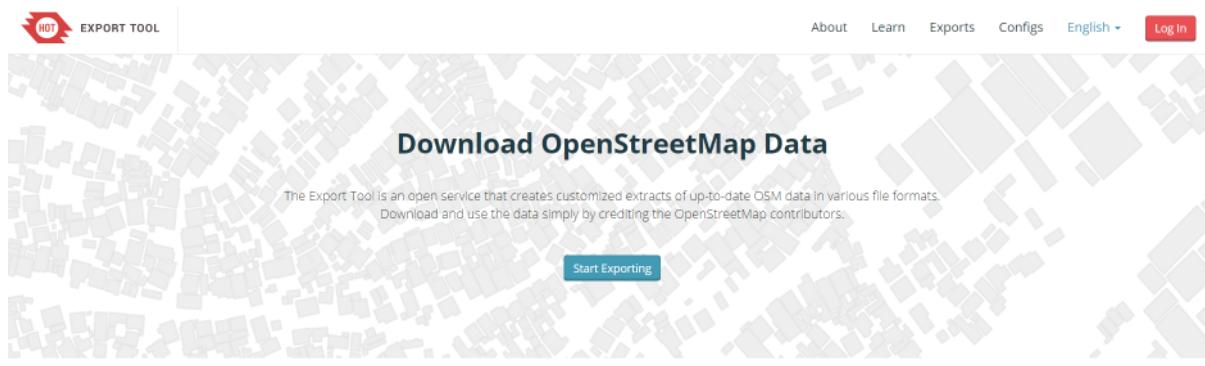
- building:structure
  - building:walls
  - building:floor
  - building:roof
  - access:roof
  - building:condition
  - backup\_generator
  - source
- The last step, click enter and suitable position types and select → type **where: key dan value**  
where: amenity='bank'
  - If the format was completed, you can save the format in .txt file in your computer.

```
bank:
  types:
    - points
    - polygons
  select:
    - amenity
    - name
    - addr:full
    - addr:city
    - capacity:persons
    - building
    - building:levels
    - building:structure
    - building:walls
    - building:floor
    - building:roof
    - access:roof
    - building:condition
    - backup_generator
    - source
  where: amenity='bank'
```

### III. How to Using YAML in Export Tool

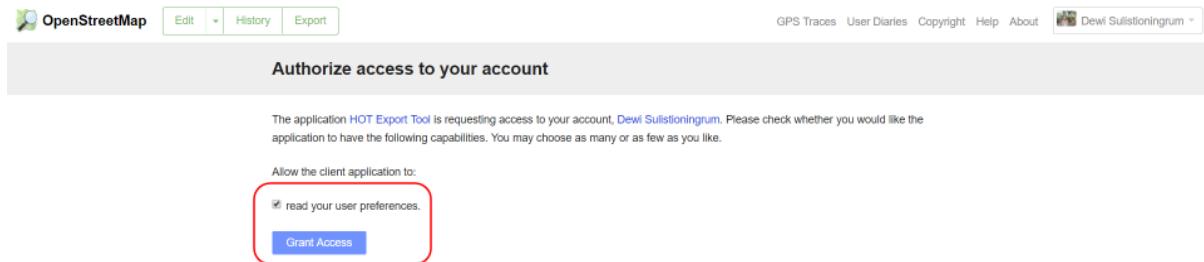
#### a. Login with OSM account

- Open your browser, and type this link <https://export.hotosm.org>



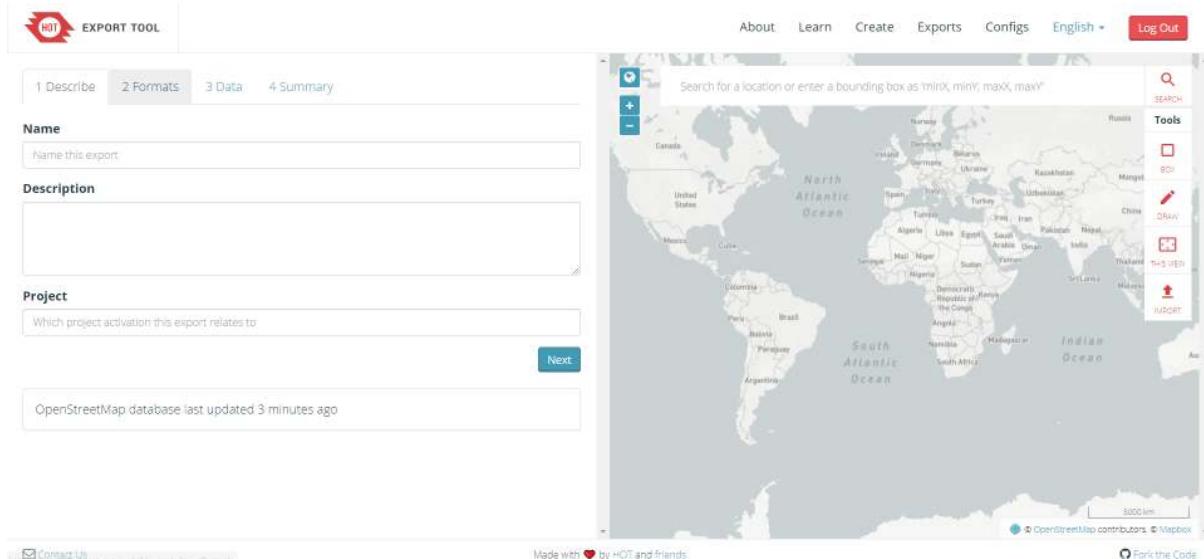
The interface of Export Tool

- The first we have login with your OSM account to using Export Tool. Click on **Login** in the right corner. The next click on 'Authorize access to your account' → **Grant Access**.



## Login to Export Tool

- To create a new project in Export Tool click on **Start Exporting**
- The Export Tool window will be displayed like the image below



## The fill from Export Tool

### b. Defining an area of interest

There are 5 ways to define an Area of Interest for your export:

- Bounding Box:** Use the "Box" tool to the right to click and drag a rectangle, or use the "Current View" tool to match the map's viewport.  
Bounding box
- Draw Polygon:** Draw a freeform polygon. This must be a simple (not multi-) polygon.  
Manually edit
- Upload:** By uploading a GeoJSON polygon in WGS84 (geographic) coordinates. If you have not the GeoJSON data, you can refer to this chapter [Using GeoJSON](#).  
Import the administrative boundary
- Search Bar:** input a minX,minY,maxX,maxY string into the search bar. This will define a rectangular area of interest.
- Current View:** Use "Current View" to match the map's viewport.

The maximum extent of export on the Export Tool is determined by the density of OSM data in the defined area. **The bounding box of the area can contain at most 10,000,000 OSM nodes.** This limitation means that a 10,000 square kilometer box over a heavily mapped area like Western Europe or North America will likely be rejected, but an equal-sized box over a sparsely mapped area will be accepted by

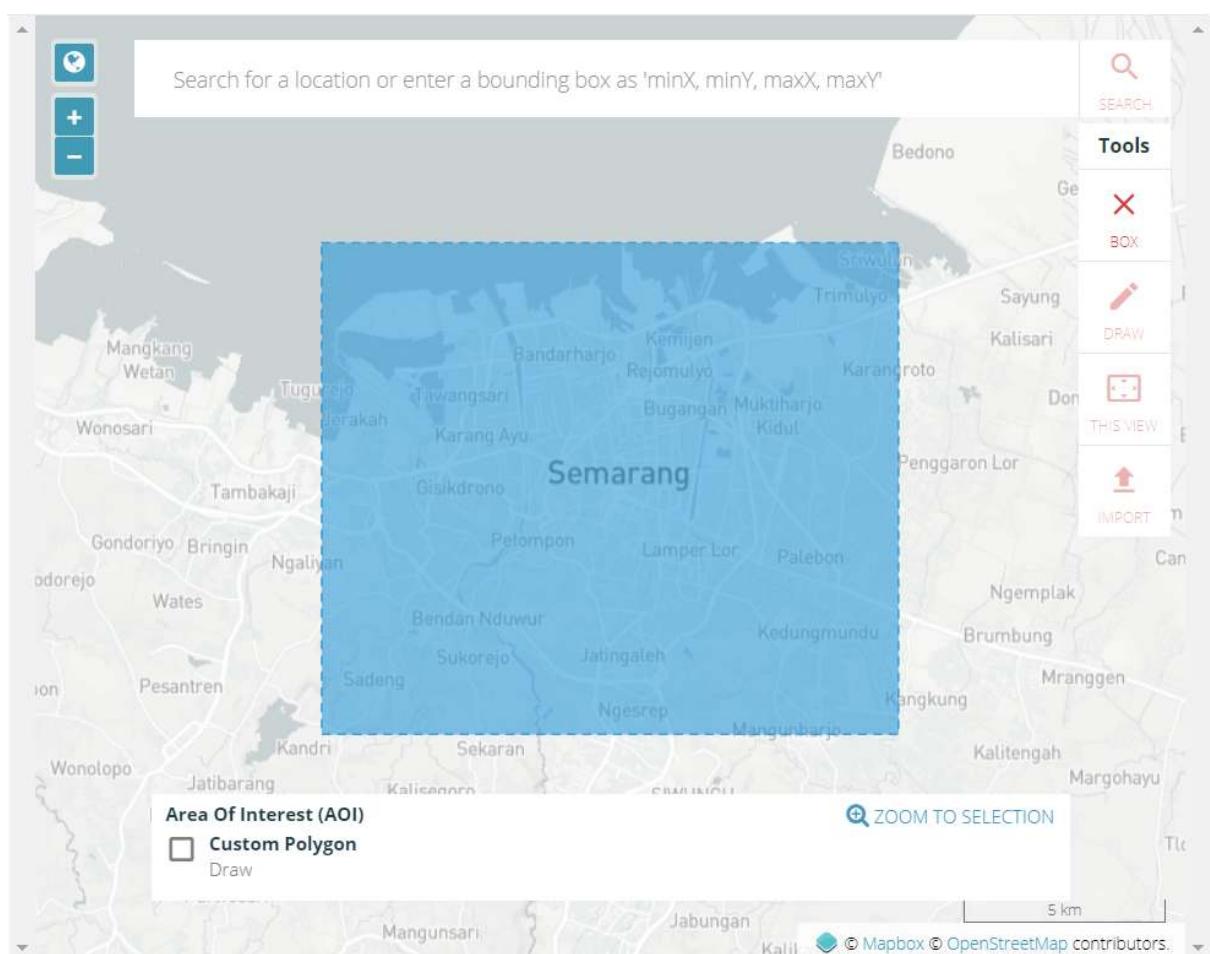


Figure 25: Bounding box

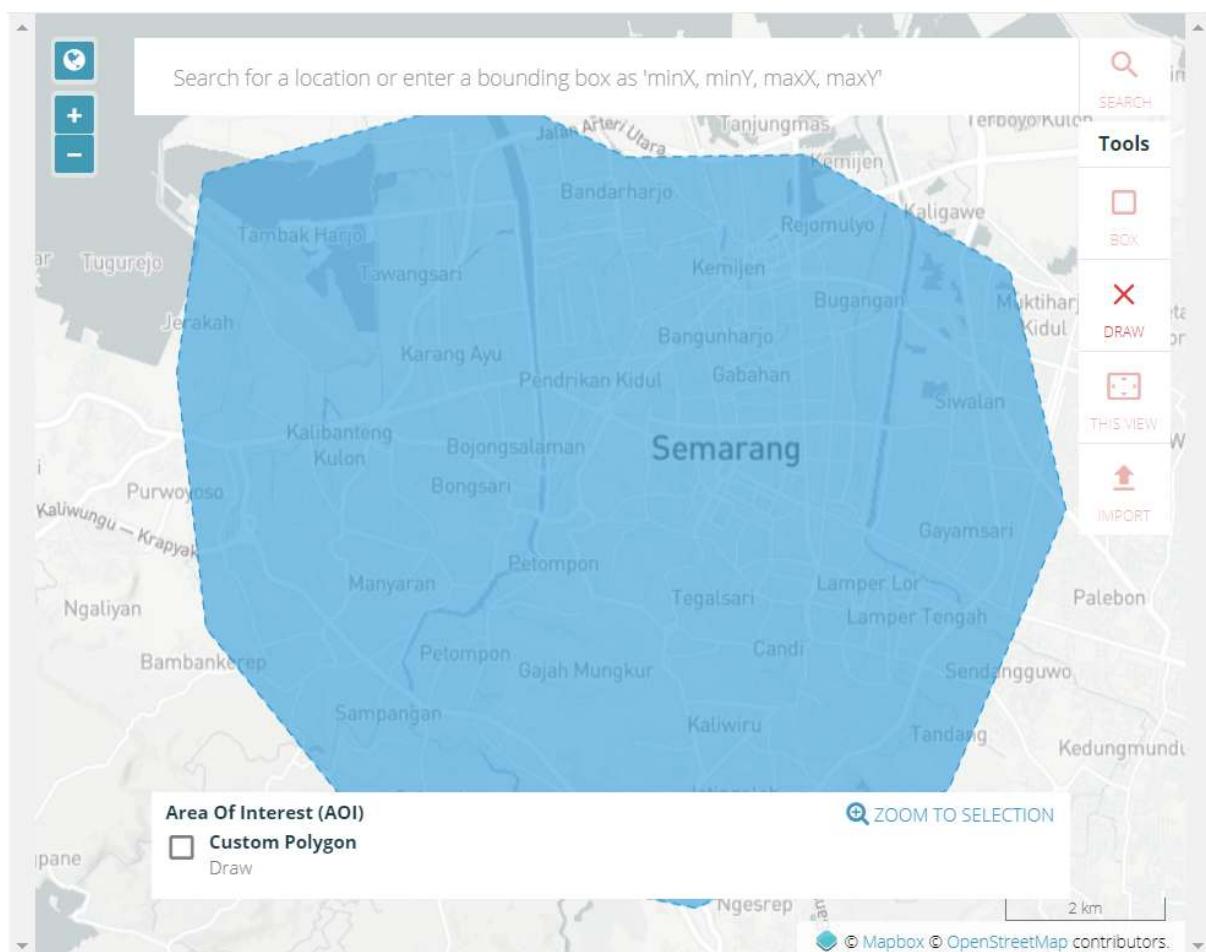


Figure 26: Manually edit

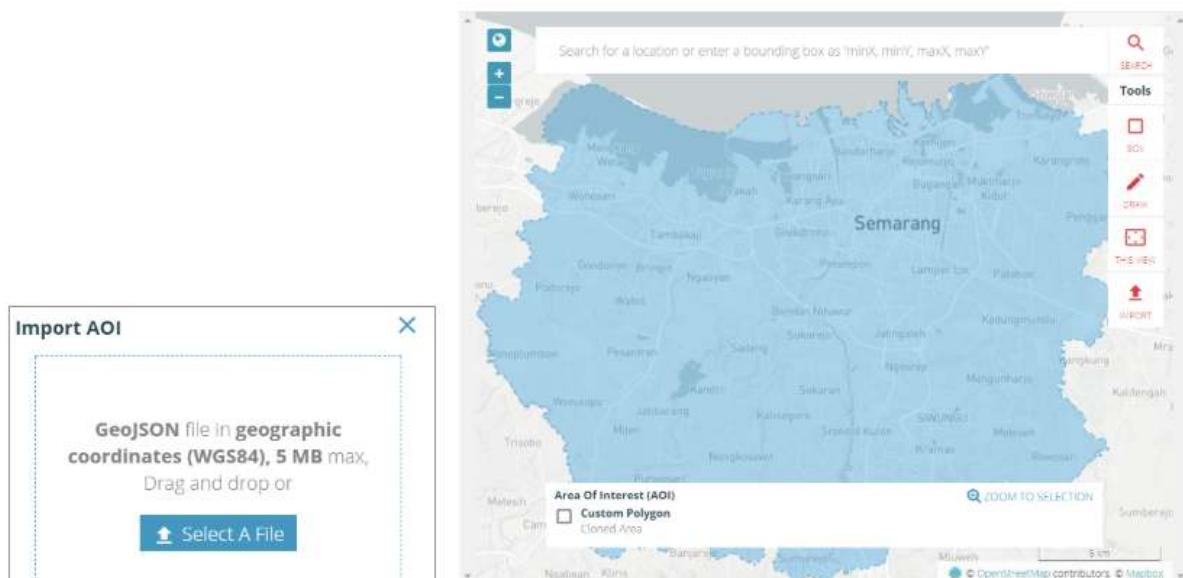


Figure 27: Import the administrative boundary

the Export Tool. If you need larger exports, please Contact Us or use an alternative resource such as downloads from Geofabrik or Mapzen.

#### c. Naming and Describing your Export

- **Name (required):** choose a short, descriptive name.
- **Description:** a long text body, perhaps describing what relevant features the export includes.
- **Project:** Helps to group together exports particular to a project, e.g. "PDC InAWARE in Semarang City"

#### d. Choosing File Format

- Check at least one file format to export. To learn more about each individual format, read the documentation: [Export Formats](#)



- Shapefile .shp
- GeoPackage .gpkg
- Garmin .img
- Google Earth .kml
- OSM .pbf
- MAPS.ME .mwm
- OsmAnd .obf
- MBTiles .mbtiles

Spatial data

#### e. Choosing Map Features

- Click on **Data Menu → YAML**. You can copy and paste the YAML from the section "Creating YAML" in the box.



EXPORT TOOL

1 Describe

2 Formats

3 Data

4 Summary

Tag Tree

Configs

YAML

**Feature Selection**

```
bank:  
  types:  
    - points  
    - polygons  
  select:  
    - amenity  
    - name  
    - addr:full  
    - addr:city  
    - capacity:persons
```

Load from JOSM Preset .XML

Next

## Menu YAML

**f. Downloading your File**

- The last step is the Summary Menu that will be displayed about the projects. Click the **Create Export** to starting the process

1 Describe

2 Formats

3 Data

4 Summary

**Name:** Buildings and roads, Bali Update**Description:** untuk upload data OSM ke geonode BNBP**Project:** Mapathon Gunung Agung**Export Formats:**

- Shapefile **.shp**

 Buffer AOI - expand an uploaded boundary by 0.02 degrees Publish this Export Bundle for POSM**Create Export**

## Menu summary

- After you submit your export using **Create Export**, you will be redirected to the **Export Detail Page**, which shows a list of **Export Runs**. You will see the first run at the top of the page. It will be in one of the following states:

**Submitted:** The export is waiting to be processed. This should be brief, depending on the server load. **Running:** The export is waiting to be processed. City-sized regions should be a few minutes

- larger regions can take upwards of 20 minutes, depending on the density of OSM data. **Completed:** Your export files are available for download. Each export format has a separate download link for its ZIP archive.

The screenshot shows the HOT Export Tool interface. At the top, there are navigation links: About, Learn, Create, Exports (which is circled in red), Configs, English, and Log Out. Below the navigation is a search bar with placeholder text "Name, description, event, or username". Underneath the search bar is a date range selector with fields for Start date and End date, and a "Search" button. A link "Show all Exports" is also present. To the right is a world map with various countries labeled. Below the map is a copyright notice: "Made with ❤ by HOT and friends". At the bottom left is a "Resolving host..." status bar, and at the bottom right is a "Part of the Code" link.

## Menu Export

- If the status will be **COMPLETED**, we can download the data with a click on **bank\_smg\_shp.zip** and save in your directory.

The screenshot shows the Export tool interface. On the left, under "Export #84caa9e3-8fce-49e1-8204-8fe06cef6605", there is a table with the following data:

Description:	untuk latihan
Project:	PDC InAware
Area:	542 sq km
Created at:	Monday, February 25th 2019, 1:23 pm
Created by:	DewiSulistioningrum
Published:	Yes
Export formats:	Shapefile (.shp)
OSM Analytics:	<a href="#">View this area</a>

At the bottom of this section are buttons: Features, Re-Run, Clone, and Delete.

On the right, under "Run #d3b6d782-65a6-47c5-b85d-23999083e79a", there is a table with the following data:

Status:	COMPLETED
Started:	Monday, February 25th 2019, 1:23 pm
Finished:	Monday, February 25th 2019, 1:23 pm
Duration:	a few seconds
Shapefile (.shp)	<a href="#">bank_smg_shp.zip</a> (39 kB)

## Completed Process

### Exercise!

- Create the new projects from this link <https://tinyurl.com/group-stats>.
- You can use the administrative boundary from Semarang City for Import in the project, download the admin in this link <https://tinyurl.com/admin-semarang>.
- The results will be used in the next chapter **Group Stats Plugin for Calculate The Objects**. If you have finished, the results consist of two shapefile (public facilities and highways).

### SUMMARY

You have learned about how to download the spatial data using YAML in the Export Tool. The results data from YAML, the attributes table will be the same with the data in your mapping projects and the attributes table have organized. You can open the file in mapping software, like QGIS.

— title: JOSM for Data Quality weight: 4 —

### Objectives:

- Understanding how to select and count numbers of objects in certain administration boundary
- Understanding how to count numbers of *error* and *warning* in certain administration boundary
- Understanding how to validate administration boundary

One of the expected results in doing mapping activity is to produce a good quality map. The quality including object information completeness and right topology. Using *OpenStreetMap* as a base map to show the result of field survey could help you to monitor the progress of your mapping activity result by counting objects and information from the field. In this module you will learn how to count your field survey data and administration boundary using Java *OpenStreetMap* (JOSM)

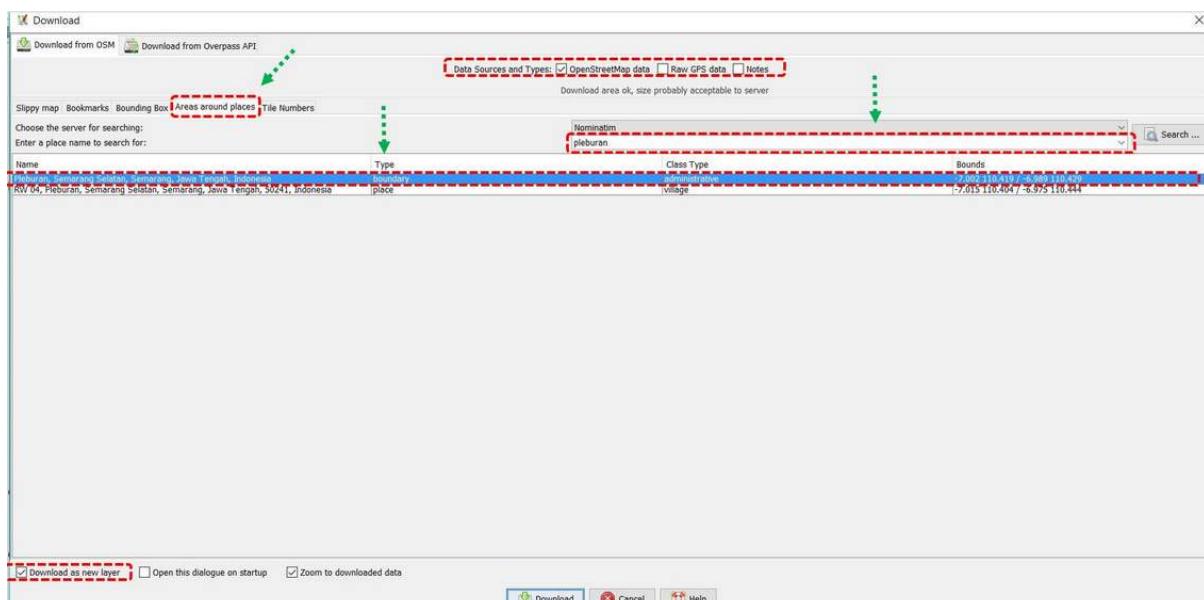
## I. Counting Objects in Certain Administration Boundary

One of the stages of data quality monitoring is by counting the objects in your mapping area. The purpose is to know the progress of the mapping activity such as before and after the mapping started. Moreover, this activity can help you to validate the completeness of information for your mapping objects. You can use JOSM to count your mapping objects on your survey area. There are steps to count objects in certain administration boundary such as village level, as follows:

### a. Download OpenStreetMap Data in Mapping Area

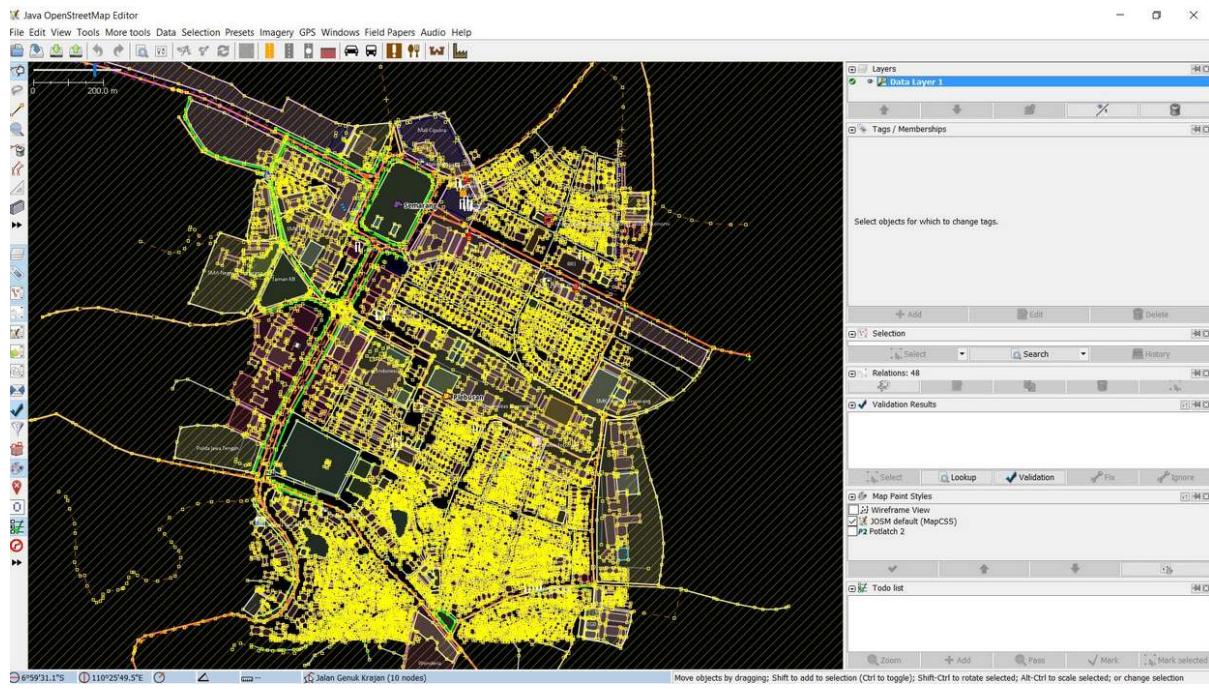
Before you start counting your mapping objects, you need to *download OpenStreetMap* data in your mapping area. When counting the objects, you can use your mapping area administration boundary such as village boundary. In this example, you will count the objects in **Pleburan Village**. These are the steps that you need to follow to *download OpenStreetMap* data:

- Open **JOSM** in your laptop / computer.
- Select **File → Download Data** menu, you will see a download box around your mapping area in *OpenStreetMap*.
- Select **Areas around Places** menu and type village name “**Pleburan**” in the search box and remember to check **OpenStreetMap Data** and **Download as New Layer** option
- If it has finished, please choose the most relevant result with your mapping area. You can look at the city location and has *boundary=administrative* tag. Your result will be in blue color



Download Area Searching Window in JOSM

- After set all the options like the picture above, you can click **Download**.



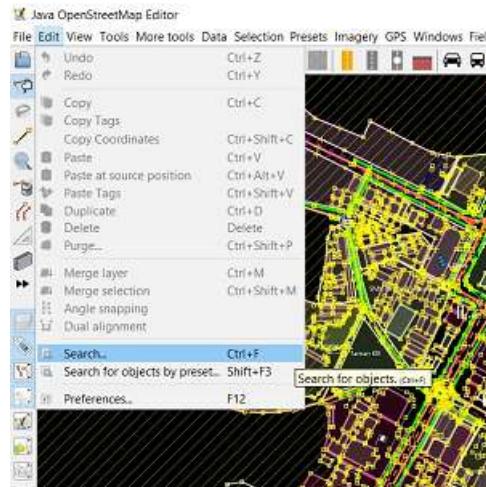
### JOSM Download Data Result

Notes : If your mapping area size is too large, please download it periodically into JOSM

#### b. Counting Objects in Certain Administration Boundary Area

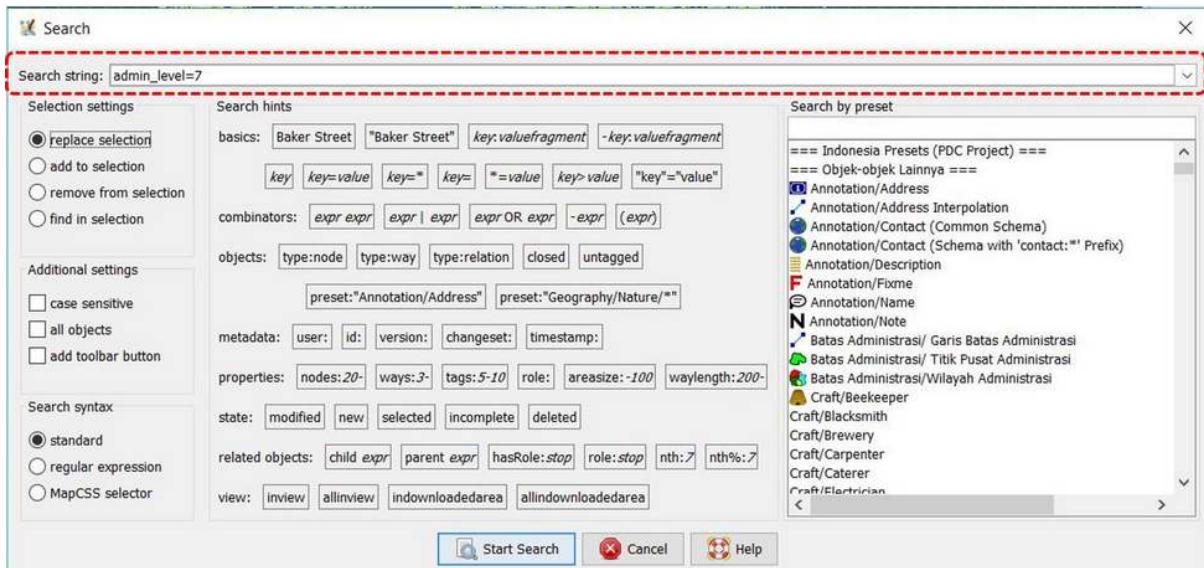
If you have successfully download data in your mapping area, the next step is counting total of objects in it. The steps to count numbers of objects in your mapping area as follows:

- Click **Edit → Search** menu to select administration boundary of Pleburan Village.



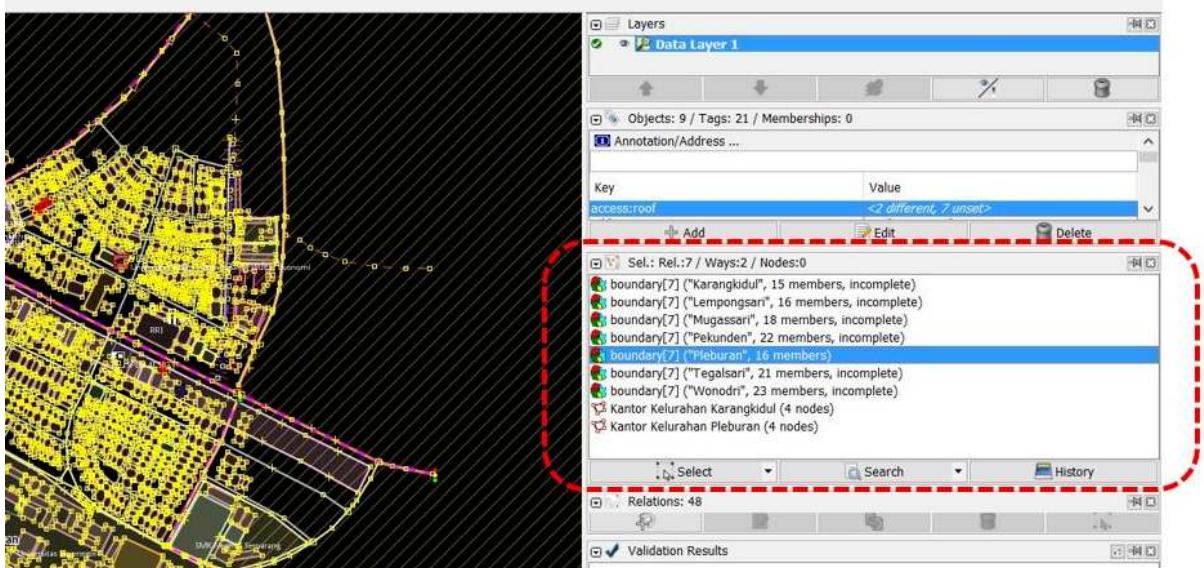
#### Data Search Menu in JOSM

- In search string, please type “**admin\_level=7**” (village level) and click **Start Search**



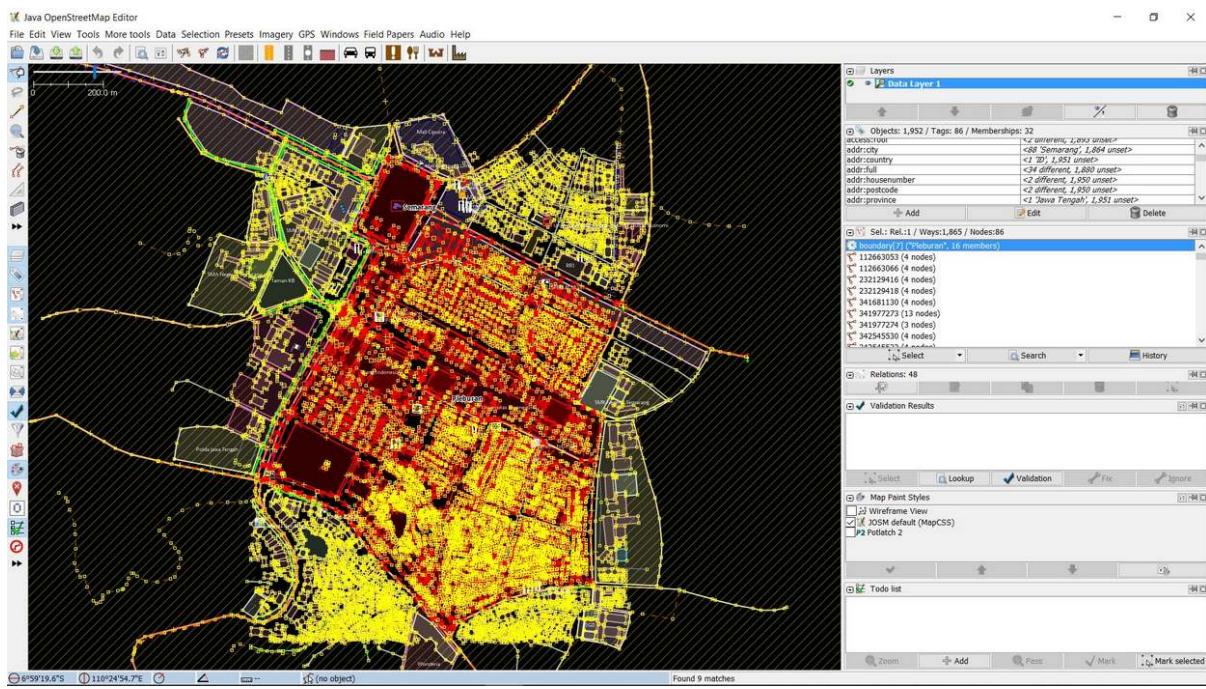
### Searching Window to select certain area in JOSM

- You will see all objects that have \_"admin\_level=7\_" tag will selected and listed in **selection** window. Then you can select **Pleburan Level** which you can count all object on it by **double click** it. You will see administration boundary of Pleburan Village will be shown in purple color in JOSM data layer which indicate that the village has been selected.



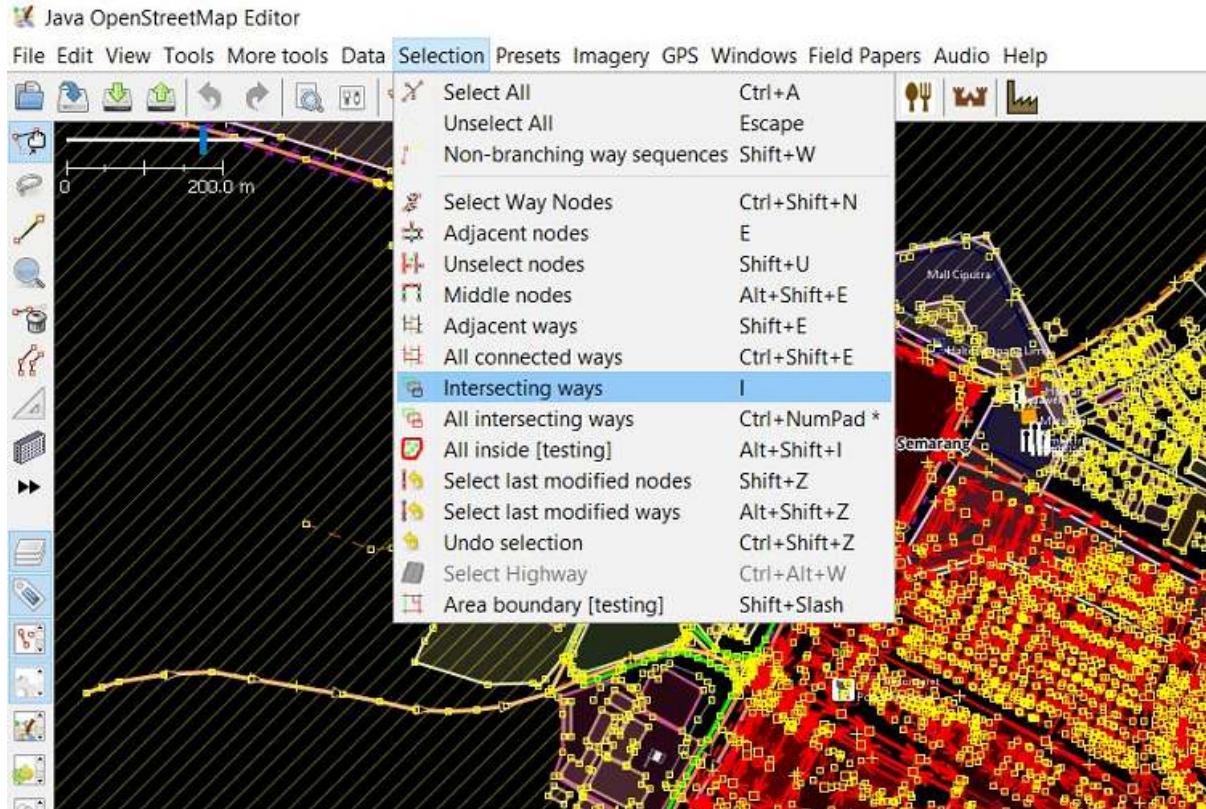
### Selected Village Output in JOSM

- If your JOSM has not **Selection** menu, you have to install **utilsplugin** plugin in your JOSM. The explanation about how to install the plugin can be seen in **Adding OSM Data using JOSM** module. After that, please select **Selection → All inside [testing]** menu. You will see all objects inside Pleburan Village will be selected and have red color.



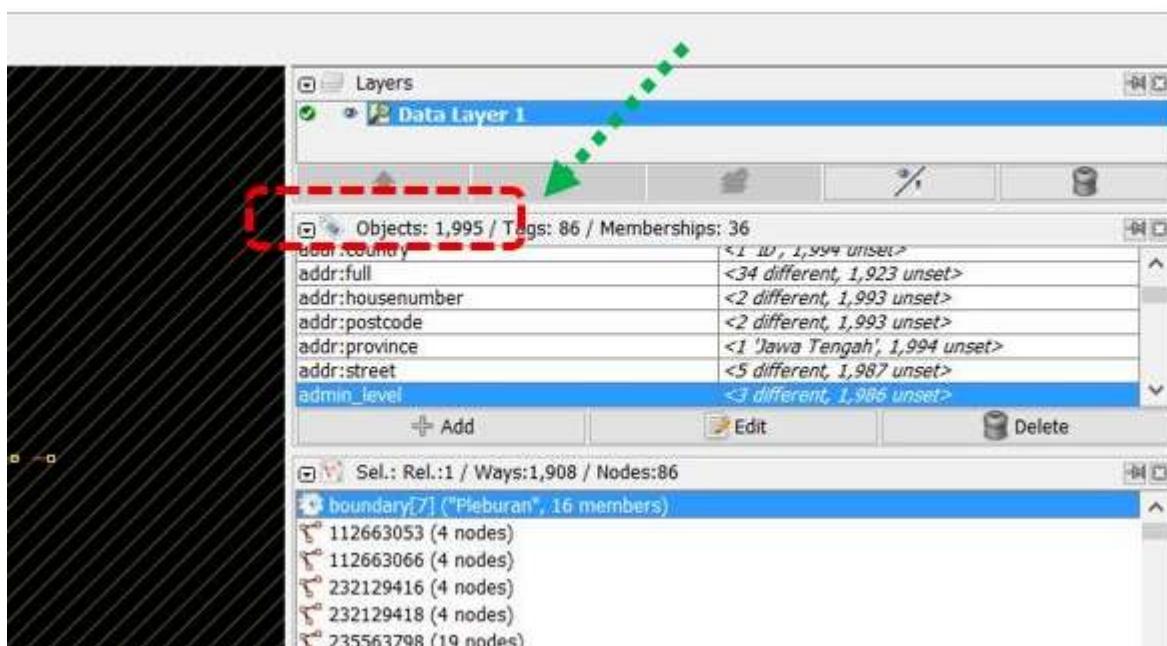
### Data Selection Result in JOSM

- After that, please select **Selection → Intersecting Ways** menu to select all objects inside and intersected with Pleburan Village, such as road networks and river. Duration of this process depends on area size and number of objects inside the village.



### All Selection Result on Certain Administration Boundary in JOSM

- You can see all the total number of objects in *properties/membership* window.



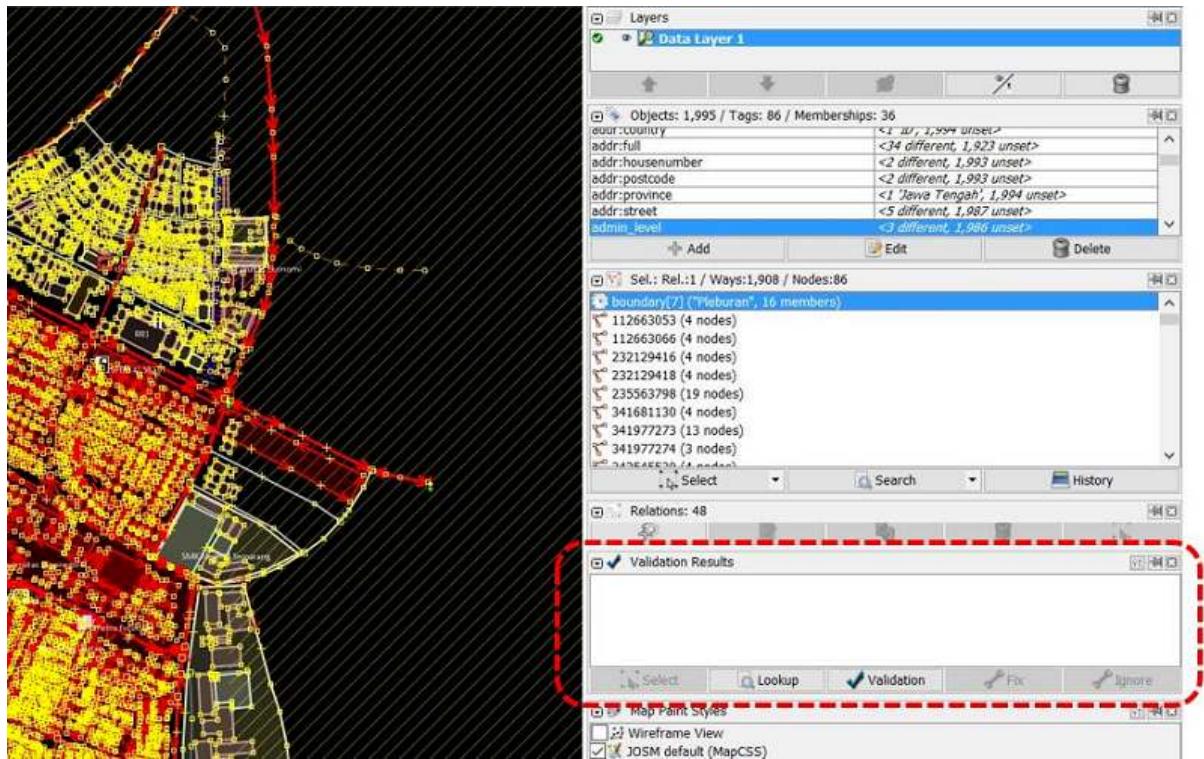
#### All Data Selection in Certain Area in JOSM

- As you can see in the image above, there are 1995 objects in Pleburan Village have been selected. Please keep in your mind, this result is **whole** selection result of objects. You do not need to count for each specific object in your mapping area using JOSM.

#### II. Count Number of *Error* and *Warning* in Certain Administration Boundary

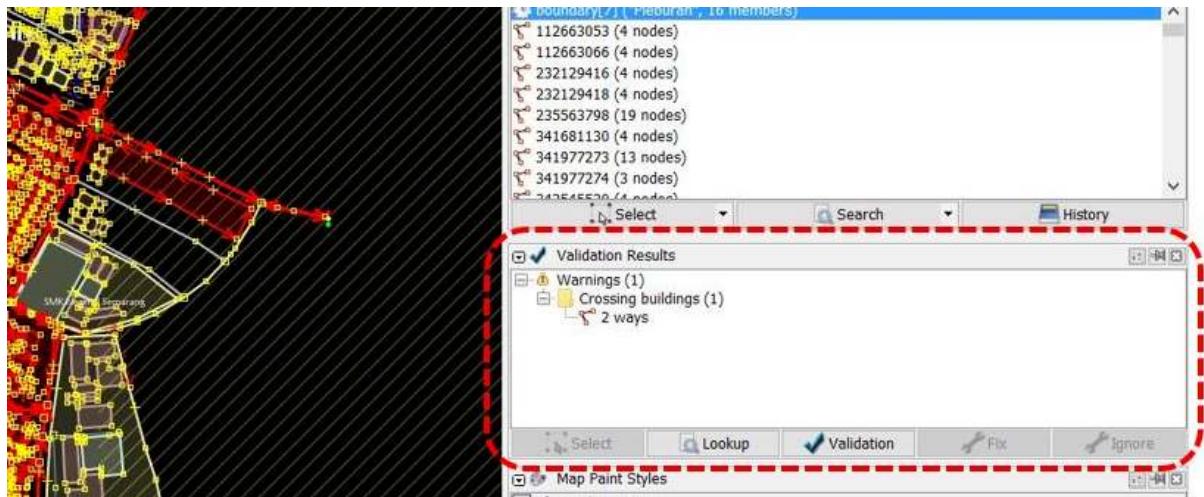
After successfully counting the total number of objects in your mapping area (in this module is Pleburan Village), you should continue to follow the steps to see and count number of *Error* and *Warning* on objects in the village:

- Click **Validation** in your validation window. Wait until JOSM finish to count the number of *Error* and *Warning* on your objects.



Data Validation Window in JOSM

- If your JOSM has finished, you will see the results in the validation window. You better write the number of error and warning then try to fix them all. For further explanation about how to validate and fix error and warning in JOSM can be seen in **JOSM for Survey Data Validation**.



Data Validation Result

- After you have fixed the error and warning , you can calculate data quality number in **Microsoft Excel or Google Sheet**. The result will show data quality comparison in the mapping area, before and after the mapping activity has done. Error and Warning types also need to be added into calculation table.

#### Table of Data Quality Recapitulation

As you can see on the table above, the number of objects in Pleburan Village before the mapping activity was 1.863 where there were 4 warnings. After the mapping activity and validation have done, the number of objects is increasing to 1.963 where there are no error and warning have been found. You can see the whole recapitulation table for Data Quality in Semarang in this link: <http://bit.ly/tabeldatasemarang>

Sub-Districts	No	Villages	BEFORE					AFTER				
			Object	Error	Error (%)	Warning	Warning (%)	Object	Error	Error (%)	Warning	Warning (%)
SEMARANG SELATAN	116	BULUSTALAN	1659	0	0.0%	0	0.0%	1628	0	0.0%	0	0.0%
	117	LAMPER KIDUL	1457	0	0.0%	3	0.2%	1557	0	0.0%	0	0.0%
	118	LAMPER LOR	1268	0	0.0%	8	0.6%	1577	0	0.0%	0	0.0%
	119	LAMPER TENGAH	3296	0	0.0%	17	0.5%	3658	0	0.0%	0	0.0%
	120	MUGASSARI	2693	0	0.0%	1	0.0%	2760	0	0.0%	0	0.0%
	121	PETERONGAN	1616	0	0.0%	12	0.7%	2010	0	0.0%	0	0.0%
	122	PLEBURAN	1863	0	0.0%	4	0.2%	1963	0	0.0%	0	0.0%
	123	RANDUSARI	2226	0	0.0%	1	0.0%	2458	0	0.0%	0	0.0%
	124	WONODRI	2949	0	0.0%	31	1.1%	3183	0	0.0%	0	0.0%

Figure 28: Data Validation Result

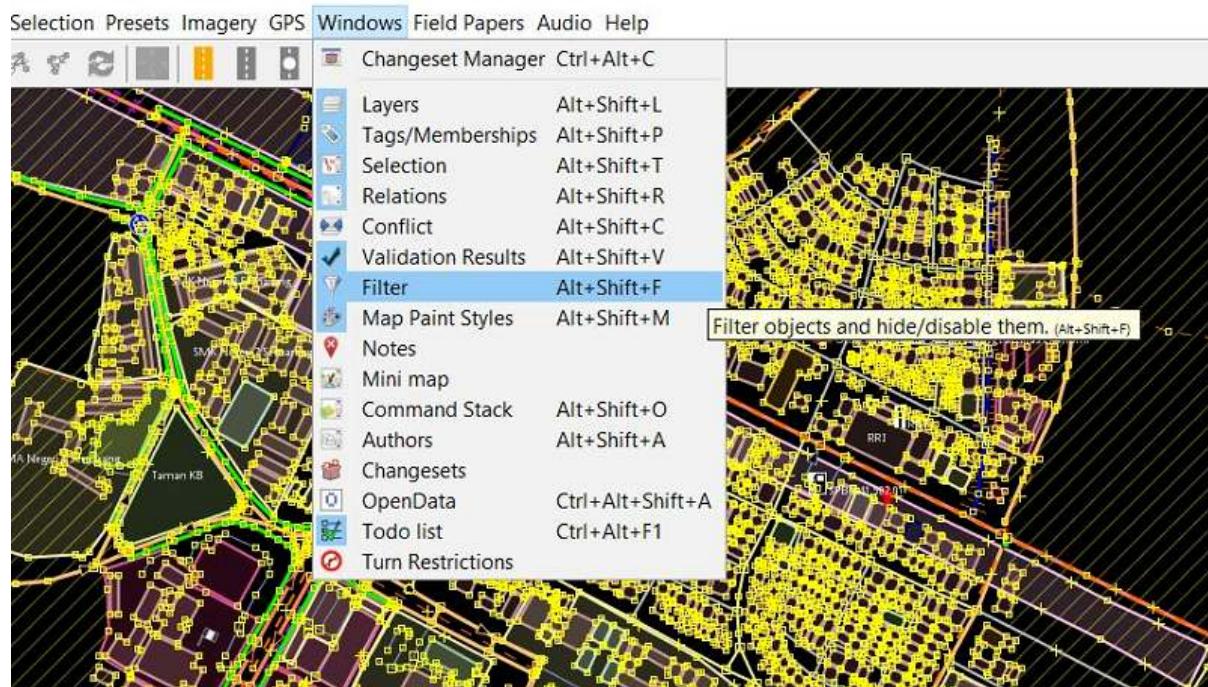
### III. Administration Boundary Validation

After have finished to calculate the number of objects and data quality in your mapping area, you need to calculate and validate the administration boundary of your mapping area. In this calculation, you will validate of administration boundary such as village and sub-village boundary (RW) in your mapping area. You need to check number of sub-village in the mapping area, boundary information (tag) completeness, relations of village and sub village boundary and backup the boundary as an .osm file. We still use **Pleburan Village** as an example in this validation.

#### a. Counting Number of Sub-Village (RW)

These are steps that you have to do for counting number of sub-village (RW) in your mapping area:

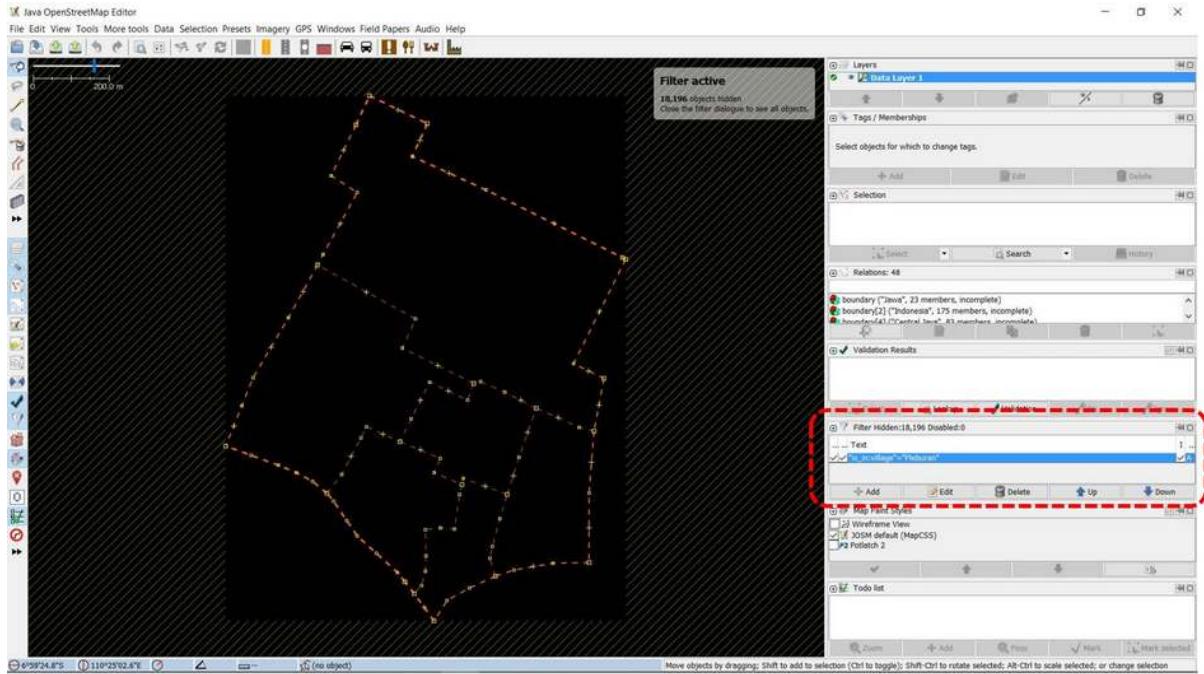
- You have downloaded Pleburan Village in your JOSM. However, it also means you download all objects in the village and it could be difficult for you to see and edit the administration boundary because so many objects around it. Therefore, you have to filter the data. If you have not known about filter tools functions in JOSM, please look at **Menggunakan Alat Filter di JOSM** module
- Activate your \_filter \_tool in JOSM by click **Windows → Filter**



Activate the filter tool in JOSM

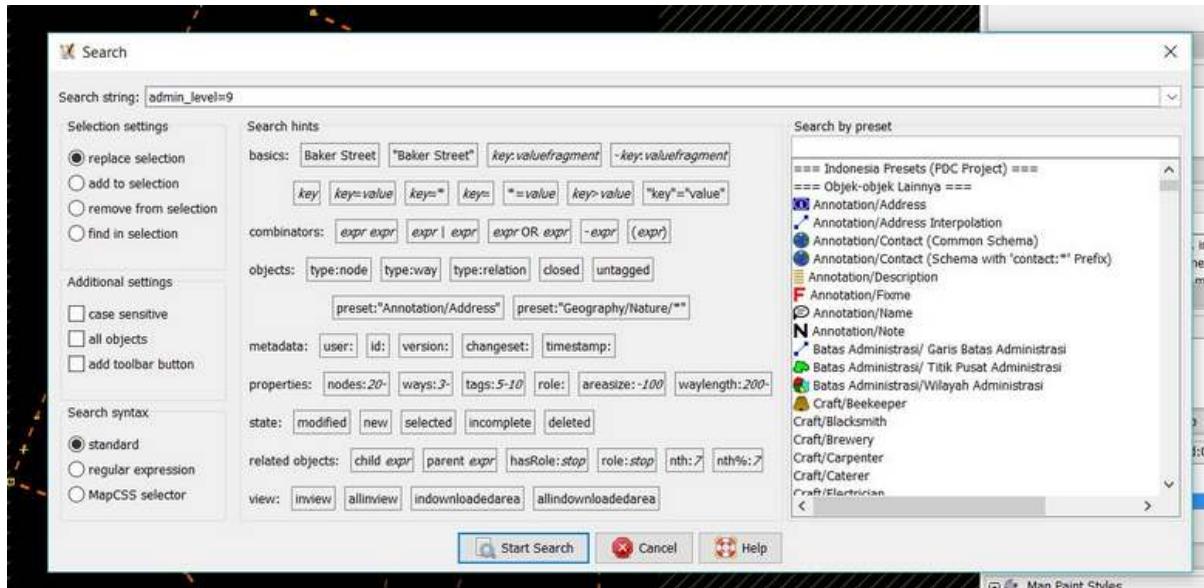
- **Filter** window will appear in JOSM. please click **add** and write **query** to filter the data show it only shows administration boundary. The query is “**is\_in:village**=”**Pleburan**”.

- You will see your data will change like the picture below:



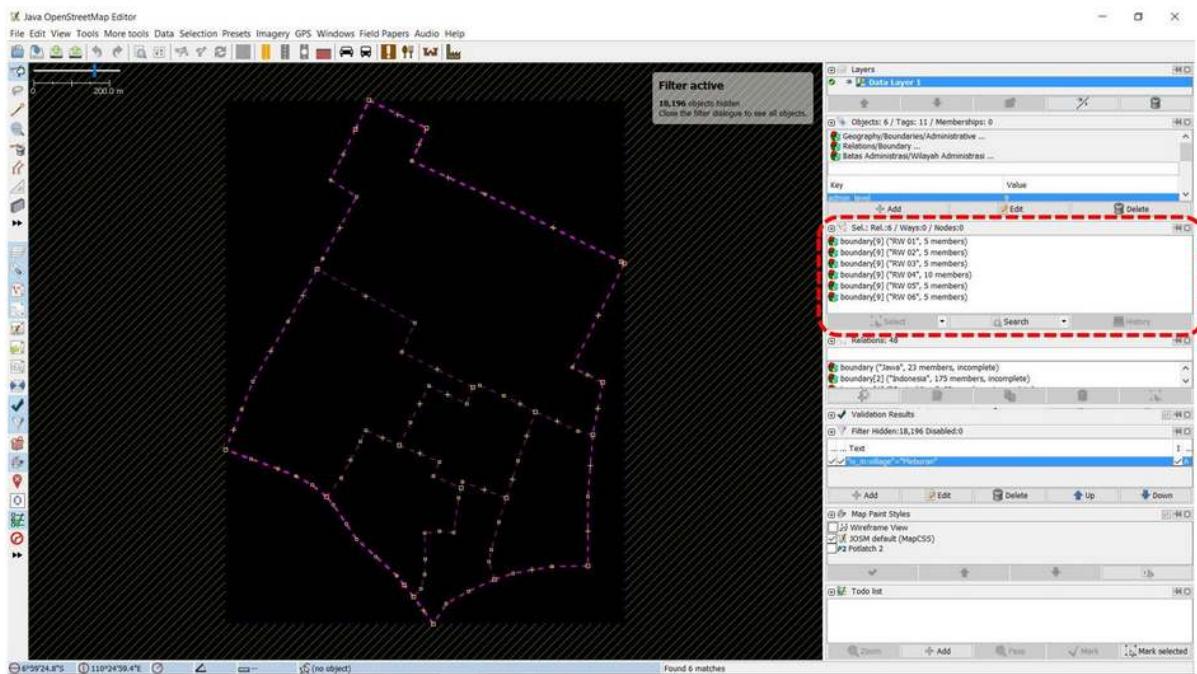
### Administration Boundary Filter in JOSM

- Select all sub-village boundary in Pleburan Village with **search** function. Click **Edit → Search**. You will see a search window and write query “**admin\_level=9**” then click **Start Search**.



### Query for search sub-village boundary in JOSM

- You will sub-village boundary in your village be selected. It is shown by purple color in the boundaries. In **selection** window you will see all sub-village list in Pleburan Village.



### Selection Result for Sub-Village Boundary in Pleburan Village

- You can compare number of sub-village (RW) in Pleburan Village which a result of selection function in JOSM in recapitulation table of field survey.

KECAMATAN	Jml. KEL	KELURAHAN	Jml. RW
SEMARANG SELATAN	10	BARUSARI	7
		BULUSTALAN	4
100% Mapped		LAMPER KIDUL	6
100% Validated		LAMPER LOR	5
		LAMPER TENGAH	8
		MUGASSARI	7
		PETERONGAN	8
		PLEBURAN	6
		RANDUSARI	7
		WONODRI	13

Table of Sub-Village Boundary Recapitulation

As you can see on the table above, the number of sub-village (RW) in Pleburan Village is 6 sub-villages. This number is same with the selection result in JOSM which also select 6 sub-villages boundaries starting from RW 01 to RW 06. Therefore, there is no error on number of sub-villages in your mapping area. You can continue to validate the tag and relation of boundary administration.

### b. Counting Tag Completeness and Boundary Administration Relations

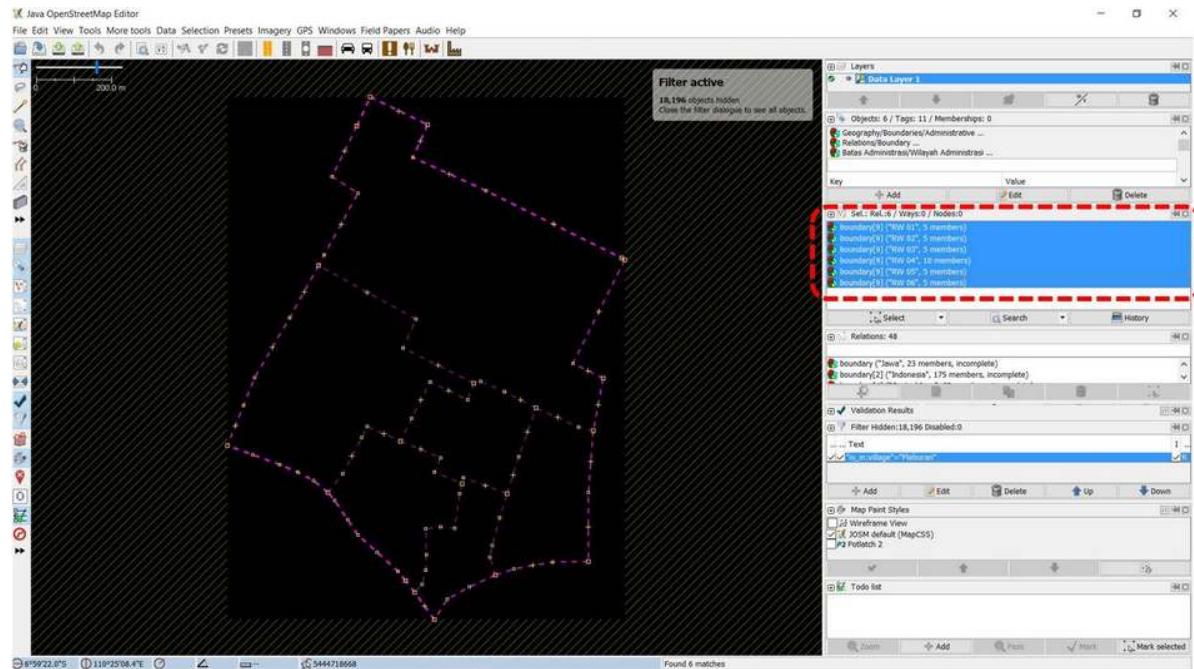
After counting number of sub-villages in Pleburan Village, now you need to validate the boundary administration tag completeness. These are the tags that need to have for each of sub-village (RW) boundary administration:

Table of Boundary Administrative (RW) Tag List

key	possible values
type	boundary
boundary	administrative
name	(RW name)
admin_level	9
is_in:province	(province name)
is_in:city (City) / is_in:town (District)	(city/district name)
is_in:municipality	(sub-district name)
is_in:village	(village name)
flood_prone *only for RW relation	yes, no
landslide_prone *only for RW relation	yes, no
source	HOT_InAWARESurvey_2018 (Based on the mapping project name)

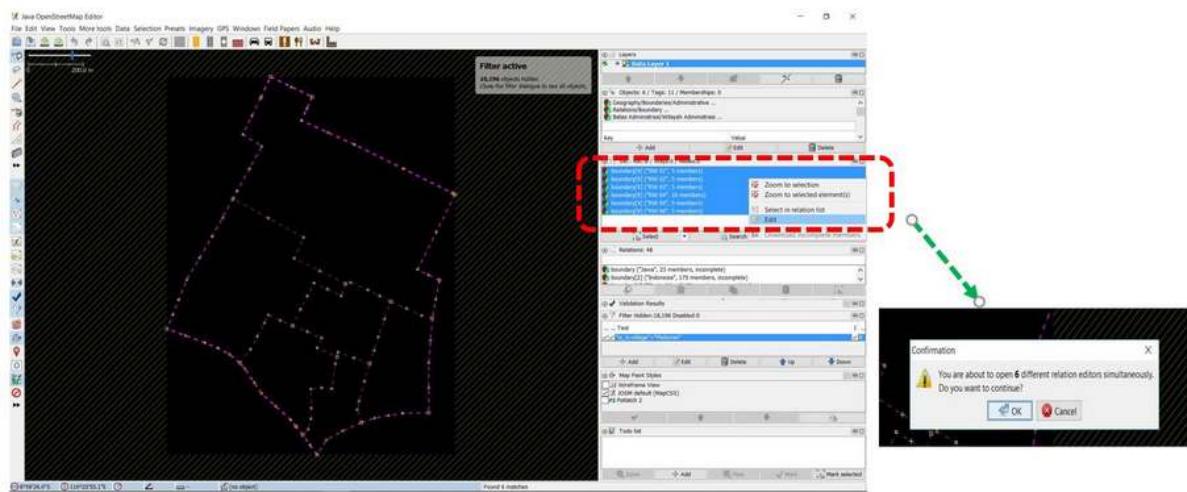
To validate tag of sub-village administration boundary, please follow these steps:

- Choose all sub-villages in **selection** list result from **search** feature in JOSM.



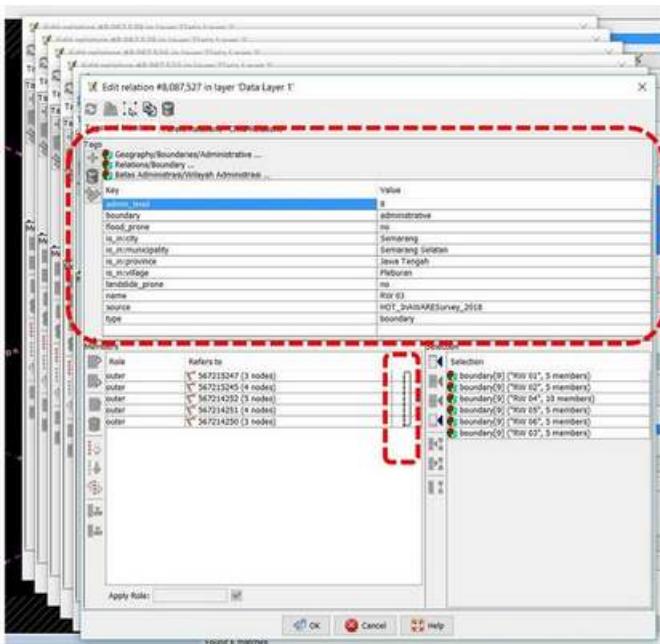
#### Select sub-villages in Pleburan Village

- Right click on sub-villages list and choose **Edit**. You will see a warning window that remind you where all information related the sub-village in Pleburan Village will be open in 6 windows. Click **Ok**.



#### Notification to see Sub-Village Information

- After the window is open, you need to check the tag completeness for each sub-villages. Moreover, the boundary relation checking needs to be done by see the relation connection in **member**. You can see whether your relation is a good relation if connection between sub-village member all connected and creating *loop* or circle. If you want to know more details about connection between relation and how to add it, please see **Membuat Batas Administrasi di JOSM** module.



#### Relation Window and Information of Administration Boundary

You can add another tag if there are some tag still not added in the sub-village based on tag list above. You also can fix the relation and member order and rules for each member.

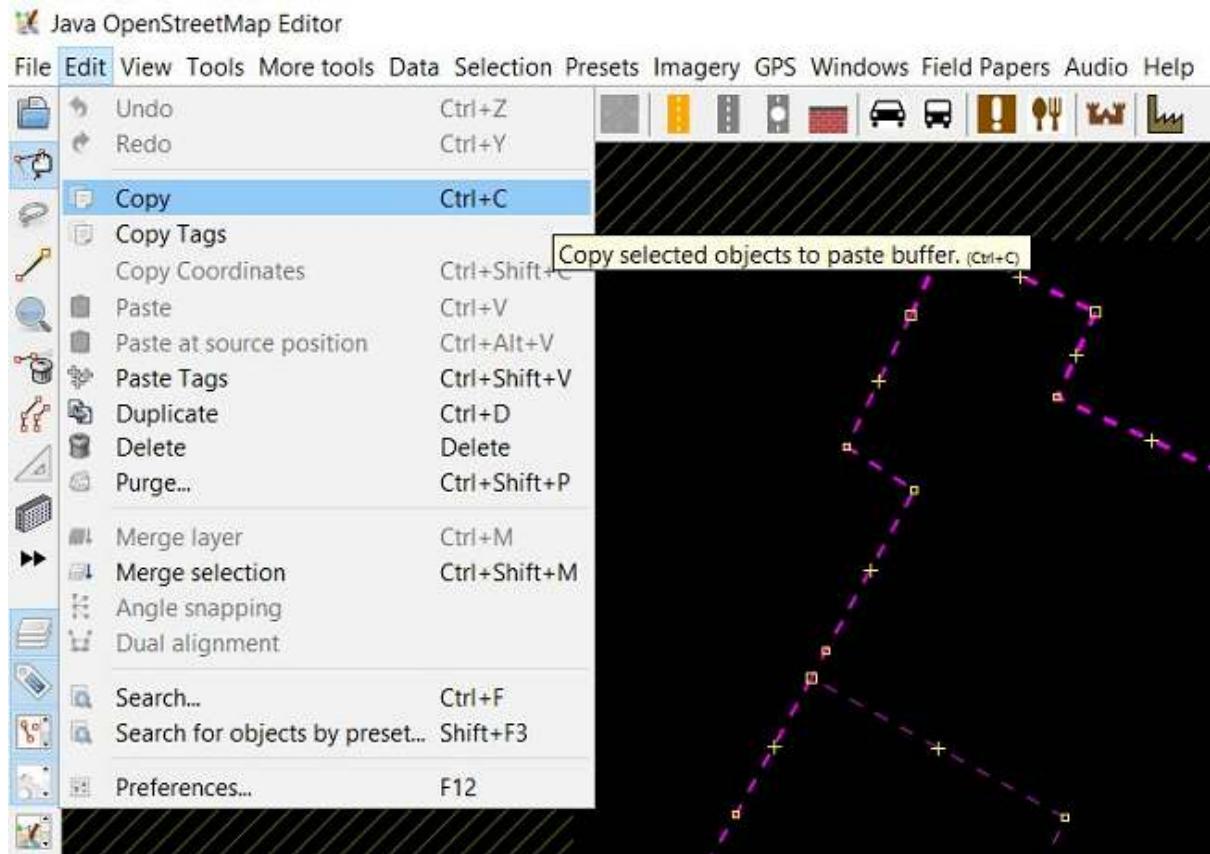
Note : If the number of sub-village does not same with the field survey (more or less), you need to discuss this problem with the Data Entry and Quality Assurance who survey and input all the boundary into OpenStreetMap. Do same validation steps for relation for sub-district ("admin\_level=6") and village ("admin\_level=7") administration boundary.

#### c. Administration Boundary Backup

After doing recapitulation and validation for administrative boundary, you need to backup the administrative boundary. Thus, you will have a backup for your administrative boundary when something unexpected events happen such as the boundary accidentally deleted or some users edit it wrong. To

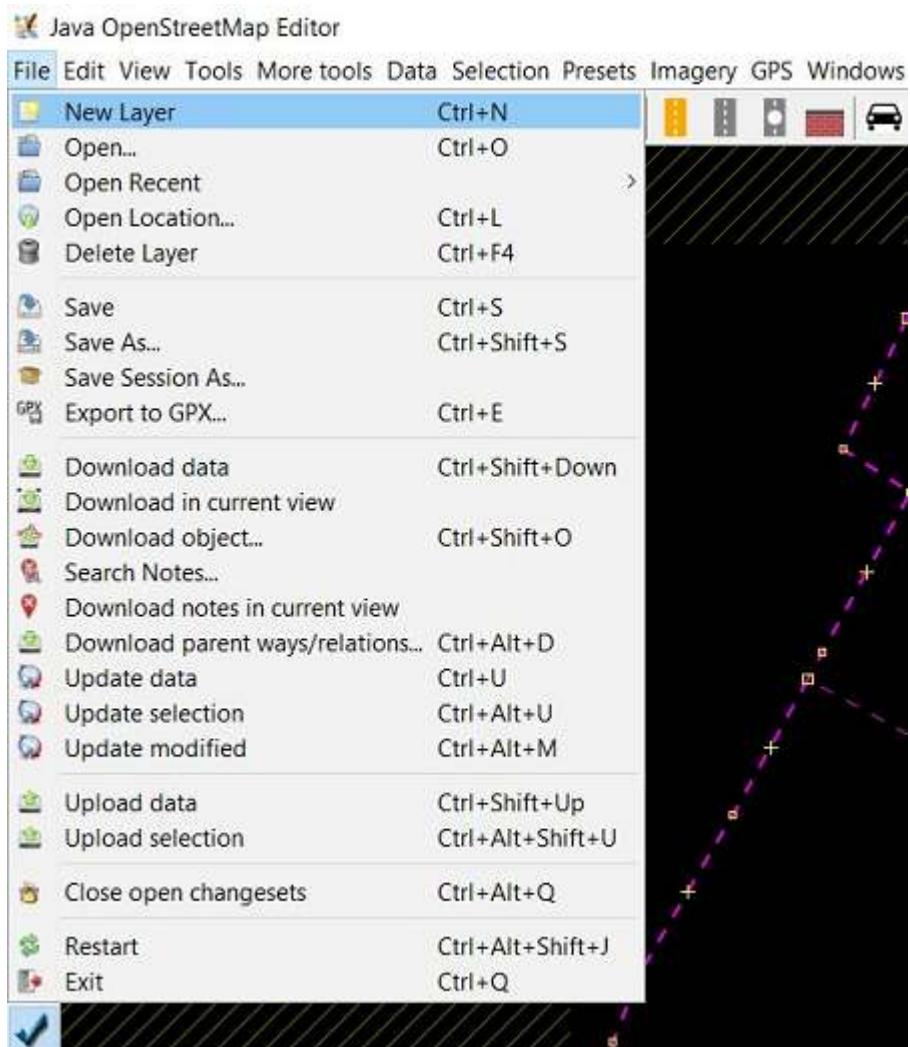
do so, the steps as follows:

- Click **Edit → Copy**



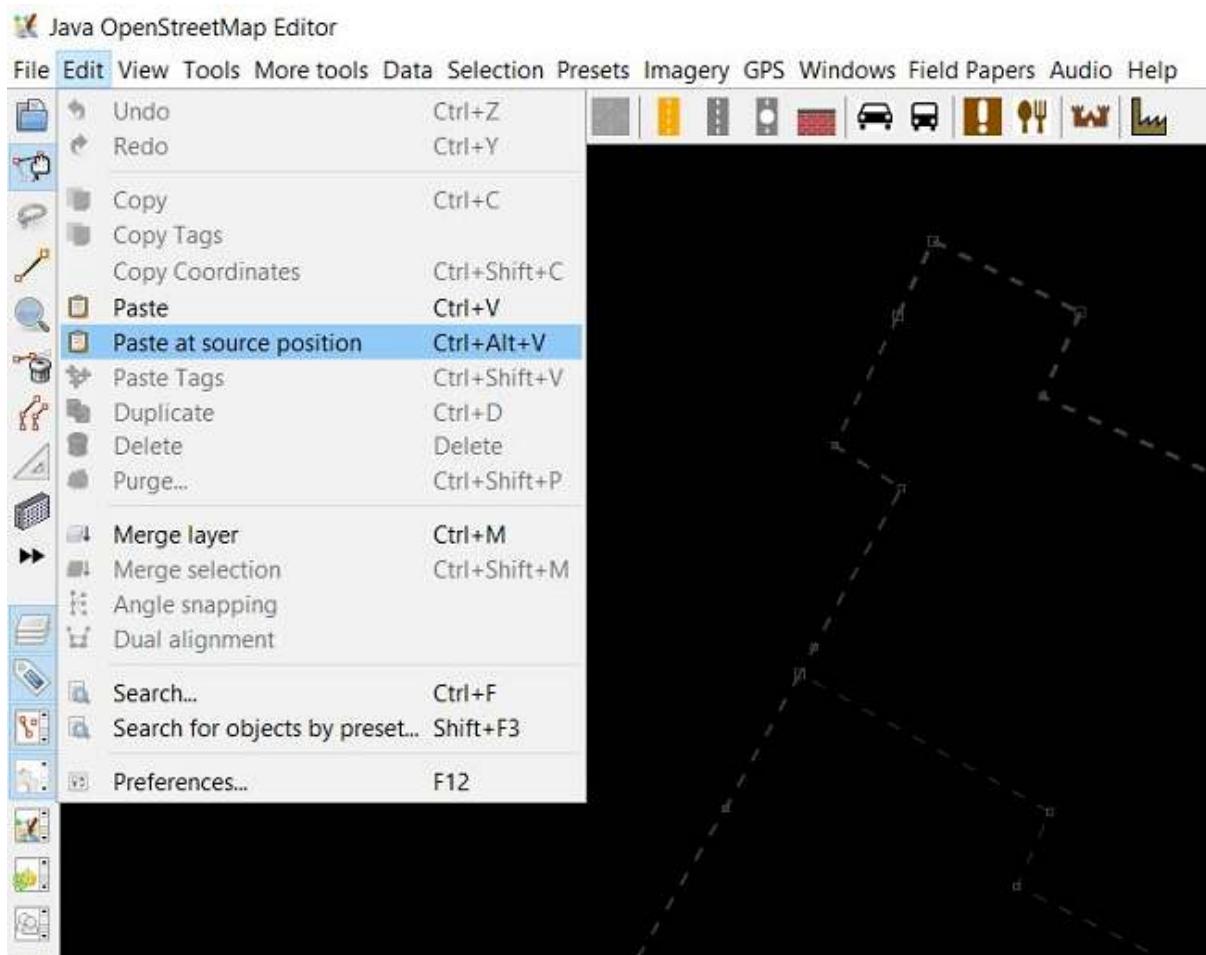
#### Copy Administration Boundary in JOSM

- Choose **File → New Layer** You will see new layer in JOSM.



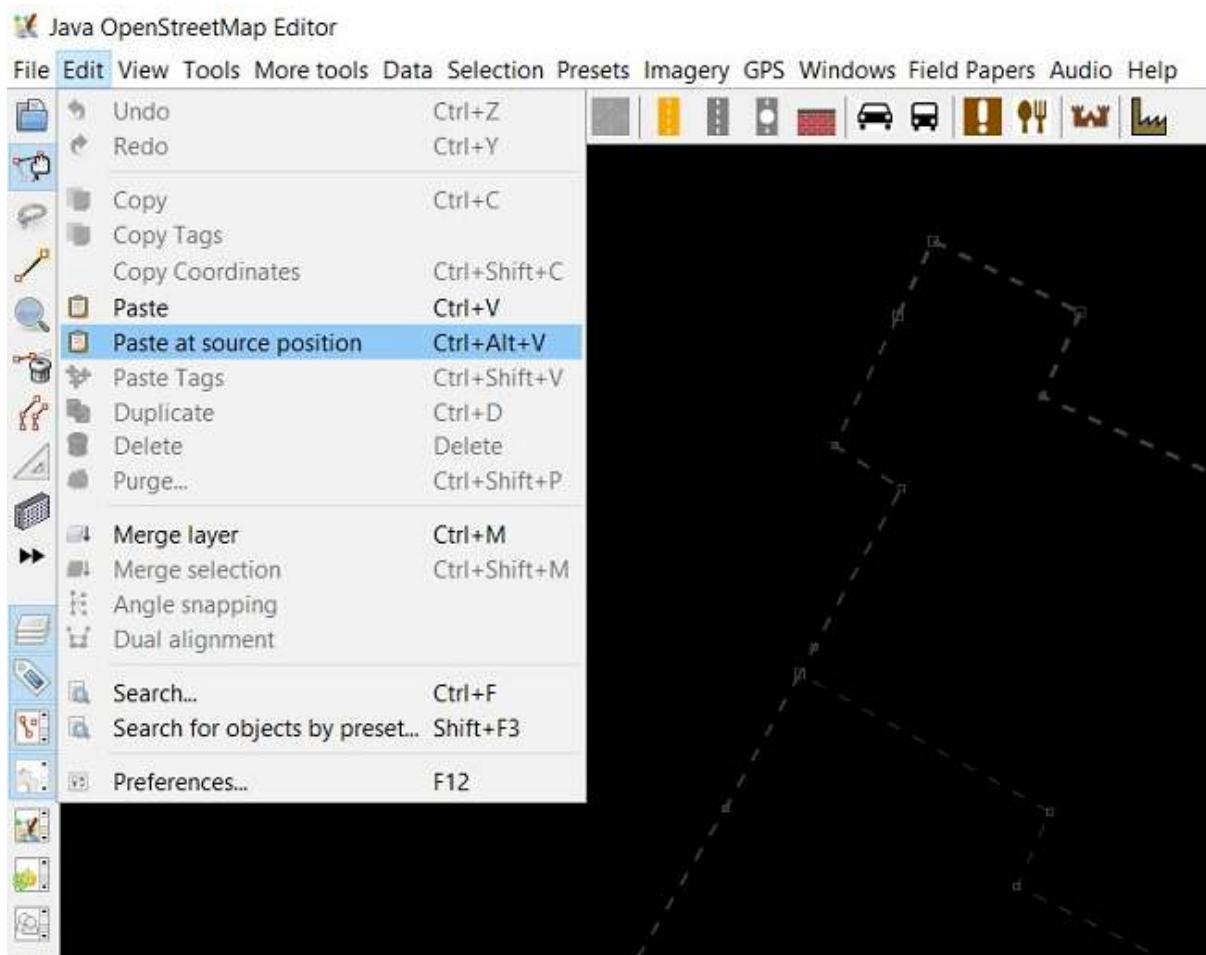
Create New Layer in JOSM

- Click **Edit → Paste at source position**



#### Copy and Paste Administration Boundary in New Layer

- You now have a new layer that only show administration boundary of your mapping area. Please click **File → Save** and save it into .osm file format and give name based on your mapping area.



Save Administration Boundary Layer in JOSM

## SUMMARY

You have learned about how to recapitulate data quality in JOSM. This activity is one of the validation activities for field survey data that has been added into *OpenStreetMap by Quality Assurance*. By doing this, your data quality will be assured and have better quality. These are details about what objectives that have learned in this module:

- Count number of objects in certain administration boundary (village)
- Count number of *error* and *warning* in certain administration boundary
- Doing Recapitulation to compare number of objects and *error/ warning*
- Validate administrative boundary including count number of sub-village in certain village, checking tag completeness and relation between administration boundary.
- Backup the administration boundary into .osm file format

# 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

## I. What is OSMTracker?

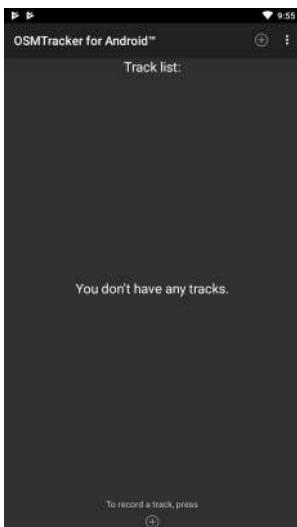
OSMTracker is an android application that allows us to record our survey data. Similar to GPS, OSM-Tracker is able to record waypoint and also track. If you want to learn more about GPS for field survey, you can see the **GPS Module**. What makes OSMTracker different with common GPS device is its capability 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

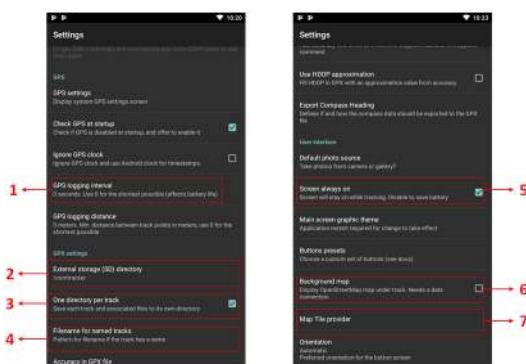
## II. OSMTracker Setting

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.

### III. 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.



Figure 29: 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.

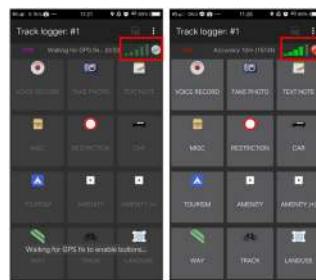


Figure 30: Track logger feature

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



Figure 31: Track logger page on OSMTracker

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.

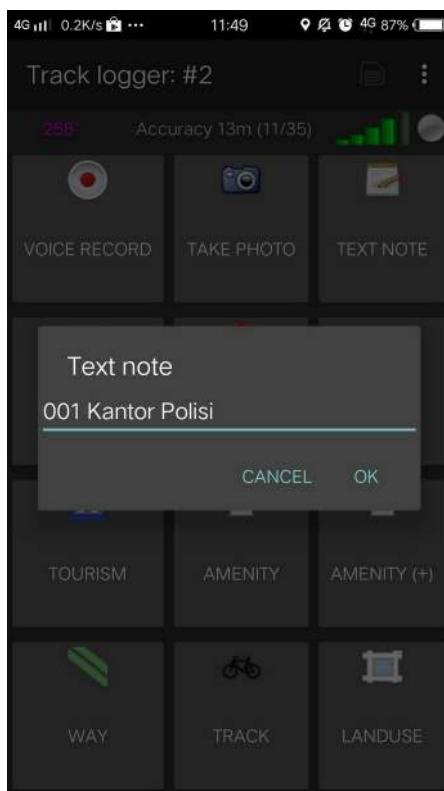


Figure 32: Text note function to record waypoint on your survey

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.

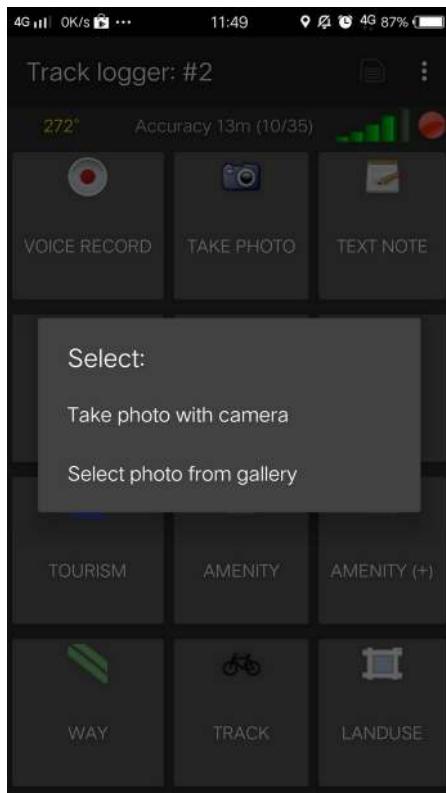


Figure 33: You can choose to take the photos straight from your camera or select from your smartphone's gallery

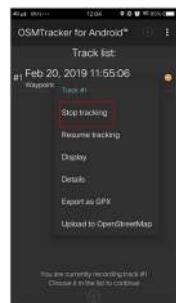
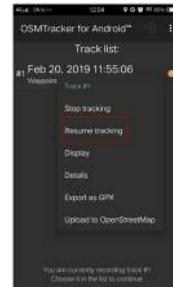


Figure 34: Option to set stop tracking

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 :

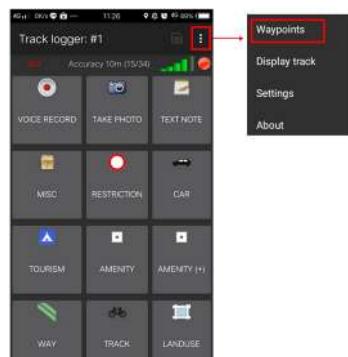


Figure 35: Ikon

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



Figure 36: Waypoint list to see list of objects you have collected

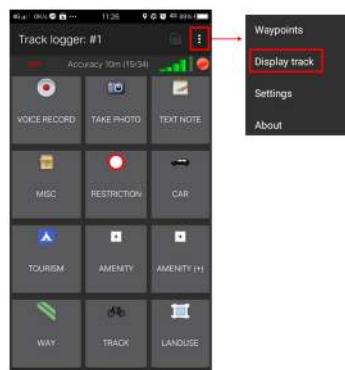


Figure 37: Display track button to see your track and objects you have collected

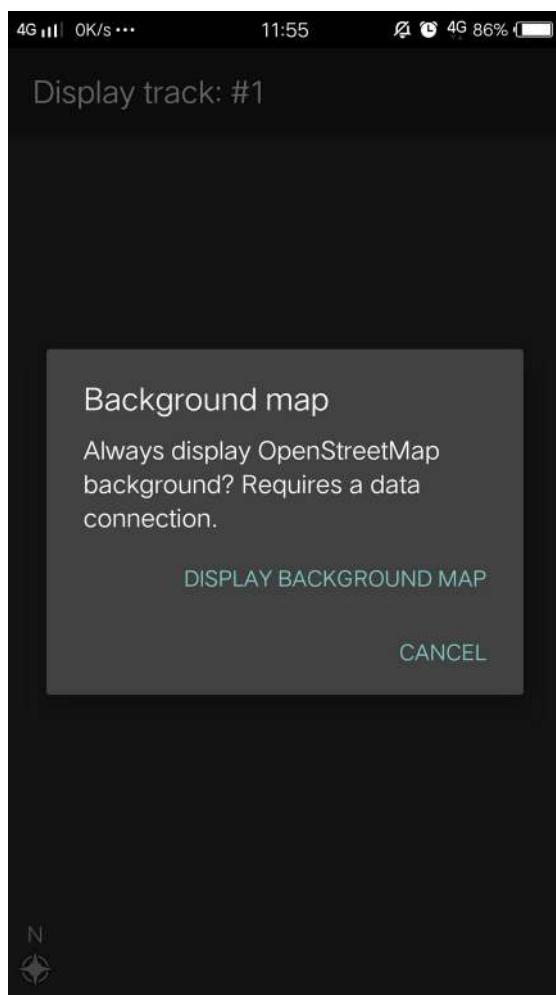


Figure 38: Option to display your background map

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.

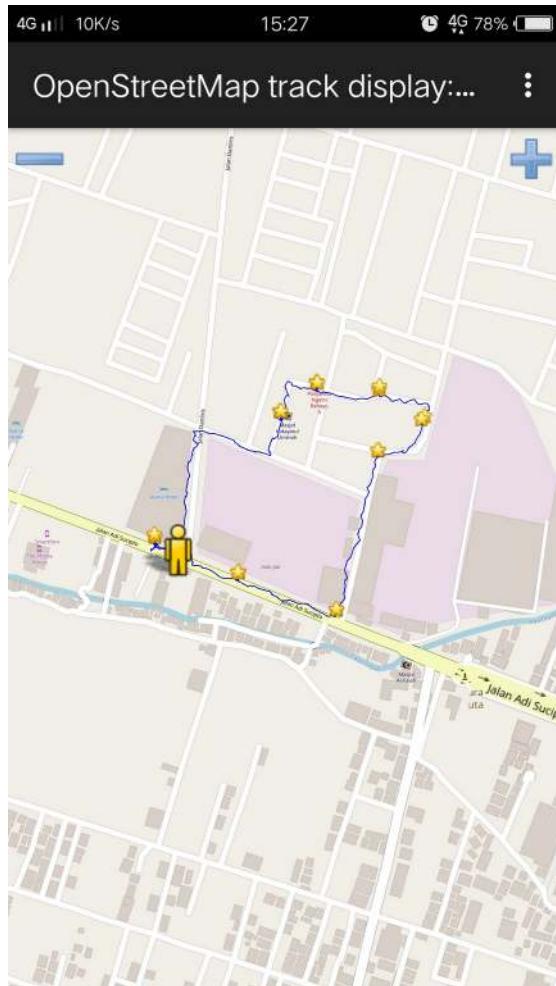


Figure 39: Track and object's collected on field survey

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

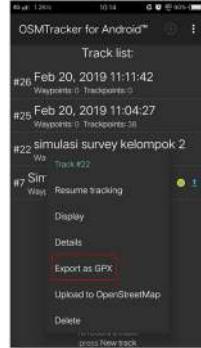


Figure 40: Menu to save your survey data into GPX

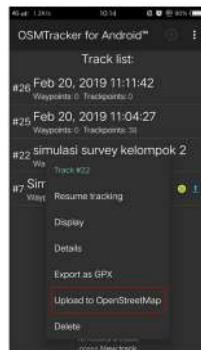


Figure 41: Menu to upload your survey data into OpenStreetMap

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

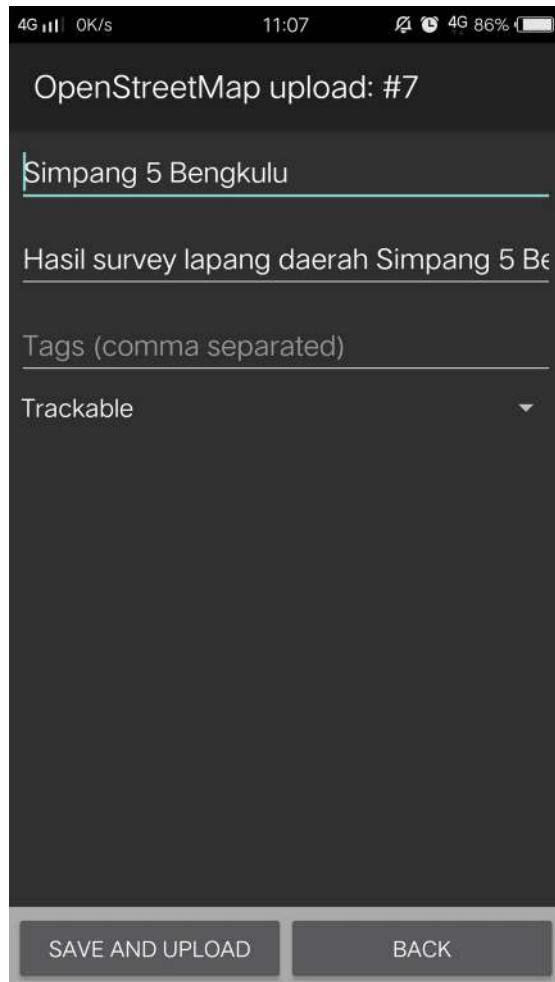


Figure 42: Survey data is ready to upload into OpenStreetMap server



Figure 43: OSMTracker folder on your smartphone's storage

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

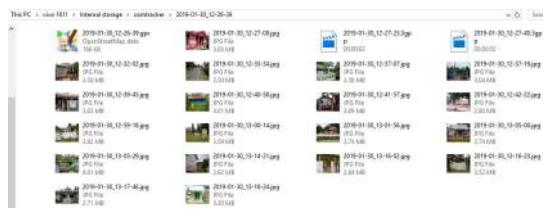


Figure 44: Example of OSMTracker data consist of .gpx file data and survey photos

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

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

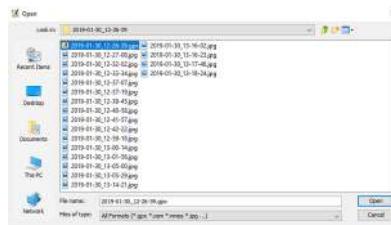


Figure 45: Open your file with .GPX format data on JOSM

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.

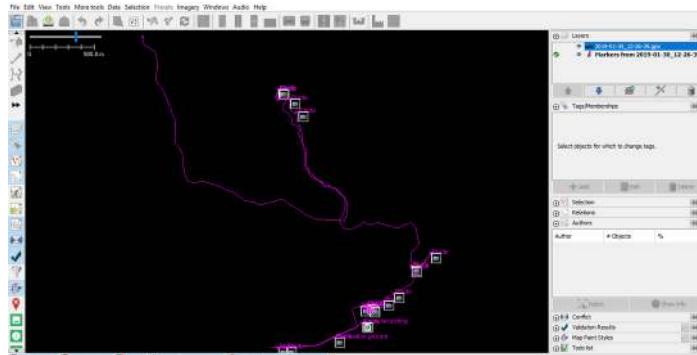


Figure 46: Field survey data when you open it on JOSM

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 OSMTracker. OSMTracker 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 OSMTracker. You can use OSMTracker as your alternative tools for your survey in case if you don't have GPS.

# Using Java OpenStreetMap (JOSM)

## Objective:

- Understanding how to use basic tools in JOSM
- Able to operate advance editing in JOSM
- Understanding editing tips in JOSM
- Understanding how to draw special objects such as bridge, school, and road networks

Java OpenStreetMap or commonly called JOSM is a desktop-based editor for OpenStreetMap. JOSM allows you to edit OSM data offline for a while or not always connect to the internet. If in the previous module you learned about operating JOSM, then in this module you will learn how to use JOSM.

## I. Basic Drawing Techniques with JOSM

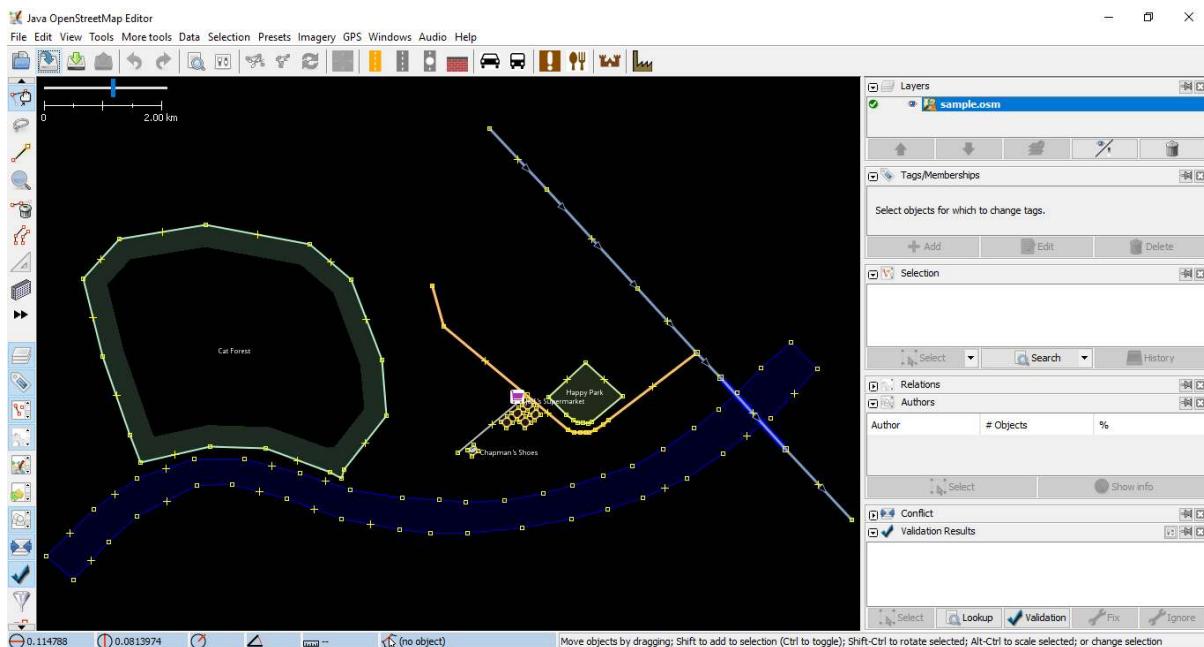
Please open an OSM sample file that we will use to learn how to draw a basic map with JOSM. Note that this data is only a sample with an unreal place, so please do not save and upload that data into OpenStreetMap.

- Download the sample file here: [www.bit.ly/osmsampel](http://www.bit.ly/osmsampel)
- Open the sample file OSM in JOSM. Click the **Open a File** button at the top left.



Open a file icon

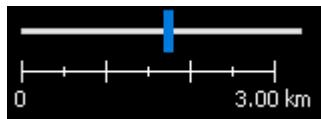
- Find and choose **sample.osm** in your computer that you have downloaded before, then click **Open**. Your computer screen will look like a picture below:



Sample file in JOSM

### a. Basic Operation

To move the map right or left and up or down, you can do that by right click on your mouse then hold and move the mouse. There are two ways to zoom in and zoom out the map. First, you can use the scroll wheel on your mouse. Scroll forward to zoom in the map and scroll back to zoom out the map. Second, use scale bar in the upper left corner on your map. Click and hold then swipe right or left with your mouse.



The scale bar on JOSM

### b. Nodes, Ways, and Polygons

In OpenStreetMap there are three types of objects. There are nodes, ways, and polygons.

- Node is a location represented by a symbol. In this sample data, there are two points: the shoe store and supermarket. The shoe shop is represented by shoe symbol and supermarket is represented by the shopping basket symbol. If you can't see it clearly, please zoom in on your map.
- There are several ways object on maps, such as roads, rivers, and river embankments. If you look closer, you will see in the way that there are nodes. These nodes do not have a symbol or information, but they form a line.
- There are some polygons in the sample map that show different places such as forests, rivers, and buildings. A polygon generally represents an area such as a building or a field. Polygons are the same as lines, but the difference is that polygons consist of several lines that form where the endpoint meets the starting point of the line.

### c. Selecting Object

To edit an object, you need to select the object. There is the step to select an object:

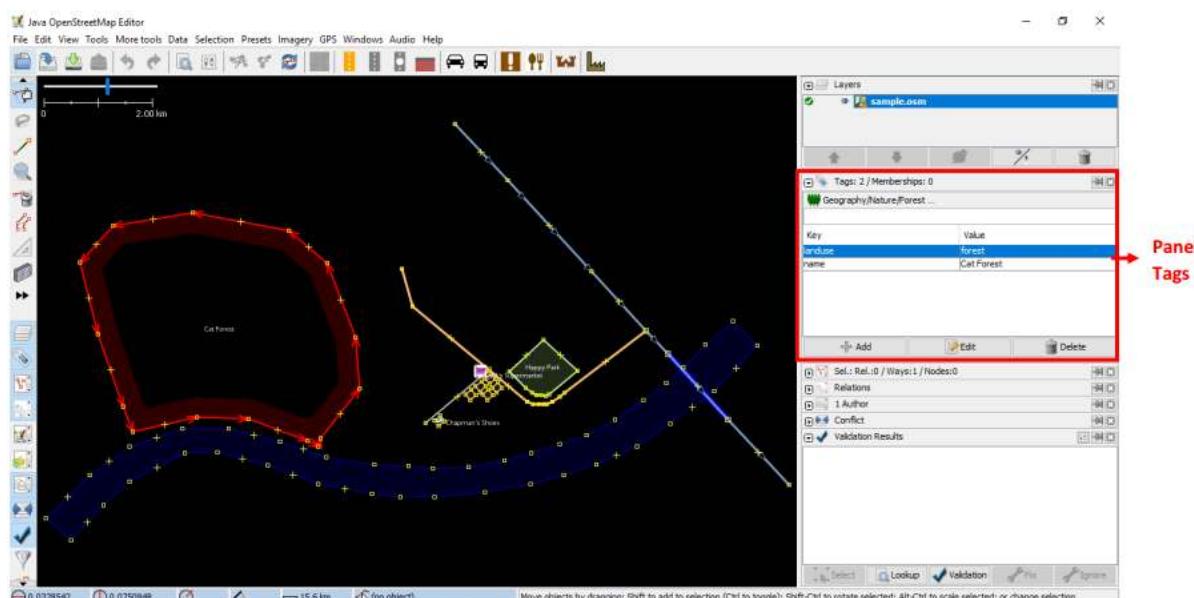
- Click **select, move, scale, and rotate object** tool for select object.



Tool select, move, scale, and rotate object icon

- Then click on an object you want to select.

When you select an object, it will be red and a list appears in the tag panel on the right side of your JOSM. Tags are a part of a node, way, or polygon that tell information about the object. Now what you need is to know the information to explain whether the object on the map is a forest, river, building, or other forms.

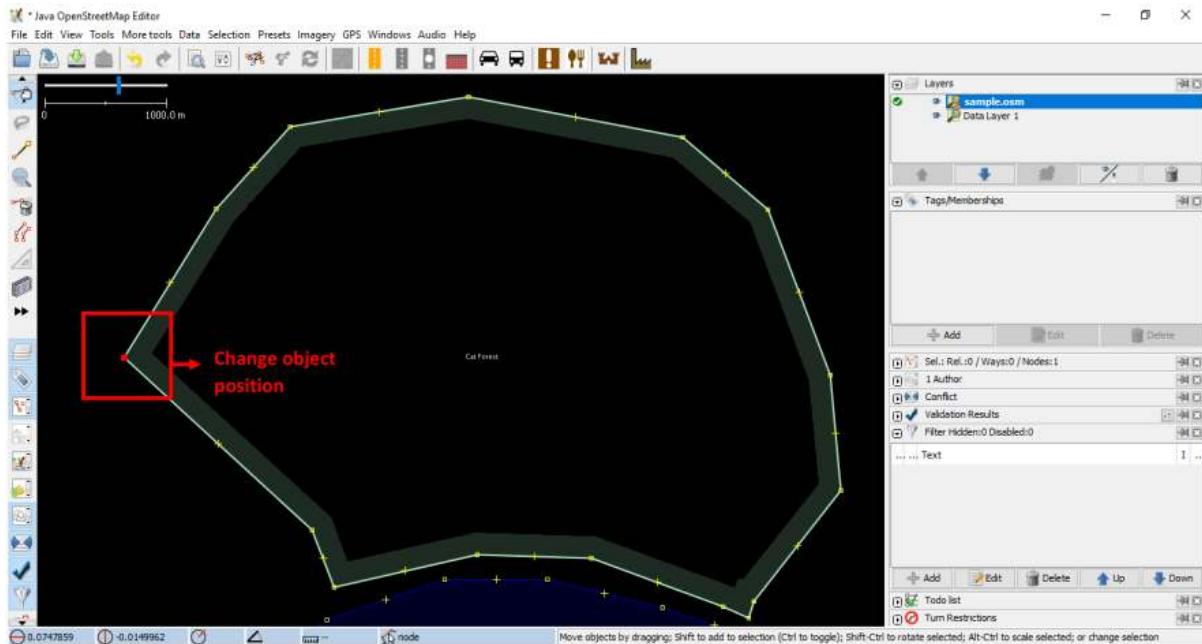


Object information in panel tags JOSM

### d. Change Object Position

You can change the position of objects that have been drawn in JOSM. There are steps:

- Select an object in the sample, for example forest object. Make sure you click the line in the forest, not the point. Then click and hold the object then slide it. You have just moved the forest to a new location on the map.
- Click one node on the forest line. Click and hold then move the node. By moving this node you can change the shape of an object.

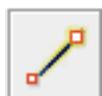


Change object position

#### e. Drawing an Object

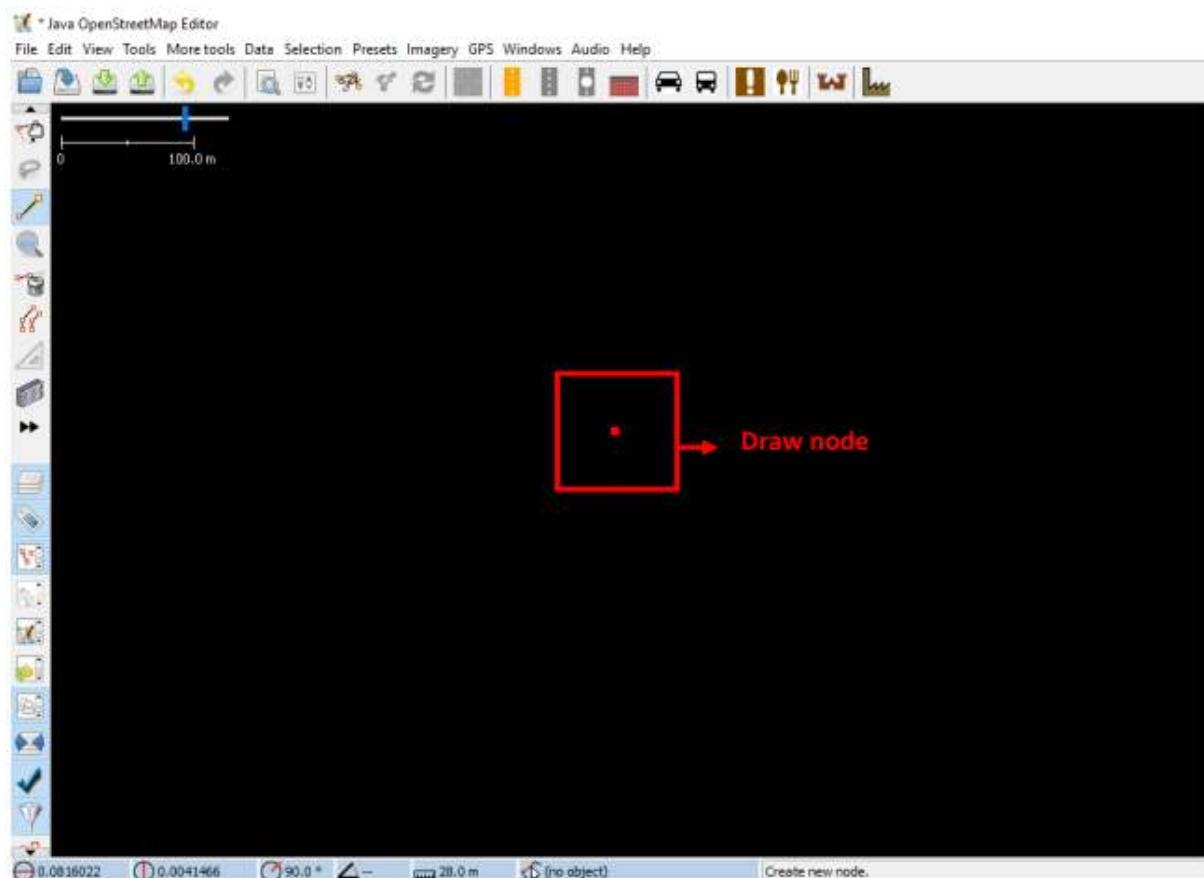
On the left side of JOSM, there are many toolbars that provide more information about the map. It can change the command when you click the mouse, one of them is to draw an object. There are the steps for drawing an object:

- Before you draw an object, make sure that is no object is selected. Click outside the object where there are no objects, to make sure no object is selected.
- Then click on the **Draw Tool** button for drawing an object.



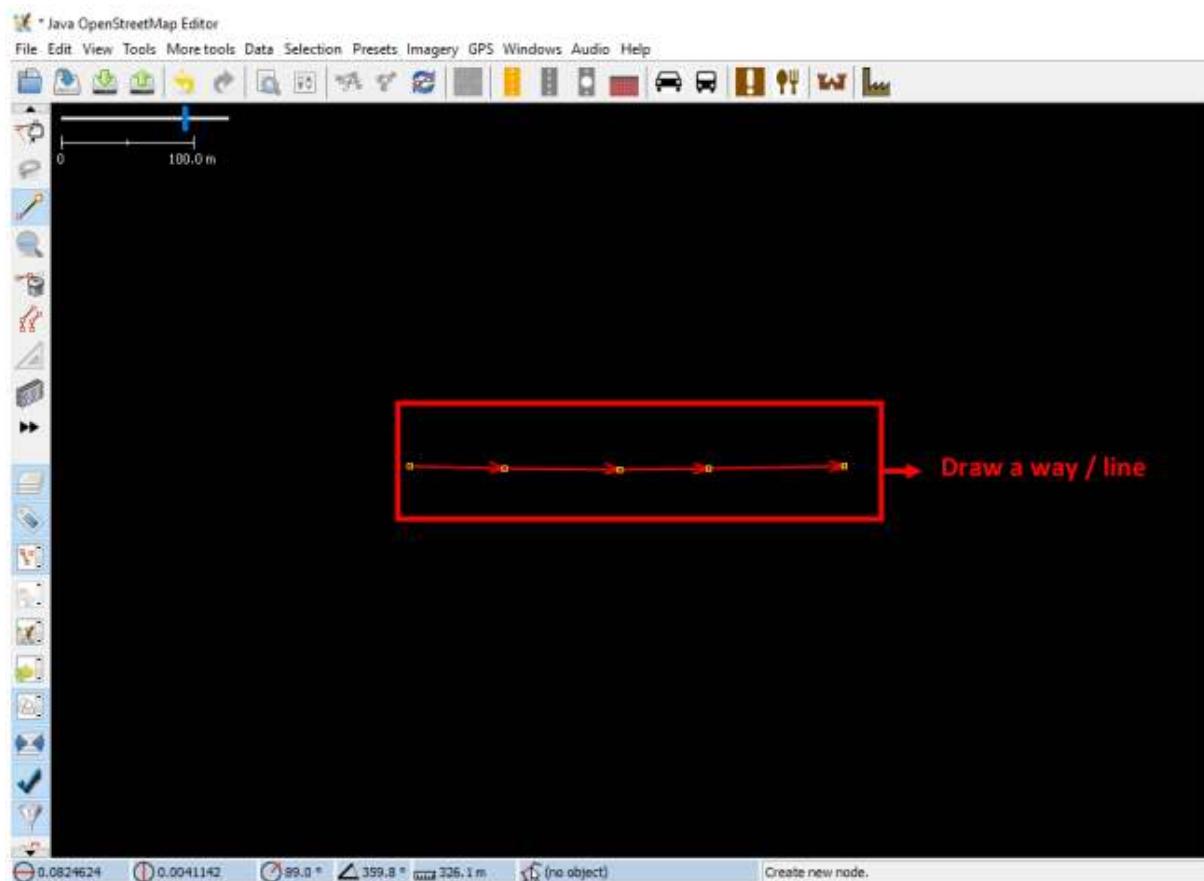
Draw Tool icon

- Find an empty area on the map, then double click with your mouse, and a single node will be drawn.



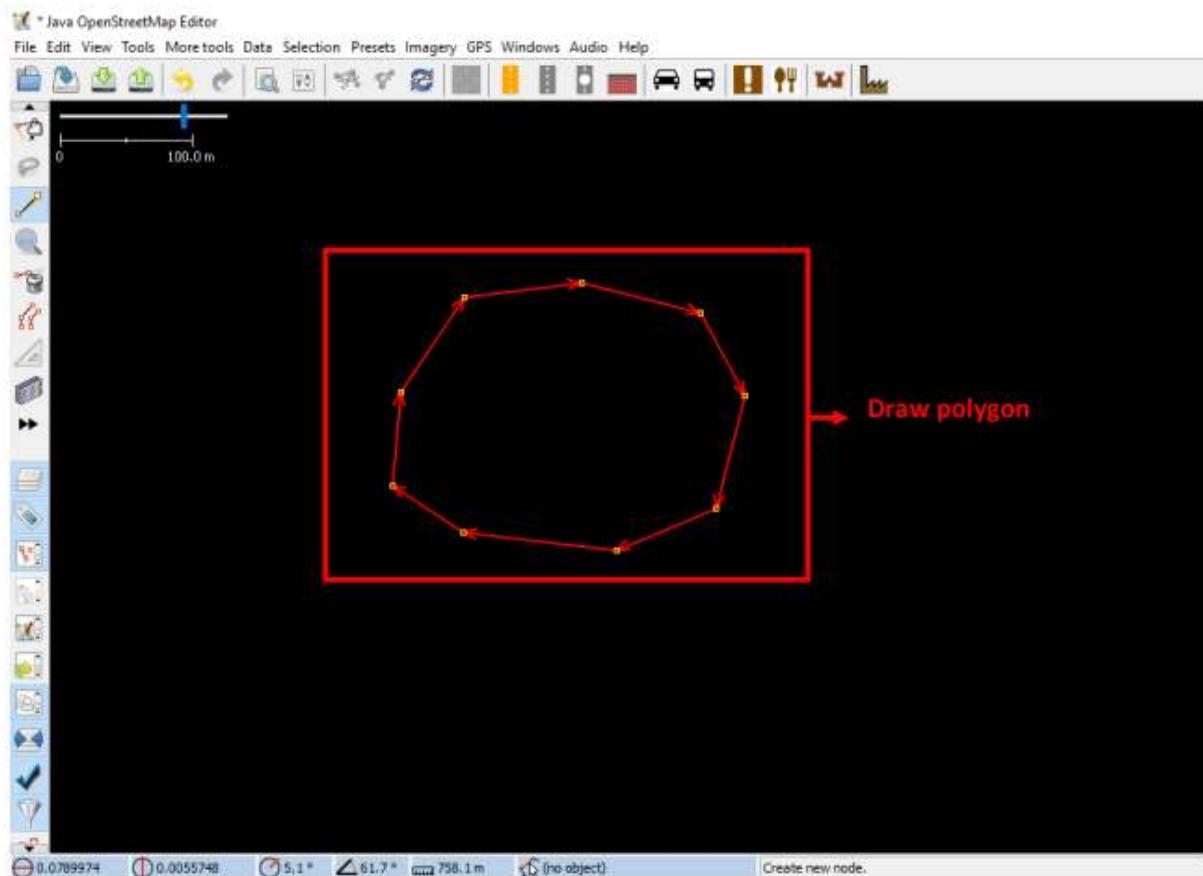
#### Draw a node object

- To draw a line, click once your mouse and move your mouse and click again. Continue until it forms a way/line. To end the line, double click on your mouse.



#### Draw a way/line object

- The way to make polygons is the same as how to make ways, but to end the polygon you should double click on the first node you made.

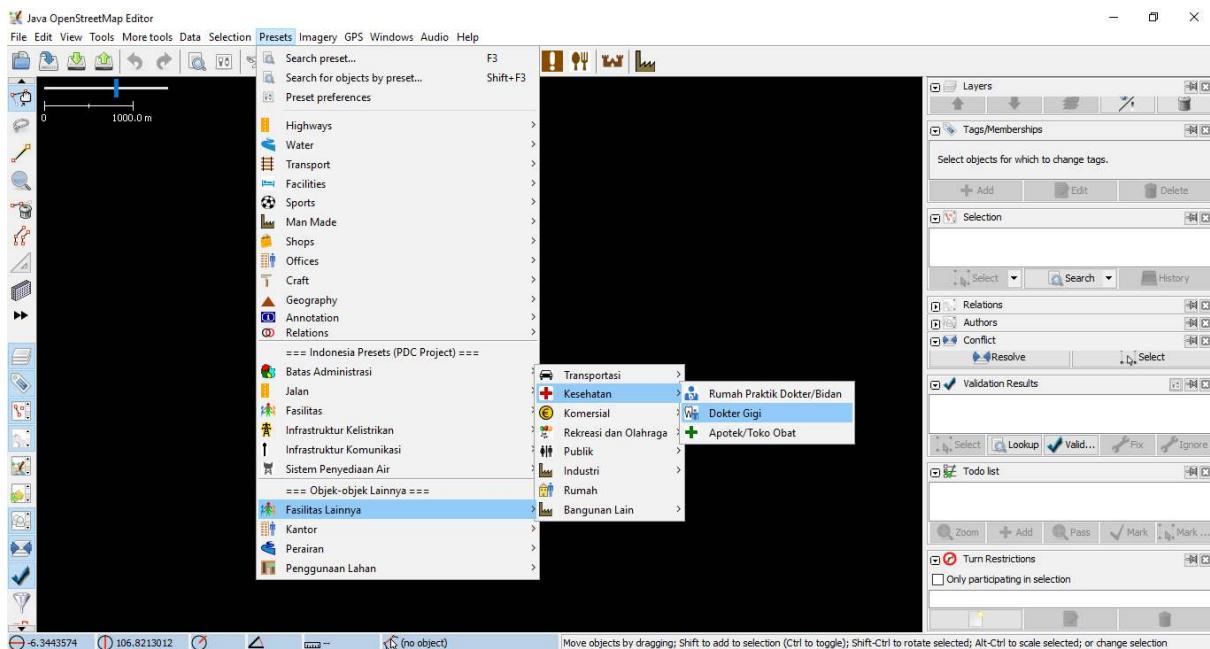


Draw a polygon object

#### f. How to Add Preset

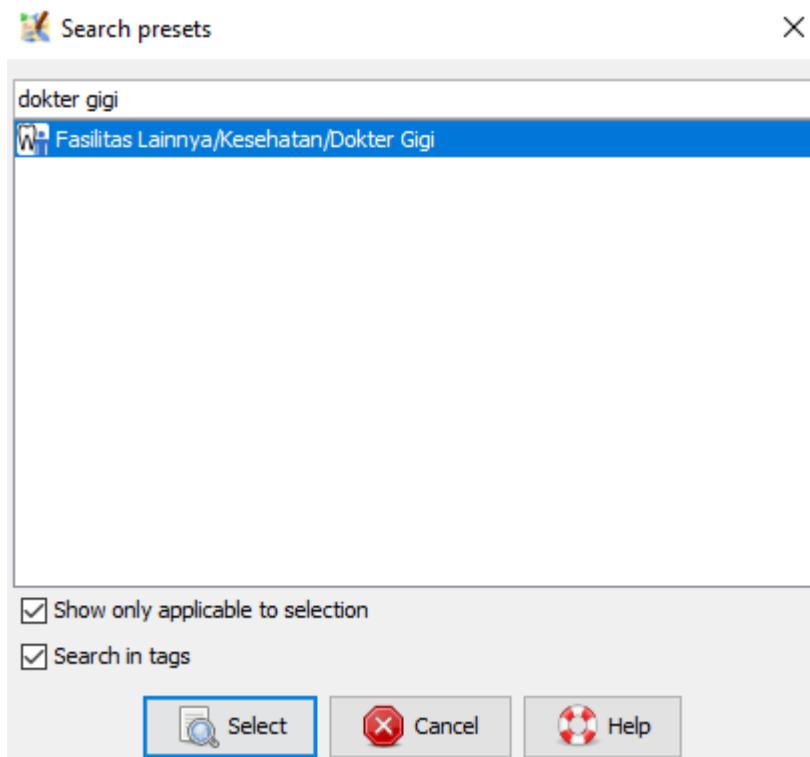
Now you understand how to draw nodes, ways, and polygons. However, you still have not given information about the object. In OpenStreetMap, giving information about the object is required, whether the object is a school, hospital, government office, or something else. This is required so the others can find out information about the object. To give information on the object that you draw or edit, you need to add preset on the object. There are steps:

- Click **Select** toolbar on the left side of JOSM.
- Select the object that you want to add preset.
- Select **Presets** menu on the top side of JOSM. Move your mouse to the sub-menu of the object that you want to add preset.



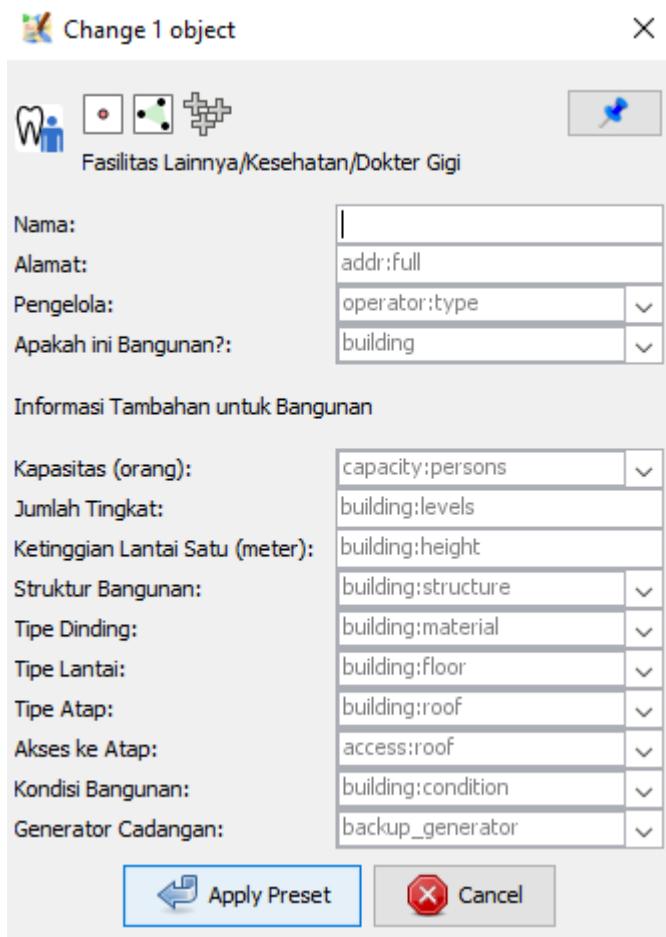
### Add preset

- If you have a problem to find the sub-menu, you can click on **Search preset** or by pressing **F3** on your keyboard.
- Then search preset window will appear. You can type the name object, such as a dentist. Then click **Select**.



### Search preset window

- Next will appear a window about object information that you want to add preset. This information is not required for all, only the information that you know. If you know all the information please fill in. If you don't know, just skip it, then click **Apply Preset**. If everything goes smoothly, the color of nodes, ways, or polygons will change or have a symbol. This change depends on the information you put in the object.



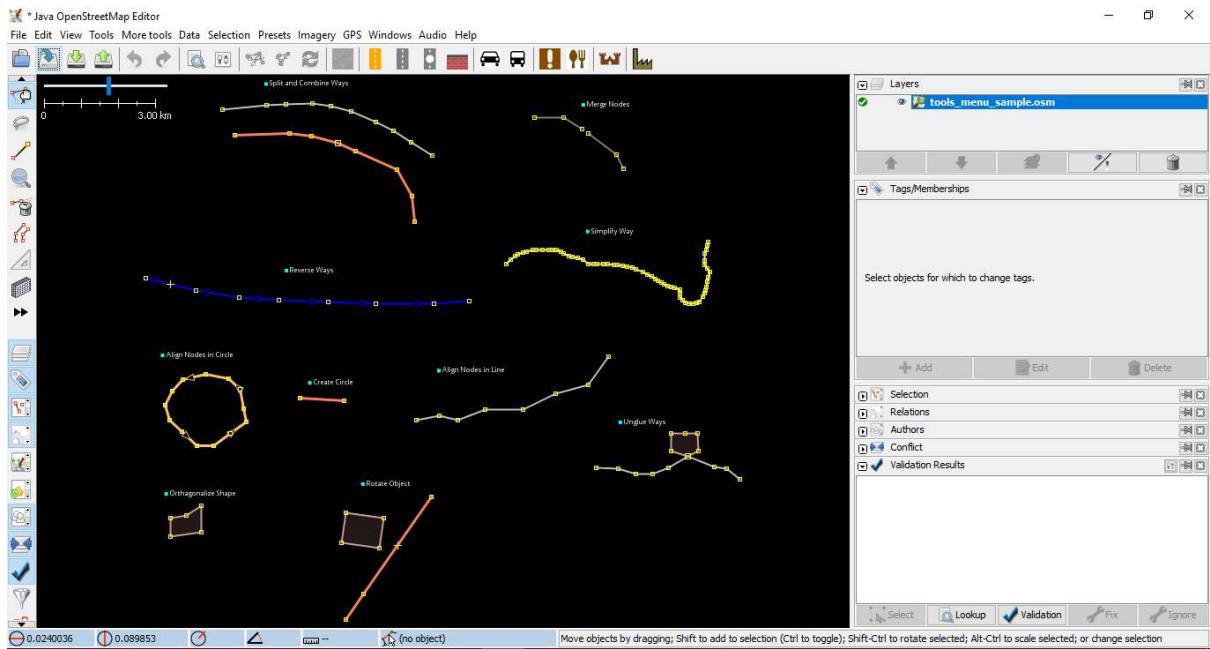
Object information window

## II. Advance Drawing Technique with JOSM

In previous session you already install JOSM and learn how to do basic drawing technique, such as draw nodes, ways, and polygons. You also already know how to add preset to object that you draw to provide information about the object. At the end, you can draw your own map on JOSM. in this session, you will learn the right step to edit OpenStreetMap map on JOSM and how you can maximize the tools that available in JOSM to help you in editing.

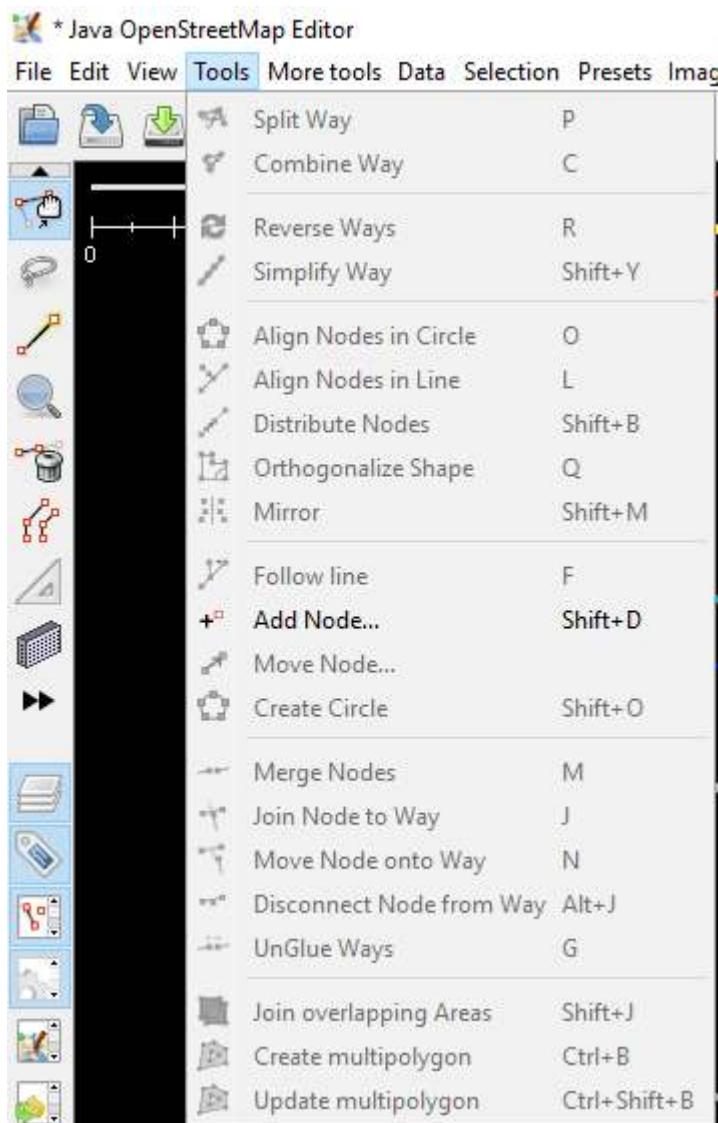
### a. Advance Drawing Tools in JOSM

In this material you will learn some basic tools and the technique for drawing map feature in JOSM. You will learn more detail for advance tools that will help you to map in JOSM. You can download the sample here <http://www.bit.ly/edittools> then open JOSM and open the sample file that you already downloaded. The JOSM will looks like this picture below:



### Sample file for editing in JOSM

JOSM has tools that will make it easier for you to edit either ways or polygons. These can be found in **Tools** menu at the top of JOSM. If you click on **Tools** menu, you will see that there are many functions that can help you draw ways, polygons, and also edit objects on the map.

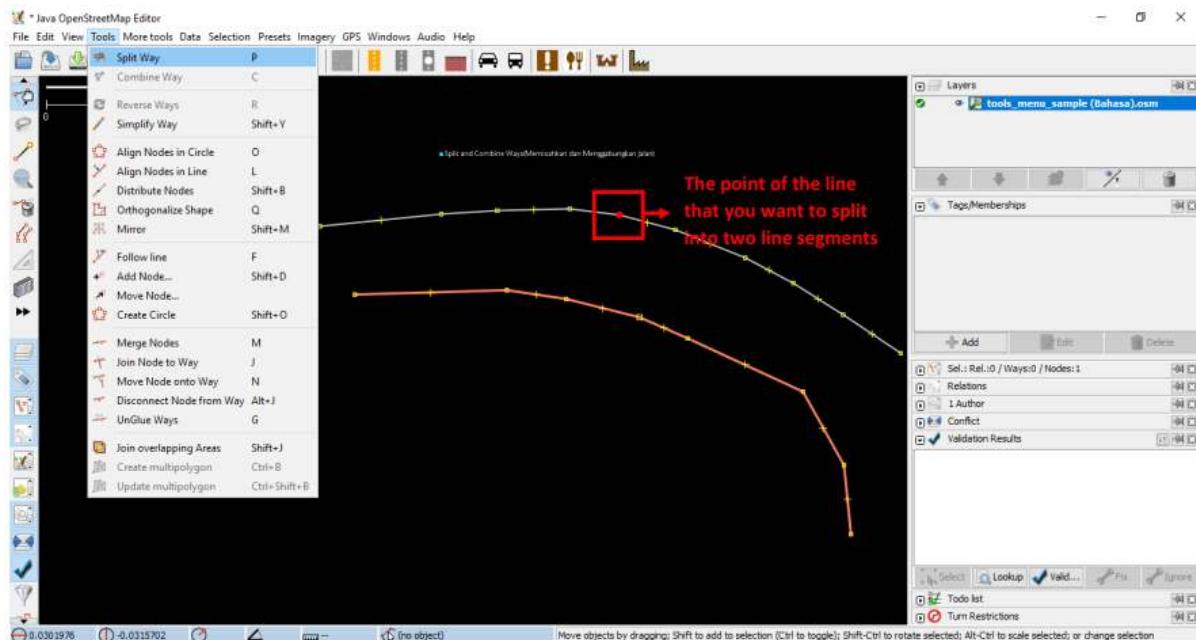


Tools JOSM menu

For applying the functions in this menu, you need to select a node, way, or polygon in the map area. The sample file that you downloaded contains various elements that are labeled with different tool names in the menu. You can try the tools using the file sample. Explanation about some tools are provided below:

- **Split Way**

Split Way is used to split a line segment into two separate line segments. This is useful if you want to add attributes to different parts of the road, such as a bridge or a different road name. To use this function, select a point in the middle of the line segment you want to split, then click **Split Way** from Tools menu, and the line will split. The shortcut key for split way is **P** on the keyboard after you select a point on the line.

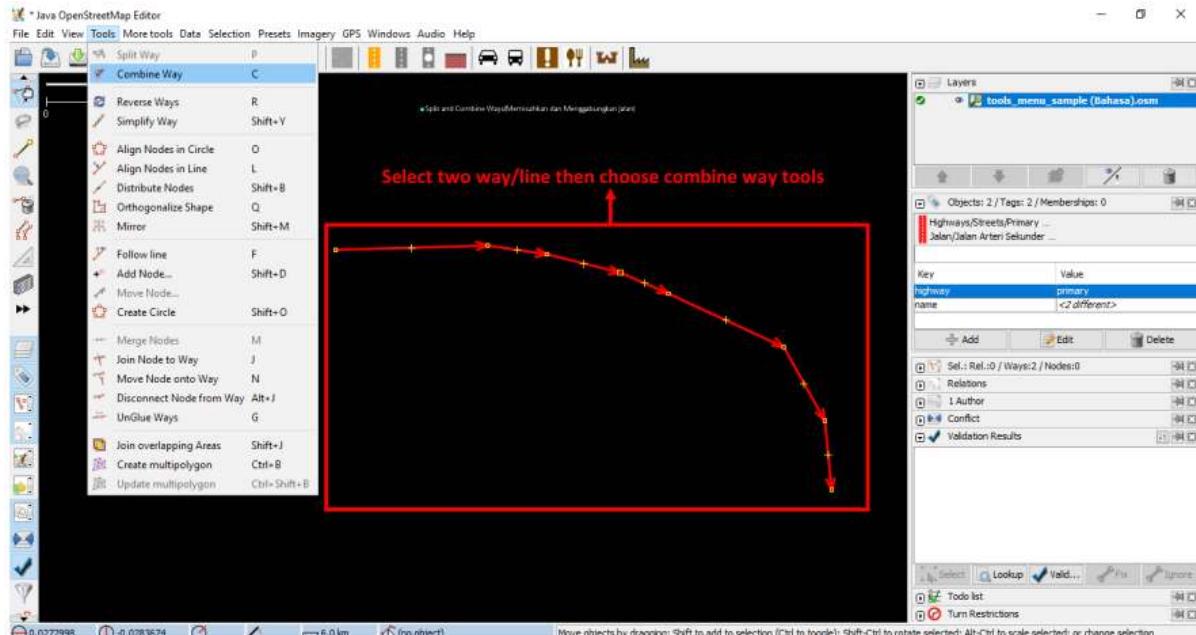


## Split way menu

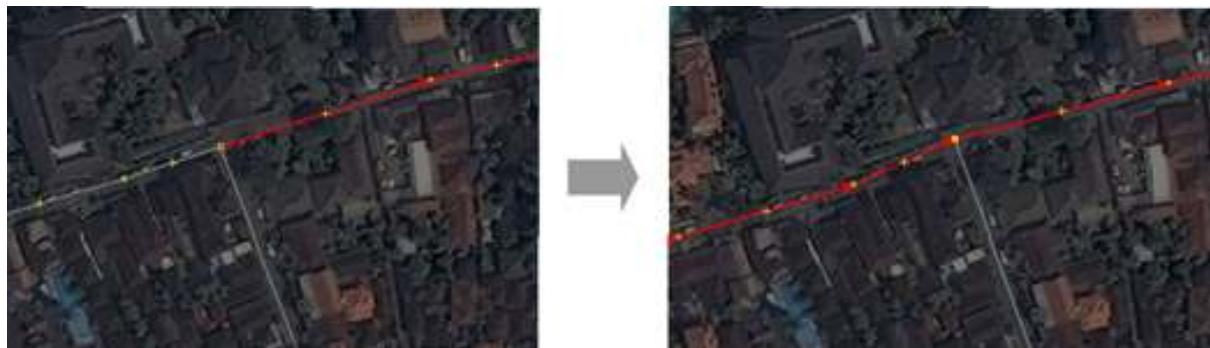
After you have split way, you can add information about each road segments that have been split, for example giving the name of a road to both roads.

- **Combine Way**

Combine way is the opposite of Split Way. Combine way used to join two line segments into one line segment. These two line segments must be connected to the same node. To use this function, select the two lines that you want to join. You can select more than one object by press shift on your keyboard and click on the both lines. When you have selected the two lines, click **Combine Way** from Tools menu. The two line segments will merge into one line segment. The shortcut key for combine way is **C** on the keyboard after you select two lines.

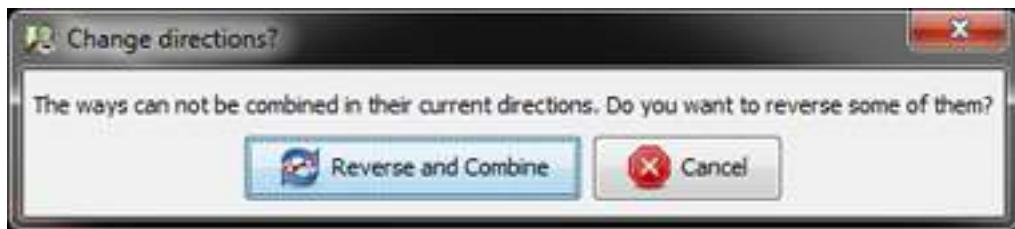


## Combine way tool



The results of combine line on JOSM

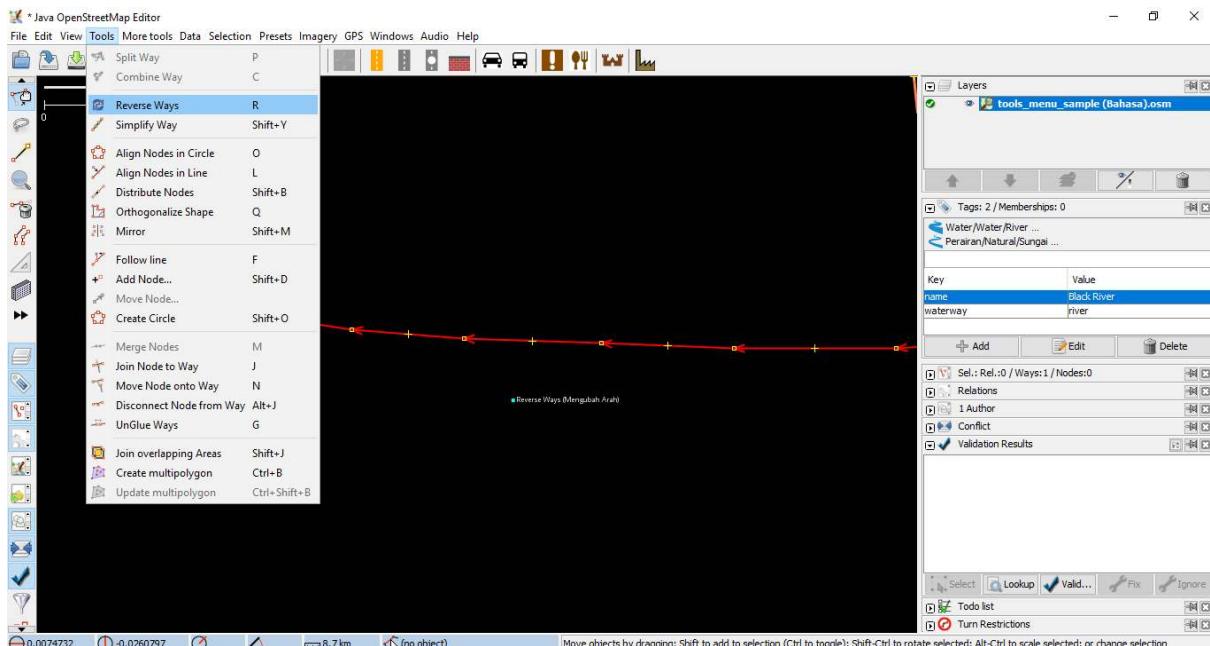
If you combine roads that have different directions, you will get a warning like the picture below. The warning means if the road is connected and it will have the same direction. If you are sure to combine the two roads, please click **Reverse and Combine**.



Warning to change directions

- **Reverse Way**

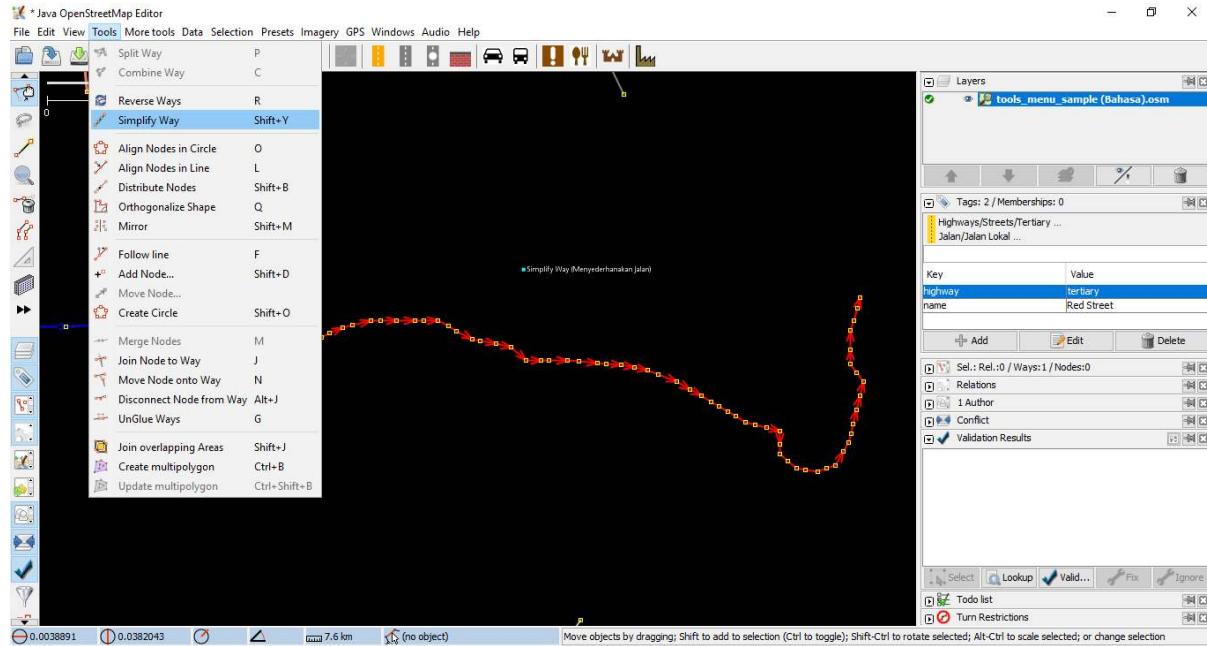
Reverse way is used to change the direction of the way. All ways in OSM have a direction which is shown in JOSM with arrows on the way. The direction is very useful for mapping roads that have one way direction and river flow (upstream to downstream). In this case, you need to reverse the direction of the way, so the way is in the right direction. How to use reverse way is click on the way that you want to change the direction, then go to tools menu and click **Reverse Ways**. The shortcut key to use reverse way is R on the keyboard.



Reverse way tool

- **Simplify Way**

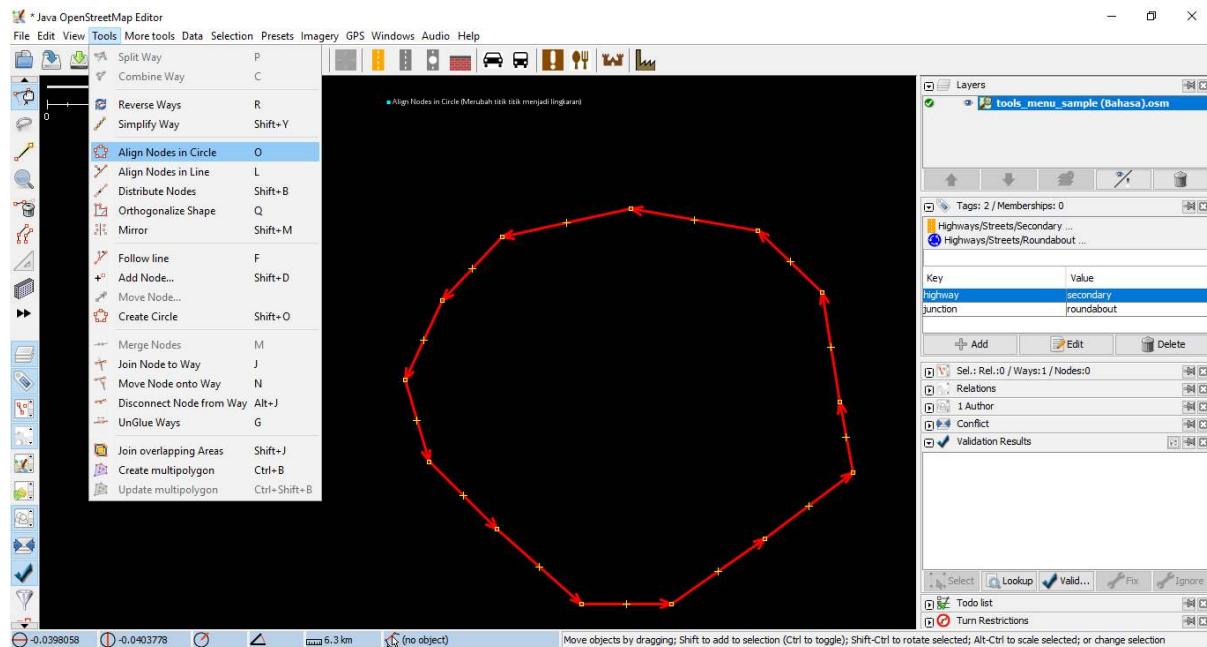
If your way has too many nodes and you want to make it simpler, simplify way menu will delete some of the nodes on the way. This tool also used to speed up when uploading data because it removes several nodes that are on the way. To use simplify way is click on the way that you want to simplify, then go to the menu tools and click **Simplify Way**. The shortcut key to simplify way is **Shift + Y** on your keyboard.



### Simplify way tool

- Align Nodes in Circle

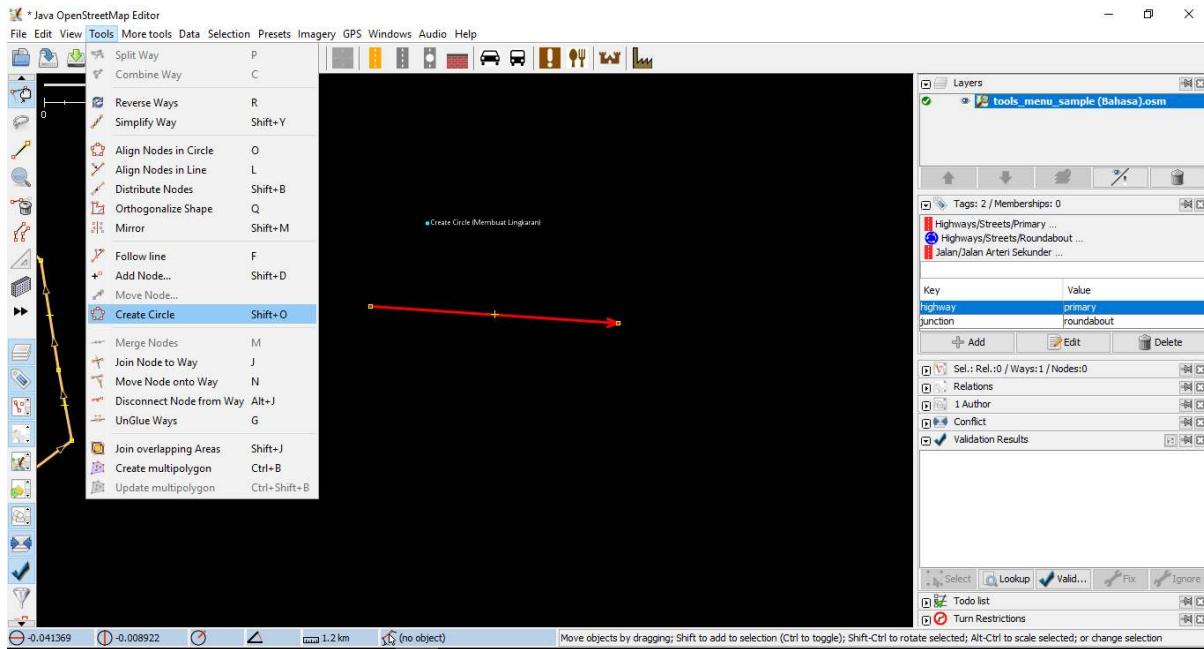
If you have difficulty to draw a circle in OSM, you can use align nodes in circle tool to create a perfect circle shape. To use this tool, you should draw a not perfect circle, click it, then go to tools menu and choose **Align Nodes in Circle**. The shortcut key for align nodes in circle is **O** on your keyboard.



### Align Nodes in Circle tool

- Create Circle

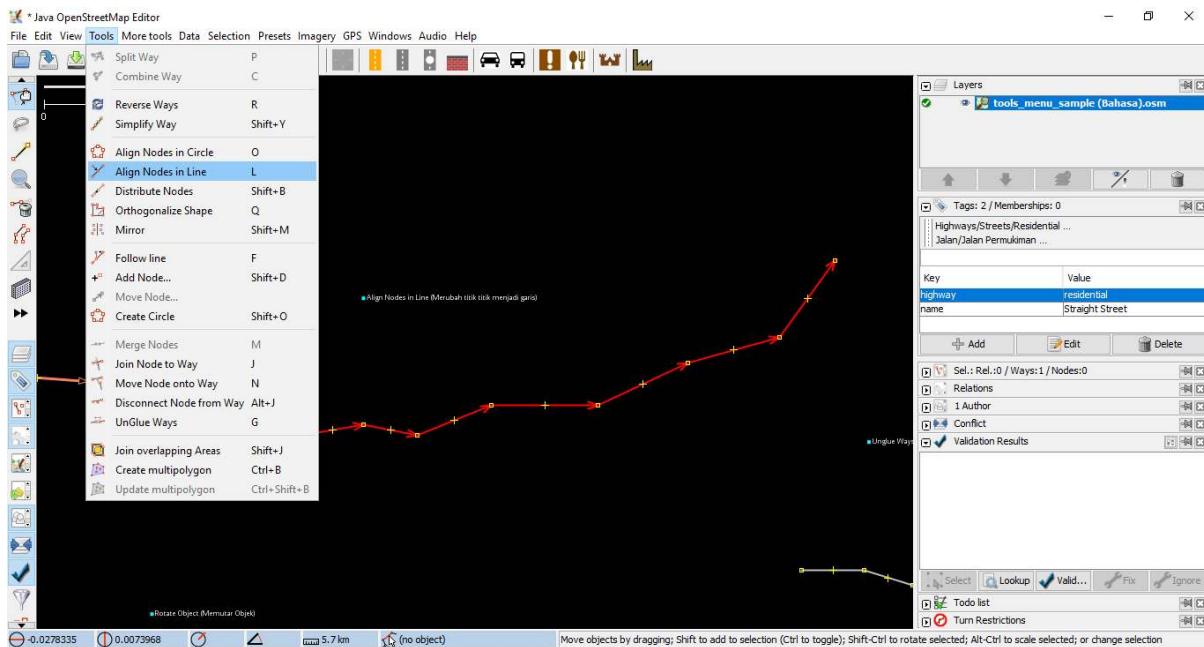
As an alternative to create circles, you can use **Create circle** tool. It will make a circle from the diameter of the circle (only requires a line way of two nodes). To use this create circle is to draw a way or line that represents the diameter of the circle you want to draw, then go to tools menu and click **Create Circle**. The shortcut key for create circle is **Shift+O** on your keyboard.



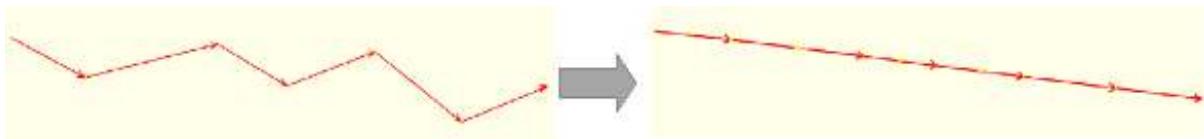
### Create circle tool

- **Align Nodes in Line**

This tool function is to convert irregular line/way into straight shapes. Be careful if you use this tool because it has a slight tendency to shift lines/ways. Remember that this tool will straighten the shape of the line according to the location of the starting point and end of the line. To use this tool is click the line/way that you want to align, then go to tools menu and click **Align Nodes in Line**. The shortcut key for align nodes in line is **L** on your keyboard.



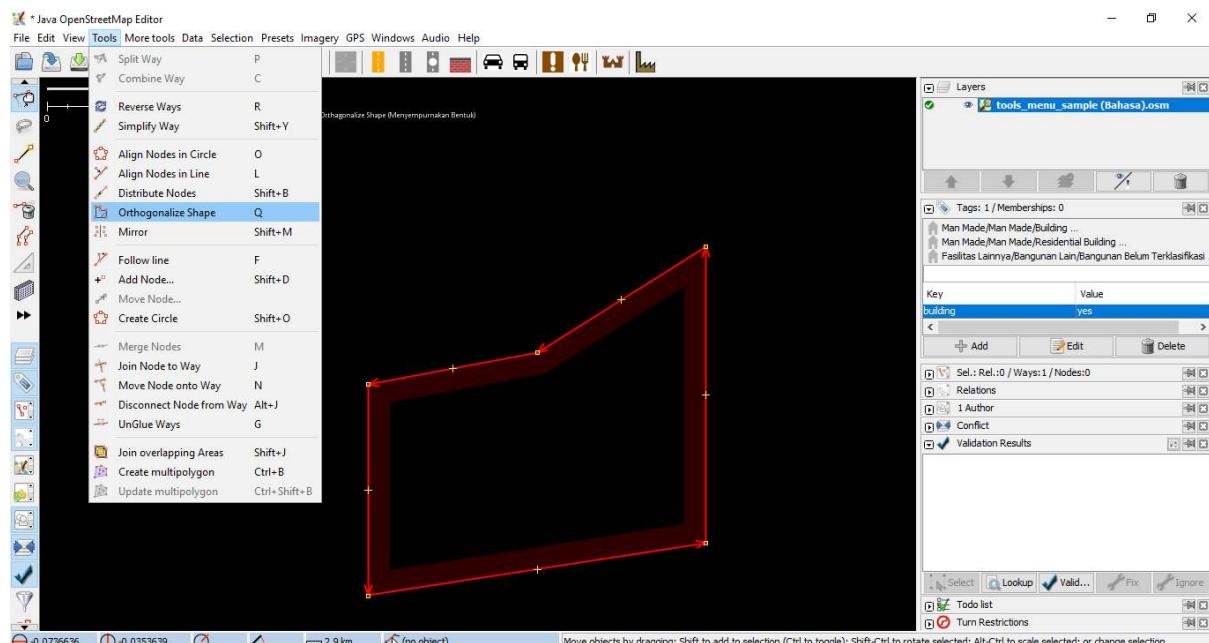
### Align nodes in line tool



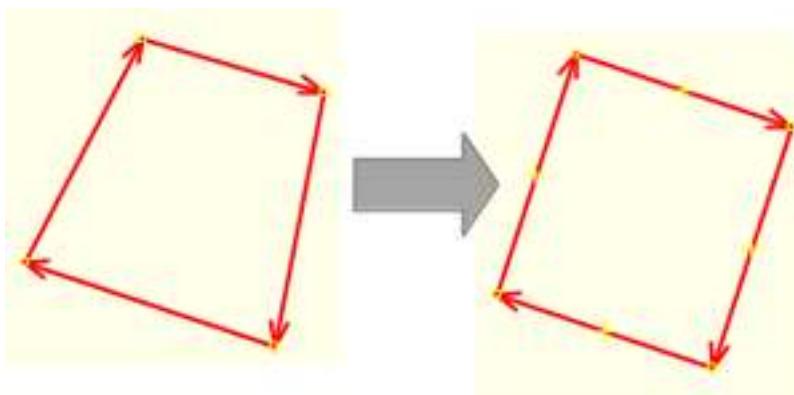
Before and after using align nodes in line

- **Orthogonalize Shape**

Orthogonalize shape is very useful to make a polygon that have irregular angles into rectangular shape, like building. After you draw a building, orthogonalize shape will form a building that has 90° square angle. How to use orthogonalize shape is click on the object that you want to change the shape, then go to tools menu and select **Orthogonalize Shape**. The shortcut key for orthogonalize shapes is **Q** on your keyboard.



Orthogonalize shape tool

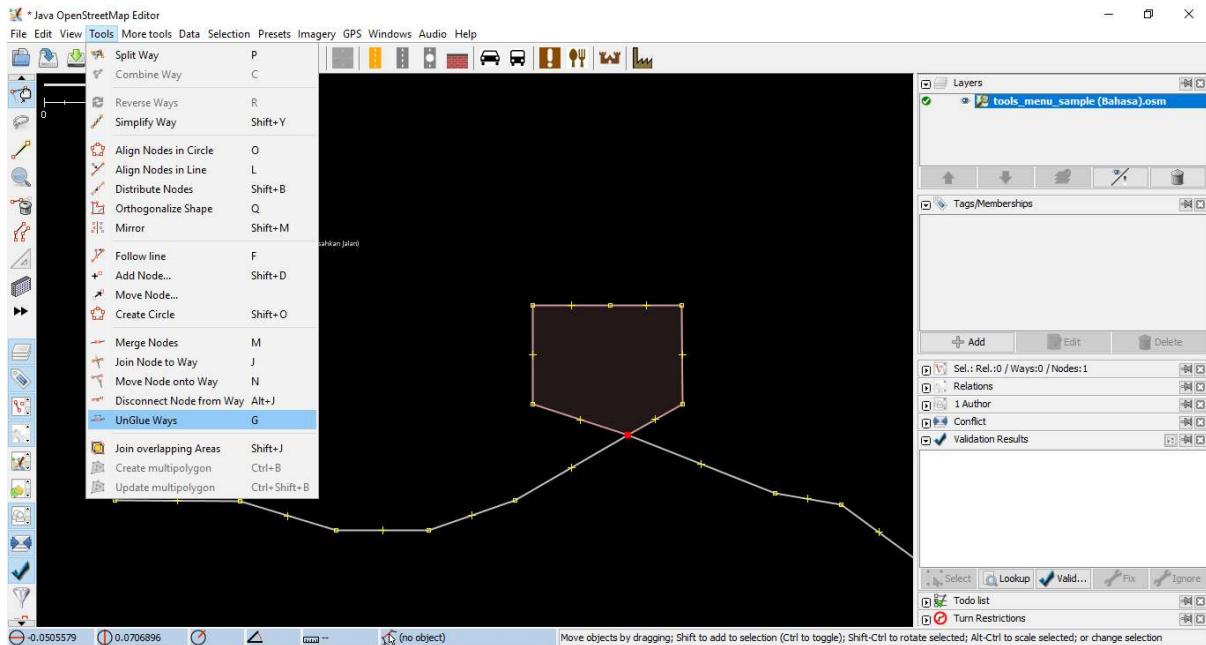


Before and after using orthogonalize shape

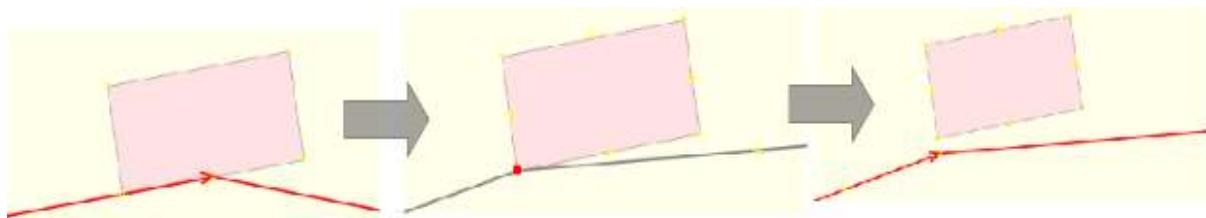
- **Unglue Way**

Unglue way has a function to release the connected nodes. Unglue way is useful when two objects are in the same nodes even though it should not. For example, a common mistake is that a road has the same node with building. Of course in the field, roads cannot join to buildings, so this is a mistake. To fix this, you can release one object from another. To use unglue way is to click the node that sticks together between two objects, and then go to the tools menu and select **Unglue Way**. The shortcut key for unglue way is **G** on the keyboard. You need to remember that if you

use this tool, between two objects that you were unglue way before will not automatically separate, you should move one of the objects.



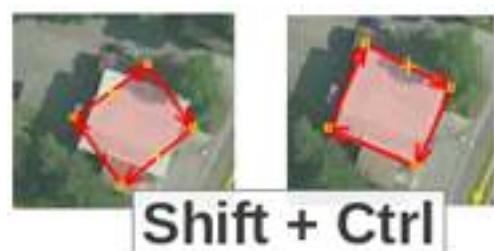
Unglue way tool



Before and after using unglue way

Sometimes there are questions about how to rotate a line or polygon after the object is drawn. There are the steps:

- To rotate an object, first select the object that you want to rotate.
- Hold **SHIFT + CTRL** on your keyboard.
- Click and drag the mouse to rotate.

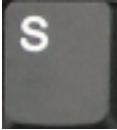


The concept of rotating objects in JOSM

#### b. Shortcut in Keyboard

After editing in OpenStreetMap, you will realize that you have difficulty to find the tools location in tools menu. To resolve this, JOSM has shortcuts keyboard for everything. This aims to make it easier for you without having to click on the object and then go through a long menu and sub-menu process. You can choose the object then press the shortcut on your keyboard. There are some of the frequently used shortcut keys:

Table of Some Shortcut Keys in JOSM

No.	Tools	Symbol
1	Activate Select Tool	
2	Activate Draw Tool	
3	Activate Zoom Tool	
4	Delete Selected Object	
5	Zoom In	
6	Zoom Out	

### III. Editing Tips

There are some common mistakes that users made when start to use OpenStreetMap. Here are some mistakes that are often made and some tips or brief instructions to map better.

#### 1. Objects That Should Not Connected

When you create polygons and lines/ways that should not connected, make sure that they are not connected by a node. For example, highway node should not connect to building node, even though in reality there are buildings located in front of road, but there is still a little space that separates the building and the road. If you want to separate two or more objects that are connected in one node, click on the node that sticks together between two or more objects, and then go to the **Tools → UnGlue Ways** or the shortcut is **G** on the keyboard, then move the object.



(Left) Building and road are connected and (right) building and road are separated

#### 2. Objects That Should Connected

Previously you learn about object that should not connected. Now you will learn about object that should connected, for example intersections that should always connected to node. If they are not connected

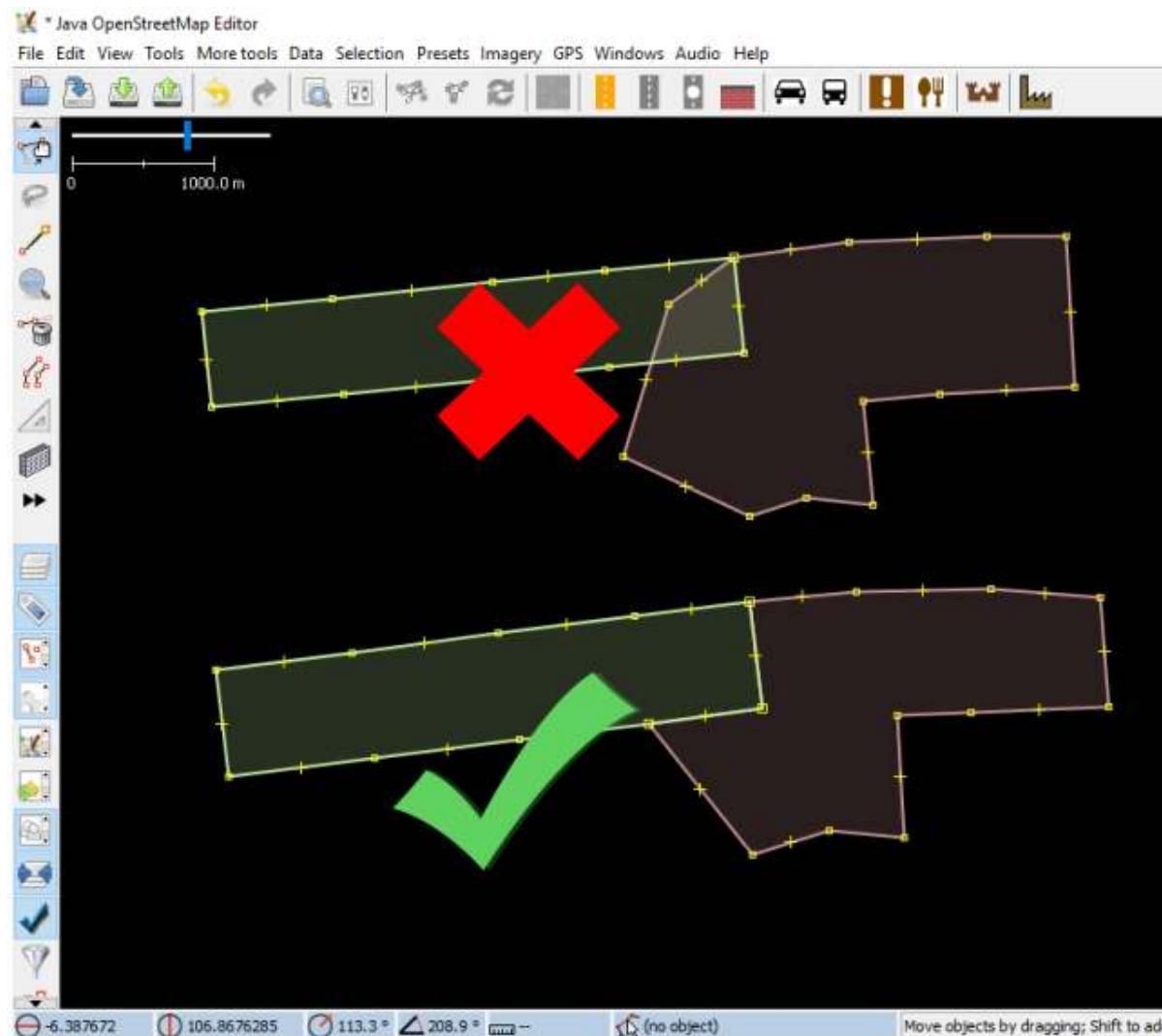
at one node, then JOSM does not know that the road is actually connected to each other. Therefore, if there are roads not connected to each other, you can fix them by selecting the node of the road that you want to connect, then go to **Tools**→ **Merge Nodes** or press **M** on your keyboard.



Road should be connected to each other

### 3. Overlap Objects

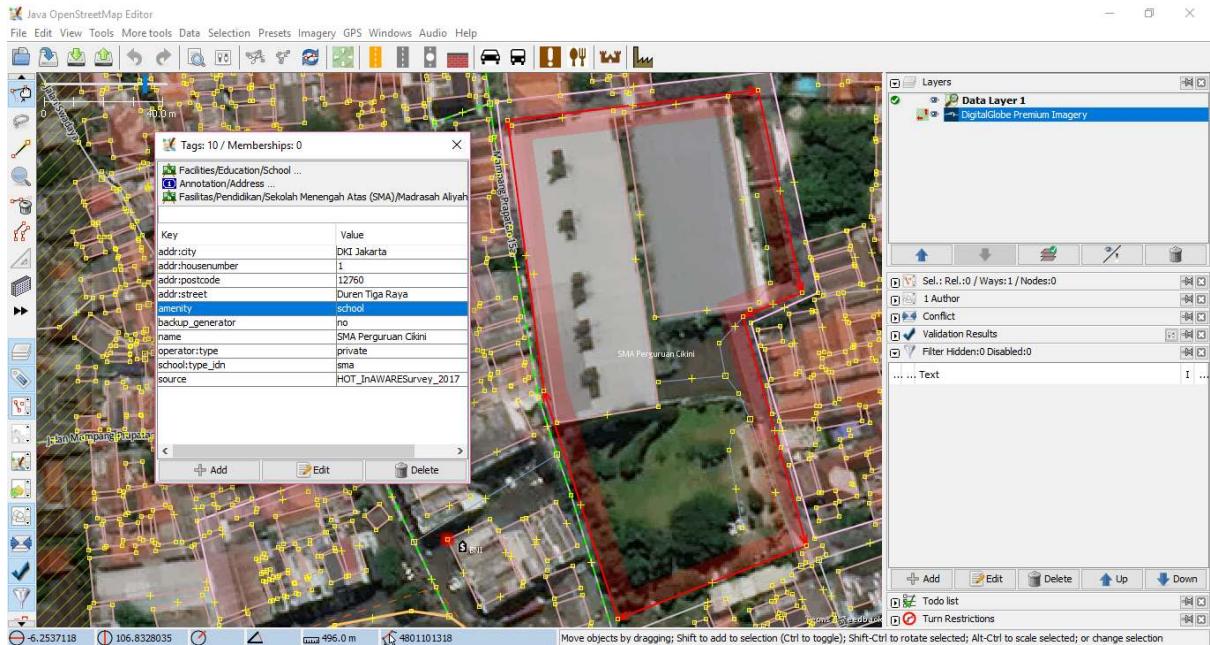
One common mistake when drawing in JOSM are overlap object or polygon. A building cannot overlap with other buildings. For example, residential land use polygons should not overlap with garden polygons.



Examples of overlapping polygons

There are some exceptions to this rule, for example school building. In the school area you may want to identify buildings using polygons, but maybe you also want to create a polygon that covers the entire

school area include the yard. In this case, polygons are allowed to overlap, but the rule is all the buildings should inside school area polygon.



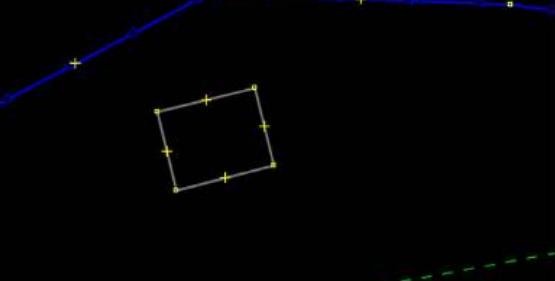
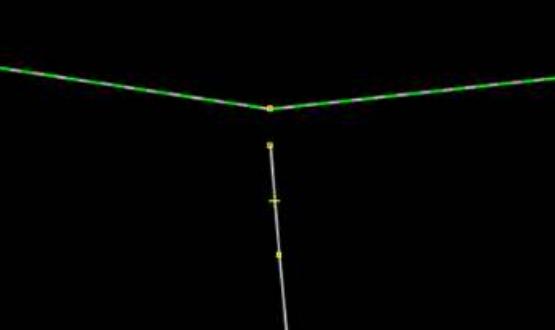
Examples of schools with polygons include the school yard and building

#### 4. Other Tips

When drawing in JOSM, there are other mistakes that often happened. There are the mistakes also the tips for avoiding it.

Table of Mistakes and Tips

Mistakes	Tips
Tags are given to nodes, not to objects (for example: buildings)	One common problem that often happen is adding tags to a node that a part of a line/way or polygon. This often happens when someone draws an object, then selects all objects (include select all nodes))

Mistakes	Tips
Intersections at a corner or intersection must be separated	When roads intersect with each other at a corner of the road, you should not make curved lines at the intersection. The line should have an angle of 90° and separate into two different line segments, as in actual conditions on the ground.
	
Examples of incorrect intersection	
	
Examples of correct intersection	
No tag on object	To fix this error, select the object and go to presets menu to add the tag based on object's information or it can be deleted if the object is a mistake. This is because, the OSM server cannot read the object that does not have tags/presets (object information))
	
Line/way are close to other line/way but not connected	To fix this, you can select the point of the line that you want to connect and then select Draw nodes tools to add points on the horizontal line/way in front of it. Alternatively, you can use Merge Node (if in front of the unconnected line is a node))
	

Mistakes	Tips
Line/way may not pass through buildings	To resolve this, you need to look at satellite imagery which objects in the wrong location. Then you can move the object to the appropriate place. Example of line/way that can not cross building is river.

#### IV. Drawing Special Object

Now you have learned how to draw an object in OSM using JOSM and what should you consider in drawing an object in JOSM. When you try to draw an object using satellite imagery, you will see several objects need special technique drawing, such as bridge, office, or large road that have barrier.

##### 1. Drawing Bridge

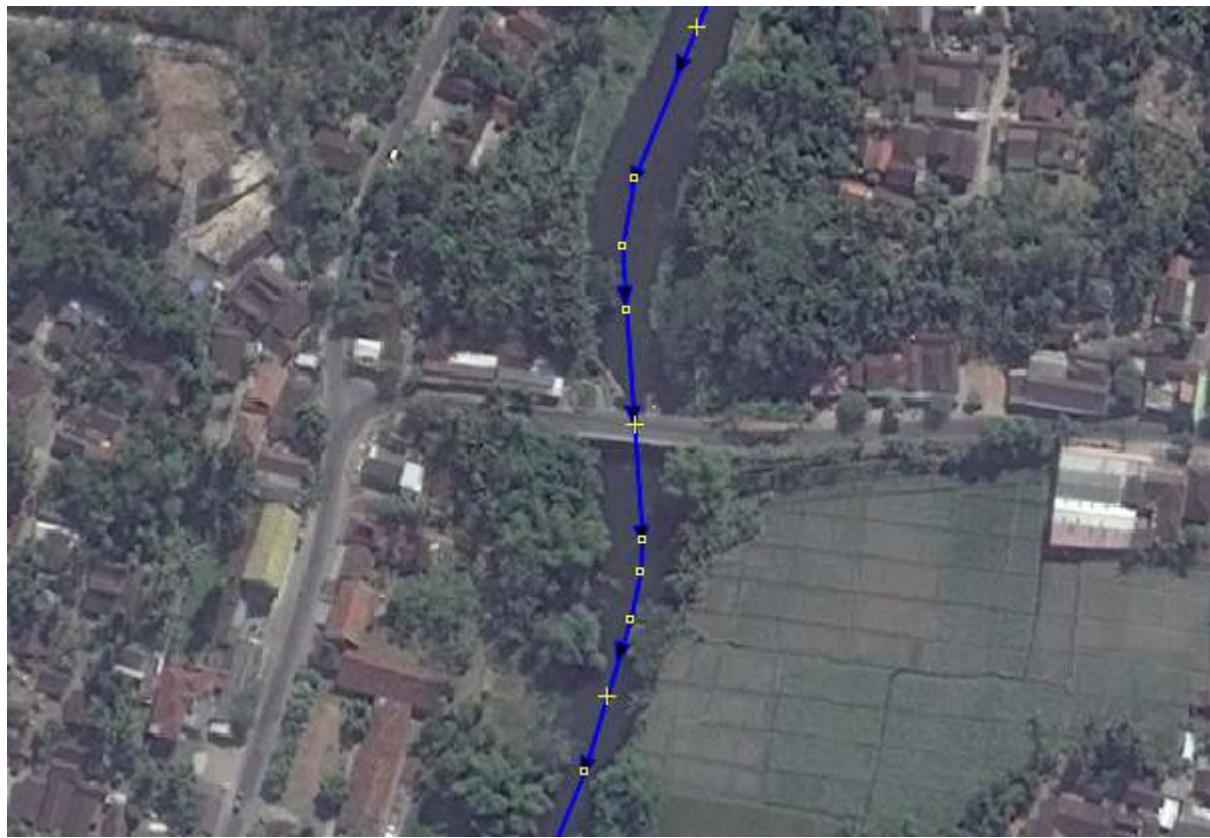
Bridge can be found on a river network. However in OSM, you can not just draw a line/road over the river. If you do that, technically your editing in JOSM can still be uploaded on OSM, but it will be a warning in the system. Then, how to draw the correct bridge? There are the steps how to draw a bridge.



Bridge object

There are the steps how to draw a bridge:

- First, draw a river network.



Example of river network

- Draw road network that cross above the river.



Example of road network above the river

- Zoom in the imagery satellite, you will see the left and right end of the bridge.



Example of the end of the bridge

- On the road line, make nodes that coincide with the left and right ends of the bridge.



Nodes in the end of the bridge

- Next, you will separate the line into bridge line and road line. Click on the two nodes you just created, which are the left and right end of the bridge, then go to **Tools** → **Split Way**.



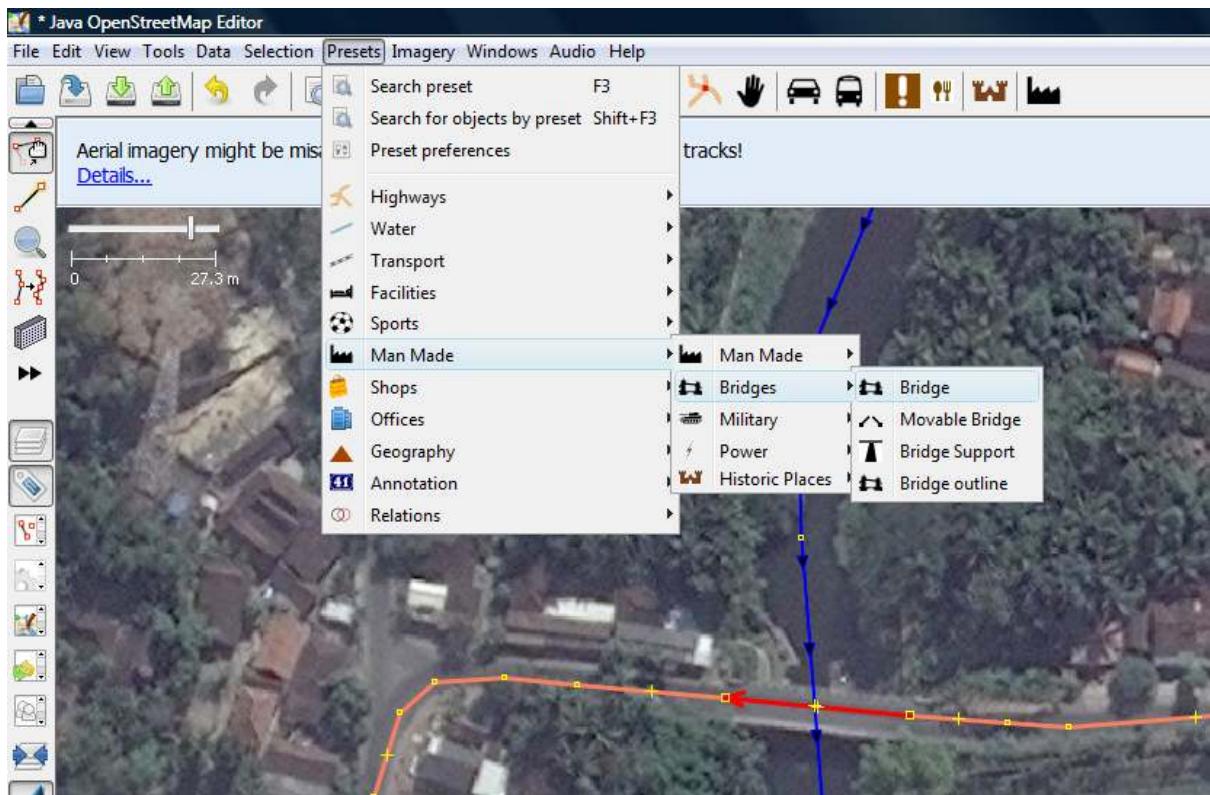
Example of split way

- So, the line that was only one segment line/road, now divided into three segments, that are (1) road network on the left side of the bridge, (2) the bridge, and (3) road network on the right side of the bridge.



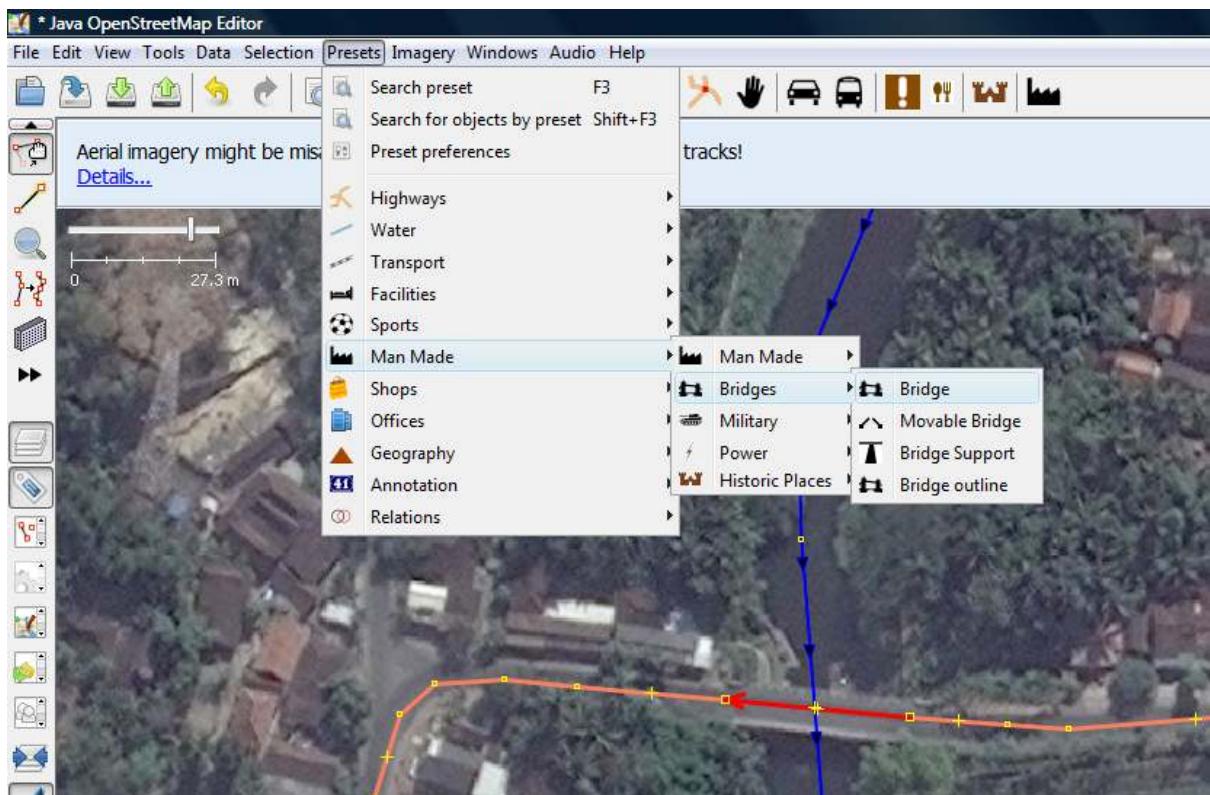
The road has been divided into three segments

- Next step is to give a tag that the object is a bridge. Now, click on the bridge, then go to **Preset → Man Made → Bridges → Bridge**.



#### How to add bridge tag/preset

- There is a bridge preset window will open. Just fill in the description **Bridge=yes** dan **Layer=1**. Layer=1 to add information that the bridge is one level higher than the ground.



#### Information that you should fill for bridge

- Finish.



Examples of bridge that have been successfully created

A screenshot of a GIS application interface. On the left is an aerial map showing a bridge over a river. On the right is a panel titled 'Tags: 3 / Memberships: 0' containing two entries: 'Highways/Streets/Primary ...' and 'Man Made/Bridges/Bridge ...'. Below this is a table titled 'Key' and 'Value' with three rows: 'bridge' (value 'yes'), 'highway' (value 'primary'), and 'layer' (value '1'). At the bottom of the panel are buttons for 'Add', 'Edit', and 'Delete'. Further down is a section titled 'Validation Results' with a warning message: 'Warnings (5)'.

Examples of bridge and information on the tags panel

## 2. Draw School, Offices, or Buildings

A school, hospital, or office building sometimes not stand alone, but consists of several buildings. In this sub-chapter, you will learn how to draw school area that has several buildings and objects. See the example image below:



Examples of school with several buildings

Some people draw it as very large building, bounded by a circular fence (picture a). Others draw each building in one area separately, then each building given a tag (picture b). With the second way, it will be calculated more than one school. This is a wrong way to draw the school area.



Picture a and picture b

So how to draw school or other building area that have several buildings in correct way? There are the steps:

- First, draw objects from the school area that are inside the school fence or outermost area, such as classrooms, parking lots, mosque, and field. Give them tags based on their object type.



Drawing of objects in the school

- After all the elements are drawn, draw the fence or outermost border of the school and giving the tag as **amenity = school**.



Draw the outer line of the school

If you draw it like the picture above, then you have successfully made a picture of the school area correctly.

### 3. Drawing a Road Network with Barrier

A road network can be found in simple form (1-3 meters wide and without barrier) (picture a), but can also be found in complex form, which are very wide (10-20 meters) and there is a barrier.



Picture a and Picture b

To draw a simple road network, of course it is very easy, which is enough to draw it with one line. However, to draw a road network that has a barrier in the middle of the road, you must draw one way road that are separate with other roads. The picture below is part of the Thamrin road section, Central Jakarta. This road has a width of approximately 40 meters, and there is a barrier in the middle of the road, which separates vehicle from the north and from the south.



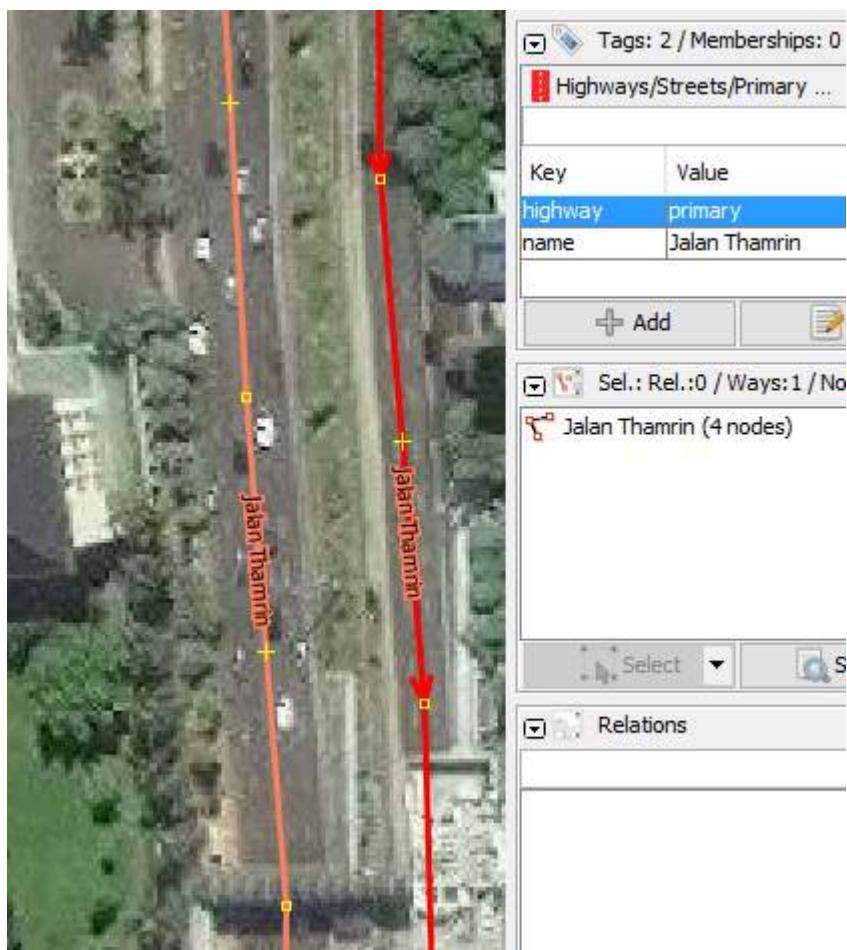
Part of Thamrin road

To draw Thamrin road, you must draw two lines, which one road is passed by vehicles from the north and the other road is passed by vehicles from the south. There are the steps for draw a road like Thamrin road:

- First, draw a line from bottom to top (south to north), then give tag `highway=primary, name=Jalan Thamrin, and oneway=yes`. Then, draw a line from top to bottom (north to south), then give tag `highway=primary, name=Jalan Thamrin, and oneway=yes`.



Draw road from bottom to top (south to north)



Draw road from top to bottom (north to south)

Please pay attention to the direction of the arrow on both lines. On the first line, the direction of the up arrow means that the road segment is passed by vehicles from south to north. On the second line, the direction of the down arrow means the road segment is passed by vehicles from north to south.

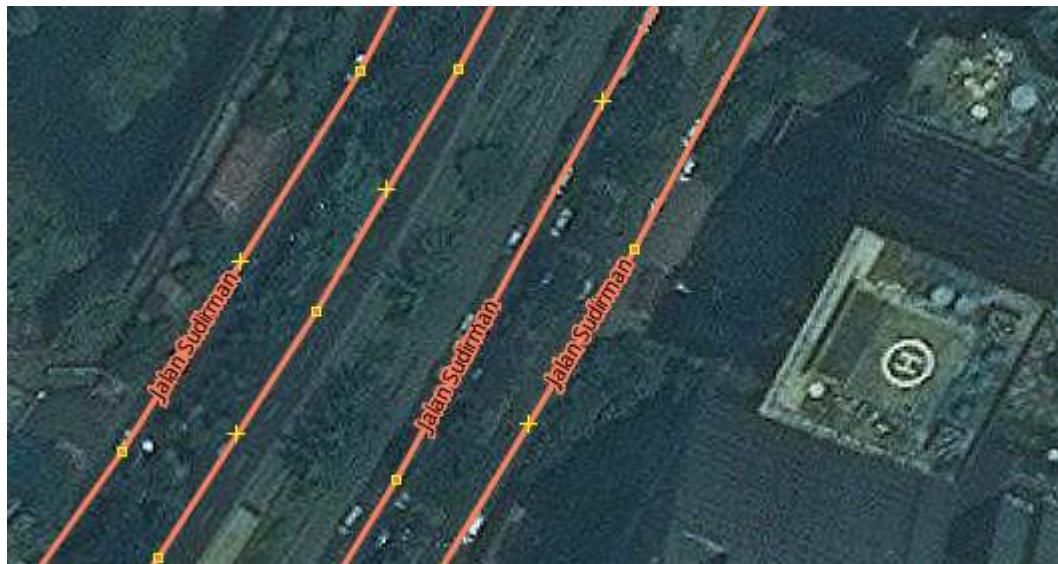
If a road has four different segments (that means have three barriers), for example a slow lane to the north, a fast lane to the north, a slow lane to the south, and a fast lane to the south; then you have to draw the road with four lines. For example on Jalan Sudirman, Central Jakarta.



Part of Jalan Sudirman, Central Jakarta, which have four segments (three barriers)



Sudirman road segments on satellite imagery



That road segments, although it is the same road, namely Sudirman road, but have four segments; on OSM, illustrated with four different lines

#### SUMMARY

Congratulations! You have learned how to use tools menu or any tools in JOSM that can help you to map objects in OSM. You have also learned editing tips that will be useful when you editing with JOSM. In the next module, you will learn more about the process to edit the OSM map in JOSM.

# Creating survey form for ODK Collect & OpenMapKit

## Objectives:

- Explain the concept of XLSForm
- Operate the creation of an XLSForm for *ODK Collect*
- Operate the creation of an XLSForm for *OpenMapKit*

In field survey activities sometimes you need a survey form to collect the data. Imagine if you need a form survey with dozens of questions for each respondent, you will certainly experience difficulties when filling data and also when entering data into a laptop. In this material you will learn how to create a survey form in digital format which will later be entered into your mobile phone.

## I. Understanding the concept of *XLSForm*

*XLSForm* is a standard form created to help speed up the process of creating survey forms in **Excel**. The creation of this survey form is done in an easy-to-read format and uses a familiar tool - **Excel / Google Sheets**. *XLSForm* produces standard standards for sharing and cooperating in making survey forms. *XLSForm* is very easy to use but can also be very complicated if you are familiar with making it.

A	B	C	D
1	type	name	label
2	text	surveyor_name	Q. 1 Nama surveyor
3	select_one yes_no	building	Q. 2 Apakah ini merupakan bangunan?



## Example of XLSForm

*XLSForm* will then be converted to *XForm*, an open standard format, where the format allows you to create a form with very complex functions, such as multilevel questions, into a format that has been recognized by both data collection tools or in the form of sites on the internet, as well as in mobile devices.

```
<xf:input id="input1" ref="input1/value" incremental="true">
  <xf:label>a text</xf:label>
  <xf:hint>Hint for this input</xf:hint>
  <xf:help>help for input1</xf:help>
  <xf:alert>invalid</xf:alert>
</xf:input>
```



a text\*  Hint for this input [?](#)

readonly  required  relevant  valid

#### Examples of XForms format

The main requirement in making *XLSForm* is the final survey form must be in this type of **Microsoft Excel** format (.xls or .xlsx). If you create survey forms using other applications such as **Google Sheets** or **Libre Office**, you must ensure that the final file is saved in format .xls or .xlsx.

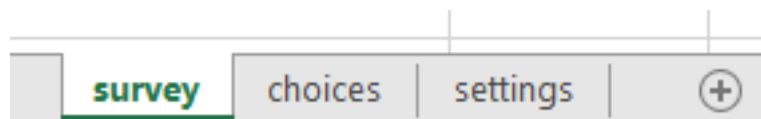
## II. Making XLSForm for ODK Collect applications

You certainly understand how to use *ODK Collect* described in the **Using the ODK Collect application** module. All questions that appear on *ODK Collect* made in format *XLSForm*. Now we will learn how to create forms survey so they can be displayed in *ODK Collect*.

### 1. Standard Format

In making survey forms, there are some conditions that you must follow so the survey forms that we make can be changed into format *XForm*. Some rules that must be followed to create an appropriate survey form are:

- a. **Three main worksheets /sheets** . In the *spreadsheet* we create, it must consist of 3 main worksheets, the named worksheet **survey**, **choices**, **settings**. The naming of this worksheet must match and must not be mistaken because it will fail when *uploading* your survey form.



Three main worksheets in each XLSForm

The first worksheet is **survey**. On this worksheet, all questions we make must be put on this worksheet. All questions that we make do not need to be included with the list of answers. All the list of answers we need will refer to the next worksheet.

The second worksheet is **choices**. On this worksheet we include all of our answer lists for each question that requires answer choices.

The third worksheet is **settings**. On this worksheet we can only enter the name of our form if the name of our form is different from the name of our file. For example, if our file name is *form\_survei\_air\_bersih.xls* then in this worksheet we can name our form with the name we want, for example the *Water Condition Form*.

**b. Three main column names.** On each worksheet there must be two or three different column names on each worksheet. The column names for each of these worksheets are also different.

**b.1. Worksheet survey** In **survey** worksheet we have to insert three columns name: **type**, **name**, and **label**. Column with name **type** indicates the type of question that will appear later, whether the question is in the form of choices, free entries or capture locations.

Column with **name** indicates the unique variable for each question list. These variables cannot be the same, do not use spaces, and are only numbers, letters or underscores.

Column **label** shows the question that will appear on the user's mobile device. There is no standard format for this column, you are free to use letters, numbers, and special characters in this column.

type	name	label
text	luas	Luas (hektar)
select_one bencana_yn	area_bencana	Apakah berada di area bencana?
select_multiple jns_bencana	jenis_bencana	Jenis Bencana
decimal	ketinggian	Ketinggian

**Show what kind of questions that will appear to the user**

**Show unique variable for each question. You cannot use space and special characters**

**Show questions that will appear to the users**

Examples of columns for survey worksheet

**b.2. Worksheet choices** At the **choices** worksheet we have to insert three columns namely **name**, **list\_name**, & **label**. In **list\_name** you create a group that contains a set of answer choices. For example like a set of answer choices that will appear under multiple choice questions. For naming variable in **list\_name** this must follow the naming provided in **survey** worksheet. For example on **survey** worksheet we enter a multiple choice type with the name **select\_one jns\_bencana**. So on the **choices** worksheet we must fill **list\_name** with name **jns\_bencana**. This will be explained further in the next discussion.

Column **name** has the same rules as column **name** on the **survey** worksheet. All must be in unique variables that are not the same as the others both on the **survey** worksheet or **choices**; do not use spaces but are replaced by *underscores*; and do not use special characters such as question marks, exclamation marks, etc.

Column **label** has the same rules as column **label** on the **survey** worksheet. This column contains the answer text that will appear on the user's cellphone. You can freely use spaces, special characters or letters in this column.

list_name	name	label
bencana_yn	ya	Ya
bencana_yn	tidak	Tidak
jns_bencana	banjir	Banjir
jns_bencana	kering	Kekeringan
jns_bencana	longsor	Tanah longsor
jns_bencana	banjir_rob	Banjir rob
jns_bencana	kebakaran	Kebakaran hutan
jns_bencana	angin	Angin puting beliung

list\_name contain set of choices for each question in survey worksheet.  
For list\_name column must follow the naming format in survey worksheet

Examples naming column on the choice worksheet

**b.3. Worksheet settings** Worksheet **settings** used when you want to make additional settings such as giving the name of your survey form, giving form a specific id, and version of your survey form. In order to use this feature, you must provide these three column names: **form\_title**, **form\_id**, & **version**.

Column **form\_title**, you can provide free naming for your form. This naming will later appear on the user's cellphone.

Column **form\_id**, you can provide your form id. The terms for naming this column are that you can't have the same id as the other forms, don't use spaces, and don't use special characters.

Column **version**, you can provide a version of your form. Adding column **version** is not mandatory. If you frequently add / change your survey forms, by providing column **version**, it will be easier for you to upload the forms on the server.

form_id	form_title	version
ckm_penggunaan_lahan	CKM Form Survey Penggunaan Lahan	ckm_001

Examples of settings on the worksheet settings

c. All entries must be in a standard format and starting from the first box. One of the most important requirements is that when we make a survey form, everything must start in the *field /quadrant A-1*.

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5								

always start here

Initial position of making survey forms

All entries form must start in those quadrant/field because the system will convert *spreadsheet* file to *XForm*, so if you do not start from that position, an error will occur in the system.

In addition, the other main requirement is that you cannot use table formats such as *merge, center, hide row / column, wrap text, etc.* Everything must be in a standard format. Settings that we can use are to add letters in bold, give color to columns or rows, and change the shape and size of letters.

## 2. Types of Standard Questions

In the paper survey form, we usually find several questions such as short answers, long answers, entering the date of birth, and multiple choices. Some of these questions, have different type questions, such as:

a. Question type **text** This type will generate a type of question with a free response question format. Users can freely enter numbers, letters, and special characters if we use this type of question.

type	name	label
text	surveyor_name	Q. 1 Nama surveyor



\* Q. 1 Nama surveyor

Examples of question text

b. Question type **Integer / decimal** This type of question will produce a question format with answers of integer numbers (specifically for **integer** type) or decimal numbers (specifically for **decimal** type). Users can only enter numbers with this type of question, a combination of numbers and letters cannot be entered if we use this type of question.

A	B	C
1 type	name	label
2 integer	total_rt	Jumlah RT terdampak

↓

**\* Jumlah RT terdampak**

Example question for integer type

c. Question type **select\_one** This type of question will give the user a choice of answers where the user may only choose one answer. In creating this type of question, you must use a format such as **select\_one [options]**. Where [option] is a group variable that will be included in the **list\_name** inside worksheet **choices**.

Lembar kerja survey			Lembar kerja choices		
A	B	C	A	B	C
1 type	name	label	1 list_name	name	label
2 select_one yes_no	building	Q. 2 Apakah ini merupakan bangunan?	2 yes_no	yes	Ya
			3 yes_no	no	Tidak

↓

**\* Q. 2 Apakah ini merupakan bangunan?**

Ya  
 Tidak

Example question type **select\_one [options]**. Note that the **list\_name** matches with **[options]** in survey worksheet.

d. Question type **select\_multiple** This question type is the same as the previous question type. The answers presented to the user are of several choices and the user may choose more than one answer. The rules for creating this type of question are the same as **select\_one**. You must use a format such as **select\_multiple [option]**, where [option] is a group variable that will be included in **choices** under **list\_name**.

Lembar kerja survey

A	B	C
1 type	name	label
2 select_multiple floodcause	penyebab_banjir	Penyebab terjadinya banjir

Lembar kerja choices

A	B	C	D
1 list name	name	label	
2 floodcause	hujan_lokal	Hujan Lokal	
3 floodcause	tanggul_jebol	Tanggul Jebol	
4 floodcause	banjir_kiriman	Banjir Kiriman	
5 floodcause	banjir_rob	Banjir Rob	
6 floodcause	limpasan_sungai	Limpasan Sungai	
7 floodcause	saluran_tersumbat	Saluran Tersumbat	
8 floodcause	rembesan	Rembesan	

\* Penyebab terjadinya banjir

- Hujan Lokal
- Tanggul Jebol
- Banjir Kiriman
- Banjir Rob
- Limpasan Sungai
- Saluran Tersumbat
- Rembesan

Example question type select\_multiple [options]. The option in the picture above is the floodcause which also appears in the worksheet choices.

e. Type of **geopoint** This type of question will ask the user to record the coordinates of their position and will produce data in the form of latitude and longitude coordinates.

A	B	C
1 type	name	label
14 text	nama_koordinator	Nama koordinator lokasi pengungsian
15 text	hp_koordinator	No HP Koordinator
16 geopoint	gps	Titik koordinat lokasi pengungsian



## \* Titik koordinat lokasi pengungsian

Pastikan tingkat keakurasiannya kurang dari 10 meter

Start GeoPoint

Example of question using geopoint

**f. Note** This type is used to add a note or notification page. Users will be presented with a single page containing only the appearance of the text without having to fill in any information. For the writing format, it still follows the writing conventions in **label**, where we are free to give any writing format.

	A	B	C
1	type	name	label
33	note	display_note1	Form Kebutuhan Mendesak. Pada halaman berikut anda akan mengisi informasi kebutuhan mendesak. Satu form untuk satu jenis kebutuhan saja.





## Form Laporan Banj...



⋮

### Form Kebutuhan Mendesak

*Pada halaman berikut anda akan mengisi informasi kebutuhan mendesak. Satu form untuk satu jenis kebutuhan saja.*

Examples of using note

**g. image, video or audio** This type of question will ask the user to take a picture, sound or video.

	A	B	C
1	type	name	label
24	image	foto	Ambil foto untuk lokasi ini



### Ambil foto untuk lokasi ini

Take Picture

Choose Image

Example of using image type

### 3. Additional Format

You can directly use your survey form by simply entering a number of standard question types that have been explained previously. The more you are good at creating *XLSForm*, you might ask if there are other types of questions that can make your survey forms easier to use and retrieve data according to your wishes. To see all types of questions that can be used in making *XLSForm*, you can go to the site <http://xlsform.org>. In this material, we will only discuss a few types of additional questions that you can use if you want to make your survey form more informative and easier to use.

**a. Hint** Hint is one additional feature that we can add to our digital survey forms. By using this feature, we can provide additional information or instructions on how to fill in a question that we make. To create this feature, we must add a new column to **survey** worksheet called **hint**. By adding this column, for each type of question we make, we can add it with the information, such as instructions to filling the form, in column **hint**.

The screenshot illustrates the use of the 'hint' column in an XLSForm spreadsheet and its resulting survey form interface. The spreadsheet (top) has columns A, B, C, and H. Column H is labeled 'hint' and contains instructions for each row. A red box highlights the 'hint' column, and a yellow arrow points down to the survey form interface (bottom). The survey form shows two questions: 'Nama Organisasi' and 'Nama Surveyor', each with its respective hint displayed below the input field.

	A	B	C	H
1	<b>type</b>	<b>name</b>	<b>label</b>	<b>hint</b>
2	start	auto_survey_time		
3	begin group	group_surveyor	Informasi Surveyor	Pastikan pengisian nama tidak memasukkan karakter spesial. Contoh : / < * & @ #
4	text	organisasi	Nama Organisasi	Pastikan pengisian nama tidak memasukkan karakter spesial. Contoh : / < * & @ #
5	text	surveyor	Nama Surveyor	Pastikan pengisian nama tidak memasukkan karakter spesial. Contoh : / < * & @ #
6	end group			

Form Laporan Banj... ⋮

Informasi Surveyor

**\* Nama Organisasi**  
Pastikan pengisian nama tidak memasukkan karakter spesial. Contoh : / < \* & @ #

**\* Nama Surveyor**  
Pastikan pengisian nama tidak memasukkan karakter spesial. Contoh : / < \* & @ #

Examples of using the column **hint**

**b. Required** This feature is needed if on your survey form, there are questions that must be answered. By using this feature, users will not be able to fill in further questions if they have not answered the question first. The types of questions that use this feature will also have a red asterisk when viewed on your phone. To use this feature, you only need to create a new column called **required** that is located on **survey** worksheet. In order to set questions becomes mandatory, you must add the value **yes** in this required column.

	A	B	C	D	E	F
1	type	name	label	hint	relevant	required
4	select_one perangkat_gps	no_gps	Nomor PERANGKAT/ALAT GPS	Lihat pada perangkat GPS yang digunakan		yes
5	text	surveyor	Nama surveyor			yes



GPS 4  
 GPS 5  
 GPS 6  
 GPS 7  
 GPS 8  
 GPS 9  
 GPS 10  
 GPS 11  
 GPS 12  
 GPS Abu-abu

Sorry, this response is required!

### \* Nomor PERANGKAT/ALAT GPS

*Lihat pada perangkat GPS yang digunakan*

- GPS 1
- GPS 2
- GPS 3

Example of using required features. Any questions that activate this feature cannot be skipped by the user if they are not already filled in.

c. **Field-list** The function of this feature is that users will be presented with a number of questions on just **one page** on the application screen. By default, each page will only be presented with one question. If we want all questions to appear on one page, then we must use this feature.

To enable this feature, you must make a number of settings:

1. You must insert format **begin\_group** at the beginning of the question that you want to display on one page and **end\_group** at the end of the question that you want to display on one page. These **begin\_group** and **end\_group** formats must be in the column **type**. By tucking in this format, the system will read that all questions that are after **begin\_group** and before **end\_group** format are one question group.
2. After you have created the question group, you must add column **appearance** and fill with **field-list** format. By adding this column, you inform the system that all groups of questions that you have created, will be included in a single page list.

A	B	C	D	F
1 type	name	label	required	appearance
2 begin_group	info_awal	Informasi awal		field-list
3 text	nama_surveyor	Nama surveyor :	yes	
4 dateTime	waktu_survey	Tanggal dan waktu survey :		
5 end_group				



Geo Data Collect > sur...

Informasi awal

Nama surveyor :

---

Tanggal dan waktu survey :

November 2016

S	M	T	W	T
30	31	1	2	3
6	7	8	9	10
13	14	15	16	17
20	21	22	23	24
27	28	29	30	1
4	5	6	7	8

3:54 AM

Example of using the field-list feature in several groups of questions

**d. Relevant** This feature allows us to make a list of questions that follow the answers to the previous questions. Suppose we are asked a question about "What causes floods?" With the answer choices "A. Bad Drainage B. Garbage C. Others". When we answer "C. Other", then the next question will only relate to the previous (other) type of answer, such as "Because in the previous question you answered others, explain further about the causes of other floods". The question will not appear if we answer with other answers such as "A. Bad Drainage". How to enable this **relevant** consists of several stages:

1. Creating the initial question type

Before using **relevant**, you must first create an Initial question that you will enter into format **relevant**. For example, by using the type question **select\_one**:

	type	name	label
1	select_one	jns_objek	Jenis objek

Figure 47: Example questions on survey worksheet

Example questions on survey worksheet

## 2. Making choices on **choices** worksheet

After you make the initial question, the next step is you have to make the choice of answers on **choices** worksheet.

	list name	name	label
1	jns_objek	gorong_gorong	Gorong gorong
14	jns_objek	gua	Gua
15	jns_objek	tempat_ibadah	Tempat Ibadah
16	jns_objek	tugu	Tugu
17	jns_objek	prasasti	Prasasti
18	jns_objek		

Figure 48: Example answer choices on theworksheet choices

Example answer choices on theworksheet choices

## 3. Insert **relevant** features in the next question

After you make the initial question and answer choices, the next step is you will make the question that will appear in accordance with the answer choices selected in the previous question. For example, in the previous question, you chose the **prasasti** for the type of object in question, then the next question will be specific only about the **prasasti**. To enable this feature, you must enter

an additional column named **relevant** on **survey** worksheet. After entering additional columns you can fill in the question rows that require **relevant** functions with the format:

Format	Deskripsi
<code>field_name = 'choice' For types select_one only  selected({field_name}, 'choice')</code>	For type select_multiple & select_one

For **field\_name** refers to the variable that you specified earlier in the **name** column on the **survey** worksheet. Meanwhile, **choice** refers to the variable of choice of answers available on the **choices** worksheet.

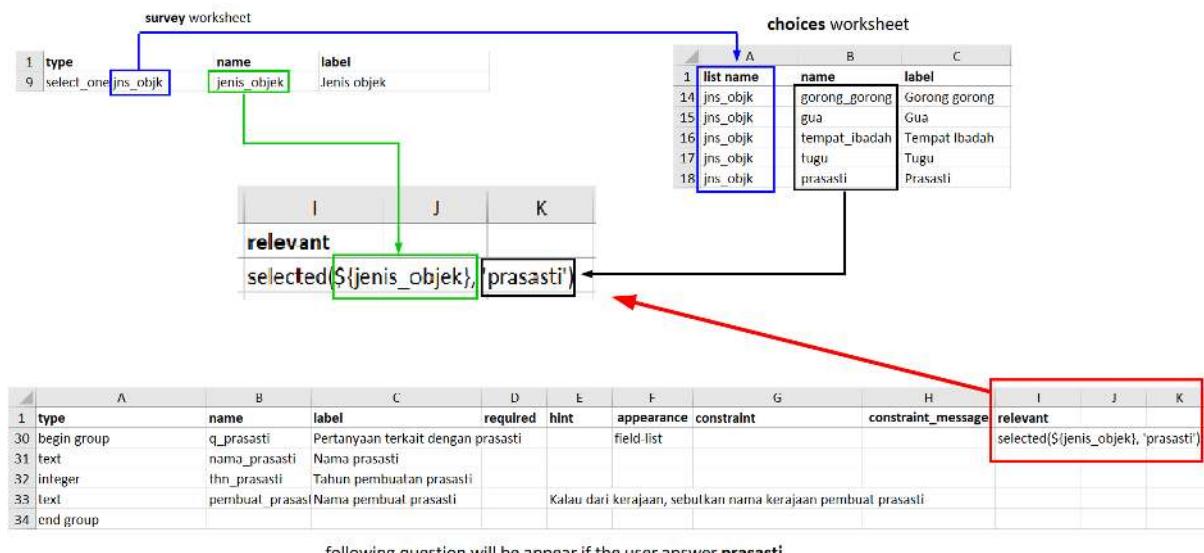


Figure 49: Example of making relevant features

Example of making relevant features

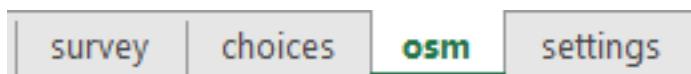
### III. Creating survey forms for the application *OpenMapKit*

In addition to using *ODK Collect*, for data collection in the field we also use *OpenMapKit*. You certainly understand how to use *OpenMapKit* for data collection in the field. If you don't know it yet, you can read the **Using the OpenMapKit Application** module. Now we will learn how to create survey forms for use in *OpenMapKit*.

Generally, creating survey forms for *OpenMapKit* follows rules such as *ODK Collect* form. Making this survey form can also be done in the same file when making *ODK Collect*. There are a number of standard settings that we must follow so that the survey form we make can be used for *OpenMapKit*.

#### 1. Four main worksheets

In general, to make *OpenMapKit* is not much different from the format *ODK Collect*. The worksheets needed by *ODK Collect* are **surveys**, **choices**, & **settings**. But for *OpenMapKit*, we have to **add a new worksheet named osm**.



## Main worksheet for OpenMapKit

**osm** worksheet contains questions and answer choices that will appear on *OpenMapKit*. It is on this worksheet that we must enter all the list of questions that will appear in *OpenMapKit*. Meanwhile, three other worksheets followed the rule when making *ODK Collect*.

### 2. Types of main questions

In order for the questions that we make successfully raised in *OpenMapKit*, we have to enter a special type of question, which is **osm**. By entering this question into **survey** worksheet, the system will bring up all the questions in *OpenMapKit* that we have created on **osm** worksheet.

This type of question must be followed by a variable that need to be linked to the variable in **list name** column on **osm** worksheet.

6	image	image	Ambil gambar objeknya
7	osm building_tags	osm_building	Pilih tag osm untuk objek ini
8	geopoint	gps	Menyimpan titik koordinat

**survey** worksheet

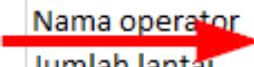
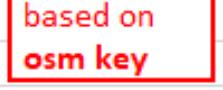
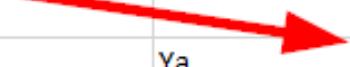
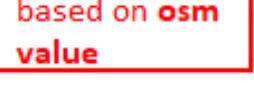
A	B	C
1	list name	
2	building_tags	power Objek apakah ini?
3	building_tags	building Apakah ini merupakan bangunan? (Isi ke
4	building_tags	rating Rating: (khusus untuk objek Gardu Listri
5	building_tags	name Nama
6	building_tags	addr:full Alamat
7	building_tags	operator Nama operator
8	building_tags	building:levels Jumlah lantai
9	building_tags	building:structure Struktur Bangunan
10	building_tags	building:walls Tipe dinding bangunan
11	building_tags	building:floor Tipe lantai bangunan
12	building_tags	building:roof Tipe atap bangunan
13	building_tags	access:roof Akses ke atap
14	building_tags	building:condition Kondisi Bangunan
15	building_tags	backup_generator Generator Cadangan
16	building_tags	source Sumber data:

**osm** worksheet

Types osm question with the same variables on osm worksheet

### 3. Three main columns

On **osm** worksheet, we must enter three main columns, namely **list name**, **name**, and **label**. The **list name** column contains questions and answer choices. The **name** column contains the unique variables that follow the standards **key** and **value** of *OpenStreetMap*. For a list of **keys** and **values**, you can look at the **Data Model OpenStreetMap** module or you can go directly to the site [https://wiki.openstreetmap.org/wiki/Map\\_Features](https://wiki.openstreetmap.org/wiki/Map_Features) and [https://wiki.openstreetmap.org/wiki/Indonesian\\_Tagging\\_Guidelines](https://wiki.openstreetmap.org/wiki/Indonesian_Tagging_Guidelines).

A	B	C
1 list name	name	label
2 building_tags	power	Objek apakah ini?
3 building_tags	building	Apakah ini merupakan bangunan? (Isi ke
4 building_tags	rating	Rating: (khusus untuk objek Gardu Listri
5 building_tags	name	Nama
6 building_tags	addr:full	Alamat
7 building_tags	operator	Nama operator 
8 building_tags	building:levels	Jumlah lantai 
9 building_tags	building:structure	Struktur Bangunan
10 building_tags	building:walls	Tipe dinding bangunan
11 building_tags	building:floor	Tipe lantai bangunan
12 building_tags	building:roof	Tipe atap bangunan
13 building_tags	access:roof	Akses ke atap
14 building_tags	building:condition	Kondisi Bangunan
15 building_tags	backup_generator	Generator Cadangan
16 building_tags	source	Sumber data:
17		
18 power	substation	Gardu Listrik
19 power	tower	Tower Listrik
20 power	plant	Pembangkit Listrik 
21		
22 building	power_plant	Ya
23		
24 building:structure confined_masonry		Rangka beton bertulang
25 building:structure steel_frame		Rangka baja
26 building:structure wood_frame		Rangka kayu
27 building:structure bamboo_frame		Rangka bambu

name column follows the key and value rules on OSM

#### 4. Questions and answer choices in one worksheet

Unlike creating survey forms for *ODK Collect*, where each question and answer choices are separate on different worksheets, for creating survey form in *OpenMapKit* we must enter all questions and choices answers on one worksheet.

### IV. Exercises to Create Survey Forms *ODK Collect* and *OpenMapKit*

Until now we have understood how to create survey forms for *ODK Collect* and *OpenMapKit*. Now we will try to make a survey form that can be used for both of these applications.

Imagine that you currently want to conduct data collection activities at a facility by using *ODK Collect* and *OpenMapKit*. Some data that you want to collect are:

- name Surveyor. (Required)

- To be at a disaster-prone location or not
- If at the disaster location, specify the type of disaster (can be more than one answer)
- Coordinates of the location of survey objects
- Name of place of amenity
- Type of amenities Amenity
- complete address of the

From the data above, you have successfully identified which types questions that go into survey forms *ODK Collect* and any kind of questions that go into survey *OpenMapKit* form. Questions that enter into *ODK Collect* are the **name of the surveyor, disaster-prone, type of disaster & coordinates of the location of the survey object**. Meanwhile the questions that go into *OpenMapKit* are the **name of the place & type of amenities, and full address**.

First of all, we have to make a survey form for *ODK Collect*. As the requirements you have learned before, in *spreadsheet* we have to make four worksheets, which are **survey, choices, settings & osm**.

After that, on the **survey** worksheet we must provide our main column, which is **type, name & label**. The types of questions we have to make for this survey form are **text, select\_one, select\_multiple, & geopoint**. Because surveyor questions are mandatory questions, we must use **required** on survey worksheet. Apart from that we also have to use **relevant** for disaster type questions. This **relevant** feature will make it easier for us to make a conditioned question.

	A	B	C	D	E	F	G
1	<b>type</b>	<b>name</b>	<b>label</b>				
2	text	surveyor_name	Nama Surveyor	yes			
3	select_one yes_no	bencana	Apakah objek ini berada di area bencana? Jika berada di area rawan bencana, sebutkan				
4	select_multiple jns_bencana	jenis_bencana	jenis bencananya.				selected(\${bencana}, 'yes')
5	geopoint	lokasi_obj	Rekam koordinat untuk objek survei ini.				

Type questions on the worksheet survey

On **choices** worksheet we put the answer choices for the type of questions **select\_one** and **select\_multiple** that we have created on the **survey** worksheet. Here we have to make three main columns namely **list\_name, name, & label**.

	A	B	C
1	<b>list name</b>	<b>name</b>	<b>label</b>
2	yes_no	yes	Ya
3	yes_no	no	Tidak
4	jns_bencana	angin	Putting Beliung
5	jns_bencana	gempa	Gempa Bumi
6	jns_bencana	gunung_meletus	Gunung Meletus
7	jns_bencana	banjir	Banjir
8	jns_bencana	longsor	Longsor
9	jns_bencana	tsunami	Tsunami

The answer choices entered in worksheet choices

Because we want to use *OpenMapKit* for our field data collection, we have to add the type of questions

that will lead us to *OpenMapKit*, the type of questions we have to enter is **osm**. On **osm worksheet**, we include all questions related to *OpenMapKit*. In the variable **name** we must refer to the **key** and **value** on the *OpenStreetMap* wikipedia .

## survey worksheet

	A	B	C
1	type	name	label
2	text	surveyor_name	Nama surveyor
3	select_one yes_no	bencana	Apakah obyek ini berada di area bencana?
4	geopoint	lokasi_obj	Rekam koordinat untuk obyek survey ini
5	osm survey_tags	obj_osm	Anda akan diarahkan ke aplikasi OpenMapKit

## osm worksheet

	A	B	C	D	E	F	G
1	list name	name	label				
2	survey_tags	amenity	Apakah tempat ini merupakan tempat ibadah?				
3	survey_tags	name	Nama tempat ibadah				
4	survey_tags	religion	Jenis pemeluk agama untuk tempat ibadah ini				
5							
6	amenity	place_of_worship	Ya				
7							
8	religion	buddhist	Buddha				
9	religion	christian	Kristen				
10	religion	hindu	Hindu				
11	religion	muslim	Islam				

Fill in the survey and osm

Finally, in **settings** worksheet we enter our form id and the title of our form. On this worksheet, only two main columns are needed, namely **form\_id** and **title**.

	A	B
1	form_id	title
2	01_Survey_Amenity	01. Survey Amenitas

Examples of settings on the worksheet settings

## SUMMARY

Congratulations! Currently you have successfully created a survey form for *ODK Collect* and *OpenMapKit applications*. To find out more about the types of questions that can be made on *ODK Collect*, you

can directly access the page <http://xlsform.org>. Making the right form will make it easier for surveyors to collect data in the field.

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

### Objectives:

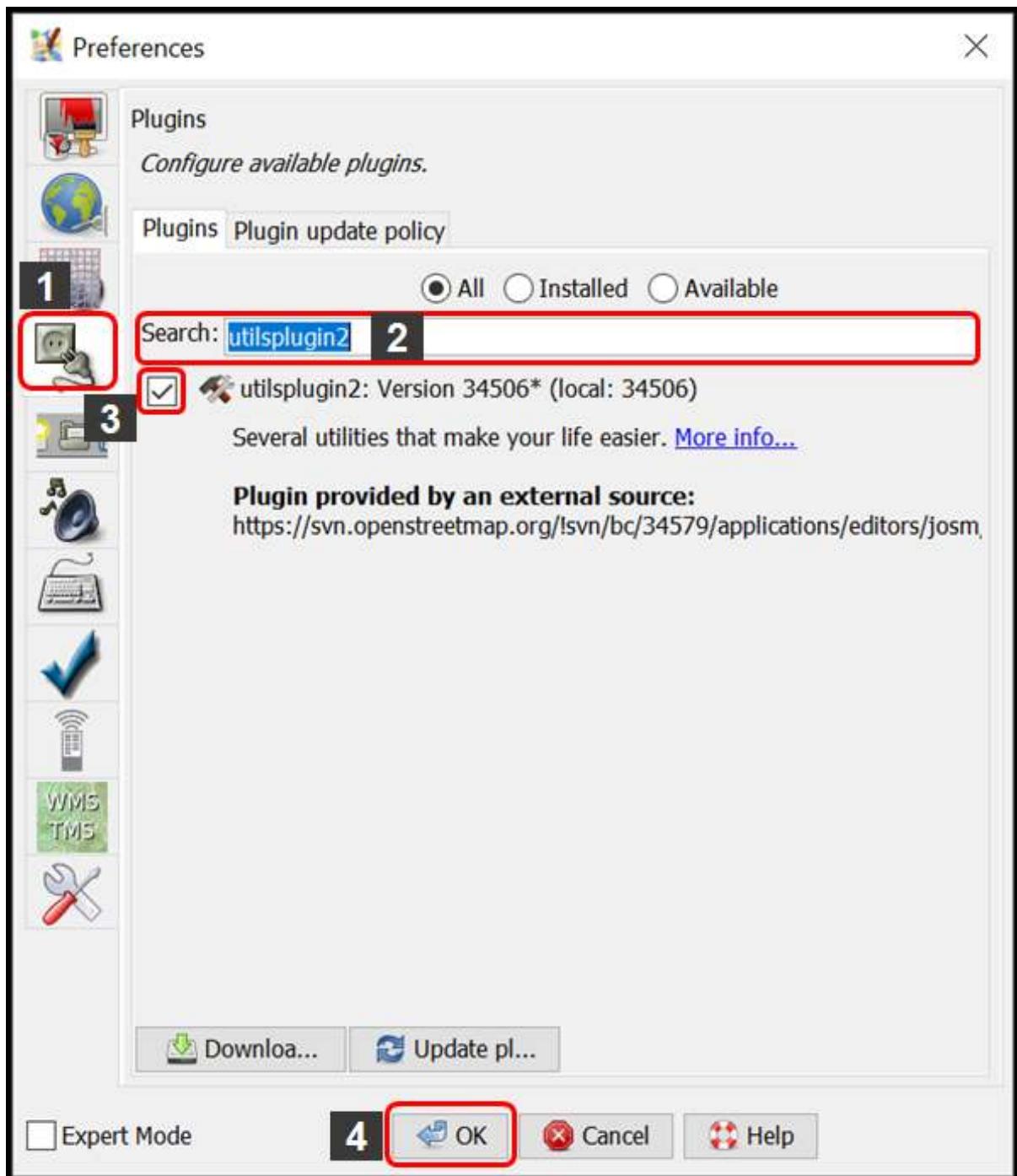
- To be able to install plugin Utilsplugin2
- To be able to merge all survey data
- To be able to save .osm file using JOSM
- To be able to download OSM data
- To be able to add satellite imagery layer on JOSM
- To be able to add and edit OSM data using JOSM
- To be able to upload changes into OSM
-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

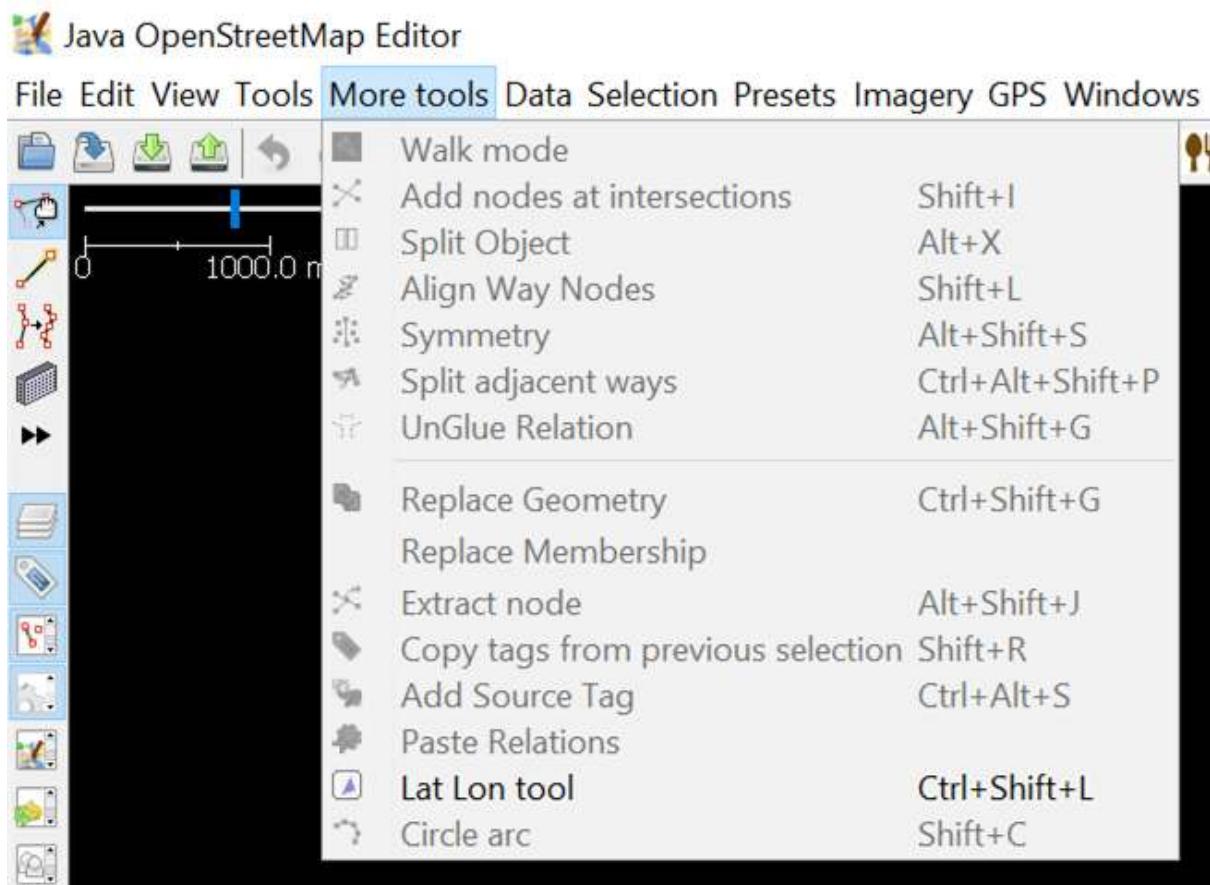
Before adding or editing OSM data using JOSM, install plugin you'll be using first. JOSM has a plugin called `utilsplugin2` whose one of the functions is makes copying preset/tag easier. To use this plugin, you have to install the plugin first since it is not installed by default. These are the steps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

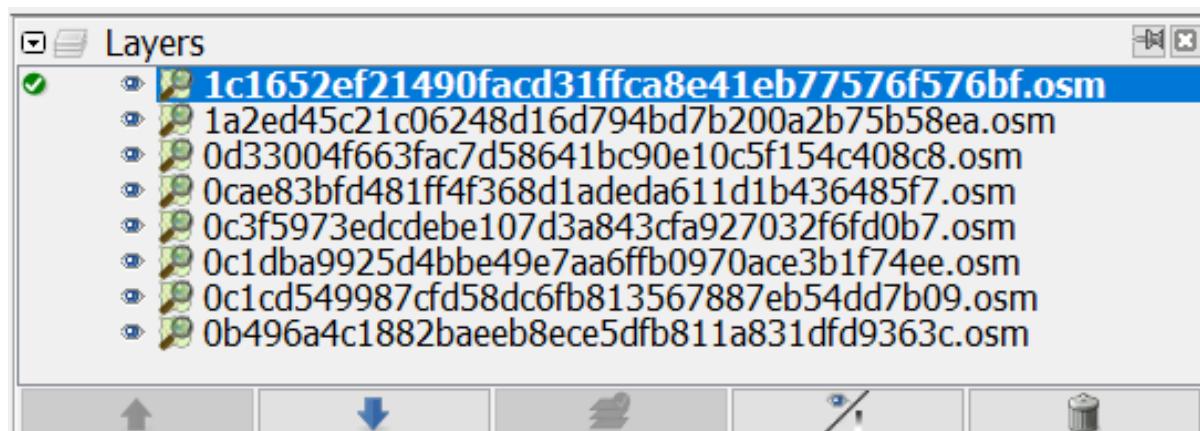
Search Results in Data Survey Jakut

osm

 1a2ed45c21c06248d16d794bd7b200a2b75b5...	E:\Documents\TROY\WORK\Survey\Data Survey Jakut\Ja...	Date modified: 12/3/2018 8:37 PM
 0d33004f663fac7d58641bc90e10c5f154c408c...	E:\Documents\TROY\WORK\Survey\Data Survey Jakut\Ja...	Date modified: 12/3/2018 8:37 PM
 1c1652ef21490facd31ffca8e41eb77576f576bf....	E:\Documents\TROY\WORK\Survey\Data Survey Jakut\Ja...	Date modified: 12/3/2018 8:37 PM
 0c1dba9925d4bbe49e7aa6ffb0970ace3b1f74e...	E:\Documents\TROY\WORK\Survey\Data Survey Jakut\Ja...	Date modified: 12/3/2018 8:37 PM
 0c1cd549987cf85dc6fb813567887eb54dd7b...	E:\Documents\TROY\WORK\Survey\Data Survey Jakut\Ja...	Date modified: 12/3/2018 8:36 PM
 0b496a4c1882baeeb8ece5dfb811a831dfd936...	E:\Documents\TROY\WORK\Survey\Data Survey Jakut\Ja...	Date modified: 12/3/2018 8:36 PM

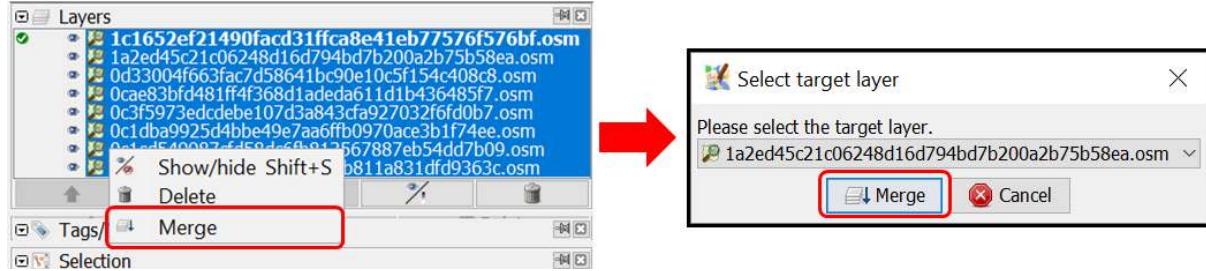
Search results for keyword “osm”

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



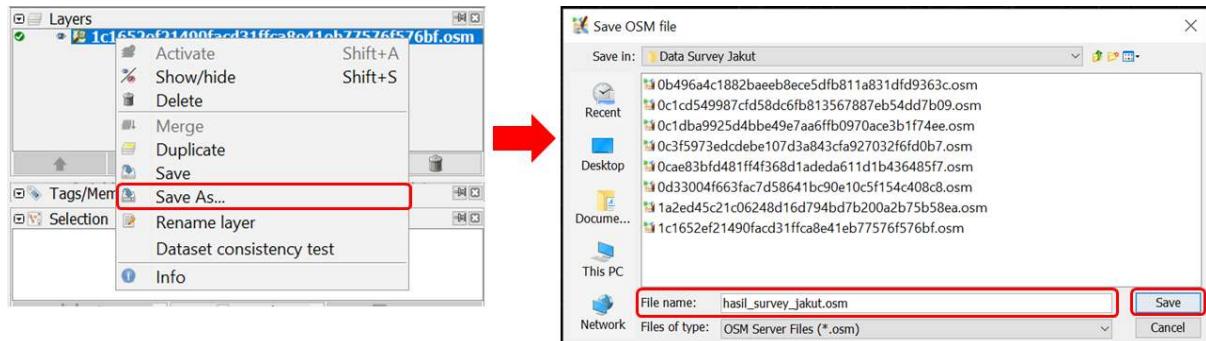
## Layers Windows after .osm file from ODK and OMK dragged into JOSM

- 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.



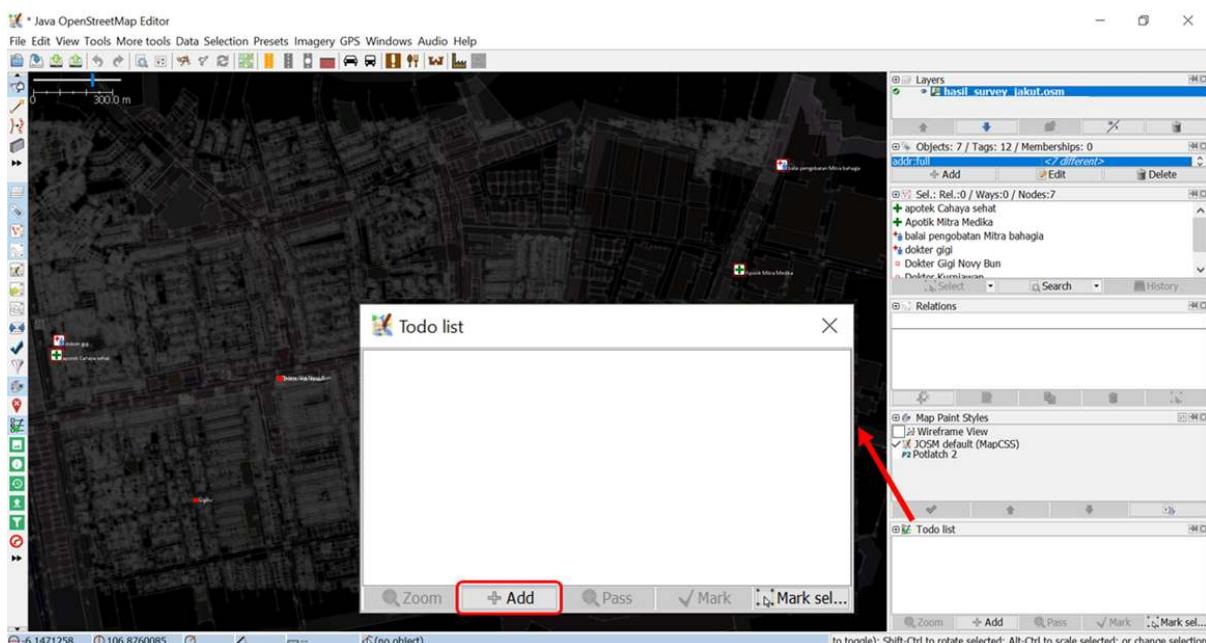
## Merging all survey data layer

- 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.

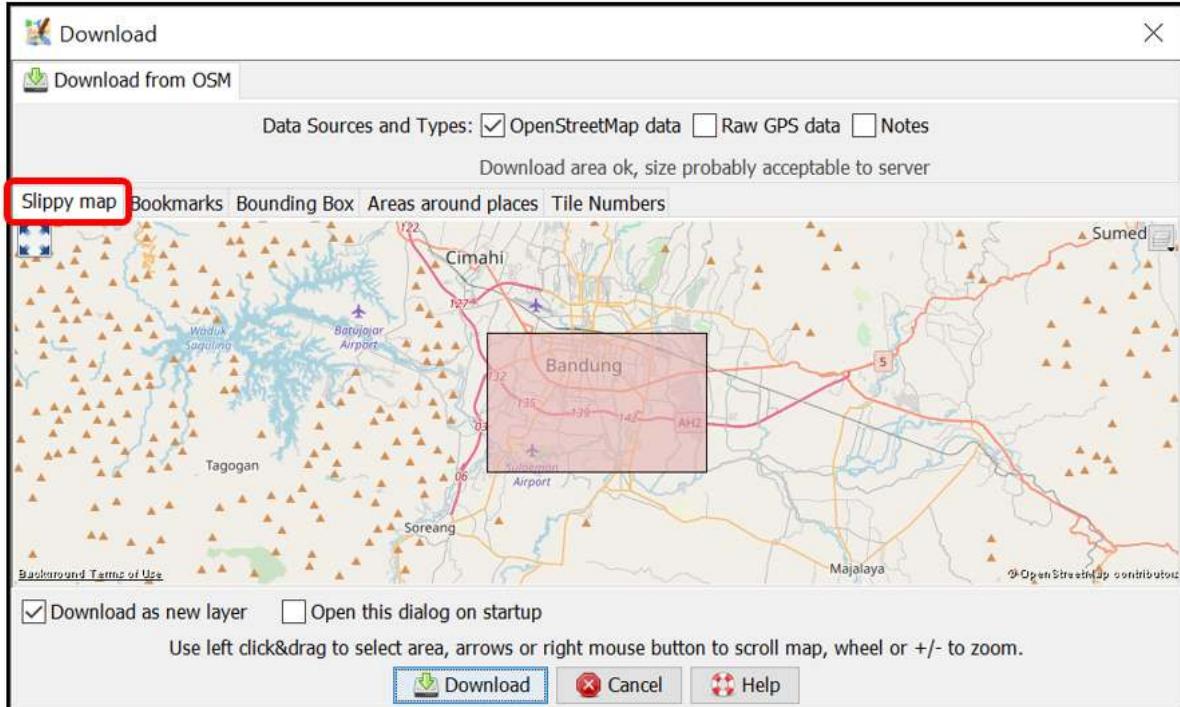


Adding objects into Todo list

### 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:

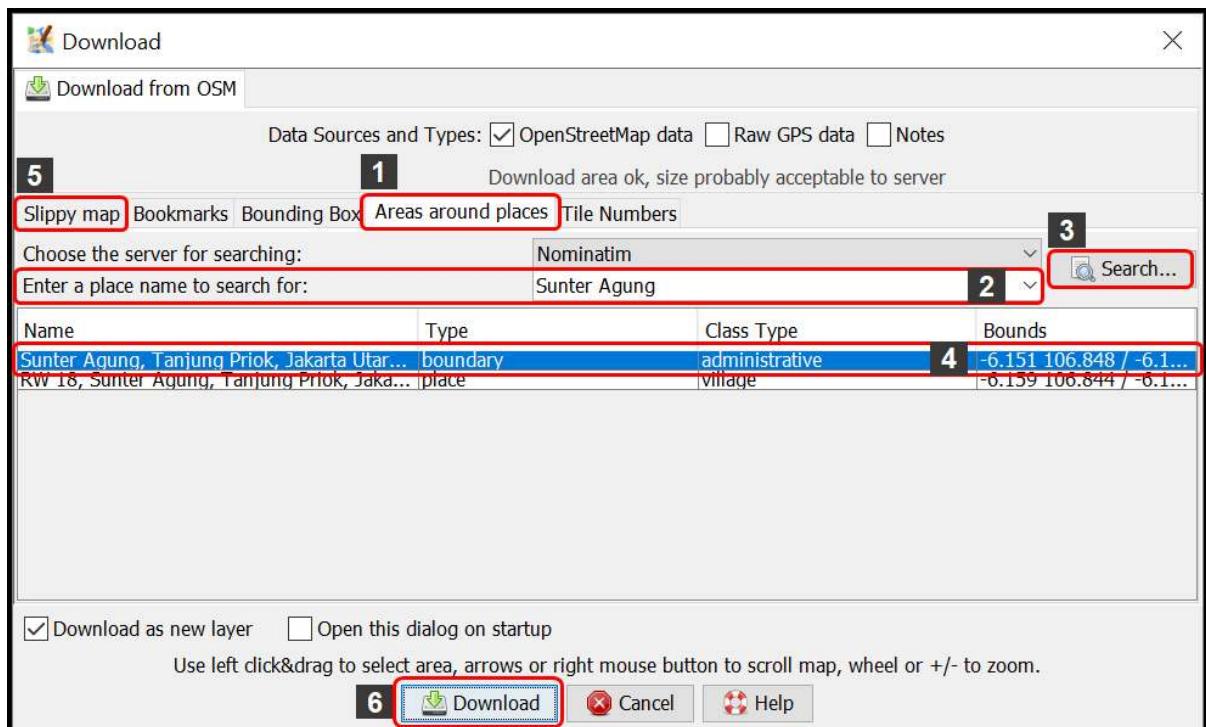
- Click menu **File → Download Data**
- **Download Windows** will appear. It will show you tab **Slippy Map** by default.



#### Download Windows on JOSM

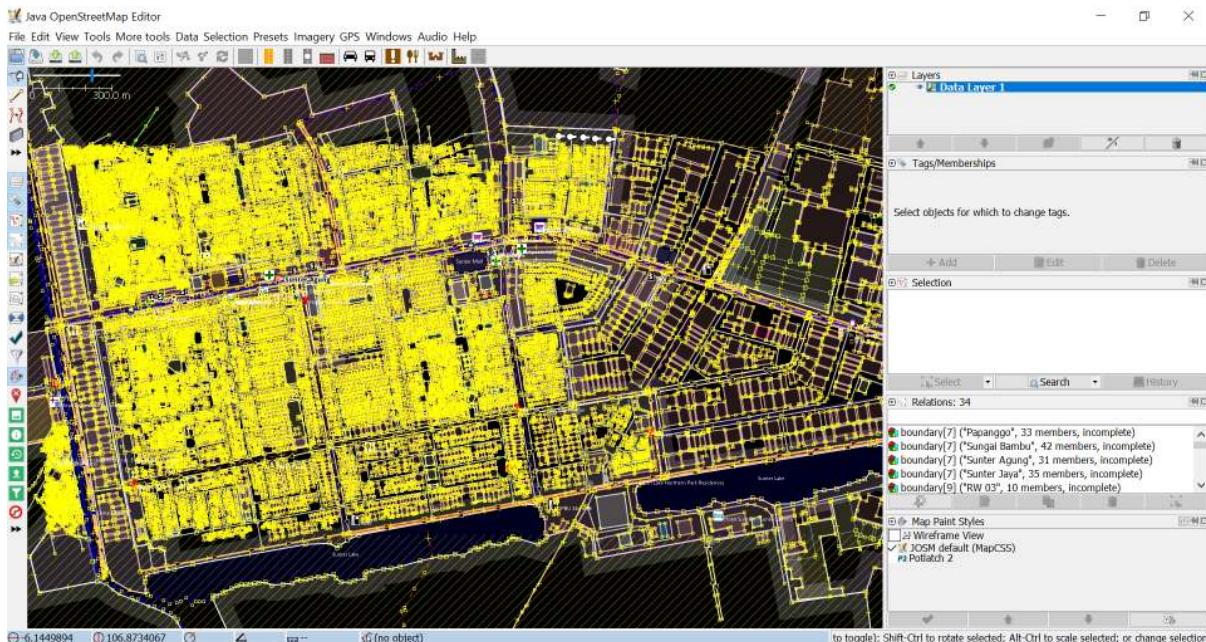
- If the map is not displaying your mapping area, slide the map by **right clicking and hold** your mouse and then **drag the map** to your mapping area. Draw a box at your mapping area by **left clicking and hold** your mouse and then **move** your mouse until a pink box cover the entire mapping area. 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.



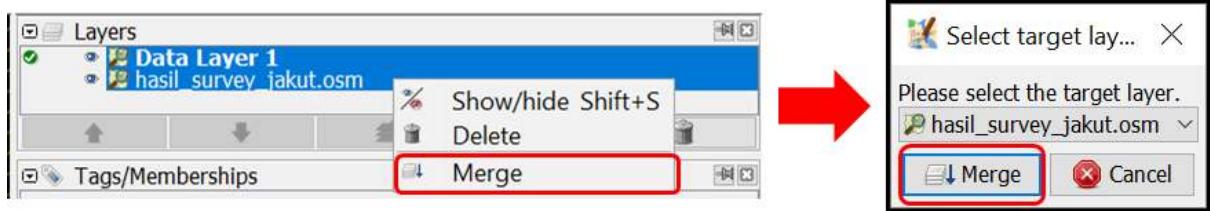
#### Tab "Areas around places" at Download Windows

- 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

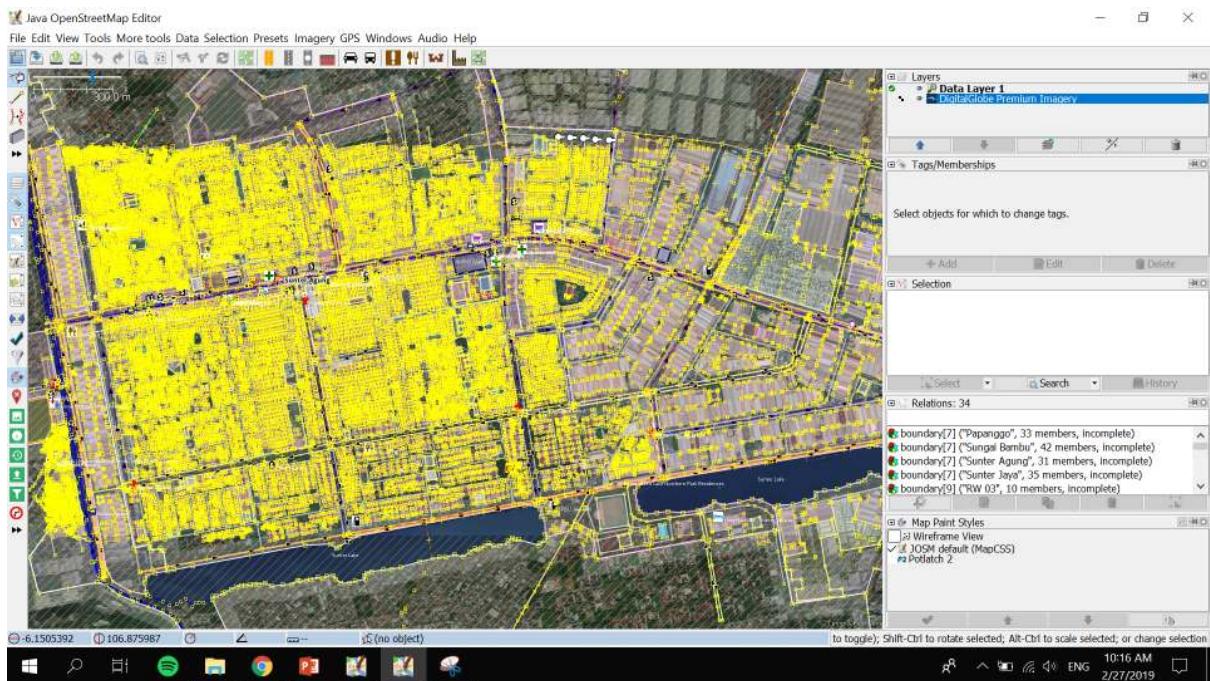
- If you already downloaded OSM data in all your area, merge your downloaded OSM data layer with your survey data layer. Select those **two layers** then **right click**, select **Merge**. Save on your survey data layer. Then click **Merge**.



Merging downloaded OSM data with survey data layer

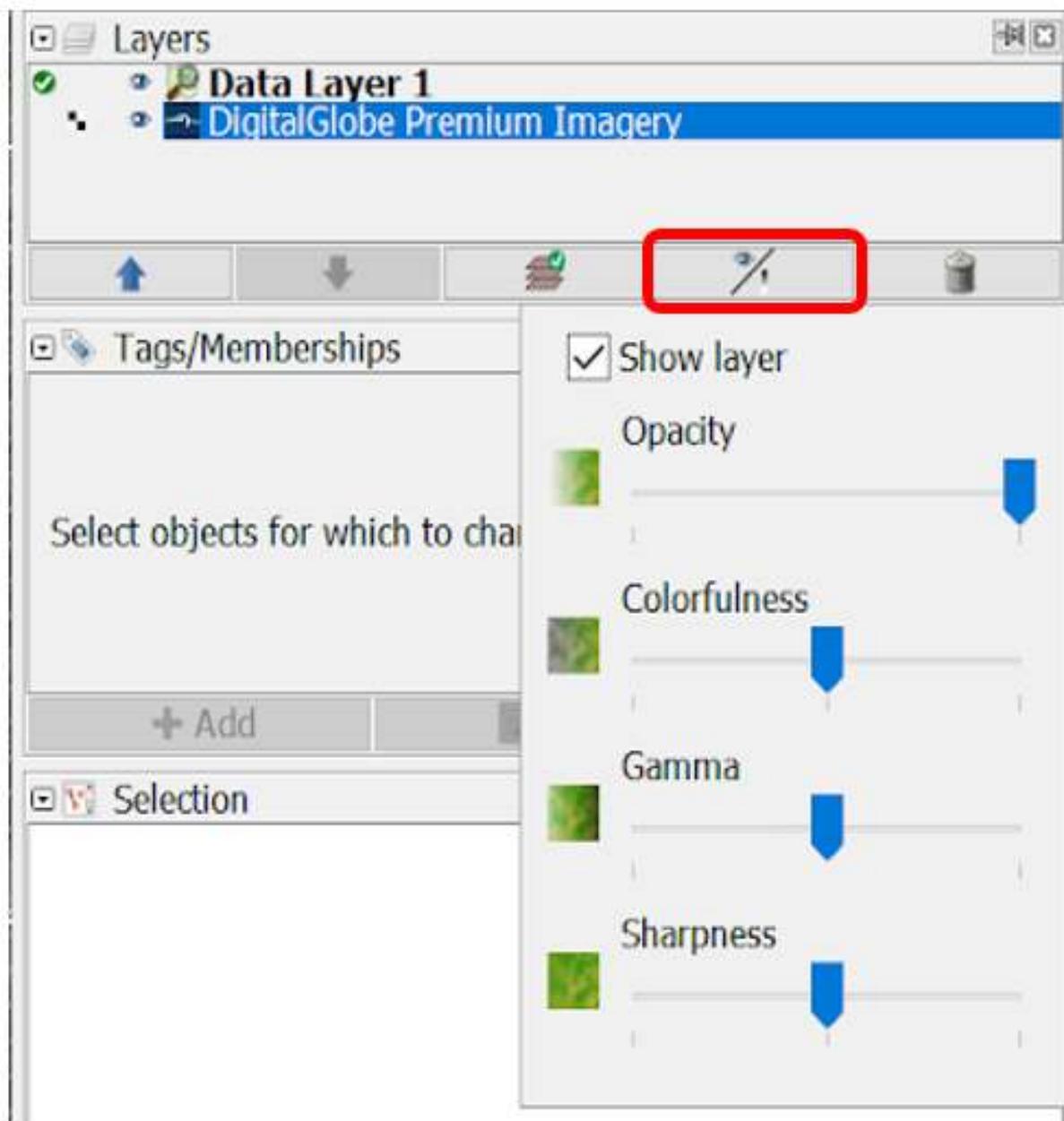
#### IV. Adding Satellite Imagery

- 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:



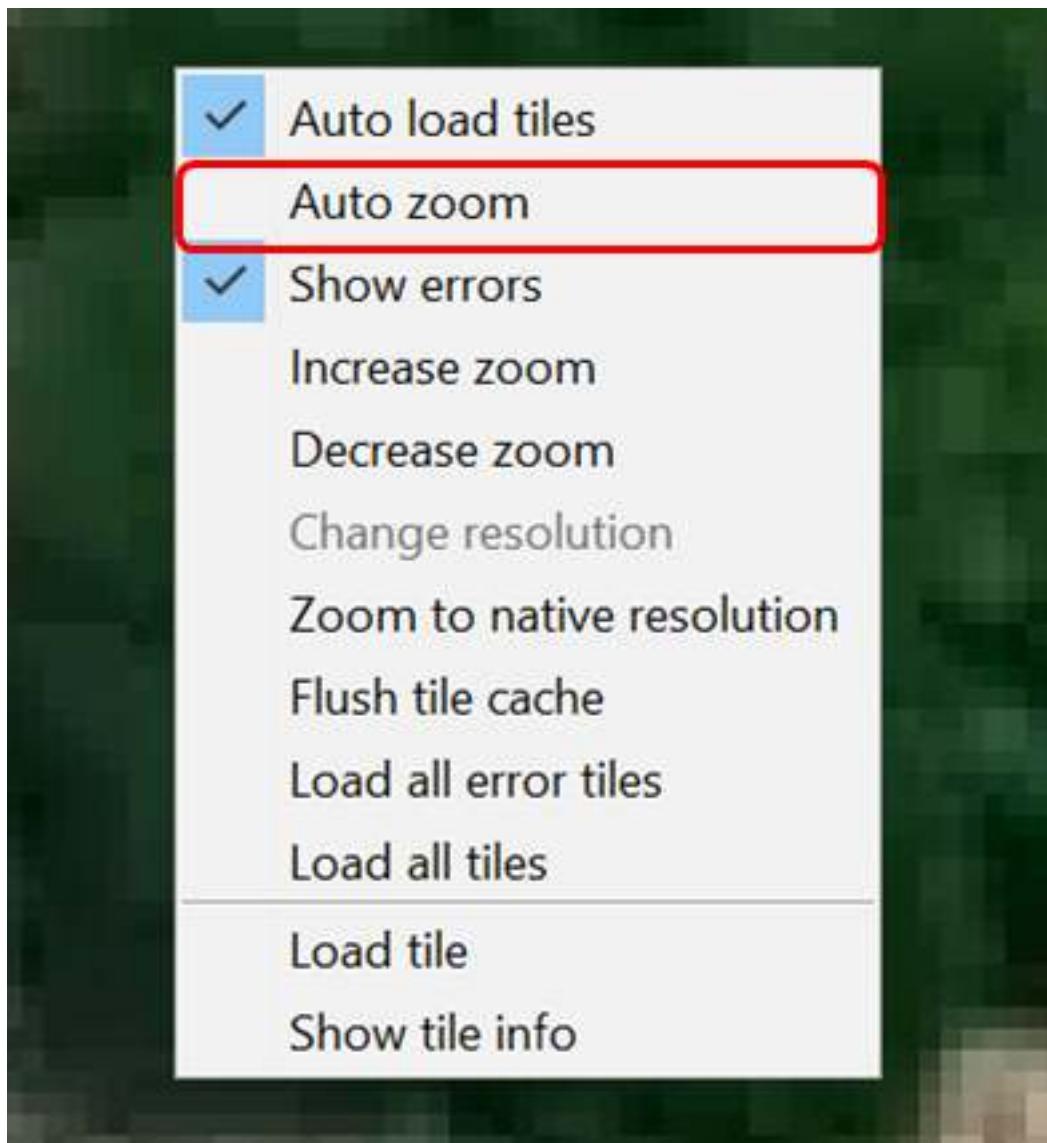
Adding satellite imagery on JOSM

- 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 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 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.

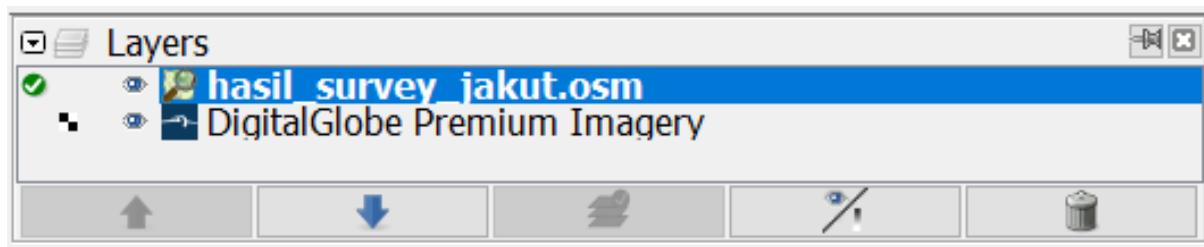


Inactivating Auto zoom for satellite imagery

## V. Editing OSM Data Using JOSM

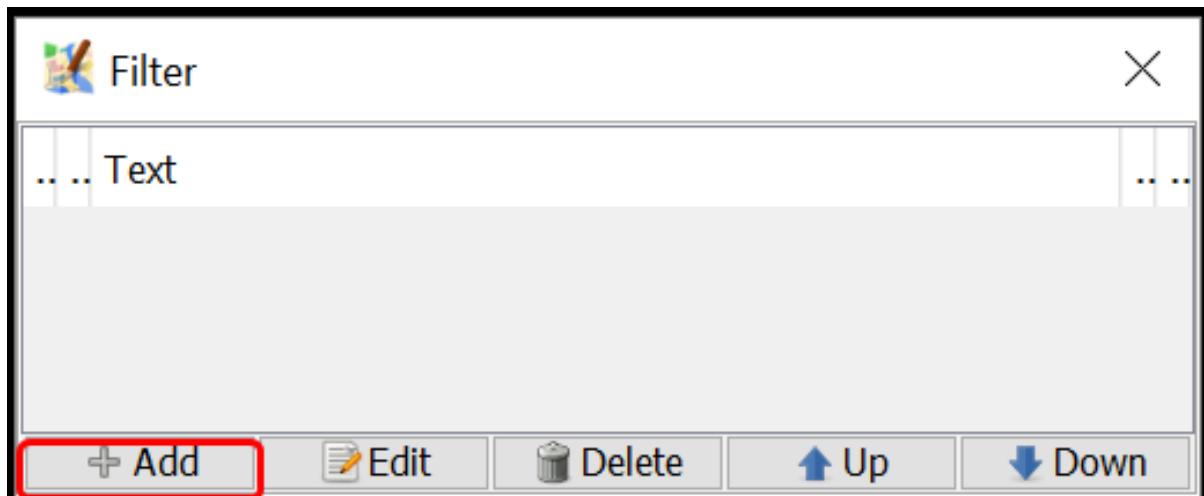
Now you are ready to add or to edit OSM data using JOSM. You can draw new objects or you can edit the existing objects using the tools mentioned in **Using JOSM** module. Here are the steps on how to add or edit OSM data using survey data, downloaded OSM data and satellite imagery that you already added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

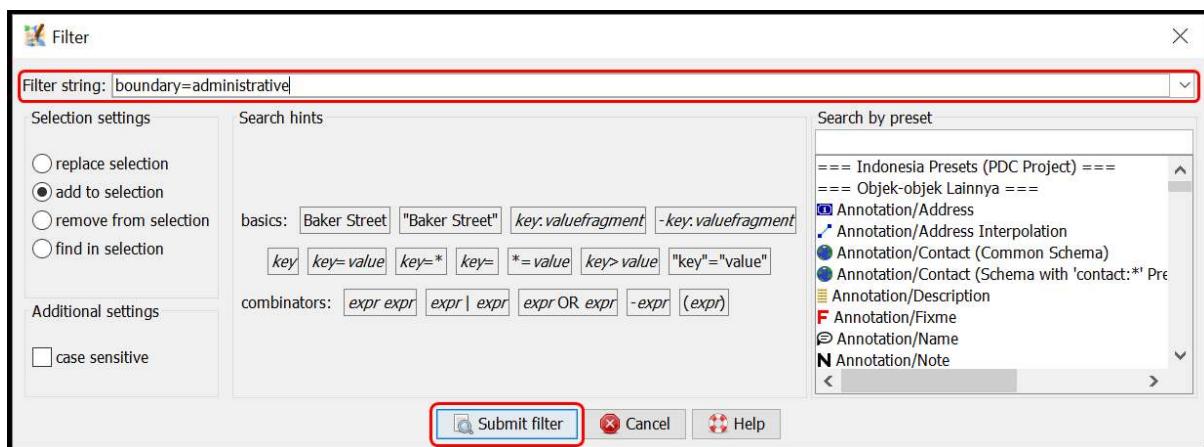


Satellite imagery layer and merged survey data with downloaded data layer

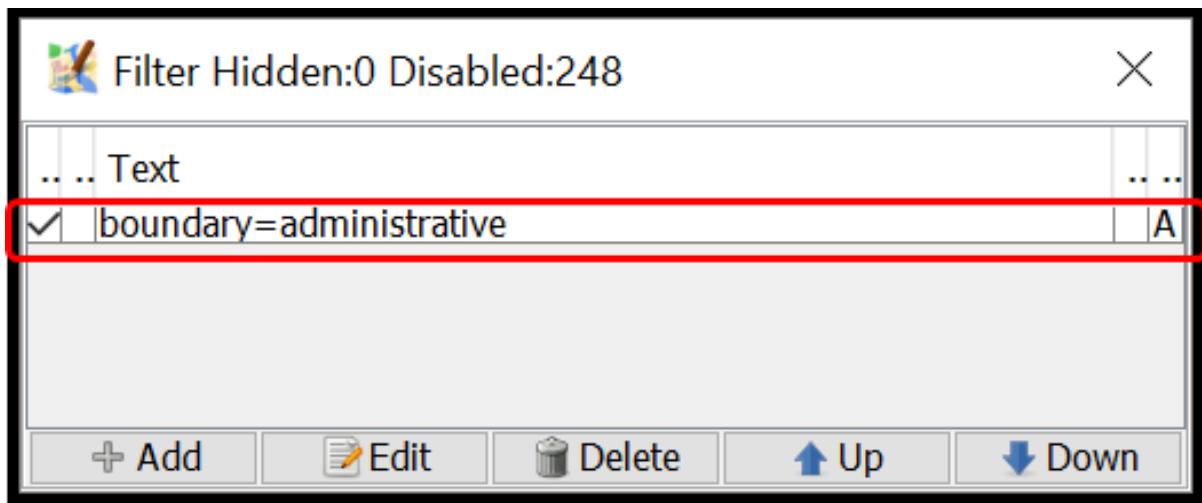
- You can use **Filter** feature on JOSM so that you don't accidentally make changes on other objects such as administrative boundaries. Administrative boundaries in OSM is a delicate objects, so if there are already administrative boundaries mapped on your mapping area then it is better to utilize the **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

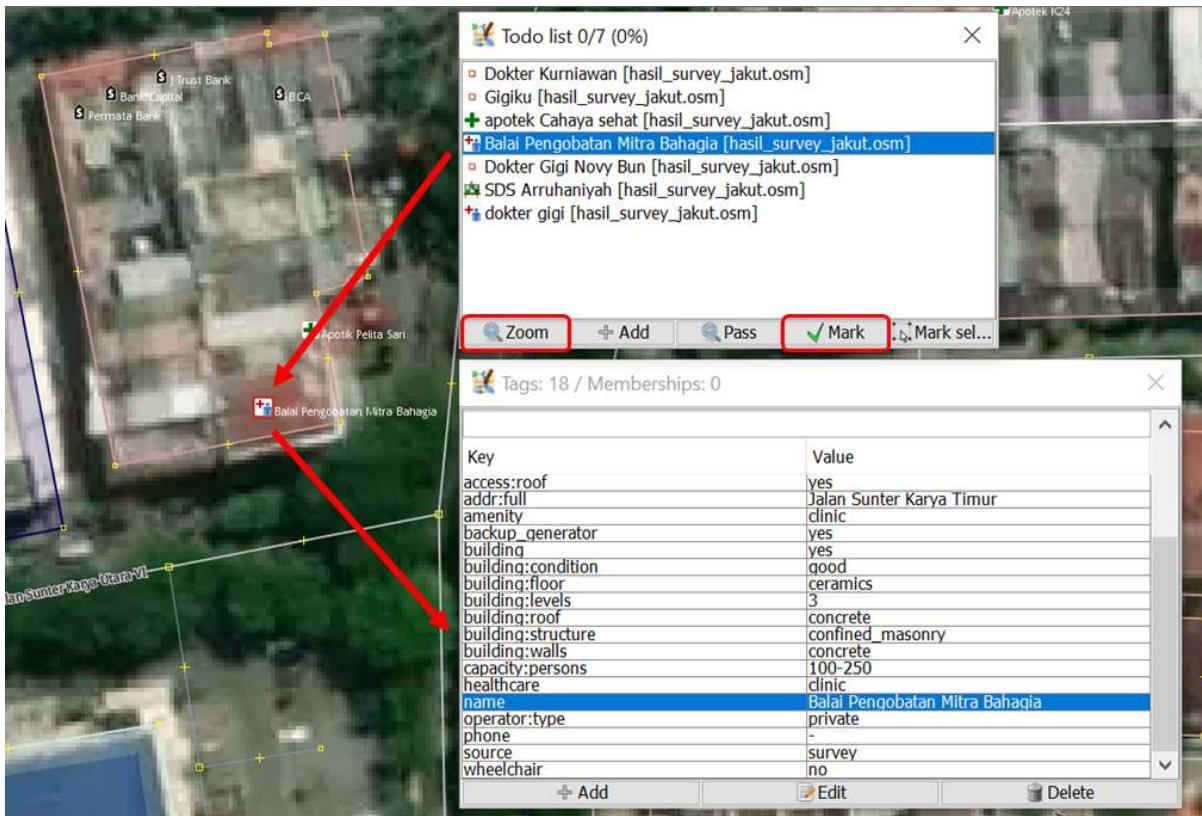


Adding filter string in the Filter Windows

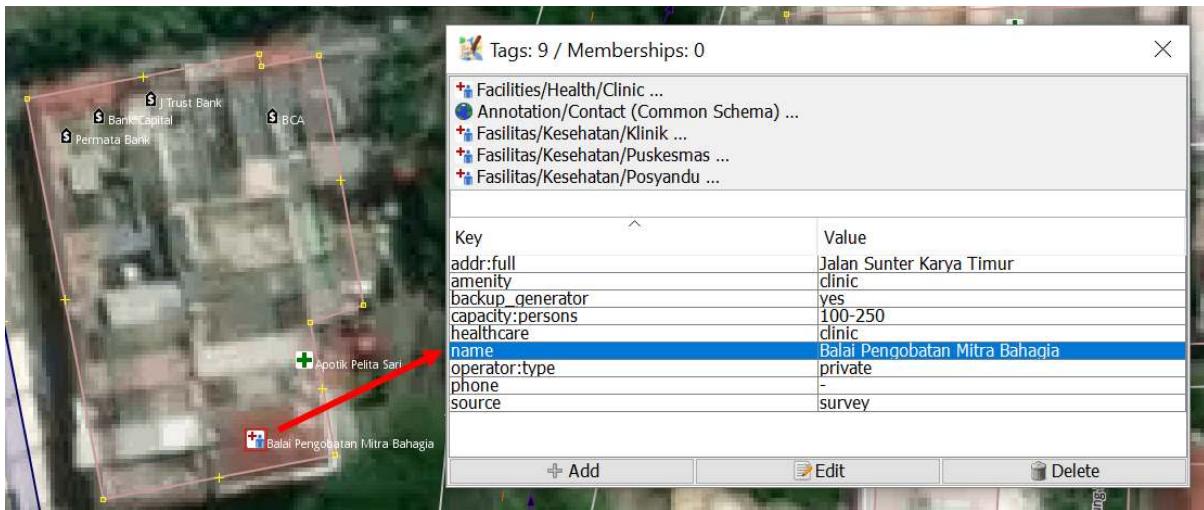


Newly added filter in the Filter Windows

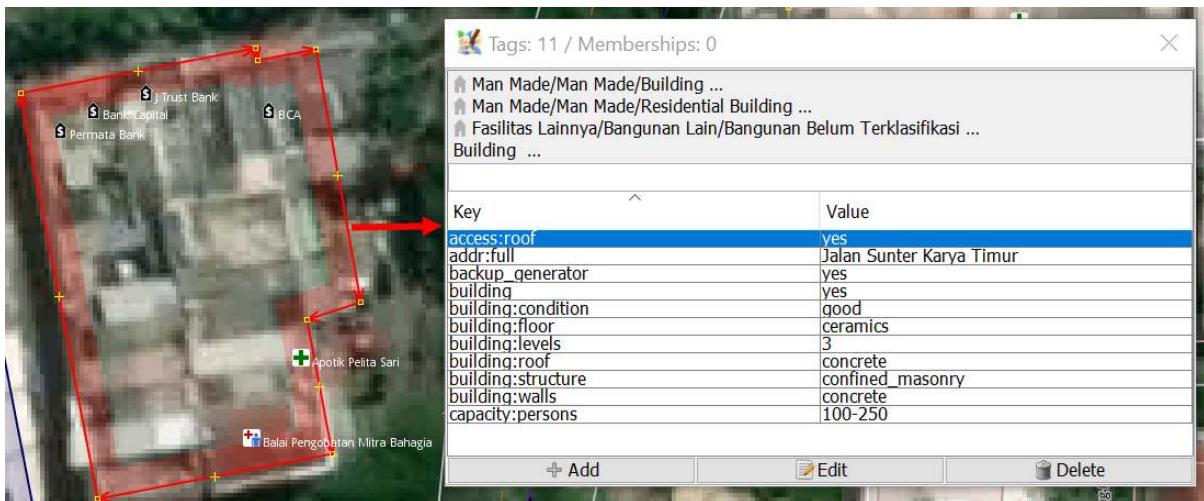
- Start mapping by zooming in to an object, select one object in the Todo list Windows and then click **Zoom**. After selecting and zooming in one object, you can copy the tag from the selected object to the downloaded OSM objects. Select the downloaded OSM object that aligns with the selected survey 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

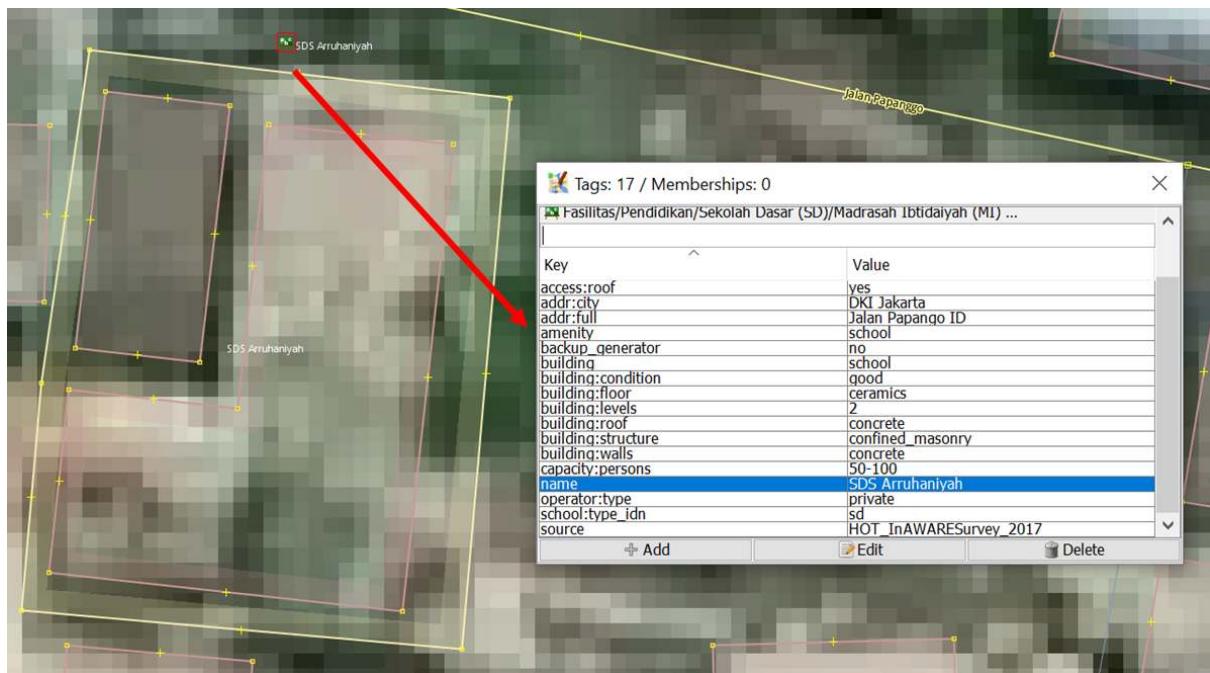


Tags suitable for point object

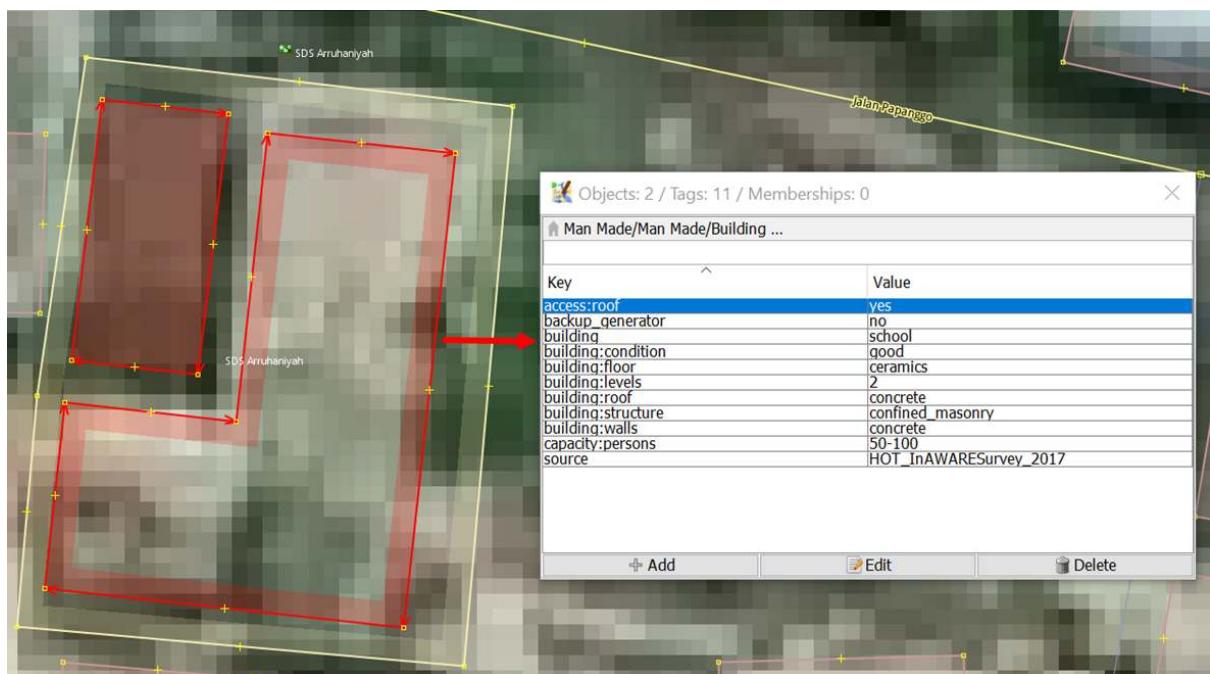


Copying building related tags using Shift + R

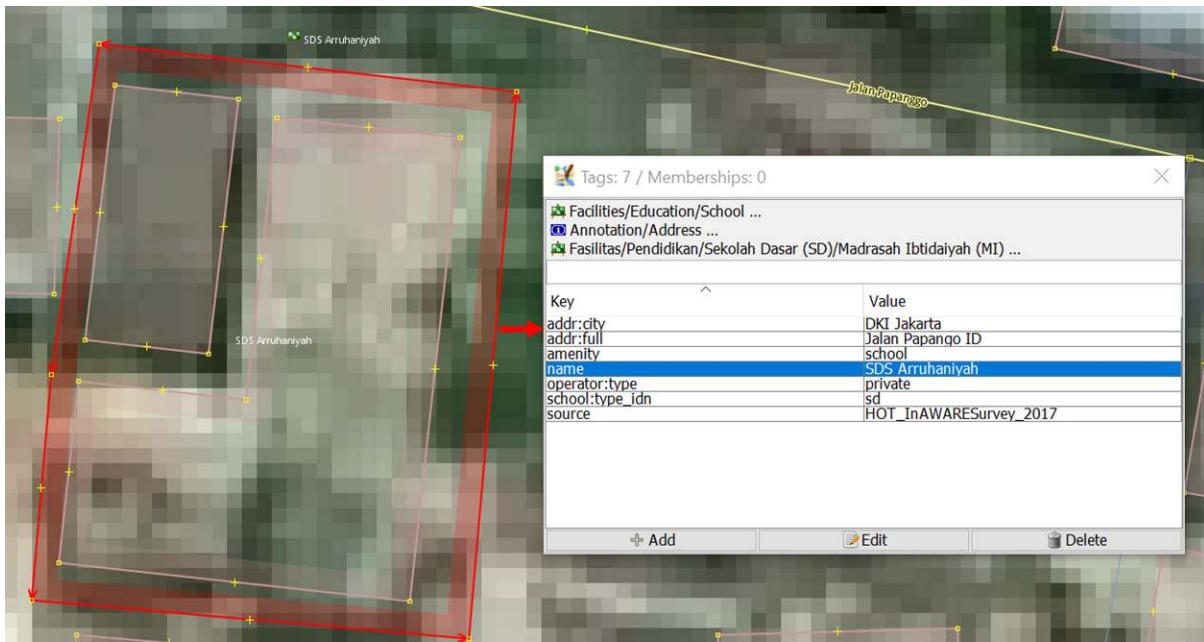
- Example given above is for point object. When you find an object that is supposed to map as a polygon, such as school complex which has more than one building inside, how to map it on OSM? Select the school object in the Todo list Windows and then click **Zoom**. Select the point object on the map. 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



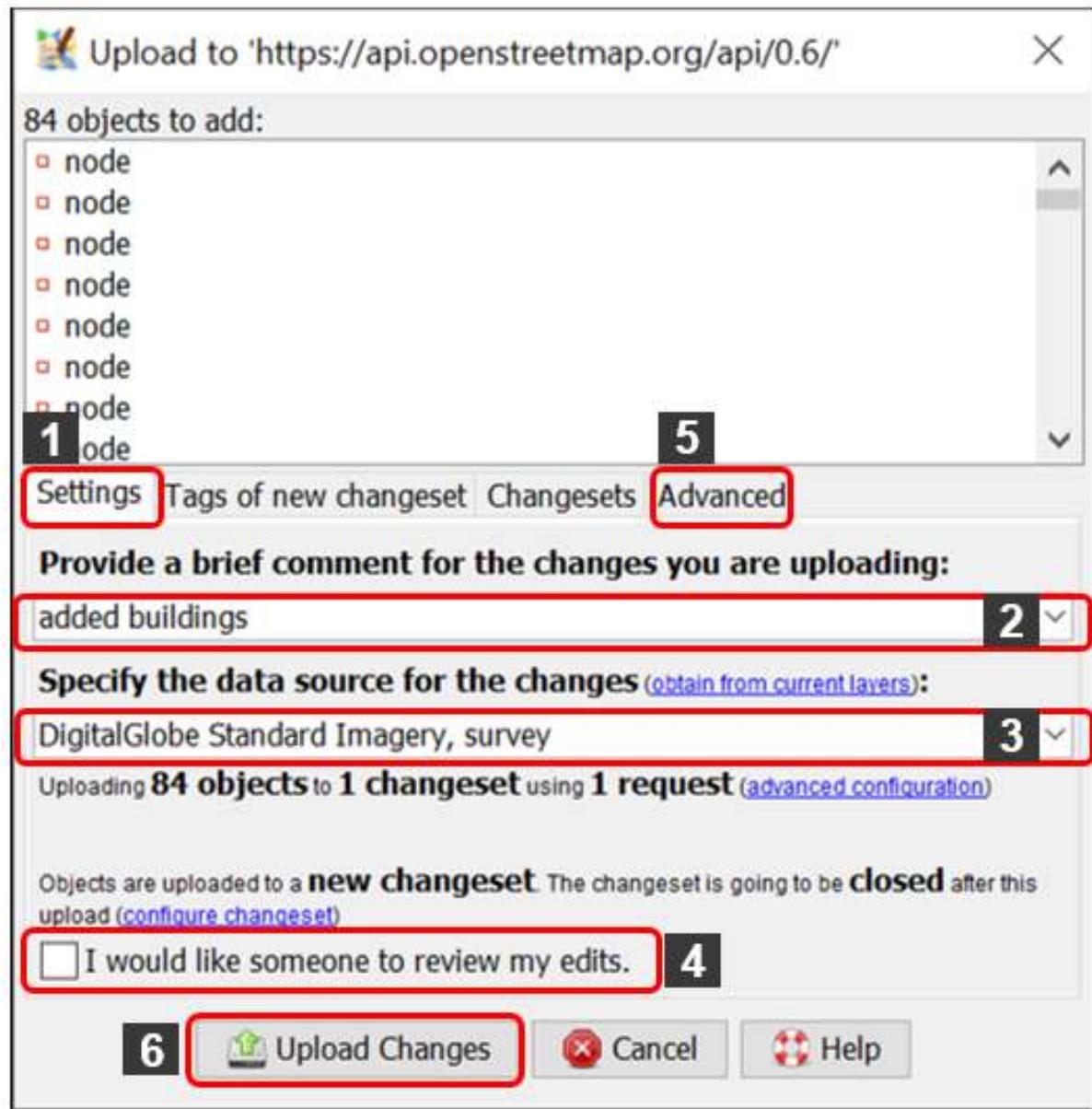
Tags suitable for school building



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**.

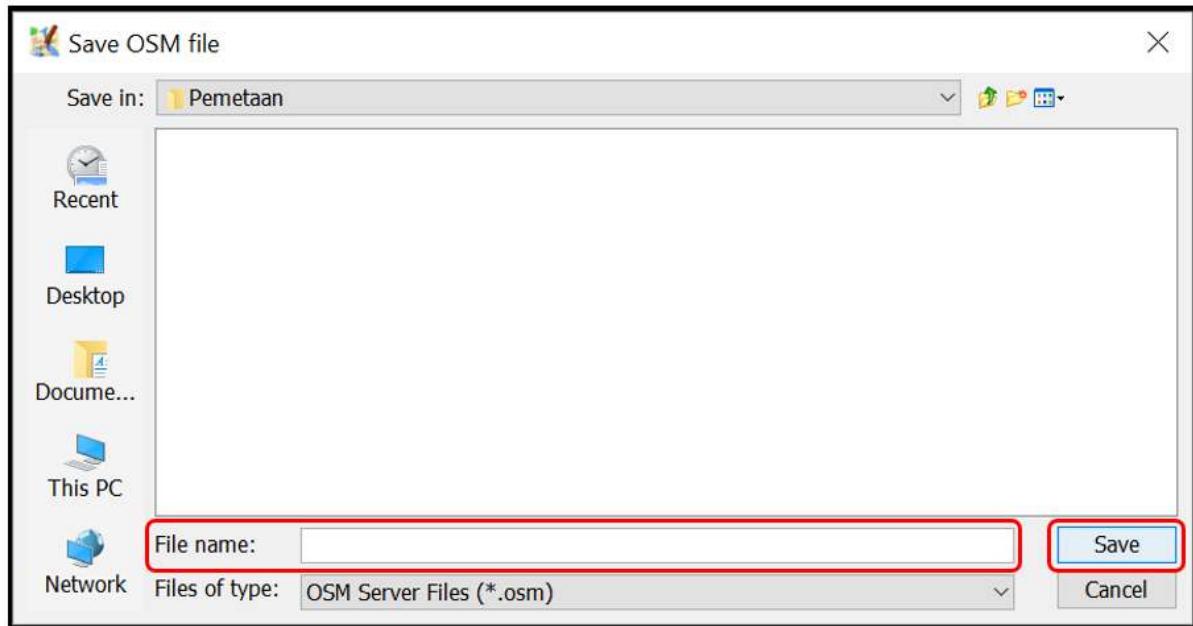


#### Upload Windows on JOSM

**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.

# Using GPS

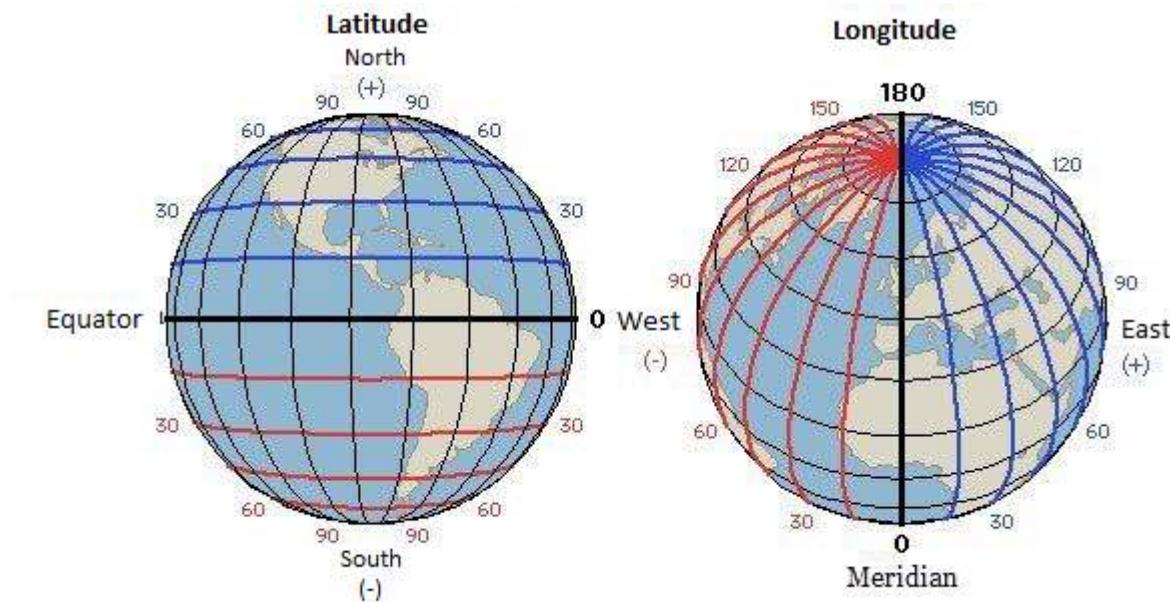
## Objectives:

- Understand parts of GPS
- Understand how to turn on GPS
- Understand how to use GPS
- Understand definition of track and waypoint in GPS
- Understand how to turn on track in GPS
- Understand how to save waypoint in GPS
- Understand how to copy track and waypoint to computer

When doing a field survey, a navigation tool that has a function to record track and point is needed. Global Positioning System or GPS is frequently used tool. In this module will explain what is GPS, how to use GPS, and how this survey result using GPS will help to make a map. In this module will explain about using Garmin GPSmap 62s/64s, that is GPS which commonly used for field survey. There are a lot of GPS type that can do the same thing. If you use another type of GPS, you don't need to worry because they have the same principal. If you don't have a GPS, you can use OSMTracker as an alternative. You can learn in [Using OSMTracker](#) module.

## I. Definition and Parts of GPS

Global Positioning System or GPS is a device or satellite-based system that can be used to give information where the users are (globally) on the surface of the earth. Basically, GPS works like handphone, but handphone get the radio signal from telecommunication tower while GPS get the signal from satellite that revolves around the earth. By receiving signals from satellites, a GPS can calculate the location on the surface of the earth. GPS record the location in coordinates format, where there are two number series of coordinates. The first number series shows your position from East or West, or commonly referred to as longitude. The second series of numbers shows your position from north or south, or commonly referred to as latitude position. The coordinates of longitude and latitude are geographical coordinates and each place on earth has different geographical coordinates.



"Latitude and longitude illustration"

Latitude and longitude illustration

There are parts of GPS Garmin 64s. If you use another type of GPS, you don't need to worry because basically all GPS have the same principle.



"The front of GPS"

The front of GPS



"The back of GPS"

The back of GPS

Here is the function of the buttons on the GPS:

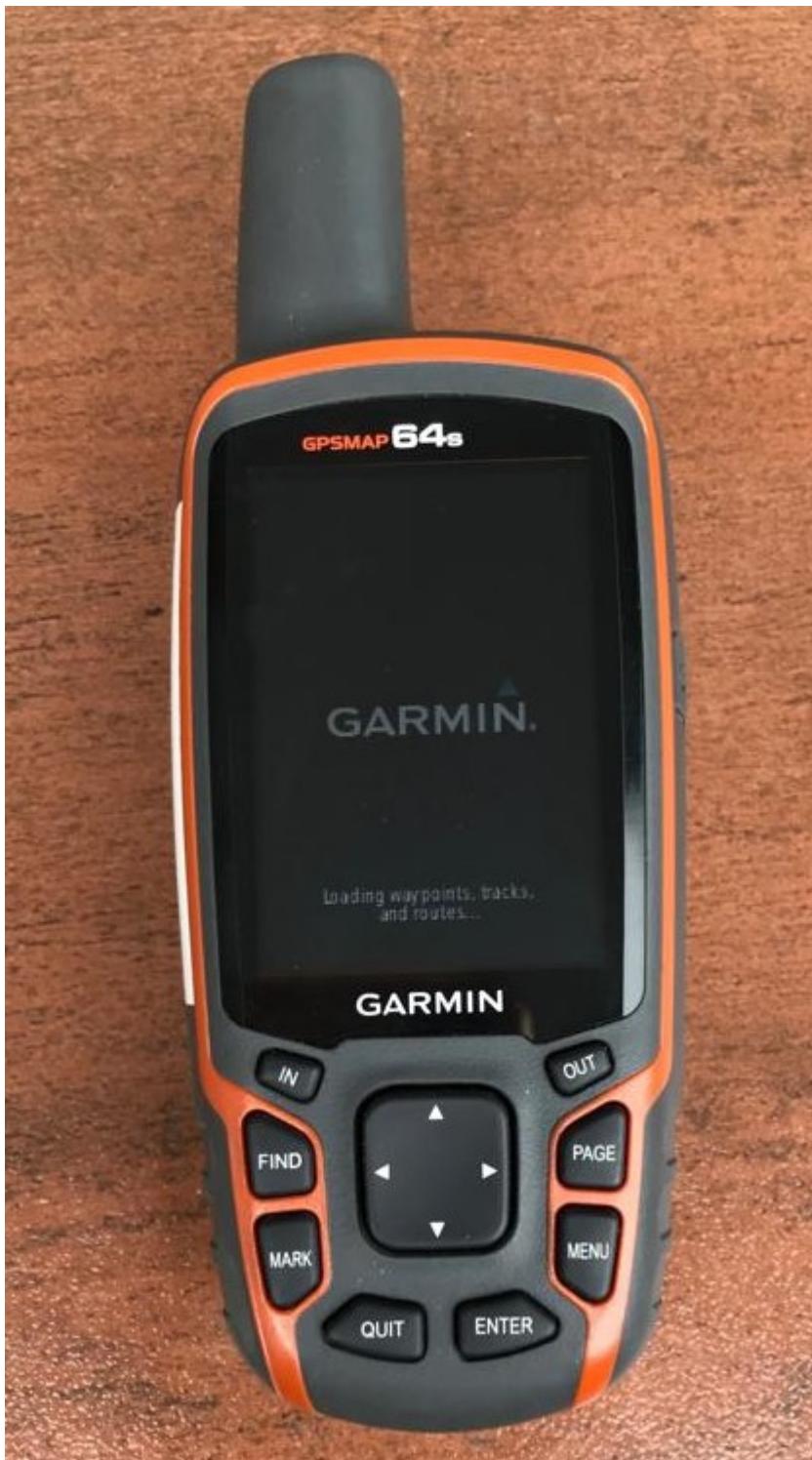
- Power button is located in the right top. Press the button for a few seconds, then GPS will automatically turn on.
- IN button is for enlarge the map display on GPS screen.
- OUT button is for zoom out the map display on GPS screen.
- FIND button is for open search menu on GPS.
- PAGE button is for access the main page of GPS.
- MARK button is for save waypoints when survey using GPS.
- MENU button is for open the menu in GPS.
- QUIT button is for cancel or back to previous menu.
- ENTER button is for select or ok on the menu that you will choose.
- Navigation button is for navigate on the map screen displayed on GPS.

On the back of the top side of the GPS, there is a port USB to connect to the laptop using USB cable. At the bottom is for AA type battery.

## II. Turn On GPS

Global Positioning System or GPS is a satellite-based device, so when you turn on the GPS, make sure you are in outdoors where you can see the sky clearly. GPS can determine your location by receiving signals from satellites, so if you are indoors the GPS will not work. This is the step to turn on the GPS:

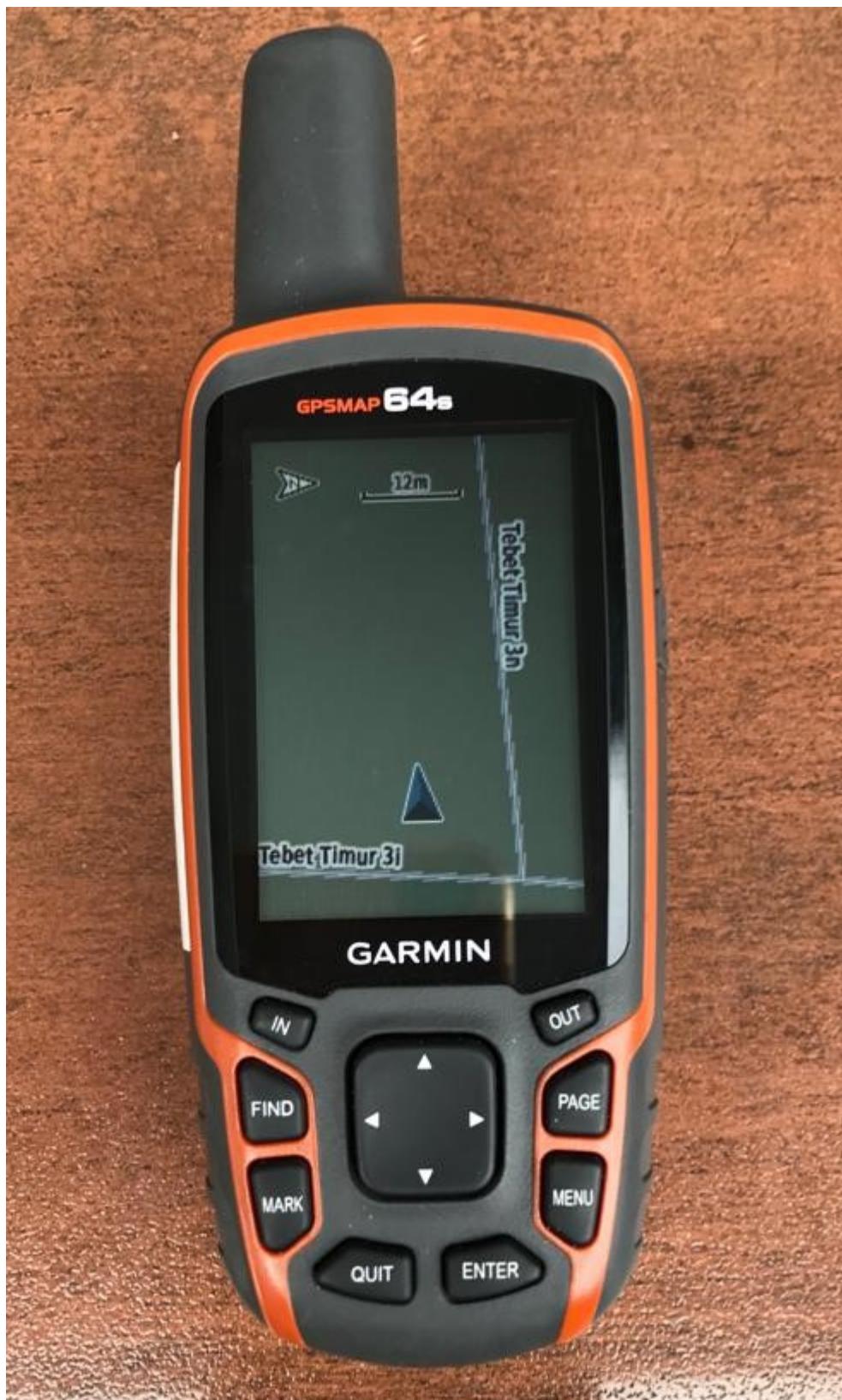
- At the top right side of your GPS, press and hold the power button for a few seconds until the screen turns on and show the "Garmin" logo. The process with the Garmin logo is indeed quite long, but you don't need to worry because GPS is processing the waypoints, tracks, and routes that are on your GPS so it takes longer.



"GPS with Garmin logo"

#### GPS with Garmin logo

- After the GPS turns on, the GPS will automatically show the location where you are, as shown below.



"GPS shows your location"

GPS shows your location

### III. Using GPS

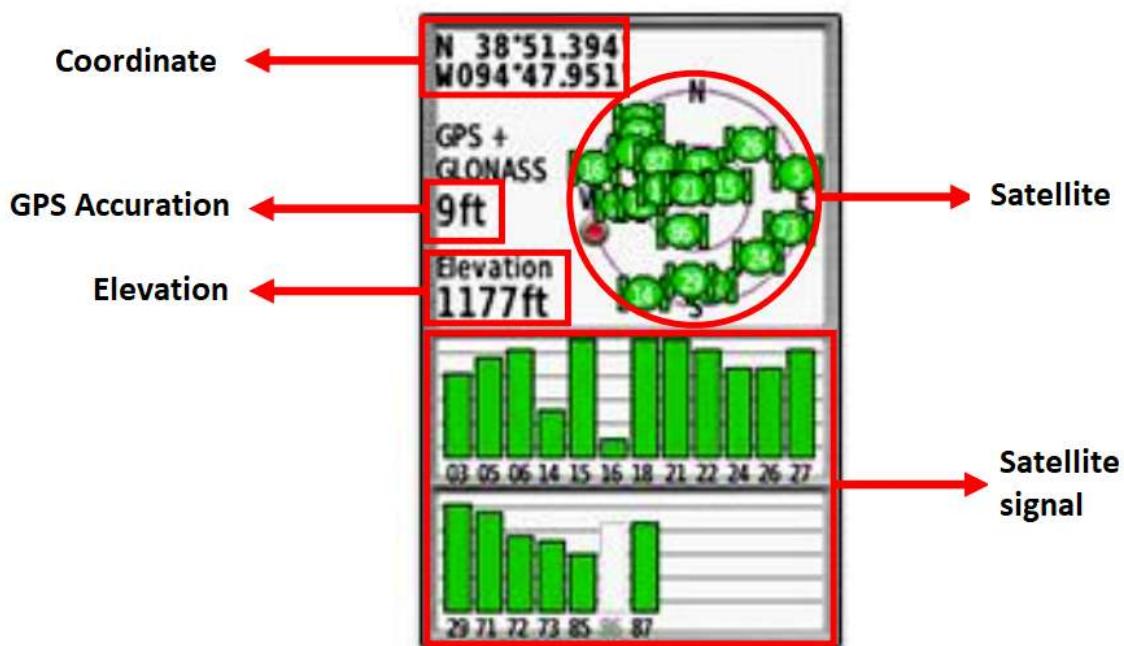
GPS has many functions that are useful for daily life, such as to show the direction or to measure distances, make maps, and can be used as reference measurements for an area. GPS has a setting that you can change as you want, one of them is to set the brightness of GPS screen. To set the brightness, you can press the power button on the right side once, then on the GPS screen will appear as shown below:



"GPS screen display for setting screen brightness"

GPS screen display for setting screen brightness

On the top of GPS screen, you can see the information about the day and hour when you using the GPS. Furthermore, there are backlight or brightness level setting that you can set by press the power button once to find the brightness level that suits you, or by pressing the navigation key. There is battery status and GPS signal at the bottom. You can also see how many satellites that your GPS has captured by pressing button **Page → Satellite**. Then your GPS screen will look like the picture below:



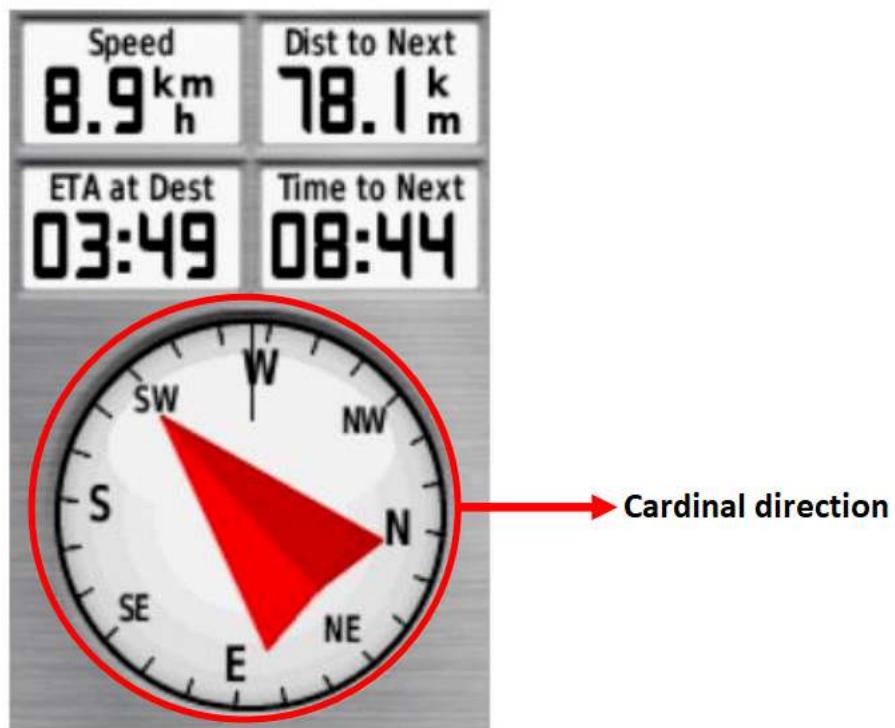
"GPS screen display showing satellites that have been captured"

GPS screen display showing satellites that have been captured

On the GPS screen you can see Satellite section, you can see the coordinates where you are, the accuracy of GPS, altitude points, the number of satellites that have been captured by GPS and satellite signals. The picture above shows that your GPS is looking for satellite signals. When it is connected to three or more satellites, the GPS will get your location.

On GPS you can also know the cardinal direction from your location point in **Compass** option. You can try it by press button **Page → Compass**.

Di GPS Anda juga dapat mengetahui arah mata angin dari titik lokasi Anda pada pilihan **Compass**. Anda dapat mencobanya dengan cara menekan tombol **Page → Compass**. Kompas ini bertujuan untuk menunjukkan arah mata angin pada saat survei. This compass aim is to show the cardinal direction during the survey.



"Compass to help as a cardinal direction when surveying"

Compass to help as a cardinal direction when surveying

On GPS you can also find out where you are and see places around your location. You can try it by press the button **Page → Map**. In this map option, you can also see tracks and waypoints if you have started recording tracks and waypoints.



"GPS screen display on Map menu"

#### GPS screen display on Map menu

The screen of your GPS may different with the picture above, it's because the GPS will show according to your current location. If the location of your GPS screen is too large, then you can zoom out by press *OUT* button on the GPS several times until the screen show the way you want. Otherways, if the location of your GPS screen is too small, then you can enlarge it by pressing *IN* button on your GPS until the screen displays the way you want.

There are various main menu in GPS, you can press **MENU** button and the menu options will appear as shown below.



"The main menu on the MENU button"

The main menu on the MENU button

#### IV. Track and Waypoint

GPS record two types of information that are useful for make maps or save coordinate from a place. First, GPS can record the route you're passed called a track. Second, GPS can record your object point location called waypoint.

##### a. Track

Track is a direction or path of your trip when it's start record and will be saved in the form of a location series wherever you move. For example, the track will record your location every one second, or every one meter, and the result will be a series of points showing the path where you have been. Track is very useful for mapping lines or shapes object, such as a road or field.

##### b. Waypoint

Waypoint is a reference point or set of coordinates that used for navigation purposes or to identify a point on a map. GPS can save your location in GPS memory. When you save a location, the coordinates will be saved with a name. For example, the first waypoint will be named as 001, the second waypoint is 002, and so on. For more details, will be discussed in sub chapter VI, Save Waypoints.

#### V. Turn On Track Mode

This is the step how to turn on the track mode on GPS:

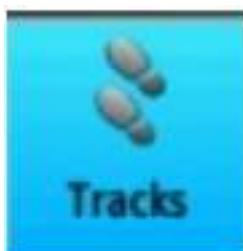
- Go to Main Menu, choose Setup.



"Main Menu display, Setup"

Main Menu display, Setup

- Choose Tracks.



"Tracks icon"

Tracks icon

- On Track Log, change into: Record, Show on Map.



"Track Log display"

#### Track Log display

- Make sure your track mode on your GPS is active before you do the survey.
- If you have finished the survey and want to deactivate *track*, do the method like turn on then select **Do Not Record**.

*Track* saved after the field survey is completed. Mostly tracks are saved per day. This is how to save the track:

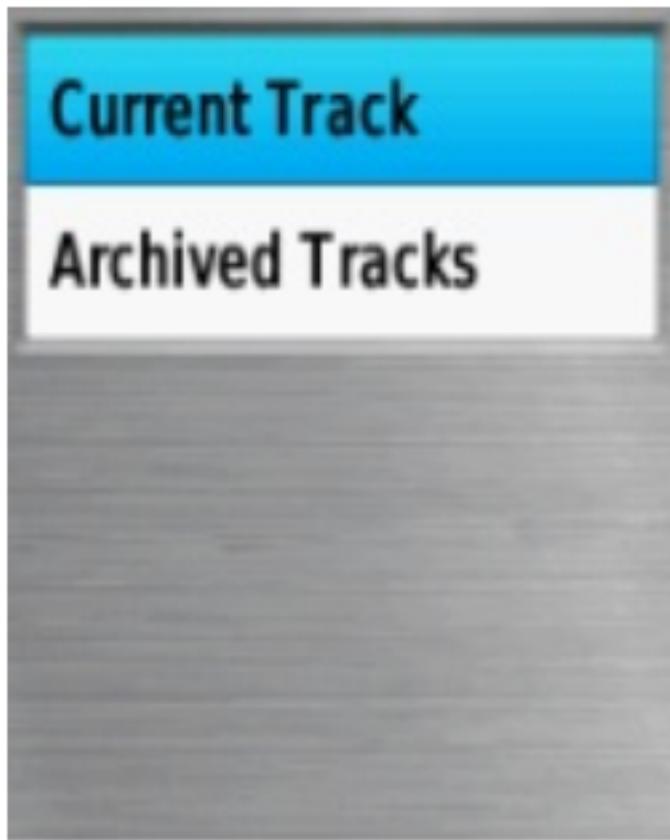
- Go to Main Menu, choose Track Manager.



"Main Menu Display, Track Manager"

#### Main Menu Display, Track Manager

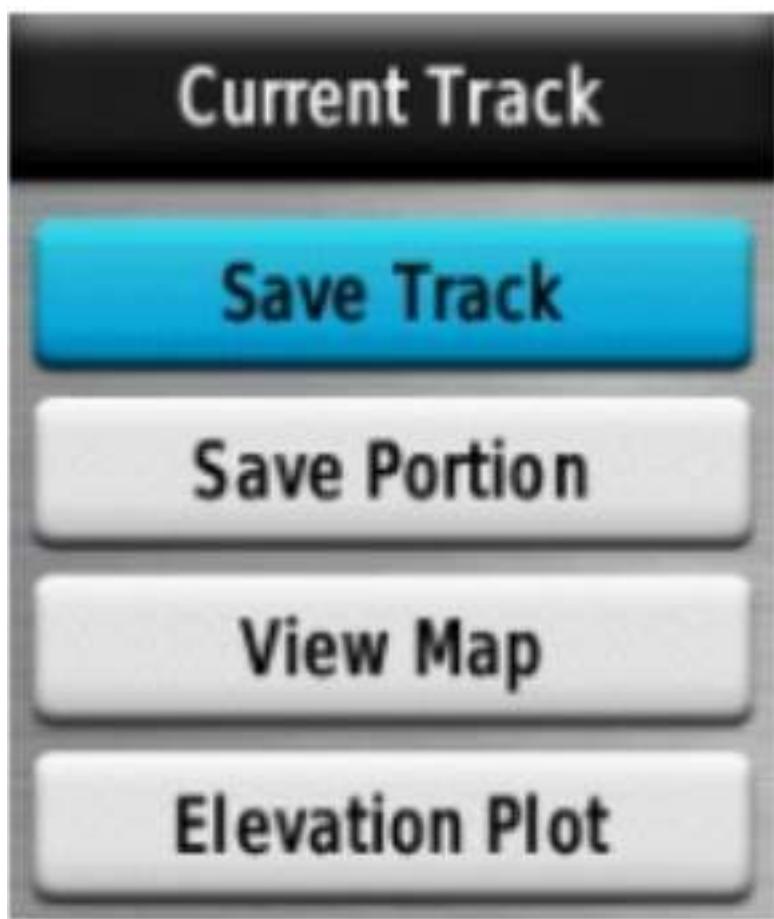
- Choose **Current Track**, which is record the track that has just been done.



"Current Track display"

Current Track display

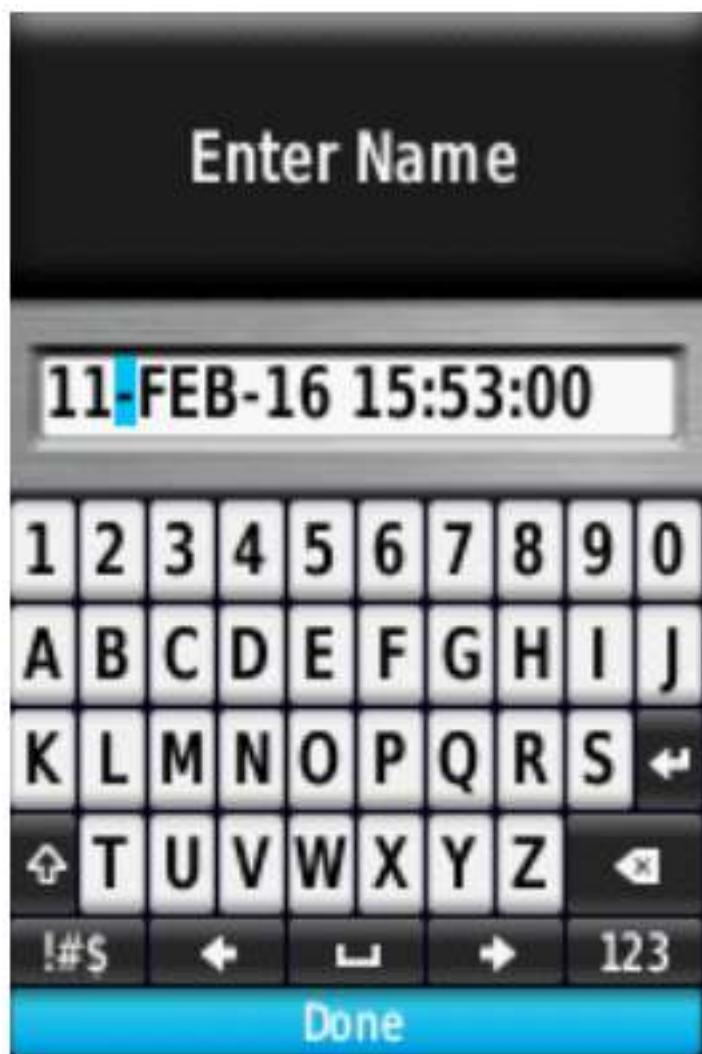
- Choose **Save Track**, for save the track.



"Save Track Display"

Save Track Display

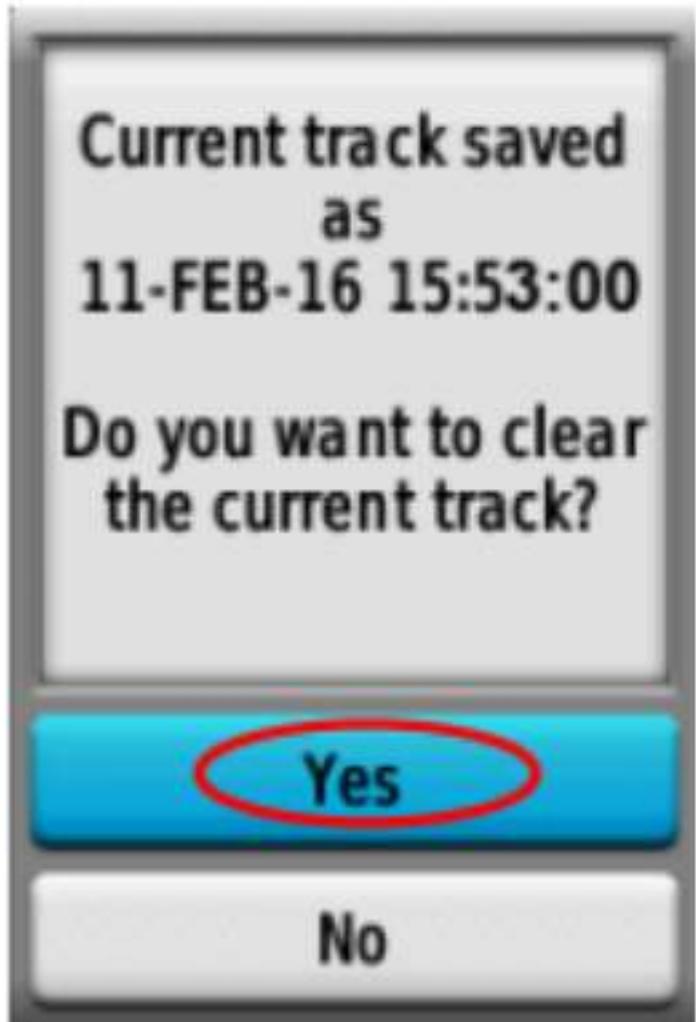
- Enter the name track, mostly using date and time of the survey, then select **Done**.



"Enter Name on GPS"

#### Enter Name on GPS

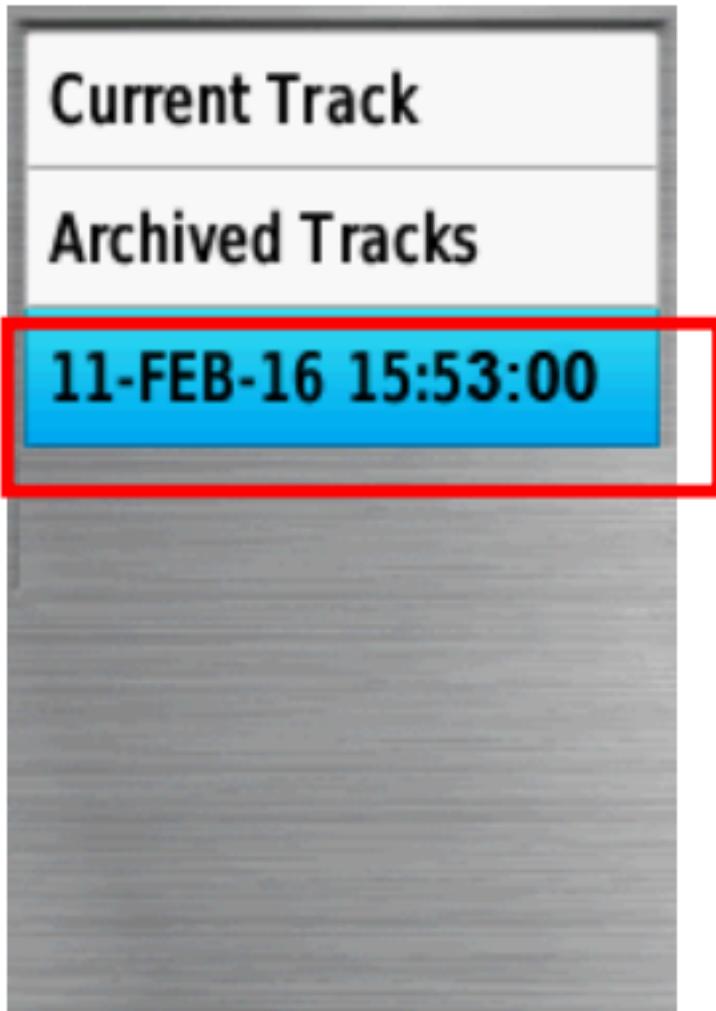
- Clear the current track, choose Yes.



"Clear the current track"

**Clear the current track**

- Make sure the track named appears. This proves that track survey has been saved successfully.



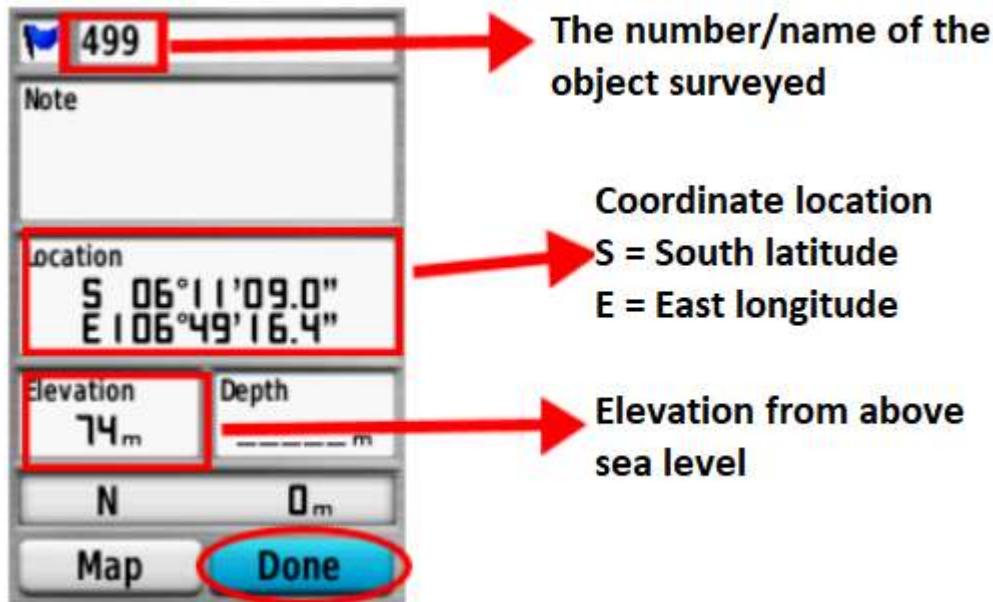
“Saved track display”

Saved track display

#### VI. Save Waypoints

This is the steps for save waypoints:

- Press **Mark** button on GPS and the GPS screen will appear like this:

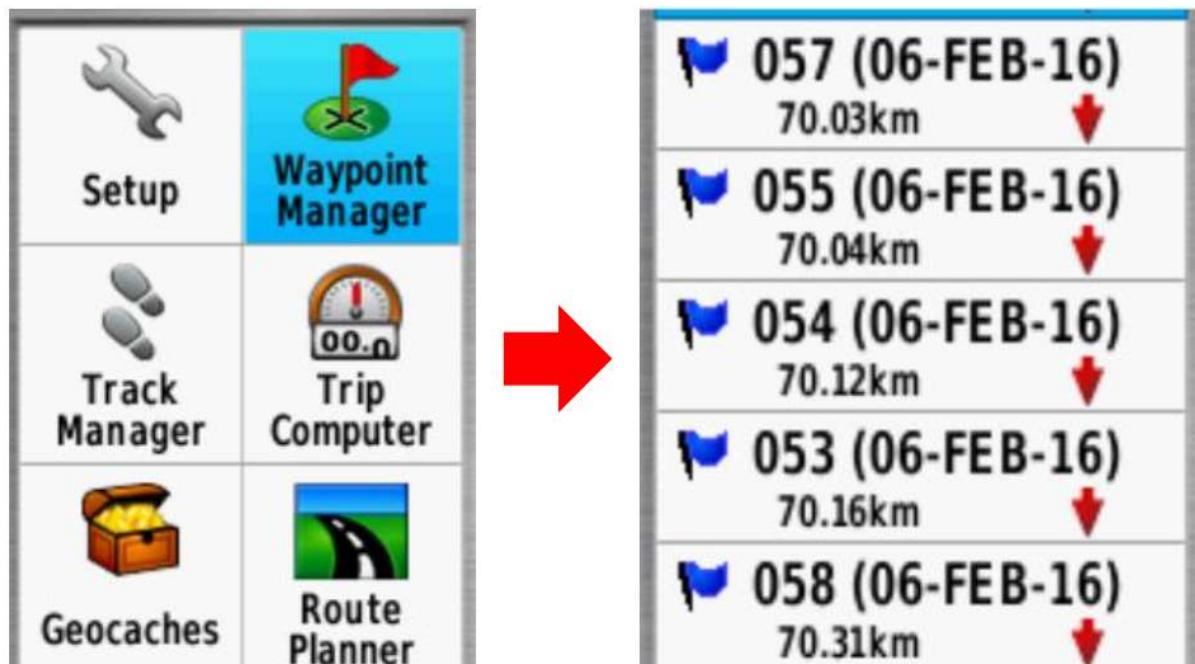


on GPS"

Save waypoint on GPS

- Choose Done to save Waypoint.

To see the list of waypoints that you have saved, please go to **Main Menu** and choose **Waypoint Manager**. Then the list of waypoints will appear.



"Waypoint lists that saved on GPS"

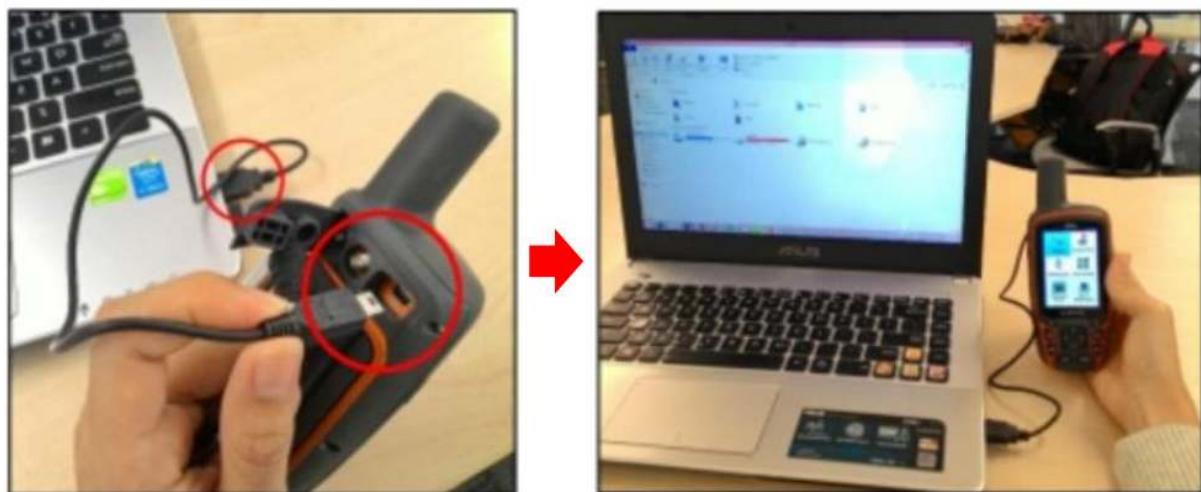
Waypoint lists that saved on GPS

To delete one waypoint that you have saved, press **Enter** on waypoint that you want to delete, then press **Menu** button and choose **Delete**.

## VII. Copy Track and Waypoint to Computer

The next step is copying the data that has been collected by GPS to computer to be used as a mapping reference. This is the step to copy the GPS data:

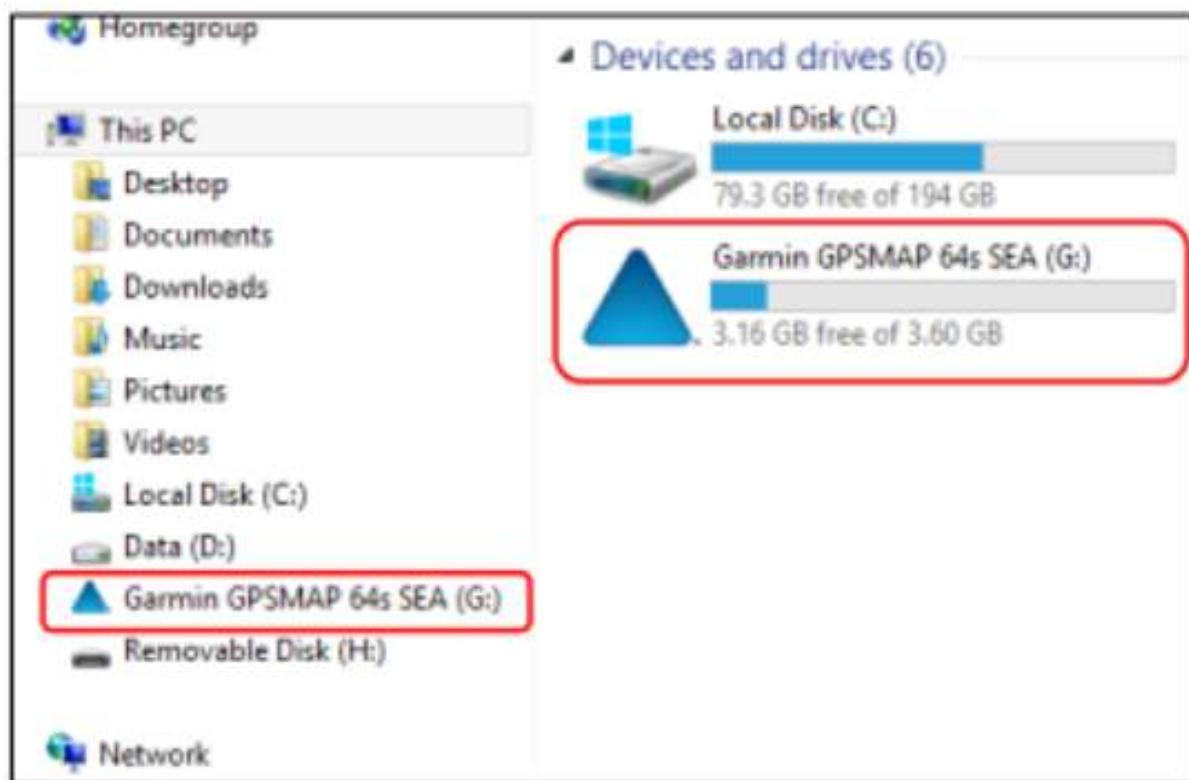
- Connect GPS to computer using data cable.
- Make sure the GPS is on.



"Connect GPS with data cable to computer"

Connect GPS with data cable to computer

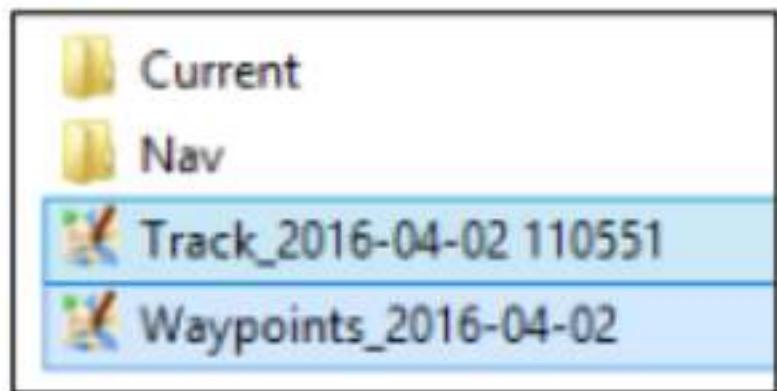
- Go to **Garmin GPSMAP** directory, then select **Garmin → GPX** folder.



"Computer display after connect with GPS"

Computer display after connect with GPS

- Select the data with the description of your survey date (Track and Waypoint) and copy the data to your computer.



"The data in GPS after move to computer"

The data in GPS after move to computer

### SUMMARY

Congratulation! Now you understand how to use GPS, if not you can try to practice save waypoints that you think it's important. In this module you have learned how to collect waypoints, tracks, and open them in JOSM. You will use the information to add new object in OpenStreetMap.

# Upload survey form to ona.io

## Learning Objectives:

- Able to explain the benefits of using Ona.io
- Explain how to upload survey forms to the Ona.io server

After we have successfully created the survey forms that have been studied in the module **Making Survey Forms for the ODK Collect & OpenMapKit Application**, You will learn the platform used to upload survey forms to one of the platforms. The platform used in this material are Ona.io. Ona.io is a platform that can be used to place survey forms which will be used for field survey activities using *ODK Collect* or *OpenMapKit*. Here you will learn what can be done using *Ona.io* and how to upload the survey form into Ona.io.

## I. Introduction to *Ona.io*

### a. What is *Ona.io*

*Ona.io* is a social enterprise that builds infrastructure data for data collection needs in the field. They provide several platforms that can be used to assist data collection, one of which is a field data storage platform. You can upload your survey form to the server provided by *Ona.io* and then you use it for your field activities. *Ona.io* provides several capabilities that will assist data collection activities. One of them is:

- Statistics of the amount of data entered in the form of graphs and tables
- Location map of the distribution of data collected in the field
- Display of images that were successfully collected during data collection
- Ability to download data in several types of files such as *CSV*, *XLS*, *KML*, *Osm* or *Json*

### b. Limitations in *Ona.io*

If you want to use the *Ona.io* platform you can create an account for free and then use the platform to upload survey forms. But there are some restrictions on using a free account on *Ona.io*:

- Can only create one private project
- For a private project can only hold 500 data entry.
- In one private project can accommodate as many as 10 types of survey forms

## II. Survey Form Management on *Ona.io*

Now that you know what is *Ona.io* and its limitations, in this module you will now try to upload the survey forms that you created earlier in the **Create Form Survey for ODK Collect and OpenMapKit** module. If you have not created a survey form, you can download a sample survey form by accessing the link: [http://bit.ly/sample\\_form\\_survey](http://bit.ly/sample_form_survey).

### a. Creating an account on *Ona.io*

Before you *upload* your survey form, you must have an account on *Ona.io* first. To create an account on *Ona.io* click on the button **Get Free Account** and then enter your name (lowercase) which will be the *url* where you save the form and will later be used in the *ODK Collect*.

## Create your own personal account

It only takes a minute.

Username (lowercase characters)



ona.io/ username

First Name

Last Name

Email

Password



I have read and agree to the [Terms of Service & Privacy Policy](#)

Sign Up

Have an account? [Sign In](#)

Display create account on Ona.io

### b. Upload Survey Form

First time you successfully create an account on *Ona.io*, you will automatically create a personal project with your own name.

Search Projects



Sort by: Project Name ▾

Show: All ▾



adityo's Project ★

PRIVATE

May 01, 2015

Apr 11, 2018

None

A

Private project with your own account name

To **upload** your form, click on the name of your own project. After successfully entering into your project. Click on the **Add a form** button and a new window will appear. Here you are asked to enter the **XLSForm file**. Select **file** your survey form. After you have successfully selected **file** your survey form, click on the **Upload Selected File**. The system will check whether your form has errors or not.

The screenshot shows a user interface for uploading an XLSForm. At the top, there are three options: "Upload An XLSForm", "Enter XLSForm URL", and "Select Dropbox XLSForm". Below this, a file path "Sample\_Form\_hot\_1\_bank.xlsx" is displayed. A large orange button labeled "Upload Selected File" is highlighted with a red box and a cursor is hovering over it. In the bottom left corner of the interface, the text "Resources for XLSForm authoring" is visible.

Display window when uploading survey forms

If you have successfully uploaded survey forms, a pop up of will appear **Verified Form**. Click on the **Save form** button to immediately save the survey form.

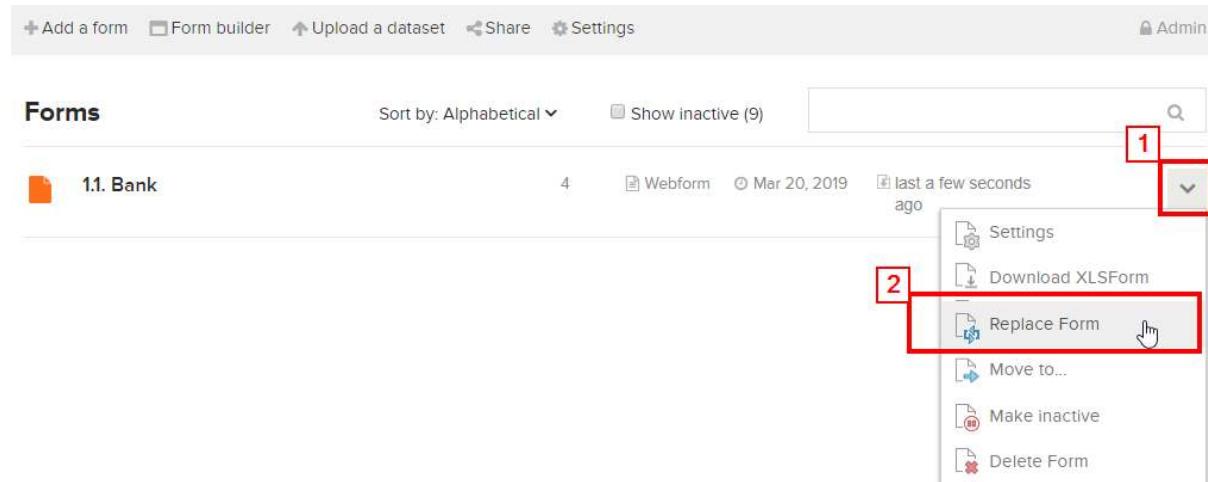
The screenshot shows a confirmation dialog box titled "Add form to". A green bar at the top says "Form verified!". Below it, a list item "1. Bank" is shown. Under "Form status", there are two radio buttons: one for "Active" (selected) and one for "Inactive". At the bottom, there are "Cancel" and "Save form" buttons, with "Save form" being highlighted with a red box.

Select Save Form to save the verified form

### c. Changing survey forms

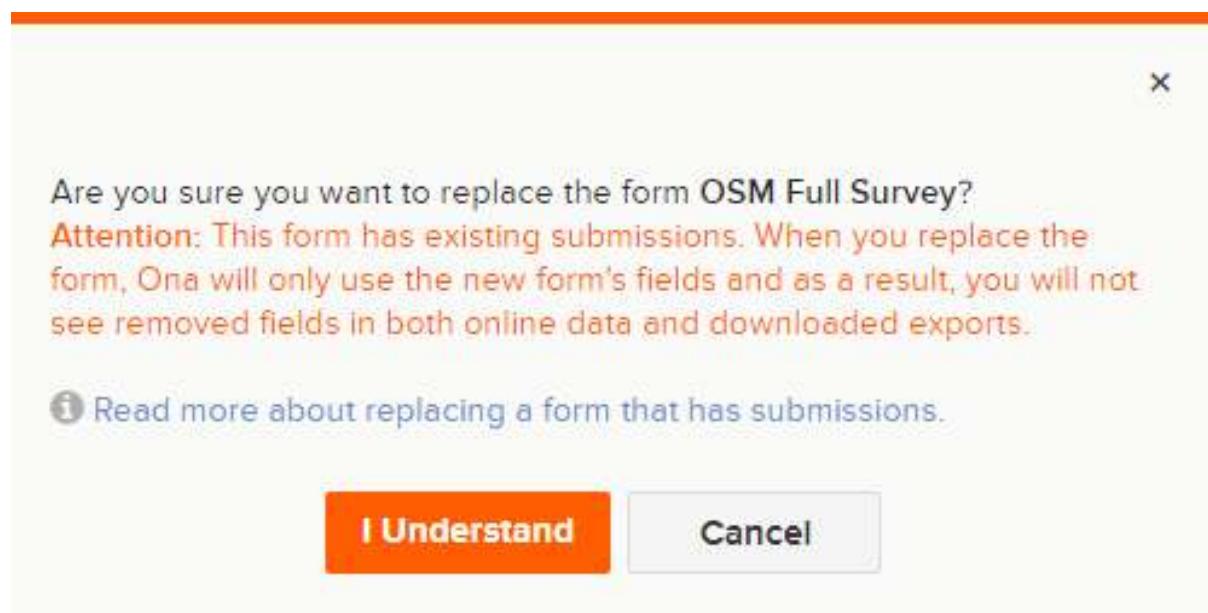
If you make changes in survey forms that have been successfully uploaded to your project, you can update the survey forms. But the thing to remember is that **when you update your survey form, if the form has already been filled out with some data, then there is a potential that the data already entered will be deleted.** Therefore, before you change survey forms, it is recommended to download your data first in case something goes wrong.

To replace your survey form, click on the down arrow located to the far right of your survey form. Then select **Replace Form**.



Click on the right side of your survey form to bring up the Replace Form menu

If your survey form already contains some fields, a warning will appear so the users can understand the consequence when changing survey forms, especially replacing variables, Ona.io will use the new variables contained in the new survey form.

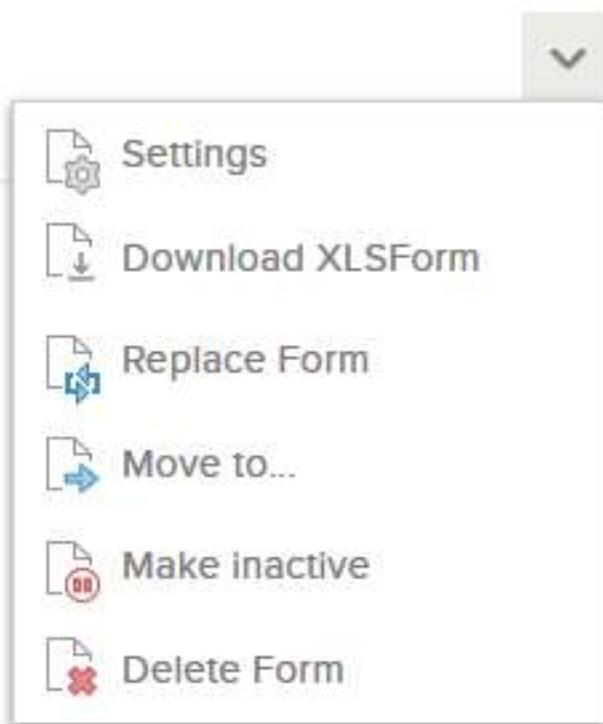


#### Warning When Changing the Survey Form

After you click the button **I Understand**, you will be directed to a window to upload the survey form. Select your new survey form and click **Upload Selected file**. After the form has been successfully validated, click on the button section **Save form**.

#### d. Delete / Deactivate Survey Forms

If you have survey forms that you want to delete / deactivate. You can do this by selecting the ↓ arrow located to the right of your survey form and then selecting **Delete Form** to erase or **Make inactive** to deactivate your form.



Display to delete or deactivate survey forms

Note:

If you choose to Delete Form. You will be asked to rewrite the name of your survey form before you can proceed. By selecting Make inactive, your survey form will not appear in ODK Collect during the stage of getting ready.

#### e. Downloading XLSForm

You can download XLSForm format of the survey forms that you have created by clicking the arrow ↓ at the right part of your survey form and then select **Download XLSForm**.

#### f. Download Survey Results

To download data from the survey. You must first choose your survey form. After you have successfully selected the survey form, you will be directed to the survey form management page.

The screenshot shows the Ona.io survey form dashboard. At the top, there are navigation links: Overview, Map, Table, Photos, Charts, Dashboard, and Settings. To the right, it says "4 Records" and "Webform". Below the navigation, there are two main sections: "Activity" and "Data Exports". The "Activity" section displays statistics: 4 Records, 5 months ago Last Submission, and 0 Contributors. The "Data Exports" section has a button labeled "Prepare Data Export" which is highlighted with a red box and a cursor icon pointing at it. Below this button, it says "NO DATA EXPORTS". To the right of the "Data Exports" section is another section titled "XLS Reports" with a note: "You do not have the required permissions to view this project's XLS reports." Further down is a "Submit data" section with three options: "Using Webforms" (selected), "Using ODK Collect", and "Importing CSV/Excel". Below this is a "Link" section with a URL: <https://enketo.ona.io/x/#BGV6ZLbj>.

View to download survey data

Click on the button **Prepare Data Export** to start downloading your survey form data. After that you will be directed to choose the type of file you want to download.

### File type

The screenshot shows a dropdown menu for selecting a file type. The options listed are: CSV (highlighted in blue), CSV (Windows Compatible), Excel, CSV Zip, JSON, OSM, SAV, KML, and Zip folder of media attachments.

Choice of file types that you can download

If your survey form does not use photos, you can choose CSV. But if your survey form uses photos, you can choose **Zip folder of media attachment**. The process to download survey data depends on how much data you produce in the data collection activity.

The survey data from *Ona.io* can later be used for various mapping purposes for example **KML** you can open it with **Google Earth**, with the **OSM** you can use **JOSM** application, and data with format **CSV** you can open with **Spreadsheet** or **QGIS**.

### SUMMARY

Congratulations! Now you understand how to upload files survey form into one of the platforms that can

be used to store survey forms online. There are several options you can use besides Ona.io to *upload* survey forms. Ona.io can be an option because it is very easy and free to use based on the terms previously explained.

# Using To-Do List in JOSM

## Objectives:

- To be able to do plugin installation to input data in JOSM
- To be able to operate to-do list plugin in JOSM to input the data

After conducting a survey using the OpenMapKit (OMK) application, the next step you need to do is to input survey data as points in OpenStreetMap using JOSM. To make it easier for you to do that, you need to install JOSM plugin named **Todo list** plugin. The Todo list plugin is an additional tool that can help you quickly find and edit the survey results that you will upload on the OpenStreetMap (OSM).

## I. Installing to-do list plugin in JOSM

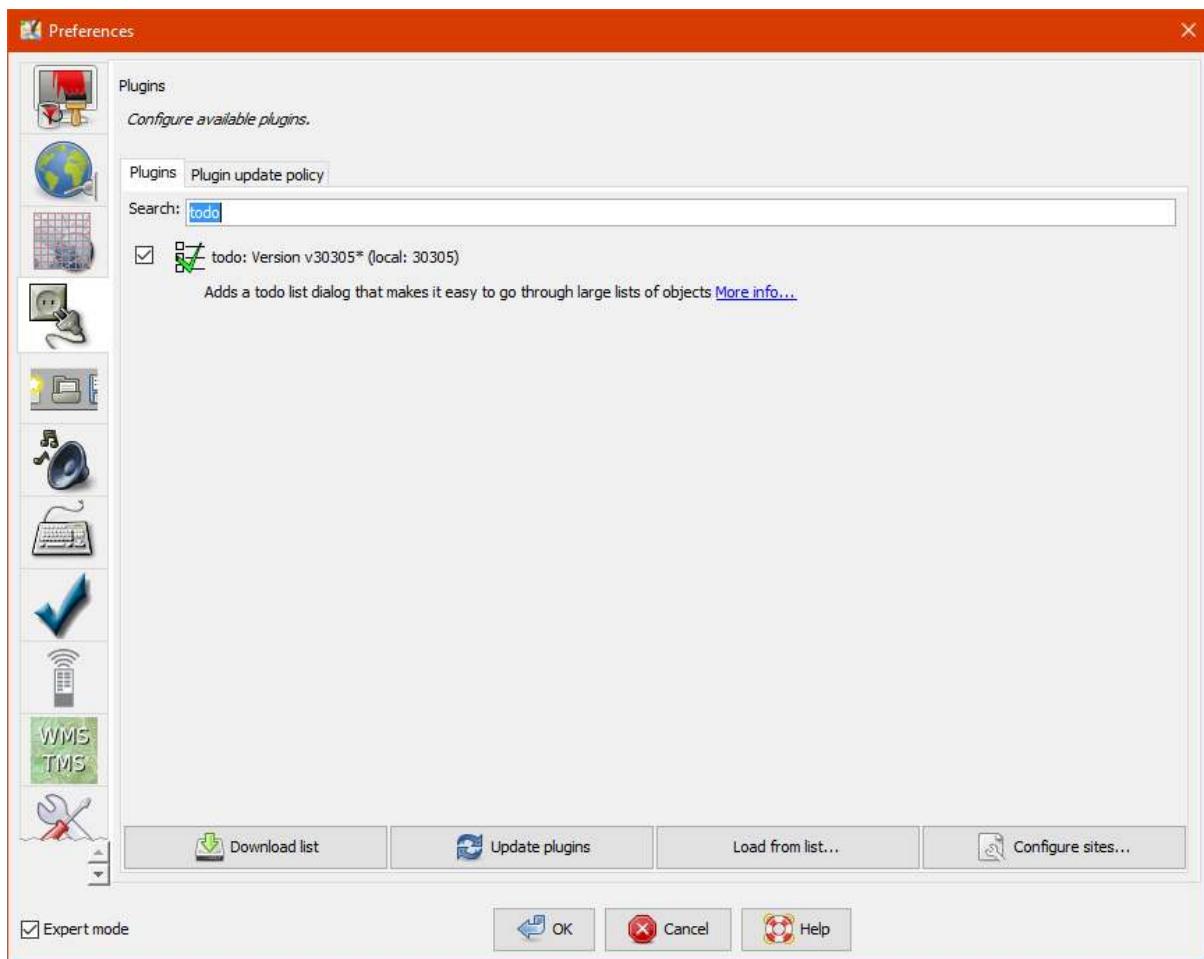
Because the Todo list plugin is an additional tool in JOSM, you need to install the JOSM plugin first before using it. The steps to install the todo list plugin in JOSM are as follows:

- Click on the menu bar **Edit → Preferences**
- The **Preferences** window will appear and select the **Plugins** menu to install the new plugin. If the plugins list has not yet appeared, you can click **Download list** and make sure your internet is connected to download the plugin.

[preferences\_window] (/en/images/03-JOSM/06-Menggunakan-to-do-list-di-JOSM/0601\_download\_plugin.png)

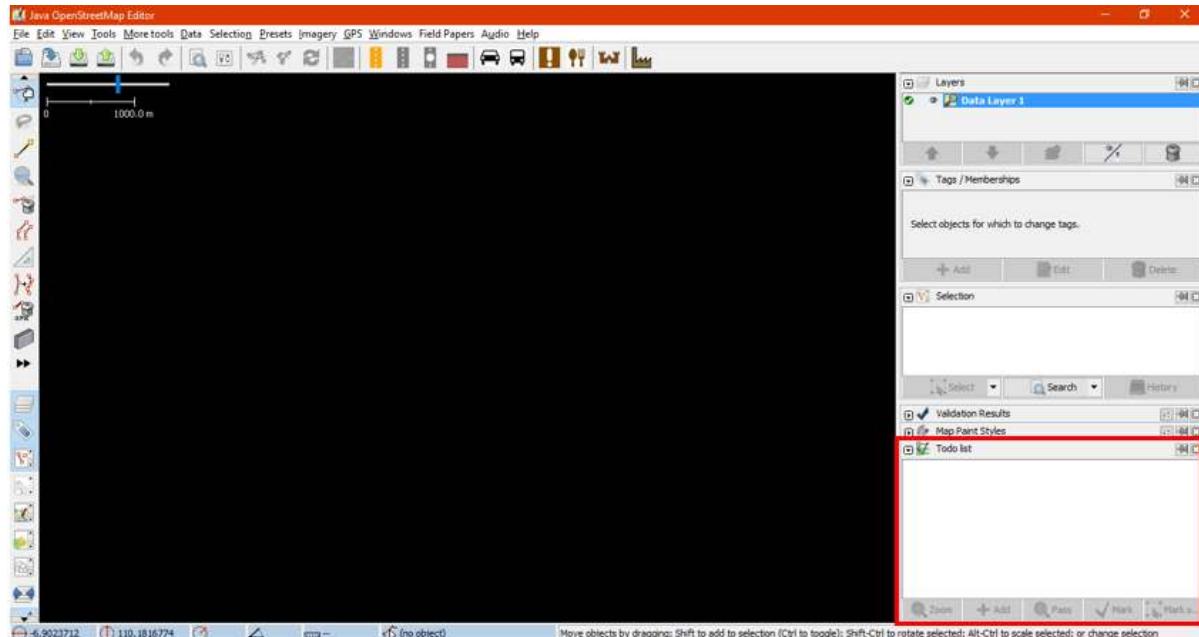
The Preferences window for Plugins option menu

- To find the todo list plugin you can use the **Search** box. Then type **todo** in the search box to find the todo list plugin. After that, you need to give a checkmark in the todo plugin box in order to download the plugin and click **OK** then wait until the download process finishes.



## Todo plugin search result

- The todo plugin window box will appear to the right of the map canvas and if the todo box does not appear, you can activate the todo plugin panel by clicking on the Windows menu bar, then clicking the todo menu. You will see the Todo list panel on the right panel.

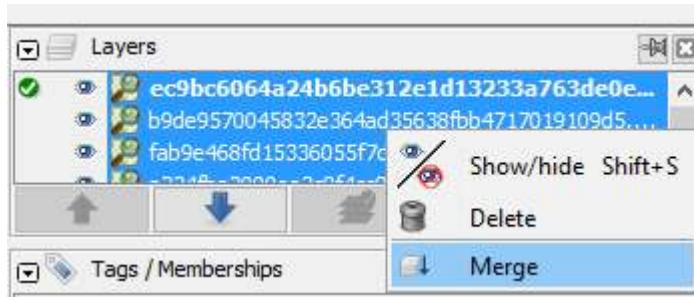


The display of Todo list panel

## II. Using to-do list

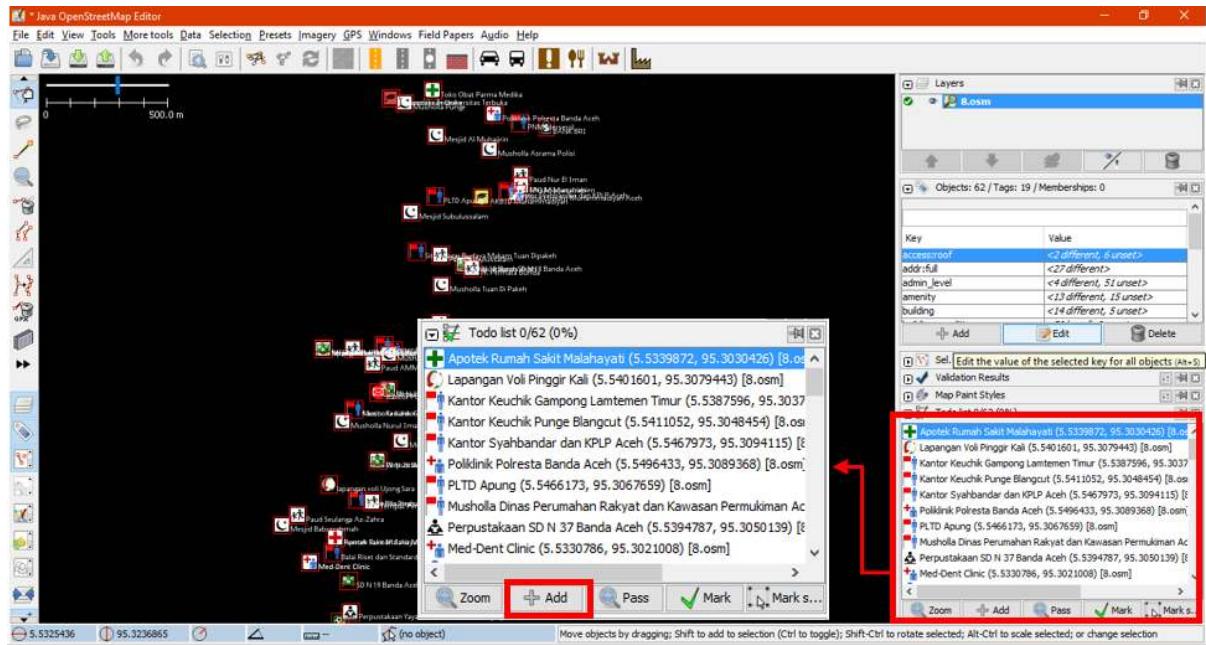
The steps to use the to-do list plugin are as follows:

- Firstly, you need to add all .osm files into that will be uploaded into JOSM. These .osm files contain survey point objects that have been exported from OpenMapKit (OMK). You should open the files by clicking **File → Open** on the menu bar.
- Because one file contains only one point object, you need to combine all the layers into one layer. You can merge the files by selecting all the layers on the **Layers** panel then right-click and choose **Merge** option. You can select several layers at one time by clicking on one layer then hold to select all layers on the panel or simply click layers one by one by pressing the **Ctrl** key on your keyboard.



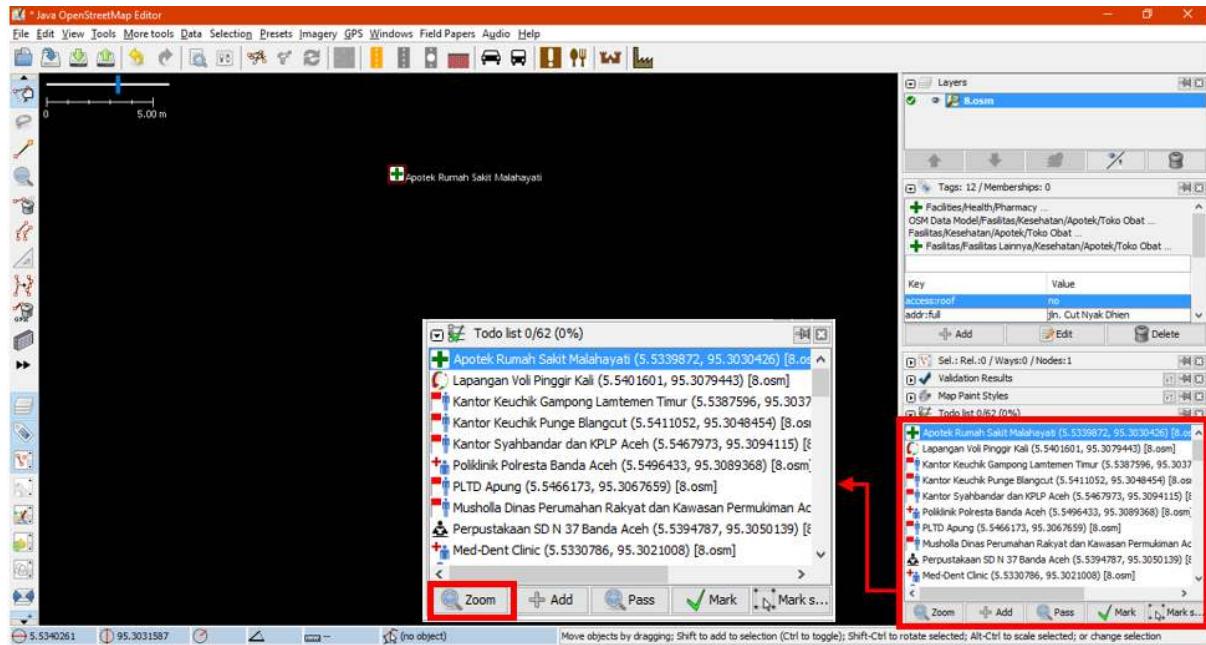
Merge several layers into one layer

- After all the point objects have been merged into one layer, you need to select one of the objects that you want to work on. You should add all the object points into the to-do list by selecting all points then clicking **Add** button on the **Todo list** panel.



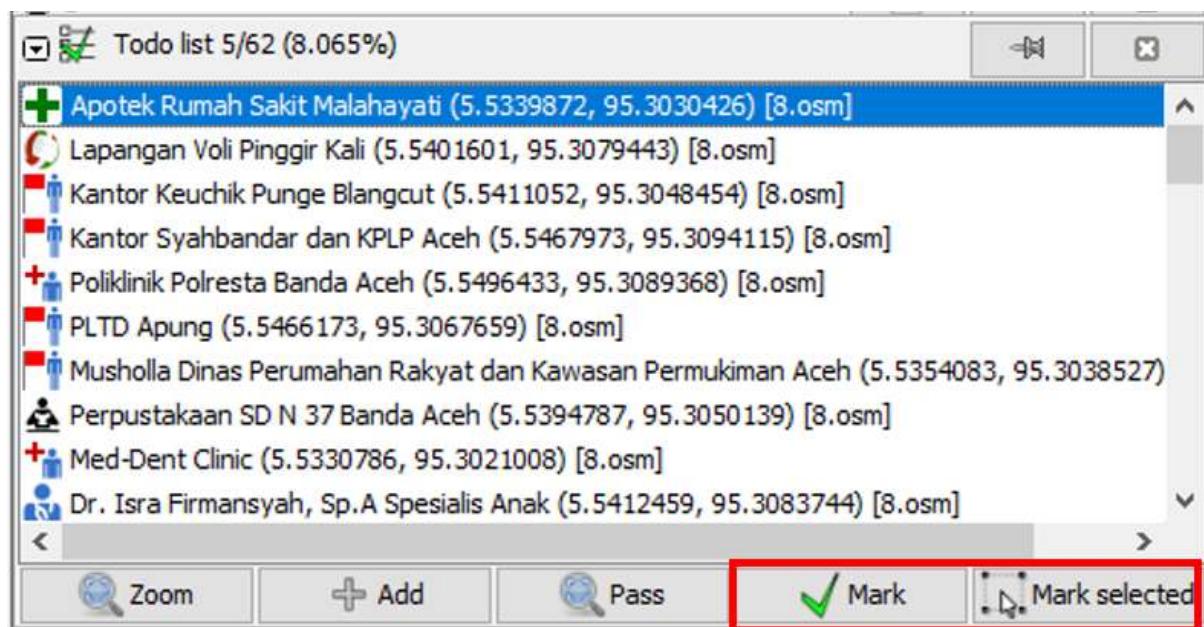
### Add list objects into todo list panel

- To zoom in on one of the objects you want to work on, you can use the **Zoom** option in the Todo list panel or double-click on the object in the list.



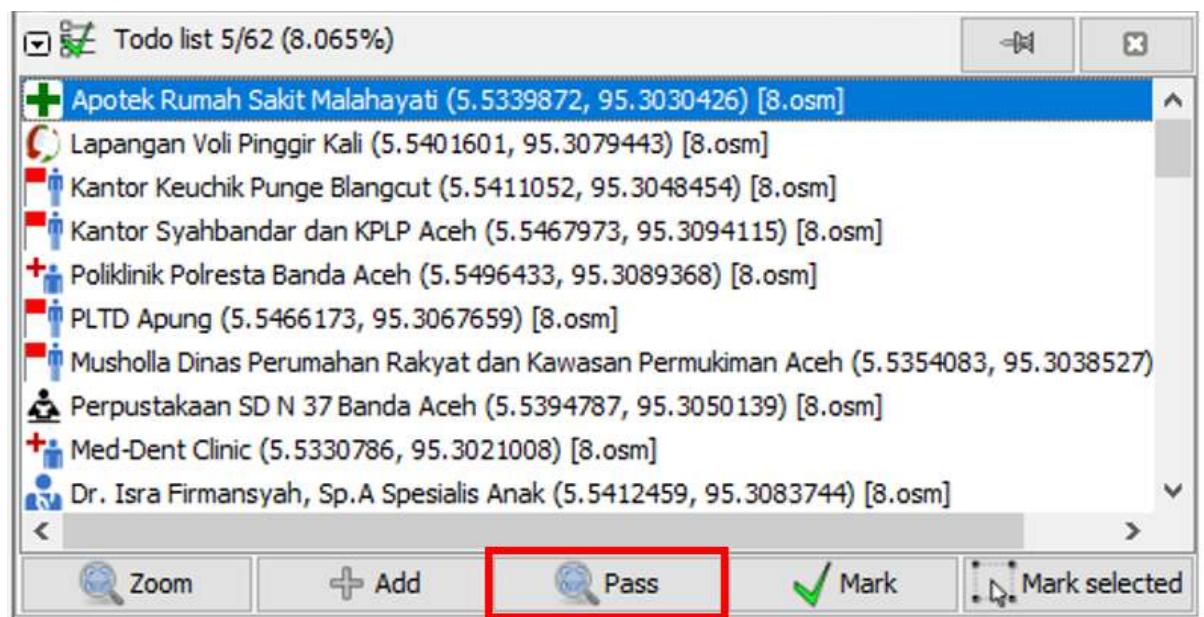
### Zoom in the objects through Todo list panel

- After you find the object that you want to work on and have made the necessary changes, you can mark the object on the todo list to remove the object name from the list by clicking **Mark** on the Todo list panel. You also can mark by selecting objects directly on the map then clicking **Mark selected**. To gain a deeper understanding of adding OSM data, you should refer to **Adding OSM Data Using JOSM module**.



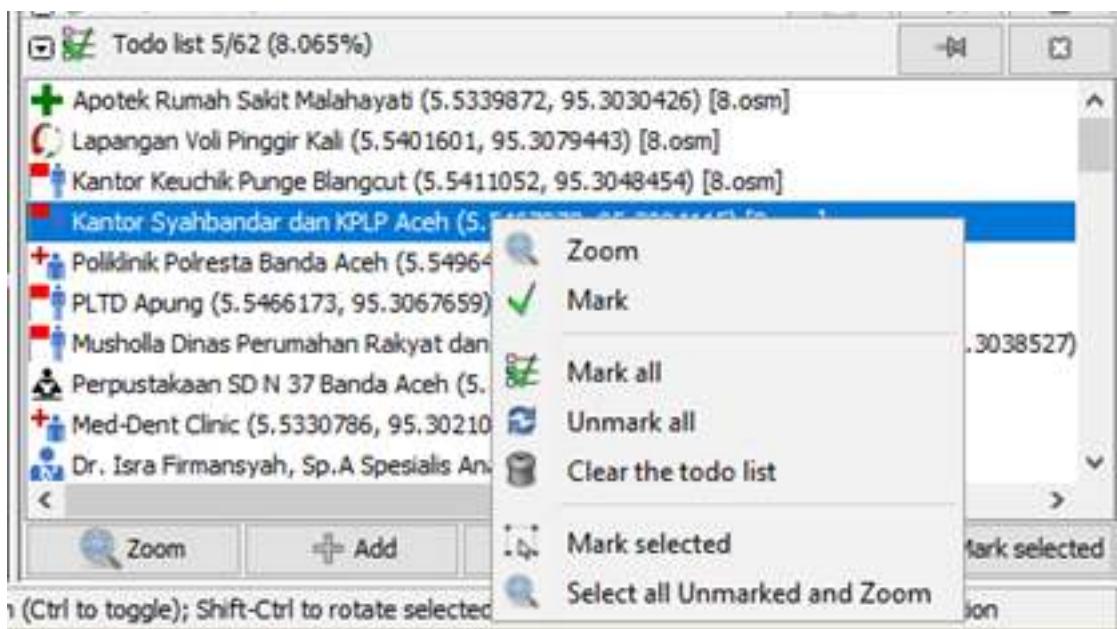
Mark the object using Mark option

- If you want to skip an object but still want to leave that object in the list to do later, you should click Pass.



Skip the object using Pass option

- To mark all the objects in the list directly you can use the **Mark All** option by right-clicking on the **Todo list** panel. Then, if you want to bring back all objects that have been marked, you can use the **Unmark all** option. You can also delete the entire object name list in the **Todo list** panel by right-clicking on the panel and clicking **Clear the todo list**.



Several options on Todo list panel

## SUMMARY

If you can follow and pay attention to all the stages in this chapter, then you have successfully installed the plugin in JOSM. In addition, you have also successfully learned and practiced how to operate the Todo list plugin in JOSM to facilitate your work.

— title: Creating Field Maps using QGIS weight: 7 —

### Objectives:

- To be able to operate QGIS to install QuicMapServices Plugin
- To be able to operate QGIS to create a field survey map

Field maps are used to advise data entry in identifying the locations during the field survey. If data entries have gotten the administrative boundary with the government in the village office, a field map can be used to delineation the administrative boundary. Then we can bring the map to our office and input the boundary using JOSM. How to create the filed map? We can use QGIS version 2.14.22 in this chapter, QGIS is a professional GIS application that is built on top and proud to be itself Free and Open Source Software (FOSS). We can download the QGIS application on <https://qgis.org/>.

## I. Download and Install QGIS

- Open the browser and go to <http://qgis.org/>
- The window will appear like the image below:



### Website QGIS interface

- Click on **Download Now → All Releases → click here** on Older releases of QGIS are available to search and find QGIS version 2.14 or we can download in this link: <http://download.osgeo.org/qgis/win64/QGIS-OSGeo4W-2.14.22-1-Setup-x86.exe> for Windows 32 bit and [http://download.osgeo.org/qgis/win64/QGIS-OSGeo4W-2.14.22-1-Setup-x86\\_64.exe](http://download.osgeo.org/qgis/win64/QGIS-OSGeo4W-2.14.22-1-Setup-x86_64.exe) for Windows 64 bit.



### QGIS version

- If you using another operating system, choose the operating system with Index of QGIS

# Index of /qgis

Name	Last modified	Size	Description
 <a href="#">Parent Directory</a>		-	
 <a href="#">data/</a>	22-Jun-2015 05:59	-	
 <a href="#">debian_ppc/</a>	10-Jan-2009 08:12	-	
 <a href="#">doc/</a>	01-Nov-2010 04:43	-	
 <a href="#">linux/</a>	09-Jul-2008 01:41	-	
 <a href="#">mac/</a>	02-Jan-2009 02:29	-	
 <a href="#">src/</a>	17-Jul-2010 05:26	-	
 <a href="#">win32/</a>	24-Feb-2019 15:30	-	
 <a href="#">win64/</a>	24-Feb-2019 15:30	-	
 <a href="#">windows/</a>	24-Feb-2019 15:30	-	

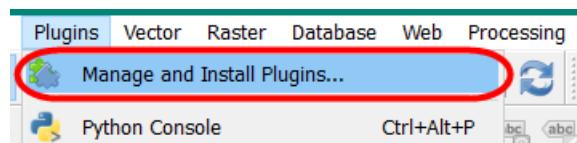
Index for other operating systems

- If you already have the QGIS application, you can directly install QGIS and follow the instructions.

## II. Install the QuickMapServices Plugin on QGIS

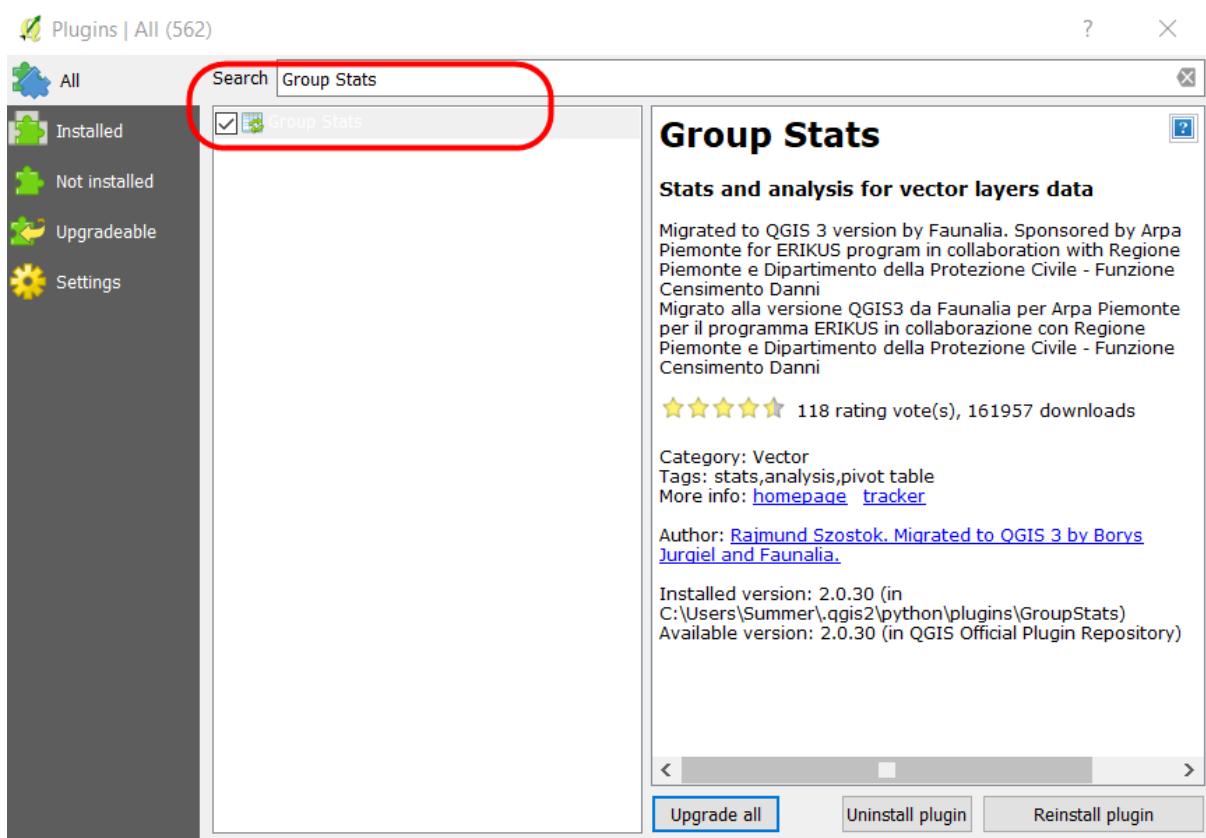
QuickMapServices is a plugin that makes work with web-based basemap easy. We need an internet connection to download this plugin in QGIS. These are the step by step to install the plugin:

- Open QGIS and ensure the internet connection is working. Click on **Plugins Menu → Manage and Install Plugins**



Menu Plugin

- Type **QuickMapServices** in the **Search** box and click on **Install Plugin**



Install the plugin

- If the installation has finished, the next step is creating the field map.

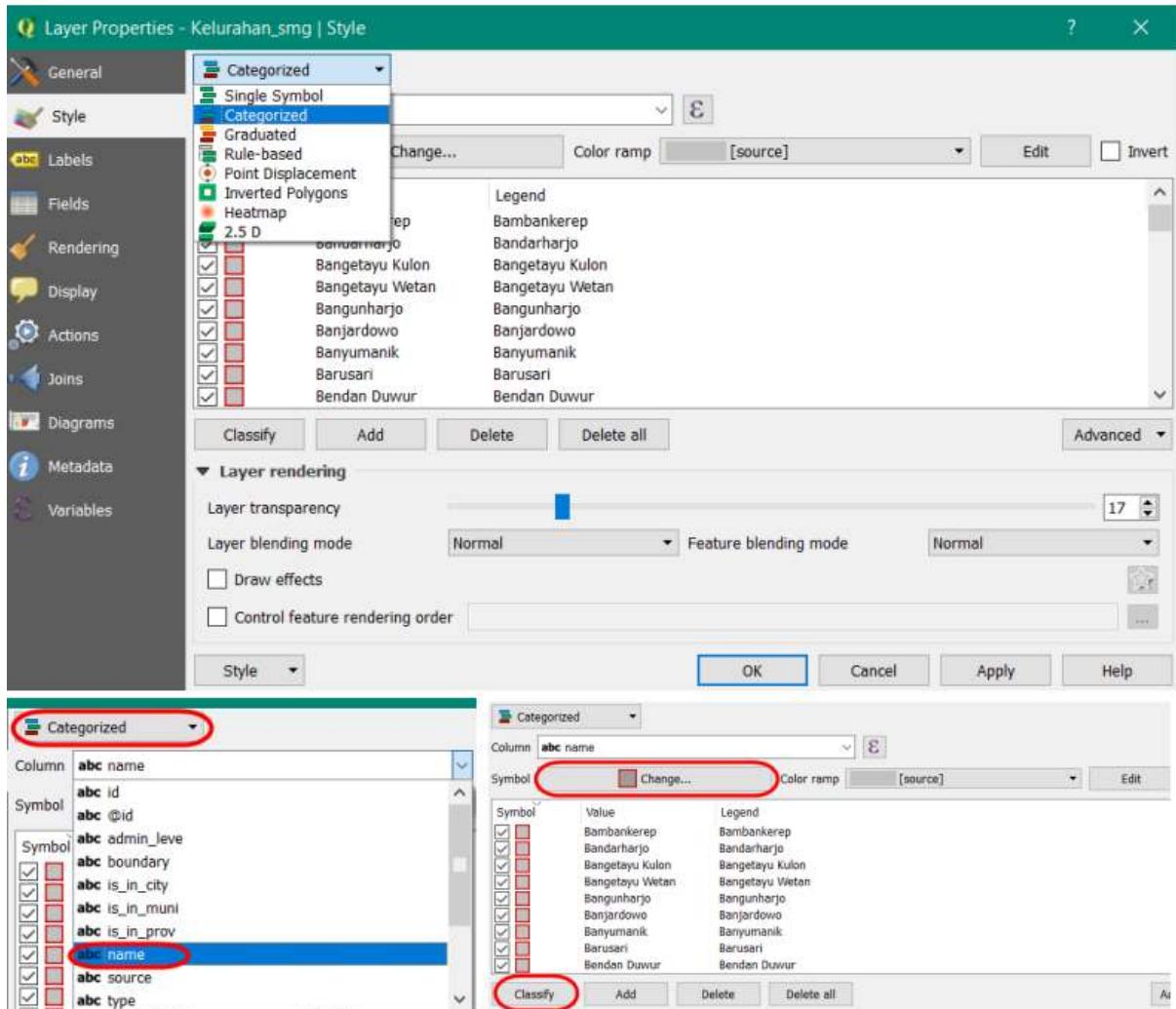
### III. Preparing the Data

Before we start to create the field maps, we have to prepare the shapefile of the administrative boundary. If you have other spatial data such as roads, it will be useful to use the data in the field map. The steps to preparing the data:

- Add the data layer in **QGIS** layer with click on **Add Vector Layer**

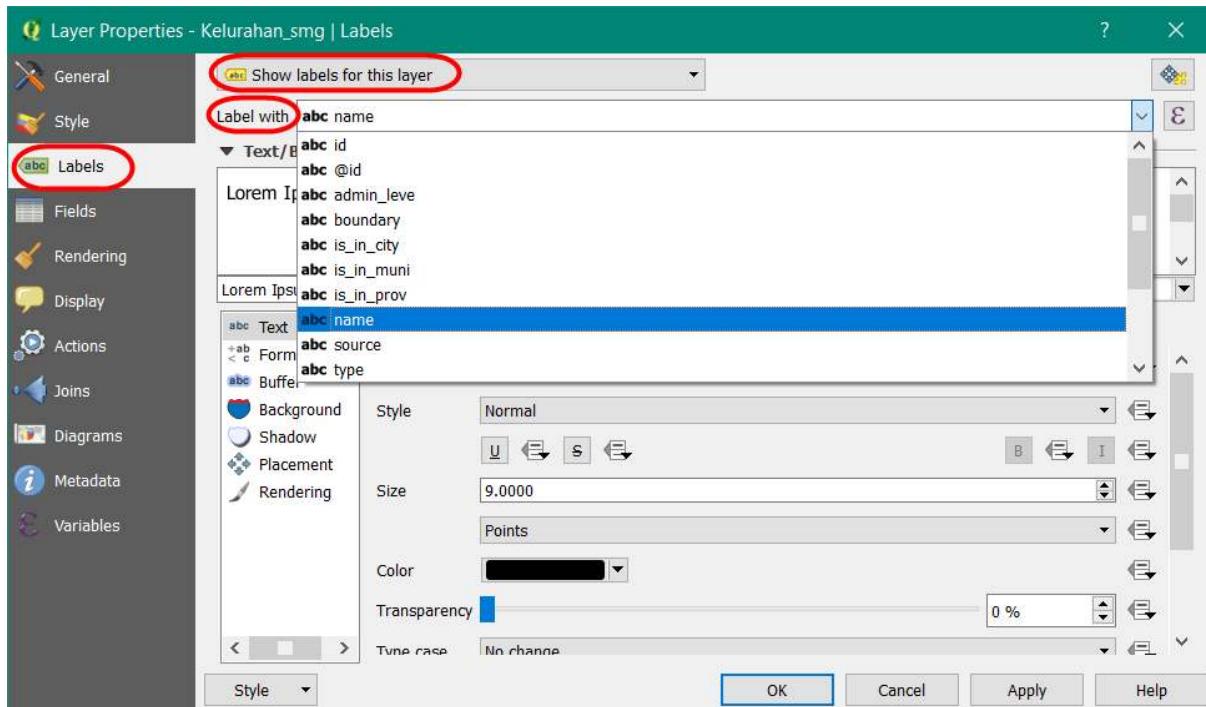


- We can change the style of the layer with symbology and labeling.
- To symbology, We can directly right click on **boundary layer** → **Properties** → **Style** → **Categorized**. Navigate the cursor to **Column** → **search the column name as village** → **Classify**. If we want to change the symbology, click on **Symbol** → **Change**.



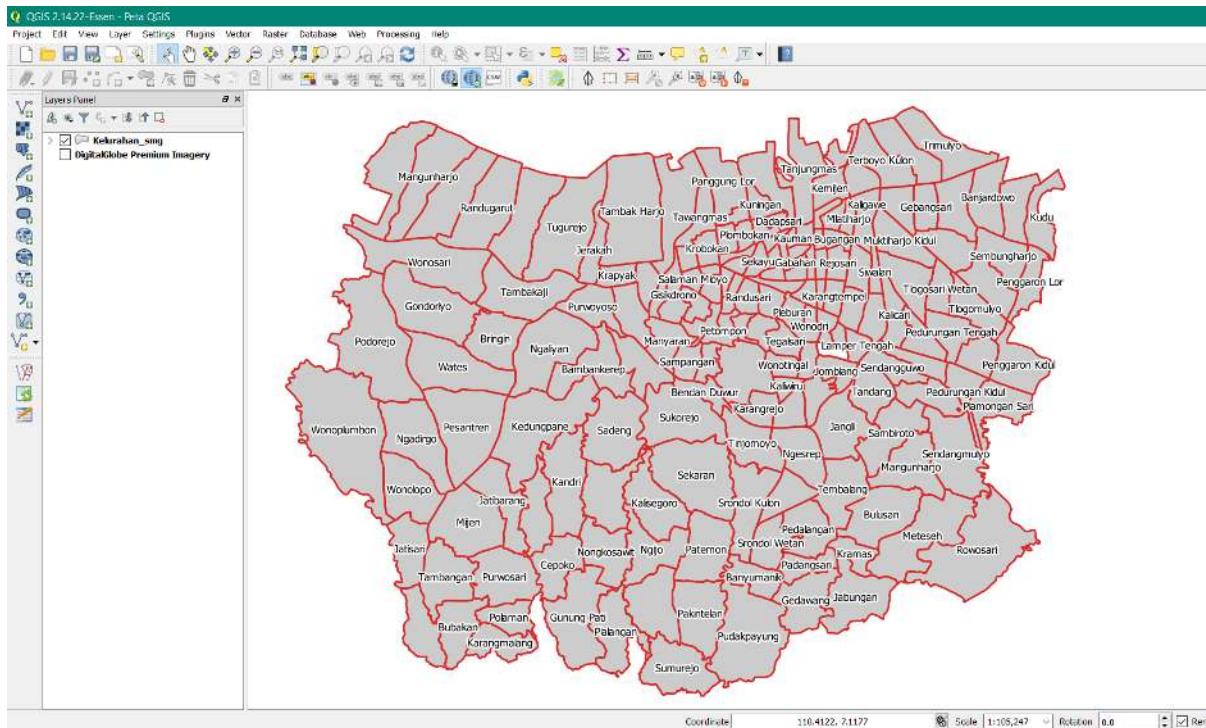
### Symbol in QGIS Layer

- To add the labeling, open the layer properties window like before and click on **Labels** → **Show labels for this layer** → **search the column name as the village**. We can adjust the font label in Text Menu, adjust the shadow label in Buffer Menu, and setting the placement label in Placement Menu.



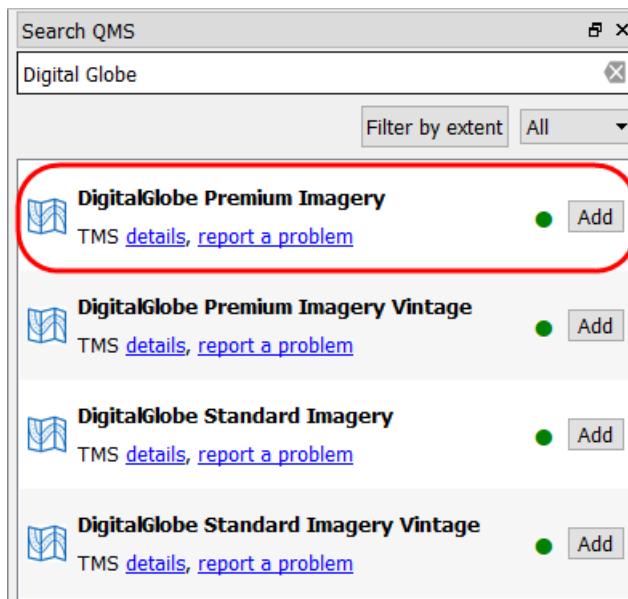
### Labeling setting

- The result will show likely image below:



### The result of the layer style

- To add the basemap on your maps, click on **Web Menu → QuickMapServices → Search QMS**. The plugin will show up in the right panel, we can type the name of available imagery, an example **DigitalGlobe Imagery**.



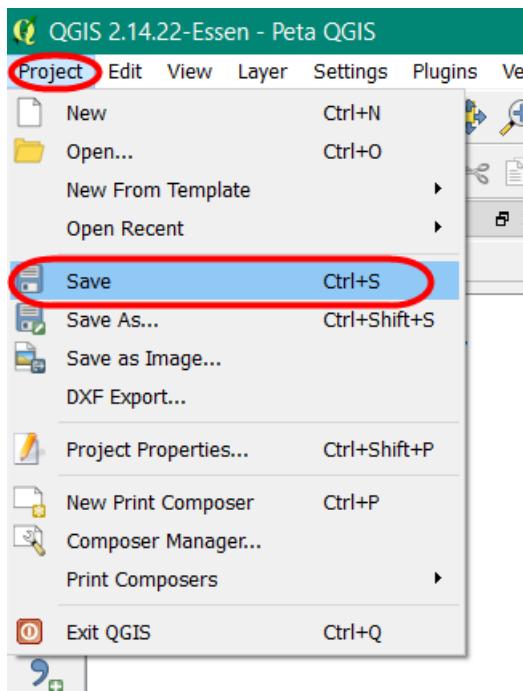
### QuickMapServices Interface

- In the QMS window will appear to lists the imagery with the name, click **DigitalGlobe Premium Imagery**. Please wait for the moment until the imagery shows up in your map canvas.



### The digital globe imagery as base map

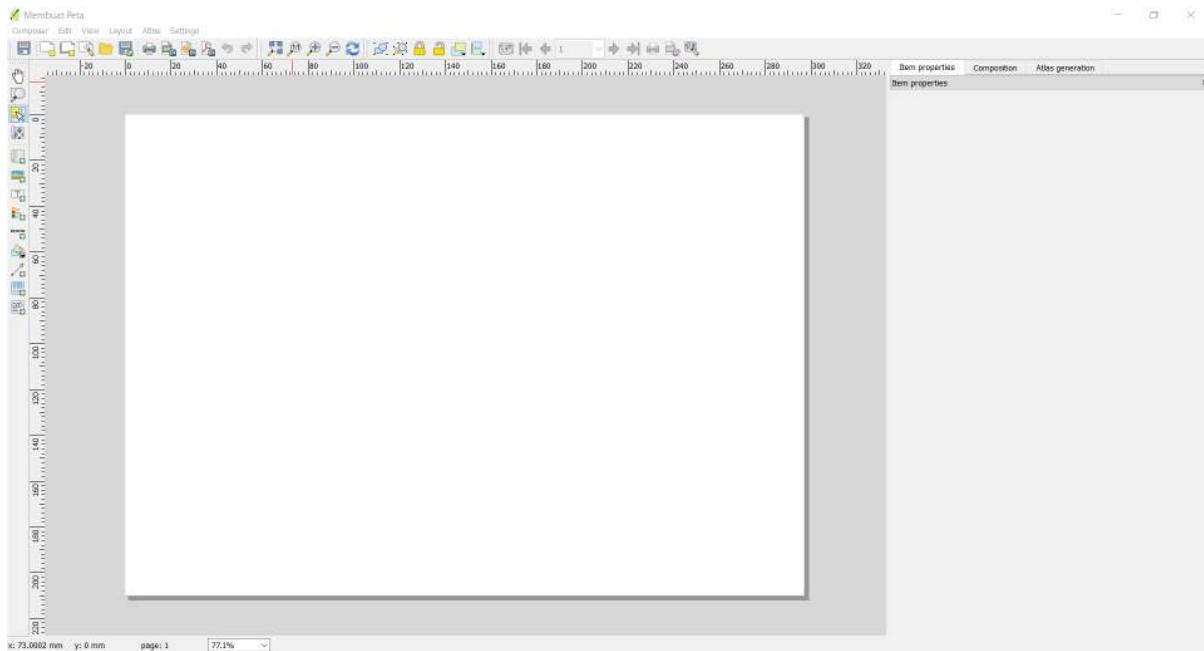
- Save your QGIS project by **Project Menu → Save → Type the name → Save**. An example, the name is Field Map.



Save project

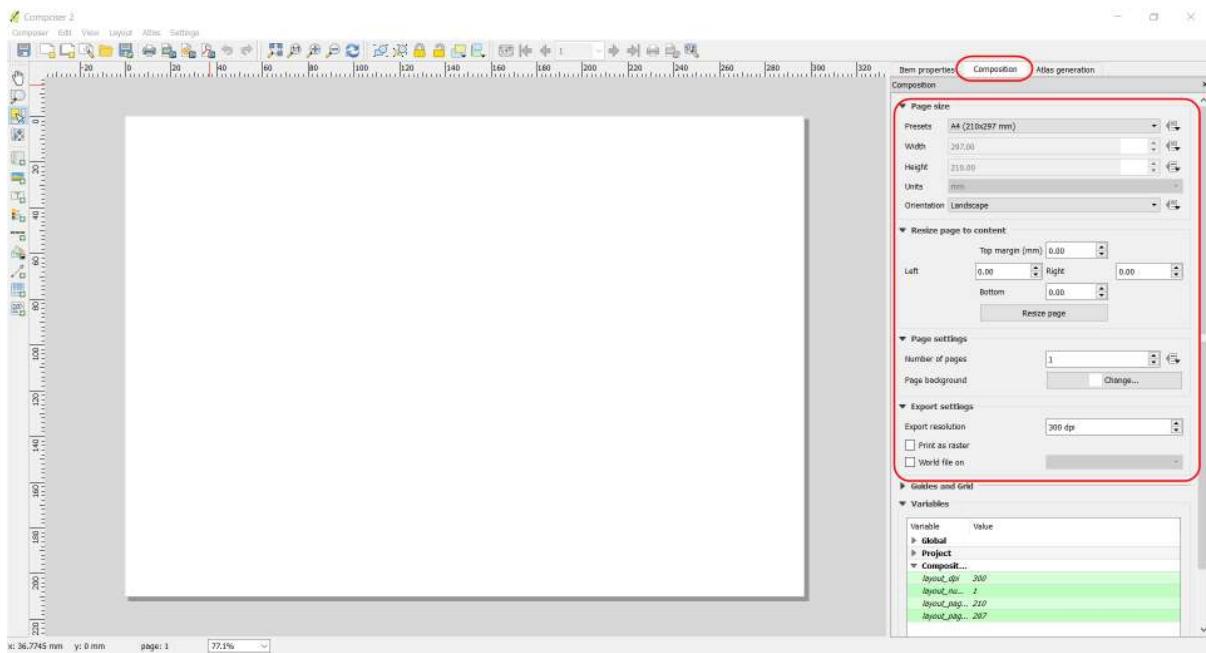
#### IV. Creating the Layout with Map Composer

- In the first step, we can create the new composer with Project Menu → New Print Composer. The composer window will show up in your QGIS project.



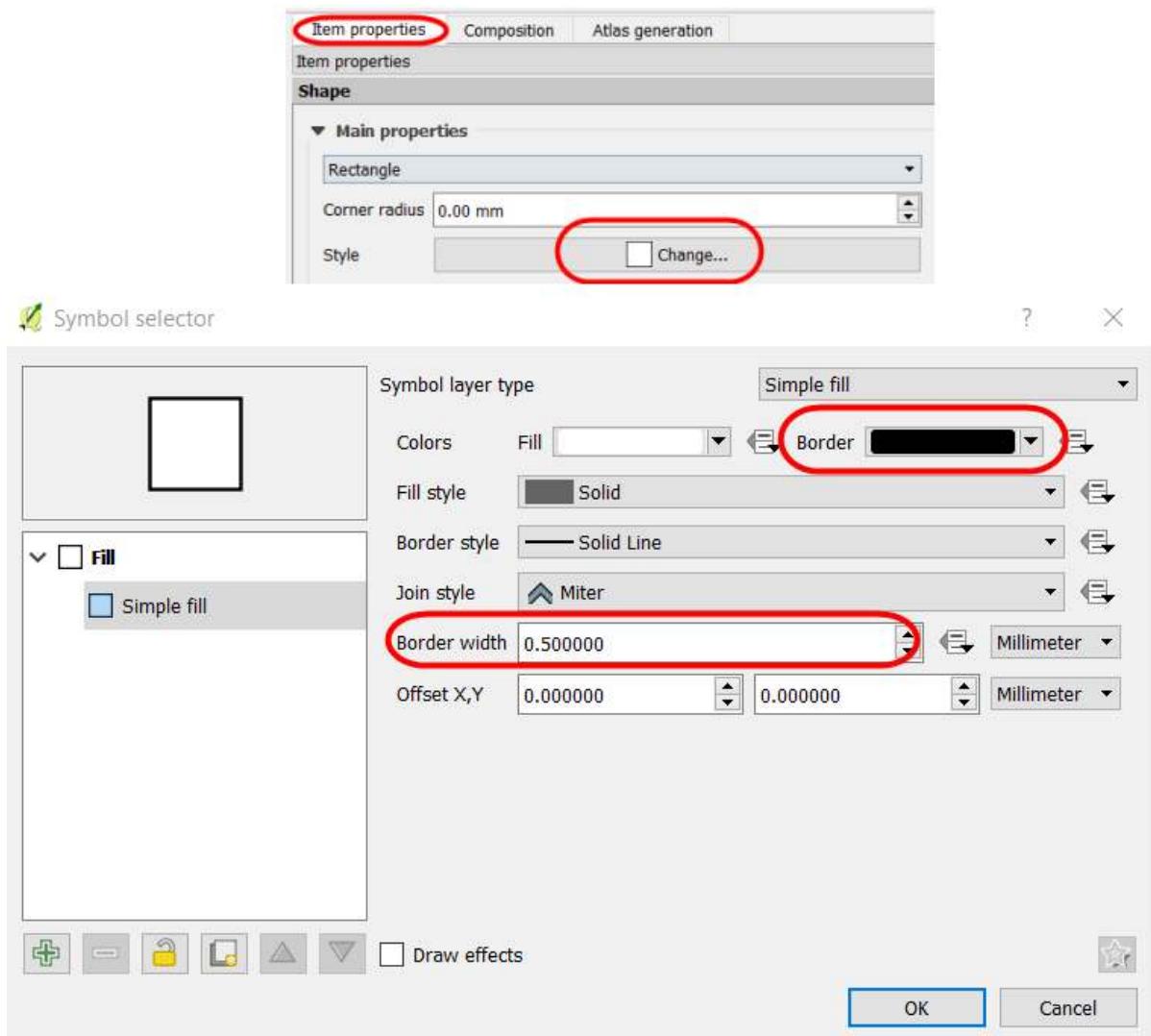
#### Map Composer

- The Composition Menu. The orientation map used to adjust the paper size, orientation, margin, and export resolution. You can do the setting in **Composition** on the right panel.



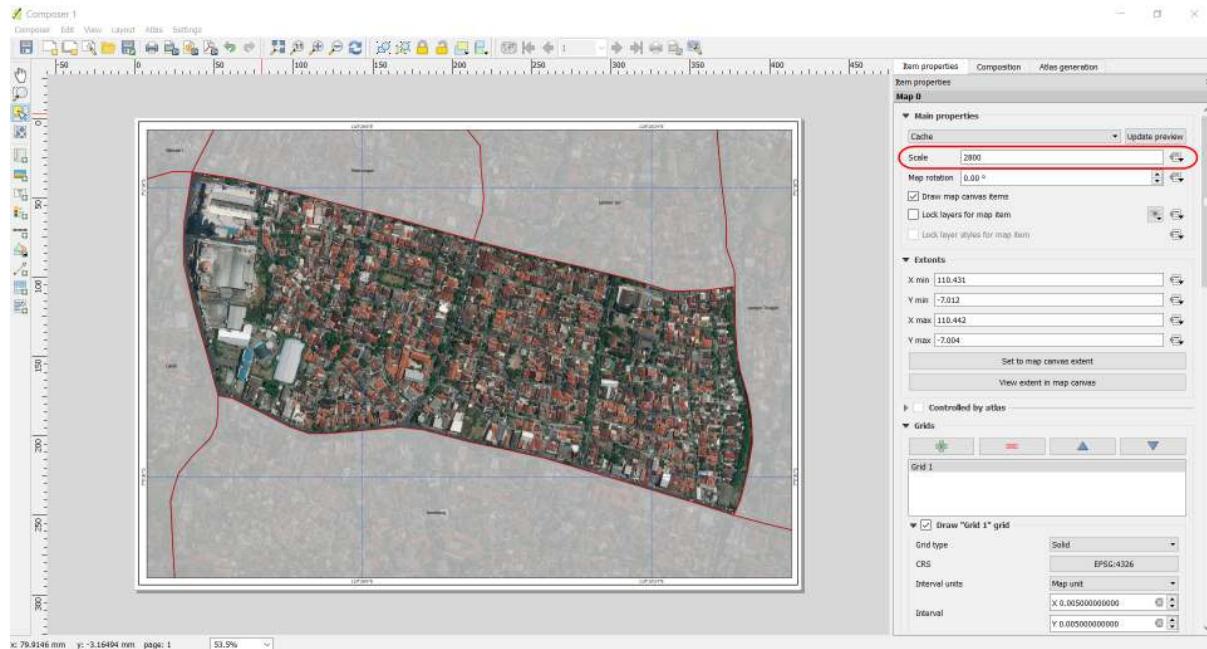
## Menu composition

- To add the outlines in the layout with



## Symbology in Outlines

- To add the maps by **Add a new map**, and click on the layout → create the square. We can change the map scale and map view with the **Item Properties** in the right panel.



## Scale map setting

- To add the grid with **Item Properties** → **Grids** → Click the button + → **Draw Grid**. The grid setting is a **grid type** and **interval**. The Interval based on a type of coordinate. To add the coordinate checklist on **Draw coordinate** and adjust the coordinate position in each grid.

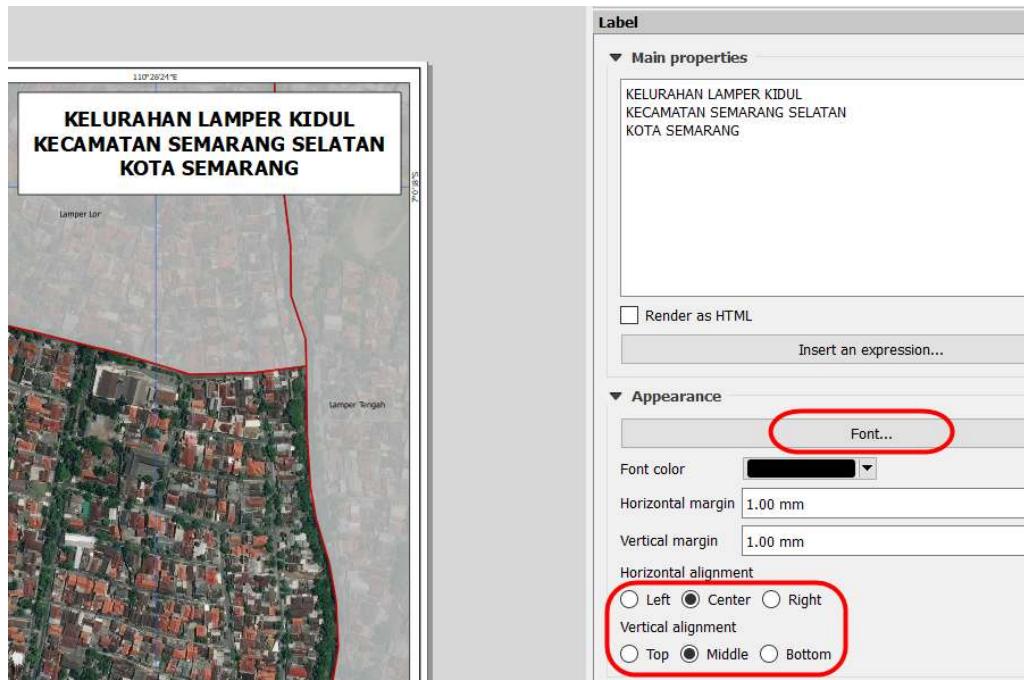
The image contains two side-by-side screenshots of the 'Item properties' panel for 'Map 0'.

**Left Screenshot:** Shows the 'Grids' section with 'Grid 1' selected. Under 'Draw "Grid 1" grid', the 'Draw coordinates' checkbox is checked. Below it, grid settings include 'Grid type: Solid', 'CRS: EPSG:4326', 'Interval units: Map unit', and intervals X: 0.005000000000 and Y: 0.005000000000.

**Right Screenshot:** Shows the 'Draw coordinates' section with various coordinate display options. It includes sections for Left, Right, Top, Bottom, Font, Font color, Distance to map frame, and Coordinate precision. The 'Format' dropdown is set to 'Degree, minute, second with suffix'. Coordinate display options like 'Show all', 'Outside frame', and 'Vertical ascending' are listed for each side.

## Grid and coordinate setting

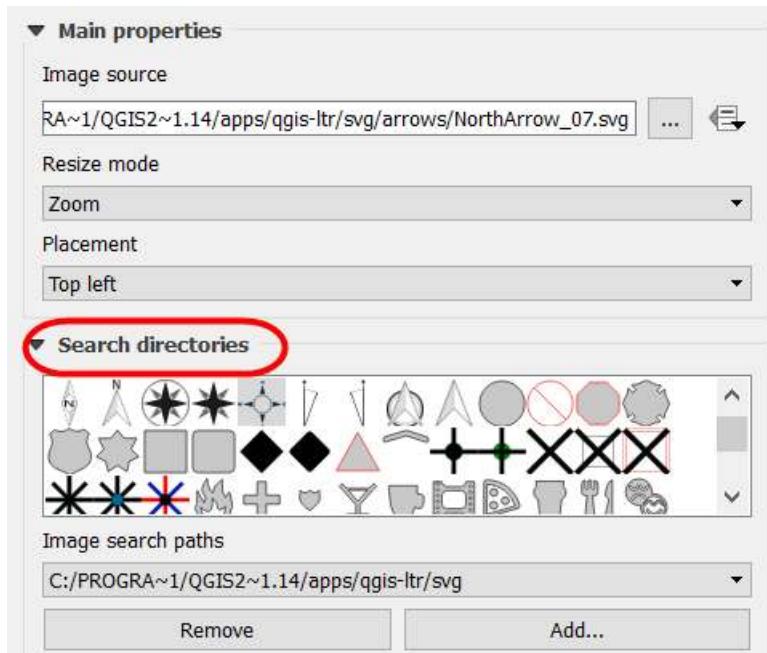
- To add map title click on **Add new label** → click in map layout the position the map title. The **Font** settings to change the appearance of the label, click the **Horizontal alignment** → **Center** to move the position in the center as horizontal and click **Vertical alignment** → **Middle** to move the position



in the center as vertical.

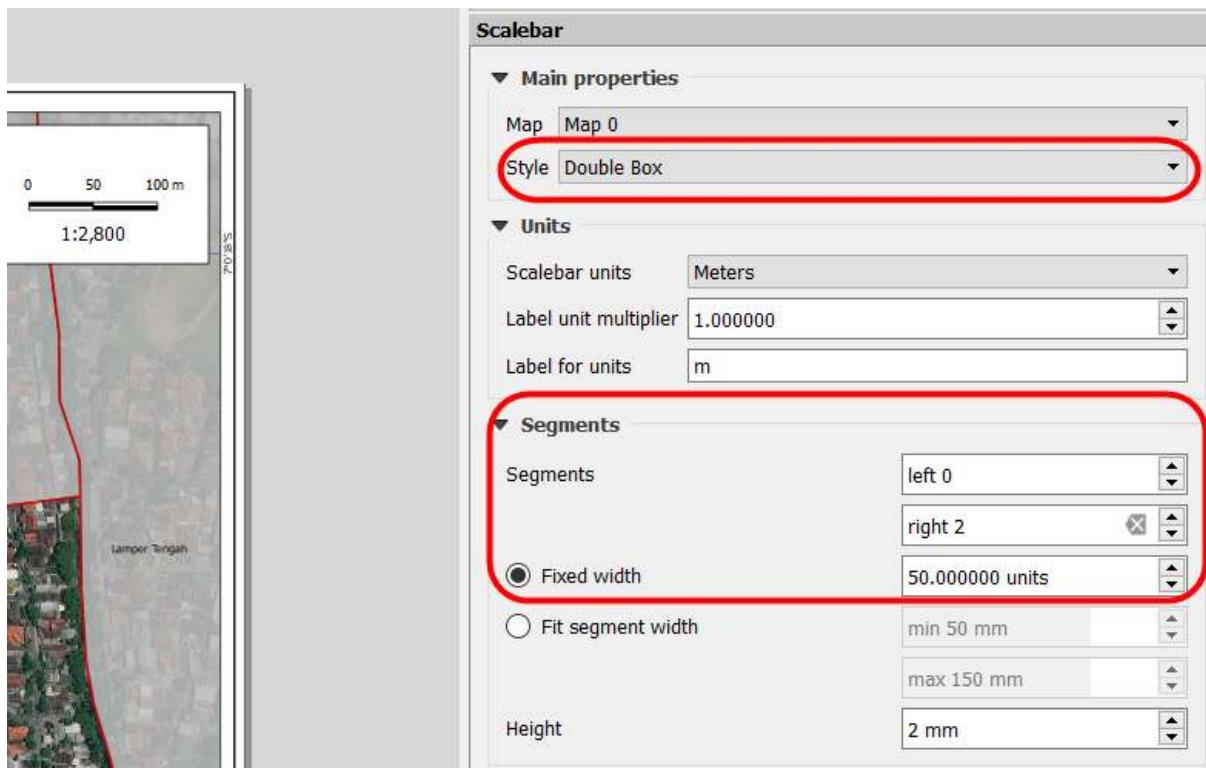
Font setting in Label

- To add the arrow for direction by tools **Add Image** → **Item Properties** → **Search Directories**. Click on the layout and draw the box and choose the image in search directories what is arrow symbol.



#### Symbol of arrow

- To add the scale bar by tools **Add new scalebar**. To add the scale map in numeric, change the **Style** in **Main Properties** with **numeric**. You can set the segments of scale bar in segments unit.



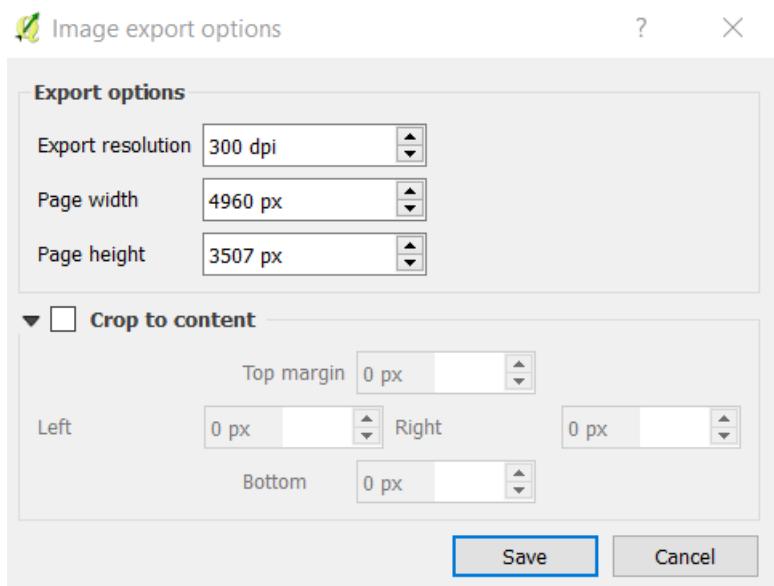
The setting of the scale bar

- To add the source of the data layer by tools **Add new label**. You can fill the information about data source with "DigitalGlobe Premium Imagery ([www.digitalglobe.com](http://www.digitalglobe.com)) © Digital Globe".

Sumber Data :  
DigitalGlobe Premium Imagery  
([www.digitalglobe.com](http://www.digitalglobe.com)) © Digital Globe

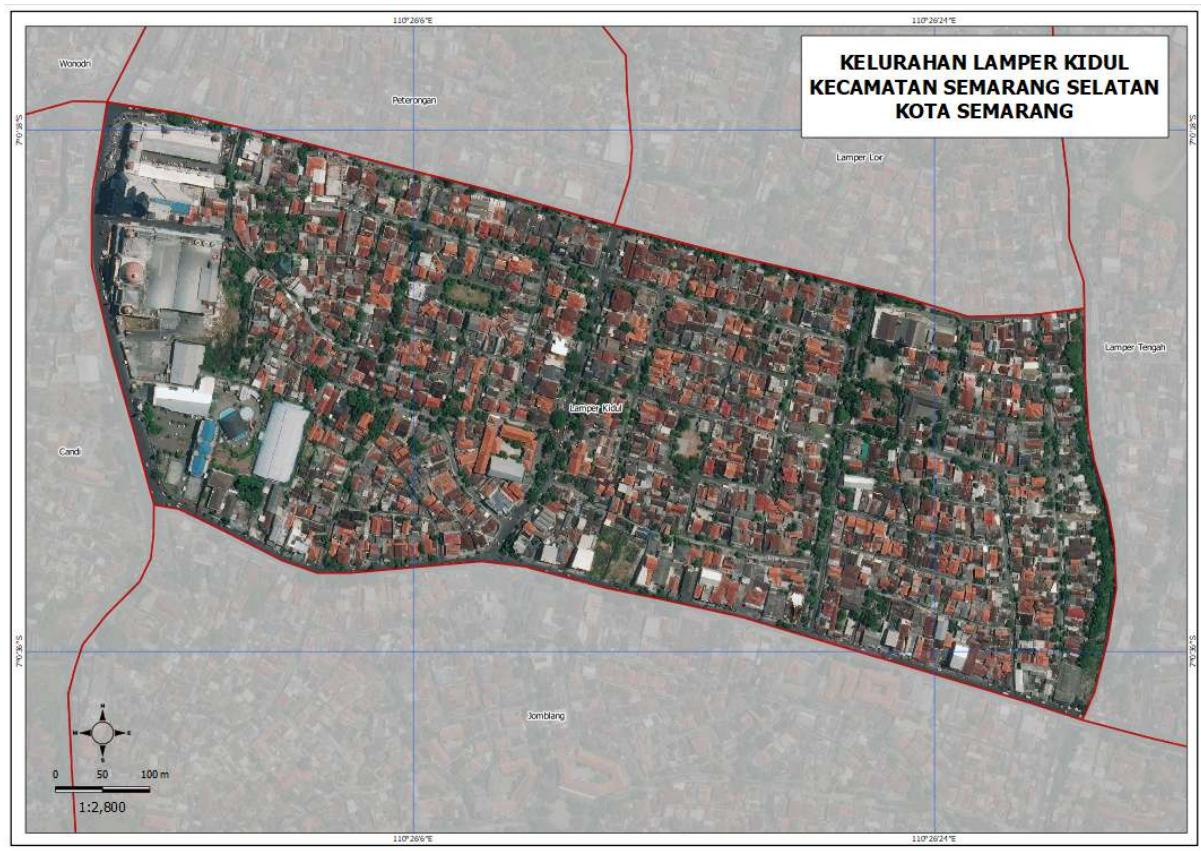
The license of Digital Globe Imagery

- If the map layout has finished, we can export the map as an image in jpg, png, pdf file. Click on **Export as Image** to start the export map to JPG, PNG, PDF, and SVG file. Before the exporting process, you can set the export resolutions to ensure the image resolution will result in the best image. Click on **Export resolutions 300 dpi** is the best result image.



## Map resolution

- After the export has finished, the result will show up like the image below



## The map result

### SUMMARY

If you can follow the whole instructions in this chapter, you have learned and practiced how to create the field map using the QGIS. You can create the field maps based on village administrative level to easy on the printout and bring to the field. The field maps will be used by data entry to identify the location, digitize the boundary, and mark the objects.

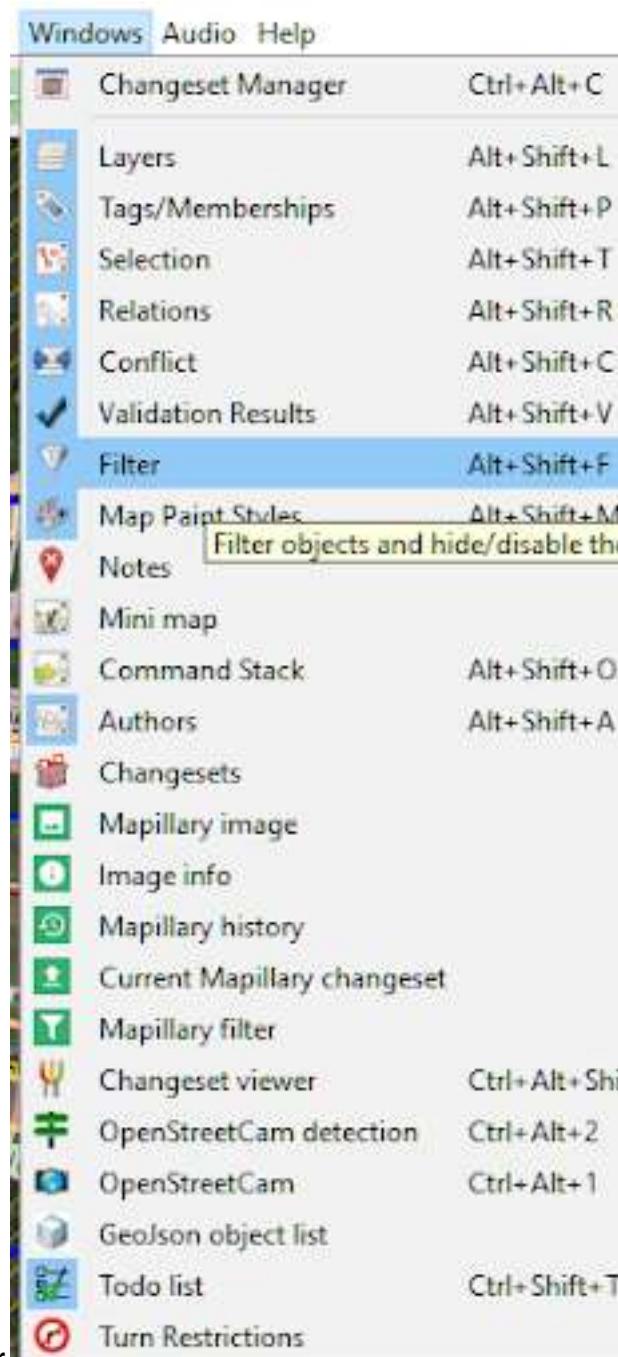
## Using Filter on JOSM

### Objectives:

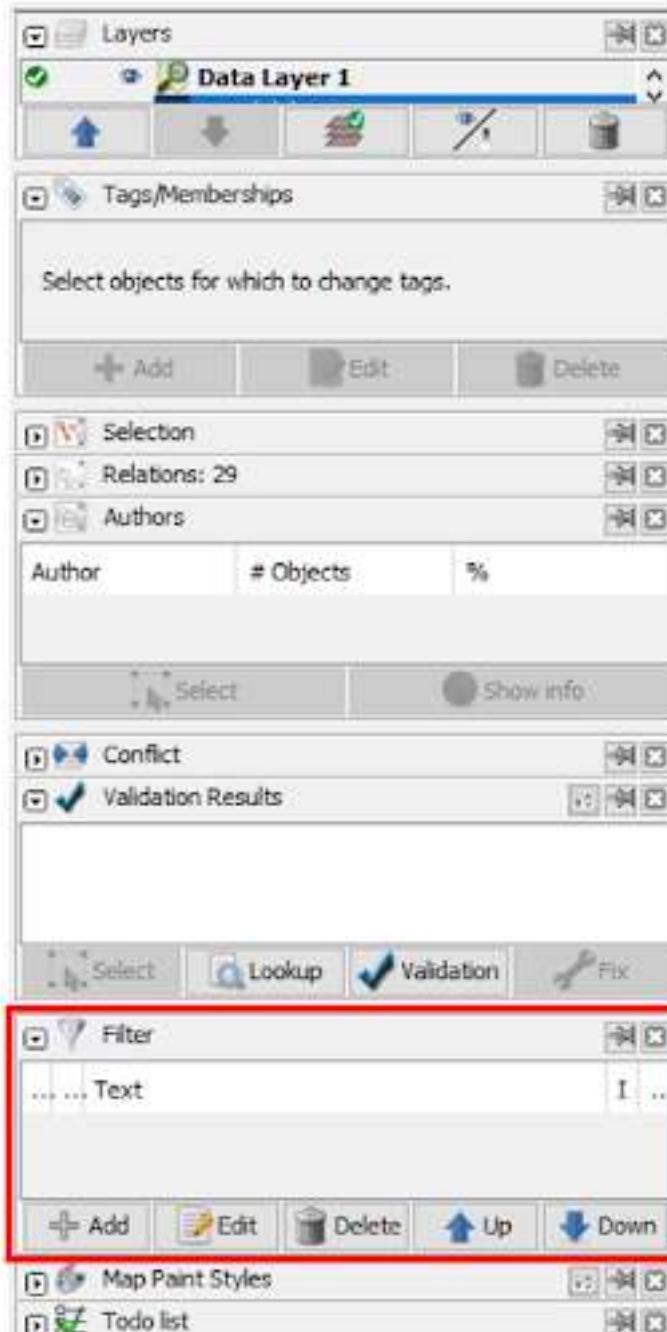
- To be able to activate data filtering mode on JOSM
- To be able to operate a data filtering tool on JOSM

JOSM has many tools that can be used by the user to make mapping things easier, like a filter tool. Filter tool is an additional tool that allows you to select or shown only certain objects on JOSM based on key and value on OpenStreetMap. With these tools, you can edit or check specific data on OSM. Filter tool allows you to see only an object based on its attribute, so you don't need to look at all the data if you only want to look at specific objects.

## I. Activating Filter Window on JOSM

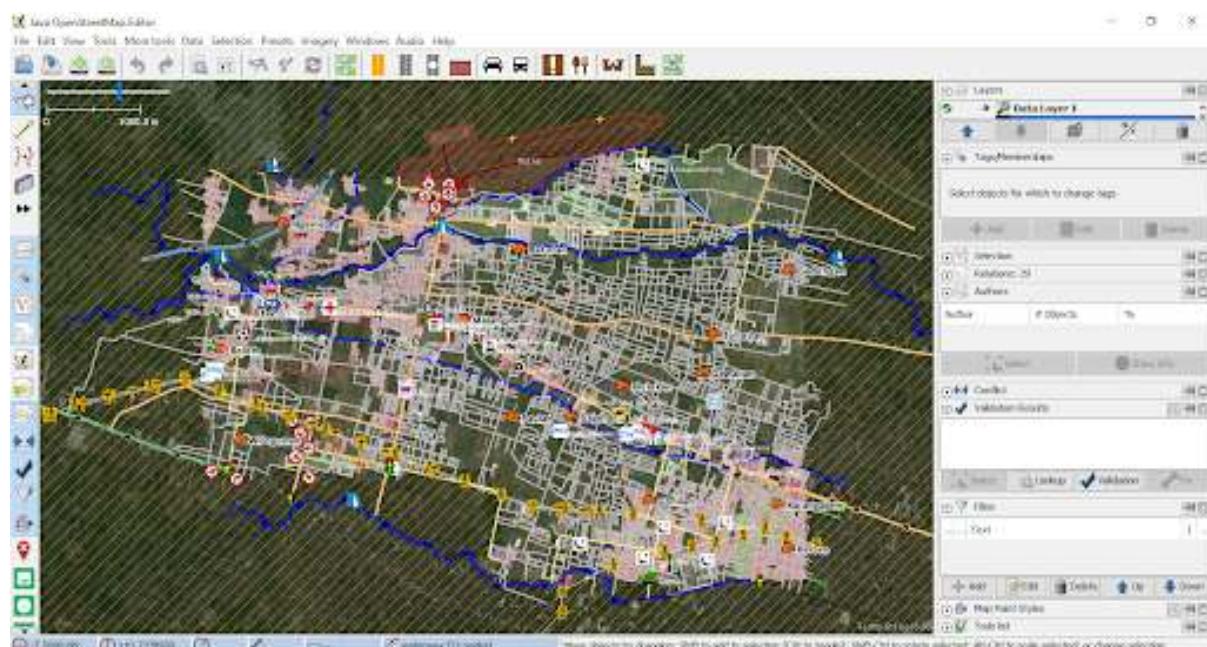


- To activate filter window, you can click **Window** then click **Filter** "image\_tooltip"
- Activate window filter on JOSM



- Window filter will show up on the right side of your screen.  
“image\_tooltip”  
Window filter on JOSM

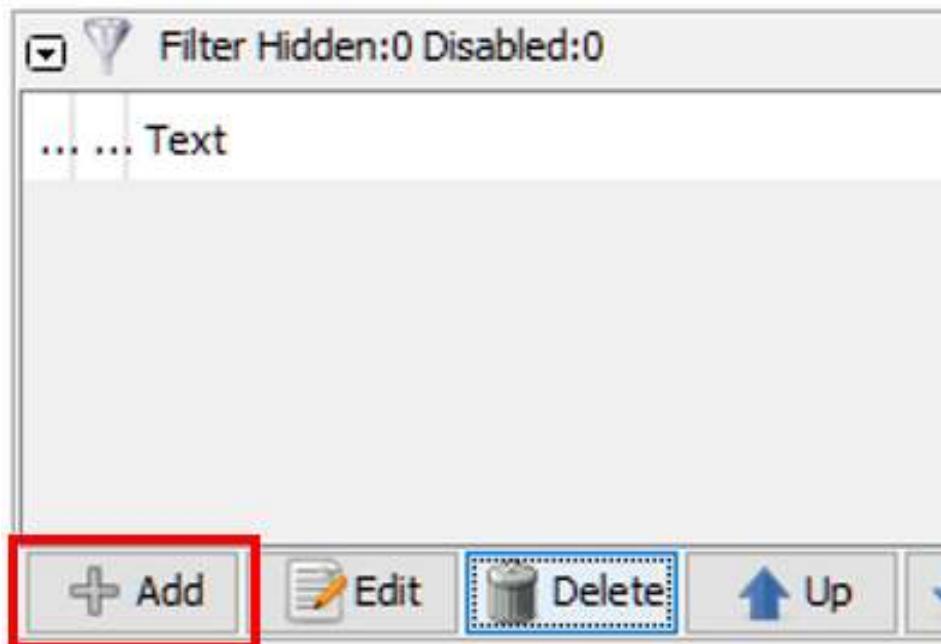
## II. Using Filter Tool on JOSM



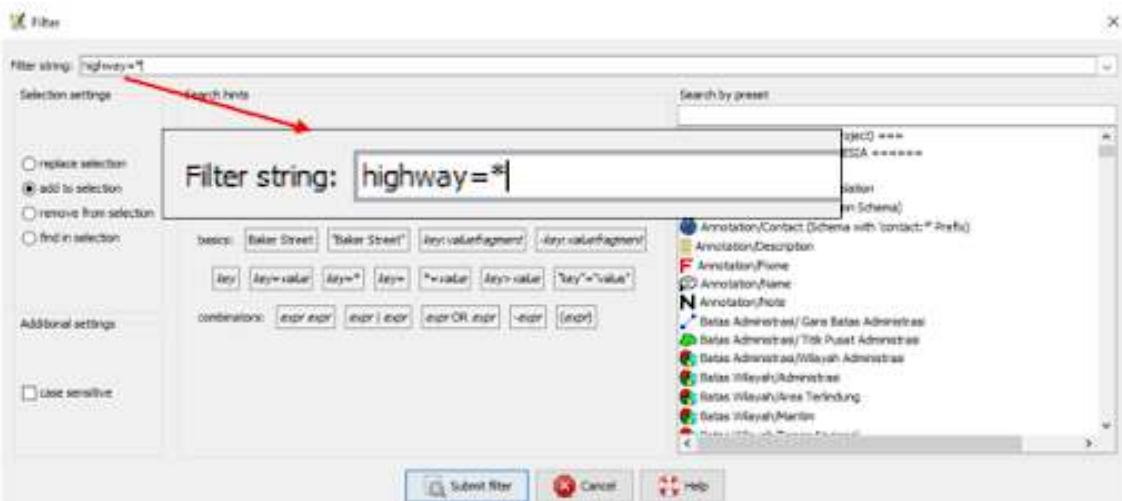
"image\_tooltip"

Example of OpenStreetMap Data on Cengklik Area

Imagine that you have data set like the picture above. Most people will get confused when they see complicated data like that. To make it simpler, you can use filters to select which object you want to see on the JOSM. For example, we will do filtering for highway. For doing so, you need to follow these steps:



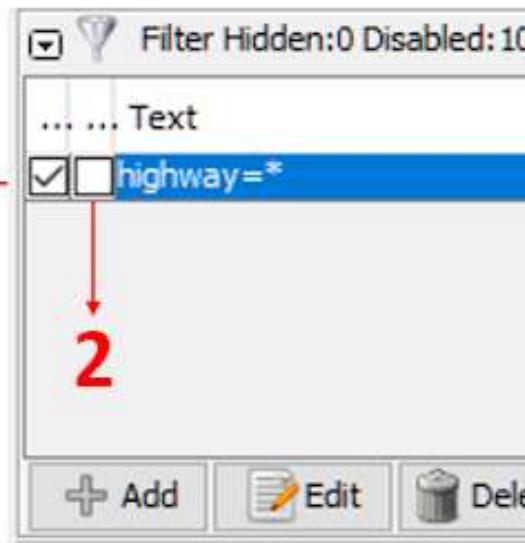
- On filter window, click **Add** menu.  
"image\_tooltip"  
Add button on window filter
- On **Filter string** section, you need to input the key and value that you want to be filtered. In this example, please write **highway=\*** (if you want to select all highway object available). After that, select



**Submit filter.**

"image\_tooltip"

Filter view

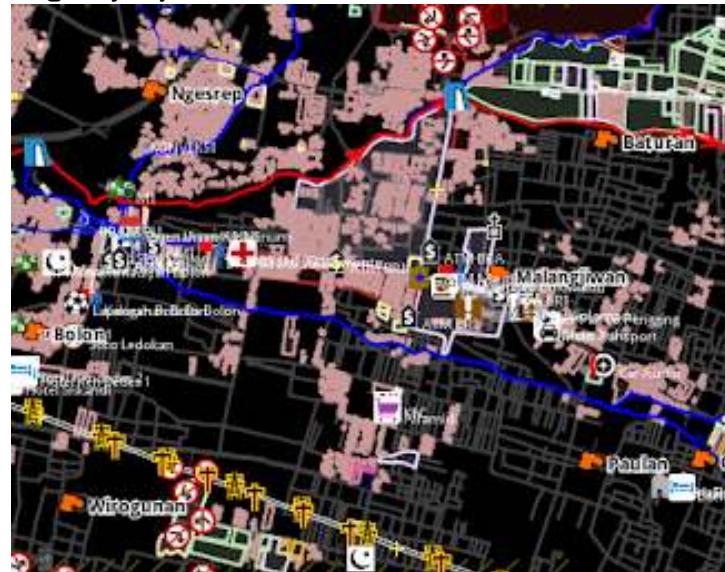


- On the filter window, you will see three checklist square.

"image\_tooltip"

Filter result

- If you only activate square checkbox on number 1, all highway object will be shown as hidden but



you still can see the object in the shade of black color.

"image\_tooltip"

Filter result 1

2. If you activate checkbox number 1 and number 2, then all highway object will be shown as fully hid-



den on layer window.

"image\_tooltip"

Filter result 2

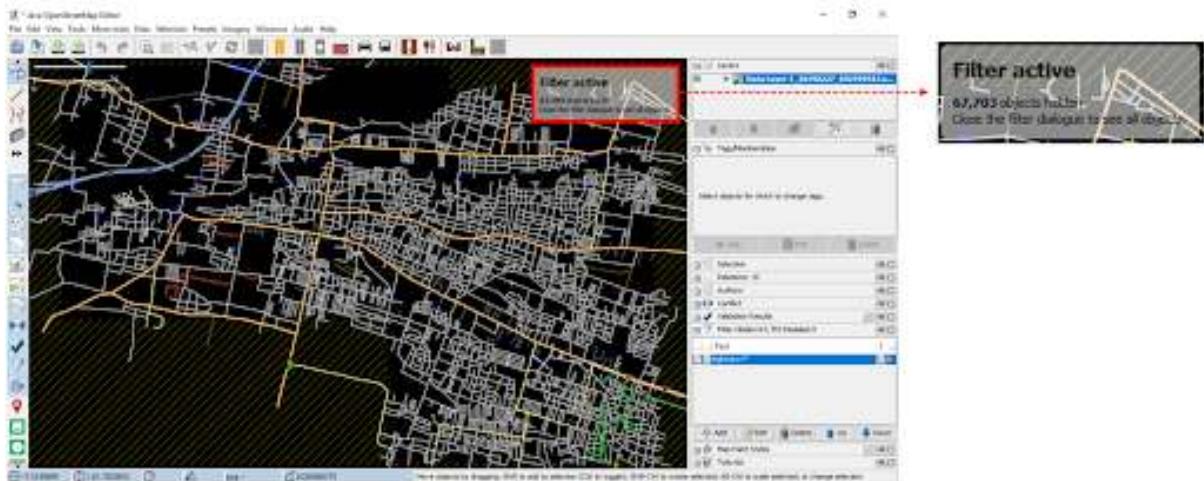
3. If you activate checkbox on number 1, 2 and 3, then you will only see highway object on JOSM.



"image\_tooltip"

Filter result 3

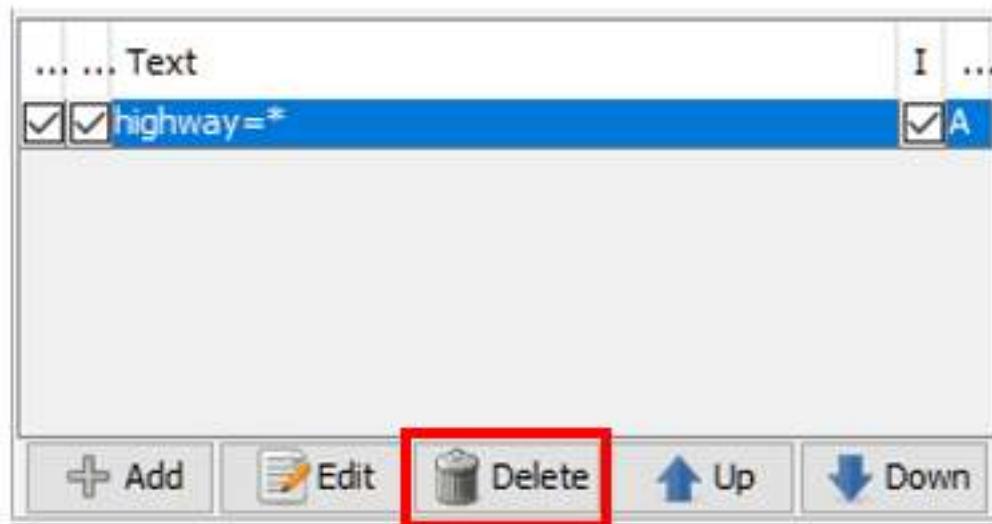
Remember when you using filter on JOSM, the result of your filter will always automatically show up even if you close you JOSM or change the location of your mapping area. If these things happen, it will cause another problem. If you still on the same filter mode (highway=\*) and you change your mapping area, you will not see the existing highway on your mapping area. If you're not careful enough, there are any changes you can make mistakes and draw the same exact highway existing before. Therefore, please make sure you already turn off filtering mode after you finish using filter function. You can check whether your filter mode is activated by checking your right side of your map canvas on JOSM. If you see Filter active still come up, it means that filter mode is currently active.



"image\_tooltip"

Filter active shows that filter function is still activated

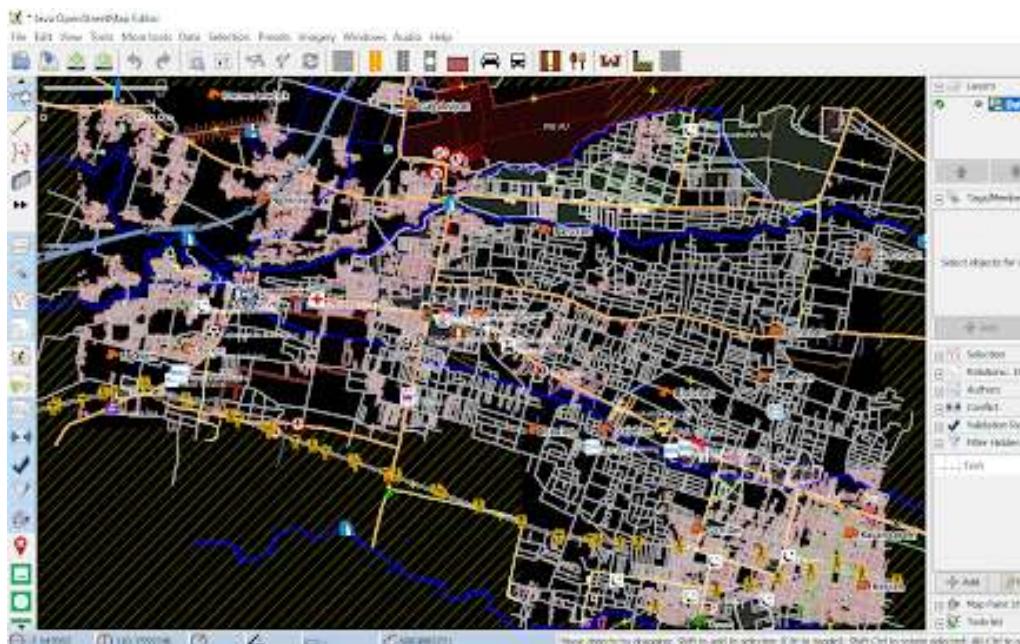
To delete active filter, select which filter you want to erase on filter window, then select **Delete** button.



"image\_tooltip"

Select Delete button to erase your filter result

After you delete the filter mode, you can see your OpenStreetMap data as it should be with the whole ob-



ject show up on the map canvas.

"image\_tooltip"

OpenStreetMap data view after filter mode is deleted

Note:

When you using filter on JOSM, the result of your filter will remain on your JOSM whenever you open

## SUMMARY

After you managed to follow all these steps, now you already learn what is filter mode about on JOSM. You also already have knowledge of how to do filter on JOSM to select which data you only want to see. Use filter mode to help you and make your mapping things easier.

# Creating MBTiles for OpenMapKit (OMK)

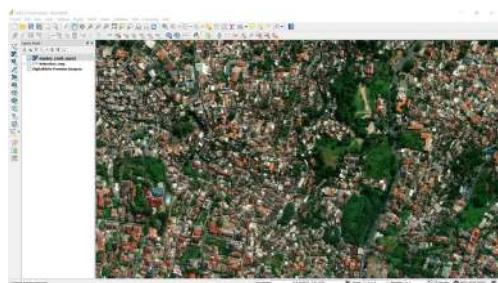
## Objectives:

- To be able to understand the concept of MBTiles
- To be able to create MBTiles using Export Tool
- To be able to create MBTiles using Plugin QTiles
- To be able to add file MBTiles into OMK in smartphone

When you use the OpenMapKit (OMK) application to conduct field surveys, sometimes you will have difficulty in determining objects in the application. It may happen because the background map is not yet mapped in OpenStreetMap and you do not have time to digitize objects in the survey area. You can use MBTiles file for background map, which is a satellite imagery, to make it easier for you to identify objects in the field.

## I. The definition of MBTiles

MBTiles is the spatial data format for storing several map tiles that are combined into one file as raster format, so that it looks like satellite imagery. You can use MBTiles as a basemap in the OMK application, which makes it easier for users to mark objects in the field. Basemap is a basic map that is used as the background of an application. It can be in the form of satellite imagery and OSM map.

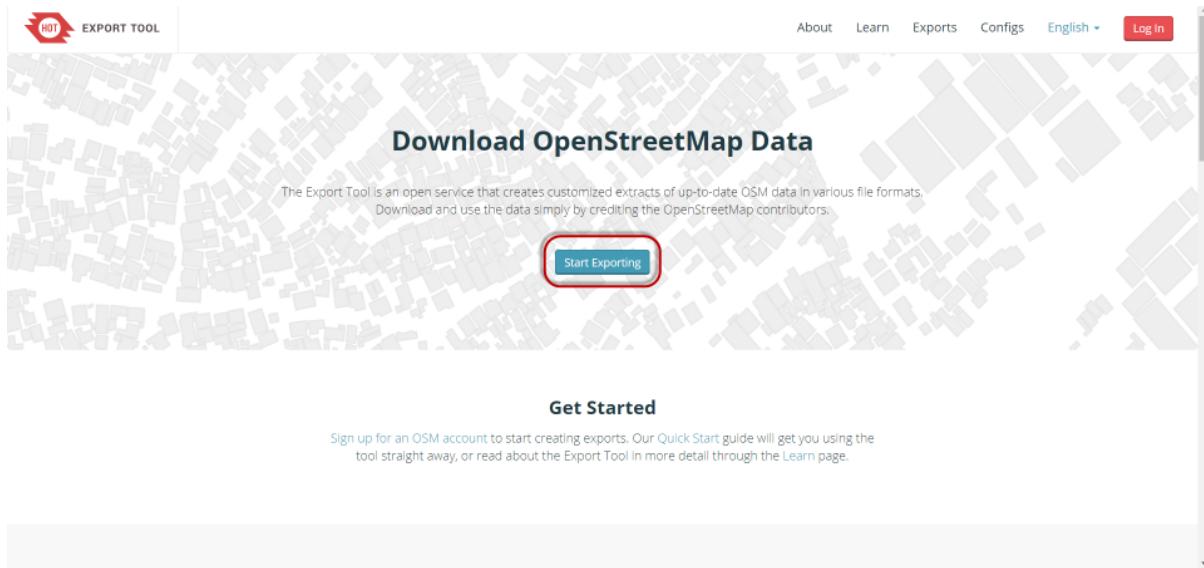


The display of MBTiles in QGIS

## II. Creating MBTiles using Export Tool

Export Tool is one of the sites that is used to download OpenStreetMap data for free based on certain features and regions. Spatial data formats that are commonly used, namely Shapefile (.shp), GeoPackage (.gpkg), and MBTiles (.mbtiles). The steps to create MBTiles using export tools are:

- Open your web browser and go to link URL <https://export.hotosm.org/en/v3/>, you need to login first to your OpenStreetMap account. If you do not have an account, you should go to <https://www.openstreetmap.org> to create one. You can refer to **Getting Started with OpenStreetMap** for the details.
- After you successfully login, click **Start Exporting**.



### Export Tool homepage

- Complete the dialog box on the left as a project description and select the area that you want. Area selection can be made with several ways using tools in the right panel. You should not make too large area selection for MBTiles area, because it will cause failure during the process. If you have administrative boundary in .geojson format, you can use the **Import** option. The important thing is that .geojson file must consist of one type of attribute data. In this module, the feature that will be used is Import option. Select **Import** and add your .geojson file. If you do not have a .geojson file, you can refer to **Converting shapefile data to GeoJSON** module.

### The settings of Describe Menu

- Next step, click **Format Menu** → Give a check mark on **MBTiles** option

1 Describe

2 Formats

3 Data

4 Summary

**File Formats** See Learn (Export Formats) for details on each file format.

- Shapefile [.shp](#)
- GeoPackage [.gPKG](#)
- Garmin [.img](#)
- Google Earth [.KML](#)
- OSM [.PBF](#)
- MAPS.ME [.MWM](#)
- OsmAnd [.OBF](#)
- MBTiles [.MBTILES](#)

The selection of spatial data format

- Then click on the **Data** menu section, you must copy the URL address of the tilemap from the satellite imagery that will be used as the basemap. You might only see OpenStreetMap as one of the options for creating MBTiles. By default Export Tools only provides OpenStreetMap as the background for your MBTiles by default. However, you can easily add another satellite imagery links. To add a link below, select one of the available satellite imagery, **copy** the link below and **paste** it in the **MBTiles Source** box in the **Data** menu.

\*\*\_Mapbox Satellite \_\*\*

[http://a.tiles.mapbox.com/v4/openstreetmap.map-inh7ifmo/{z}/{x}/{y}.png?access\\_token=pk.eyJ1Ij...](http://a.tiles.mapbox.com/v4/openstreetmap.map-inh7ifmo/{z}/{x}/{y}.png?access_token=pk.eyJ1Ij...)

\*\*\_Digital Globe \_\*\*

[https://a.tiles.mapbox.com/v4/digitalglobe.316c9a2e/{z}/{x}/{y}.png?access\\_token=pk.eyJ1IjoiZG...](https://a.tiles.mapbox.com/v4/digitalglobe.316c9a2e/{z}/{x}/{y}.png?access_token=pk.eyJ1IjoiZG...)

- After you paste the link, you can swipe to the left and select the link that you entered.

1 Describe

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## MBTiles Source

A source is required when generating an MBTiles archive.

### Source:

[http://a.tiles.mapbox.com/v4/openstreetmap.map-inh7ifmo/{z}/{x}/{y}.png?access\\_token=pk.eyJ1Ijoi...](http://a.tiles.mapbox.com/v4/openstreetmap.map-inh7ifmo/{z}/{x}/{y}.png?access_token=pk.eyJ1Ijoi...)

http://a.tiles.mapbox.com/v4/openstreetmap.map-inh7ifmo/{z}/{x}/{y}.png?  
access\_token=pk.eyJ1Ijoi...  
3x-C5eX-wAqTw

Next

2 minutes ago

The setting of satellite imagery link source

- You can change the **Zoom Range** setting to select the zoom level for MBTiles display. We need to keep in mind that if the distance between the zoom range is getting farther away, the file size will be even greater.

1 Describe

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## MBTiles Source

### Source:

<http://a.tiles.mapbox.com/v4/op...>  

### Zoom Range:

0      5      10      15      16      18

Next

OpenStreetMap database last updated 2 minutes ago

The setting of Zoom Level



Left (zoom level 10) and right (zoom level 18)

- Last step is select **Summary** menu, this section will show the summary of your project. If your project wants to be seen by other users, you can choose **Publish this Export**. Then click **Create Export** to process the creation of MBTiles.

1 Describe
2 Formats
3 Data
4 Summary

**Name:** mapbox\_candi

**Description:** sebagai basemap

**Project:** PDC InAware Indonesia

**Export Formats:**

- MBTiles

Buffer AOI - expand an uploaded boundary by 0.02 degrees

Publish this Export

Bundle for POSM

Create Export

OpenStreetMap database last updated 2 minutes ago

#### Last step in the Export Tool settings

- The process of making MBTiles will take several minutes depending on the internet network, the area size, and the zoom range that has been set previously. You do not need to wait, because the export tool will notify you through email when the process is complete. You can also see other projects that have been created in the **Exports** Menu.

The screenshot shows the 'Exports' section of the HOT Export Tool. At the top, there are navigation links: About, Learn, Create, Exports (which is highlighted with a red circle), Configs, English, and Log Out. Below the navigation is a search bar with placeholder text 'Name, description, event, or username'. Underneath the search bar are date range filters ('Date Range: Start date \_\_\_\_\_ End date \_\_\_\_\_') and a 'Search' button. There is also a link to 'Show all Exports'. The main area displays a table of exports:

NAME	DESCRIPTION	PROJECT	CREATED	OWNER
mapbox_candi	sebagai basemap	PDC InAware Indonesia	1/16/2019 9:52 AM	DewiSulistioningrum
fasum	untuk data lathan	BPBD Kota Semarang	12/19/2018 9:48 AM	DewiSulistioningrum
Simpang_Lima	untuk data lathan	Pelatihan BPBD Kota Semarang	12/19/2018 9:31 AM	DewiSulistioningrum
test_fasum	calculate	PDC InAware Semarang	12/13/2018 11:00 AM	DewiSulistioningrum
test_fasum	calculate	PDC InAware Semarang	12/12/2018 3:39 PM	DewiSulistioningrum

At the bottom left is a 'Contact Us' link, and at the bottom right are links for 'Made with ❤ by HOT and friends.', 'OpenStreetMap contributors', and 'Mapbox'. There is also a 'Fork the Code' button.

### The display of Exports menu

- After the process completed, the project status should be changed to **COMPLETED**. Click the file name in the blue color to download .mbtiles file directly.

The screenshot shows two export runs in the HOT Export Tool. On the left, an 'Incomplete' export run is shown with the following details:

- Description: sebagai basemap
- Project: PDC InAware Indonesia
- Area: 0 sq km
- Created at: Wednesday, January 16th 2019, 10:04 am
- Created by: DewiSulistioningrum
- Published: Yes
- Export formats: MBTiles (.mbtiles)
- OSM Analytics: View this area

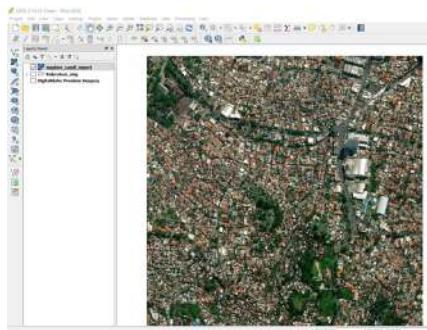
At the bottom of this section are buttons for Re-Run, Clone, and Delete.

On the right, a 'Completed' export run is shown with the following details:

- Status: COMPLETED
- Started: Wednesday, January 16th 2019, 10:38 am
- Finished: Wednesday, January 16th 2019, 10:38 am
- Duration: a few seconds
- MBTiles (.mbtiles): mapbox\_candi1\_export\_mbtilles.zip (1.71 kB)

### Downloading MBTiles file

- MBTiles can be opened using mapping software such as QGIS, so that it displays offline satellite imagery. This way can be used to check the .mbtiles file first before inserting it into the OMK application, open **QGIS → Add Raster Layer**.



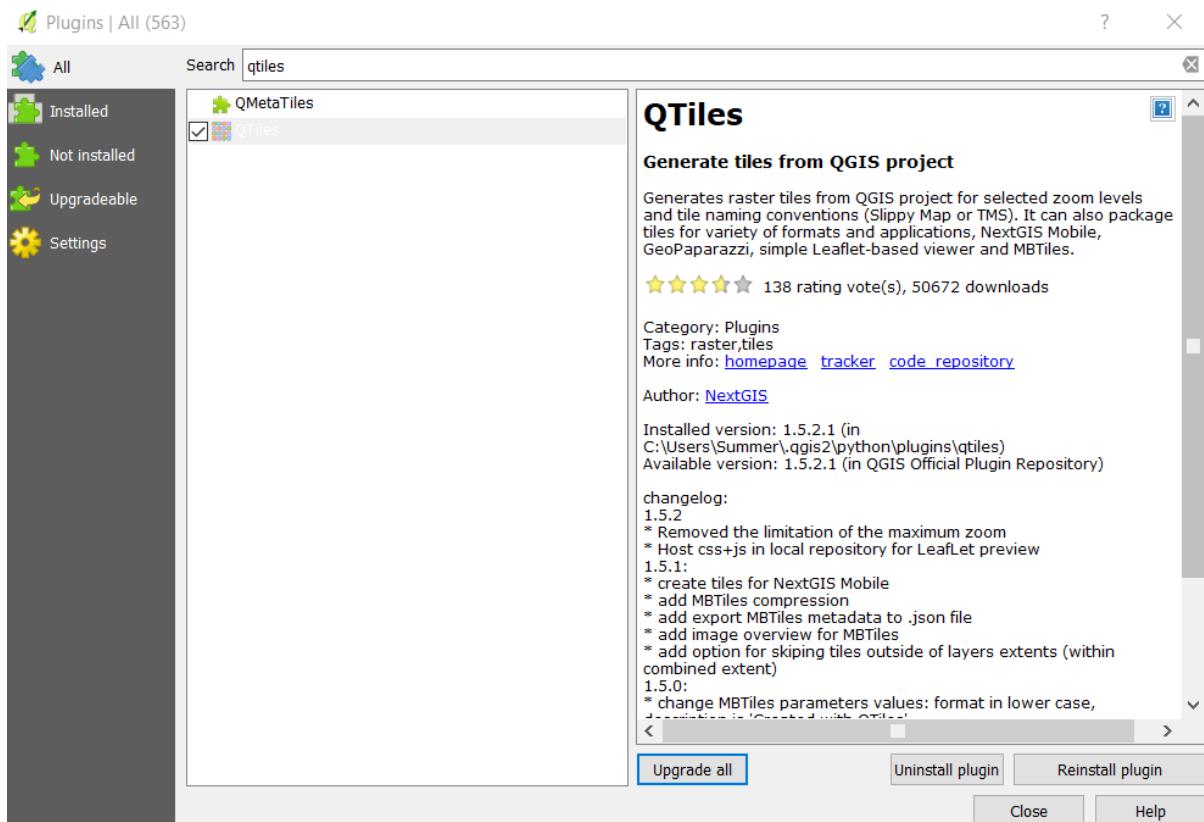
The display of MBTiles in QGIS

### III. Creating MBTiles using *Plugin QTiles*

The QTiles plugin is a plugin that can be used to produce tile rasters from QGIS project. This plugin can save the tile raster display settings from tilemap services such as Slippy map, TMS. You can use the QuickMapServices plugin in the previous module **Creating Field Maps with QGIS** to display tile raster services. Another advantage of using this plugin is that you can display the road layers and administrative boundaries in the QGIS project, so that the OMK basemap display will help data entry in the field surveys introduction. The steps to create .mbtiles with the QTiles plugin are as follows:

#### a. Installing Plugin QTiles

- Open QGIS and install the plugin by clicking **Plugin Menu → Manage and Install Plugin**. Type “qtiles” in **Search** box so your display will be the same as the picture below, give a check mark and click **Install Plugin**. If your download process failed, check your internet connection immediately.



#### Installing Plugin QTiles

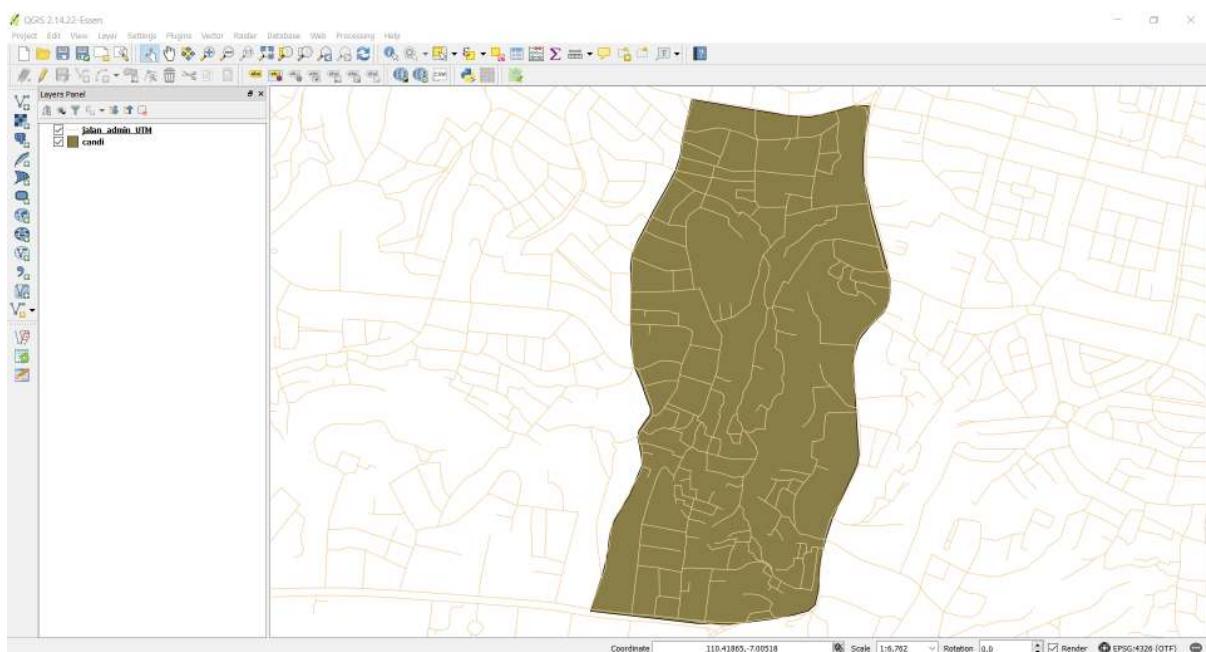
- QTiles will appear in **Plugin Menu → QTiles → QTiles**



QTiles plugin

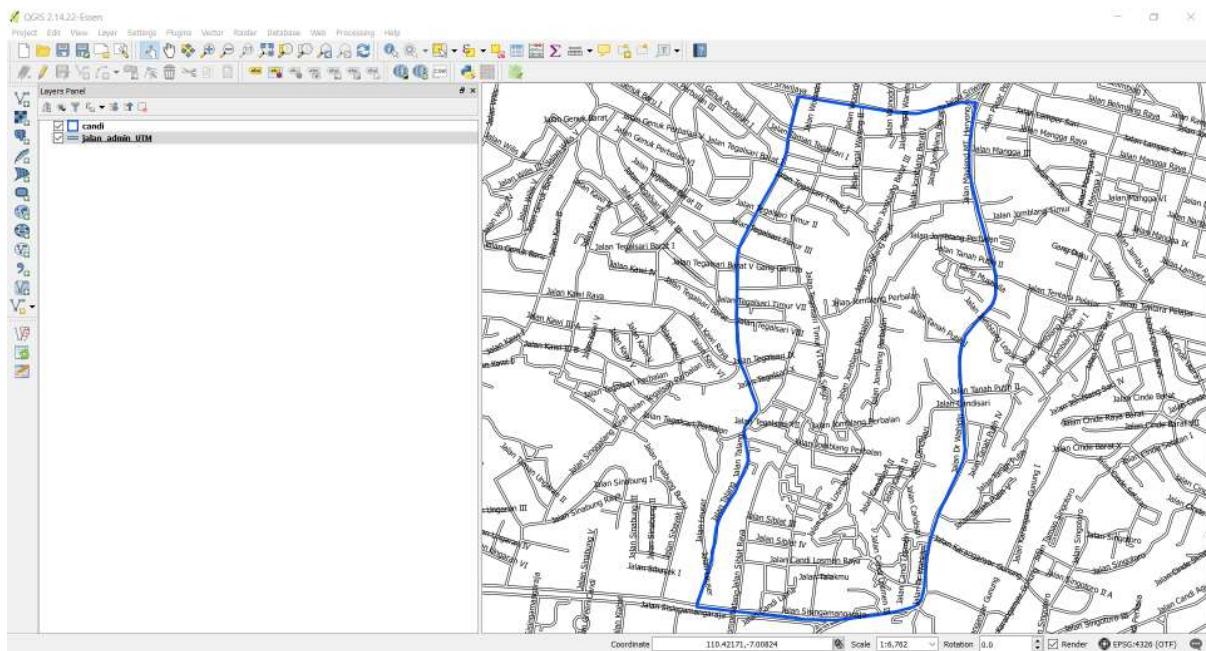
### b. Preparing Data Layer

- Add administrative data layer and road network that is taken from field survey mapping. Then, click **Add Vector Layer** → choose the directory file → **Open** → **Open**. Data layer will appear in both map canvas and layer panel.



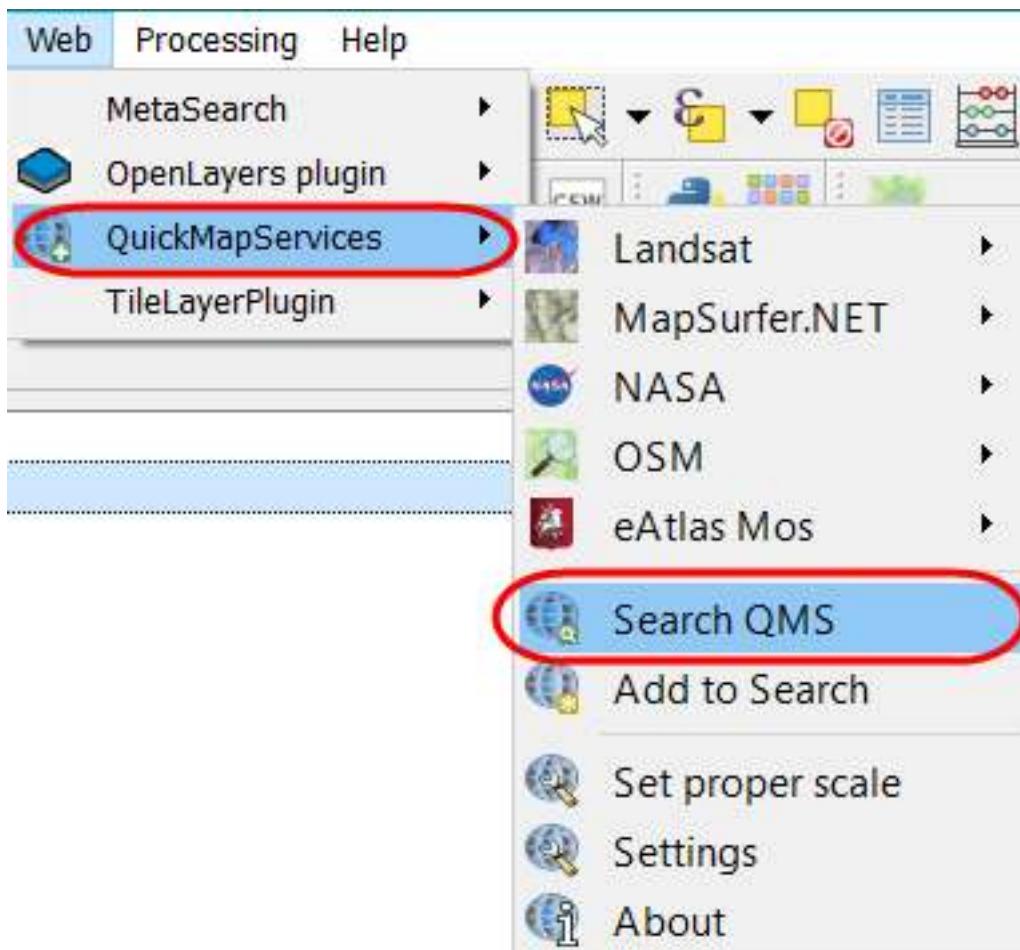
Adding layer

- You should do symbology and labelling to the layer in order to facilitate data entry in field survey introduction.



#### Symbology and labelling

- Now you can add tilemap data layer to display satellite imagery on map canvas in QGIS by clicking Web menu → QuickMapServices → Search QMS\_



#### QuickMapServices Plugin

- In the search box **Search QMS** search box, type **DigitalGlobe Premium Imagery**, then click\_

Add\_.

Search QMS

Digital Globe Imagery

DigitalGlobe Premium Imagery

DigitalGlobe Premium Imagery Vintage

DigitalGlobe Standard Imagery

DigitalGlobe Standard Imagery Vintage

Filter by extent All

Add

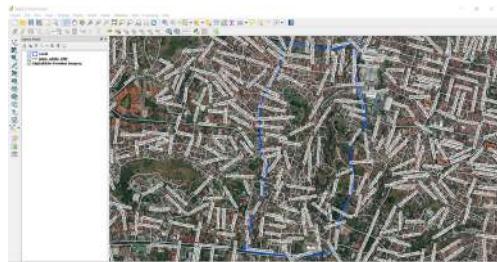
Add

Add

Add

#### Basemap selection

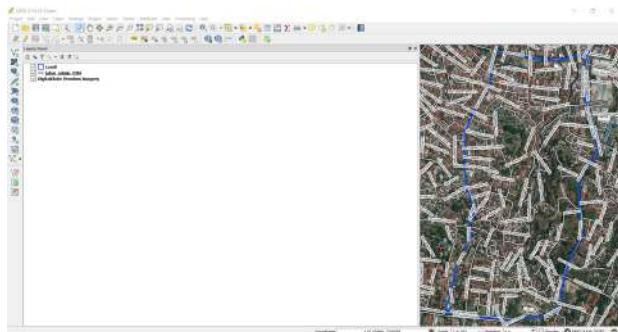
- Satellite imagery basemap will appear in both layer panel and map canvas.



The display of DigitalGlobe Imagery satellite imagery

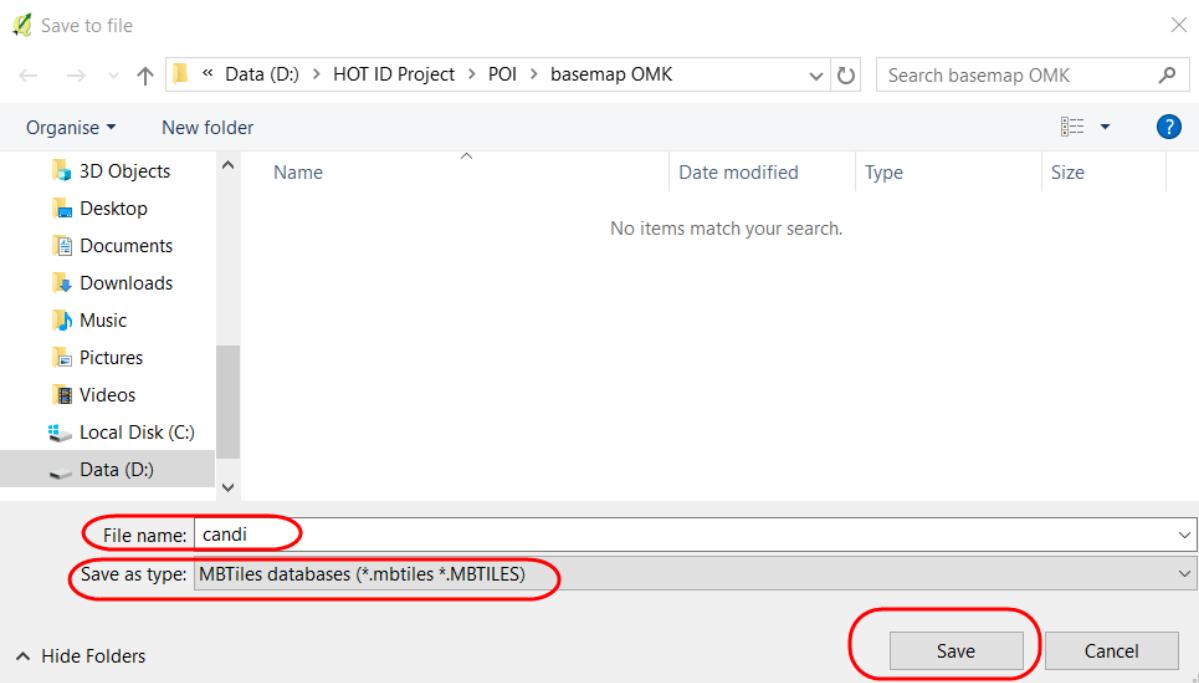
#### c. Using QTiles Plugin

- You can set up the appearance of your data layer, for example, you can set the appearance of administrative boundaries to speed up the mbtiles making process.



#### The setting of administrative boundary display

- To show QTiles plugin, click **Menu Plugin → QTiles → QTiles**. Then, QTiles dialog box will appear, click **Browse** in **Directory** and make a new folder and file name in your laptop/computer. Save the file as **.mbtiles** type.



#### Saving a new file in QTiles

- You can adjust the zoom level on the digital globe basemap with the settings located under the QTiles dialog box. Make adjustments to the **minimum zoom** and **maximum zoom**, the distance between the two should not be too far to speed up the process of making .mbtiles. Click **Run** to start the .mbtiles creation process. This process will require the internet network.



?

X

Output

File i /HOT ID Project/POI/basemap OMK/candi.mbtiles

Directory i   Browse...

NGM i  

Tileset name test

Extent

Canvas extent

Full extent

Layer extent candi

Zoom

Minimum zoom 18 ▲ ▼

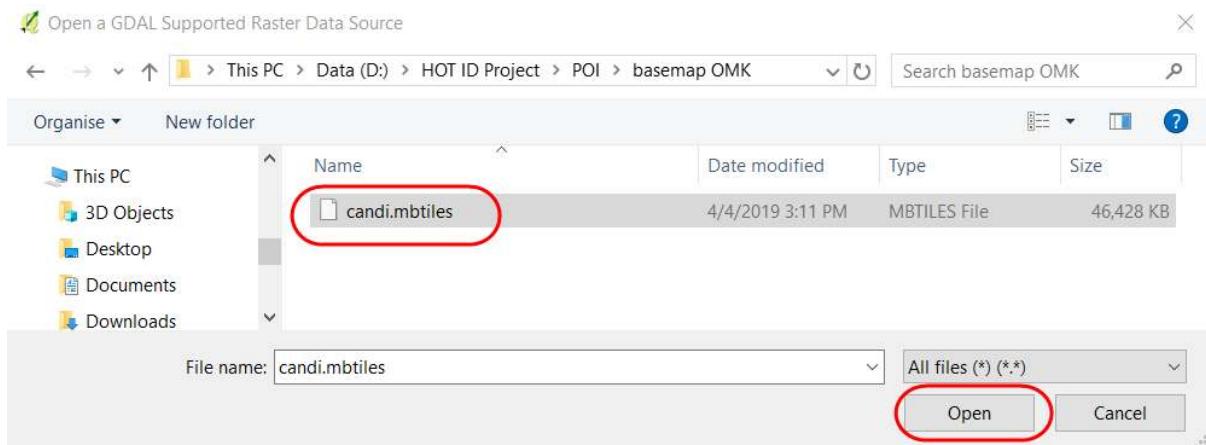
Maximum zoom 20 ▲ ▼

► Parameters

0% Run Close

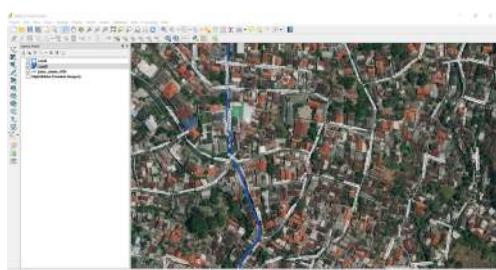
#### Settings in QTiles

- When the process is completed, then you can click Close. To check the .mbtiles file, you can insert the file into QGIS by using **Add Raster Layer** → navigate to your storage directory → click Open.



### Searching mbtiles file

- The mbtiles display will appear on QGIS canvas map as shown below



.mbtiles result

### IV. Inserting MBTiles into OMK

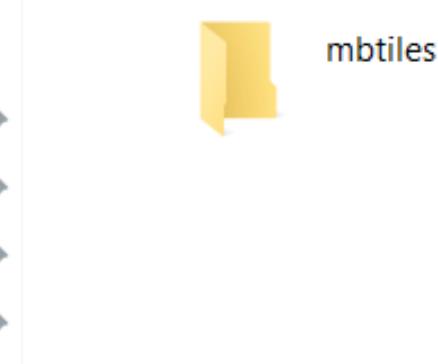
In this process, you already have .mbtiles file that will be inserted into OMK application on android smartphone.

- Connect the smartphone device with the computer to move the two files into the OMK application with the data cable/USB.
- Find the OMK application in the smartphone's internal directory, navigate to the mbtiles folder. You should copy the mbtiles file into mbtiles folder.

---

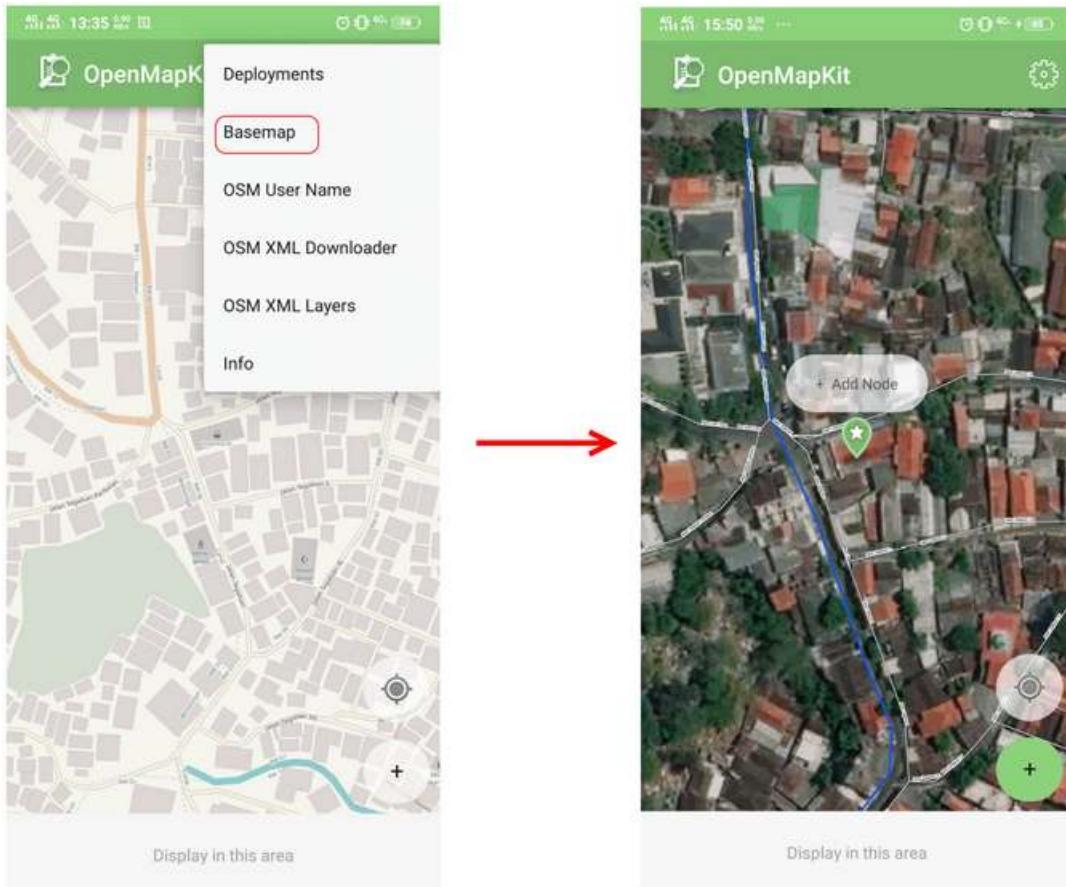
This PC > vivo 1804 > Internal storage > openmapkit

---



OpenMapKit (OMK) directory

- Open the OpenMapKit application on your smartphone and activate the .mbtiles file that has been moved by clicking the Basemap Menu in the OpenMapKit application. You can refer to **Using OpenMapKit Application** module to find out how the application works.



.mbtiles file when opened in OMK

## SUMMARY

If you have already finished this module, you can create all basemaps based on the administrative area that is needed for the OMK application for field survey. Please replace .mbtiles file per day based on the survey area in your smartphone so it will not burden your smartphone's performance.

# Using buildings tools on JOSM

## Objectives:

- To be able to install plugin for drawing buildings
- To be able to use JOSM plugin to draw buildings

When you map using JOSM without conducting field survey, the information mapped on OSM will be very limited since you only use satellite imagery as reference. One of the objects that can be mapped using satellite imagery as reference is building. However, you won't be able to figure out the specific function of the mapped buildings unless the building has a unique shape such as an L-shaped or a U-shaped school building.



A U-shaped school building

Using OSM, you can map buildings in general without knowing its specific function. You can add preset **building=yes** for those buildings to identify that the objects you draw are buildings. However, it will be inconvenient if you map a lot of buildings and add preset **building=yes** for every building you map. JOSM provides a plugin to make building mapping easier. This plugin enables you to create a polygon that automatically has the preset **building=yes**. This plugin also makes the polygon you draw more orderly in terms of shape. This plugin is called **buildings tools**.

## I. Installing buildings tools

To use **buildings tools** plugin, you need to install it first. These are the steps to install building tools plugin:

- Open JOSM
- Click menu **Edit → Preferences**
- **Preferences** Windows will appear. Select menu **Plugins** (icon plugin) to install new plugin. If you haven't already downloaded available plugins, click **Download List** and make sure your computer is connected to the internet.



Plugins menu on Preferences Windows

- On the **Search** box, type **buildings\_tools** to search **buildings tools** plugin. After finding the plugin, give a checkmark next to **buildings\_tools** plugin. Then click **OK** and wait a little while until the installation process is finished.



## Search result for buildings\_tools

Note:

Sometimes JOSM asks you to Restart JOSM after installing new plugin to apply newly installed plugins

- If the **buildings\_tools** plugin is successfully installed, you will have **Draw buildings** tool in the upper left side of your JOSM. Now you can use it to draw buildings.



Draw buildings icon appears after successfully installed buildings tools

## II. Using buildings tools

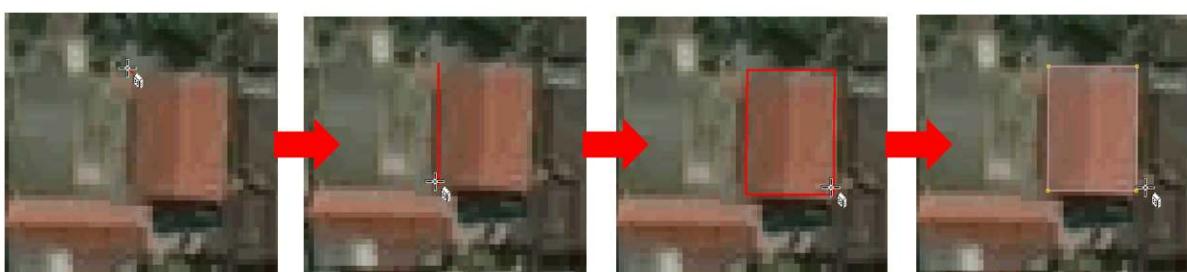
These are the steps to use **buildings tools** plugin:

- As explained in **Adding OSM Data Using JOSM** module, to add OSM data using JOSM you need to download existing OSM data in your mapping area first. To download OSM data, click menu **File → Download Data**.
- Draw a box covering your mapping area by **left clicking and hold** your mouse and then **move** your mouse until a **pink box** covers the entire mapping area. Then click **Download**.
- After downloading OSM data, new layer will appear in the Layer Box in the right side of your JOSM. It will be the layer where you add or edit OSM data. Make sure you only add or edit OSM data within the clear area since the shaded area is not your downloaded area.
- Add satellite imagery as mapping reference by clicking menu **Imagery → select the imagery you want to use, such as Digital Globe Premium Imagery**.
- Now, you are ready to add OSM data. Use the buildings tools to draw buildings. Click **buildings tools** button (icon Draw buildings) which is located in the upper left of your JOSM or **press B** on your keyboard. If your cursor has changed into a plus icon with building, then you are ready to map buildings using buildings tools.



Cursor display after buildings tools button is activated

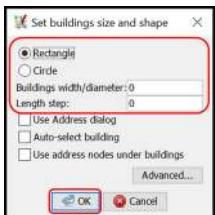
- After that, draw the building as seen in the satellite imagery. **Right click once** on one of the corner of the building. Then **move cursor** to another corner of the building, next to the first corner, then **right click once**. Lastly, **move cursor** to the other corner of the building, next to the second corner, then **right click once**. See illustration below:



Drawing building process using buildings tools

- If there are buildings with similar shape and size in your mapping area, you can set the building's length and width by clicking menu **Data → Set Building Size** then fill the width number in **Buildings width/diameter** box and fill the length number in **Length step** (both units are in meters). On the **Set Building Size Windows**, you can set the default shape of the buildings. There are two shape

choices: **Rectangle** or **Circle**, since buildings in general have the shape of rectangle, choose **Rectangle**. Then click **OK**.



### Set Building Size Windows

- If you find a complex shaped building, such as an L-shaped or a U-shaped building, draw two or three overlapping buildings until it is formed like L or U letter. Select those two or three overlapping buildings, then click menu **Tools** → **Join Overlapping Areas** or press **Shift + J** on your keyboard to join overlapping area of the buildings. After the buildings merged, make the building look orderly by selecting the merged building and then clicking menu **Tools** → **Orthogonalize Shape** or press **Q** on keyboard.



### Creating a L-shaped building

- After all the buildings are mapped, do not forget to upload it by clicking menu **File** → **Upload Data**. Type the changes you made, which is adding buildings, in the comment box and type the source for your mapping such as the name of the satellite imagery used and then click **Upload Changes**.

#### Notes:

Make sure there is no buildings selected when using `buildings_tools` so that the cursor can be moved

### SUMMARY

If you can follow and go through all the instructions above, you are able to install buildings tools plugin and use the building tools plugin to draw buildings.

— title: Group Stats Plugin for Calculate The Objects weight: 9 —

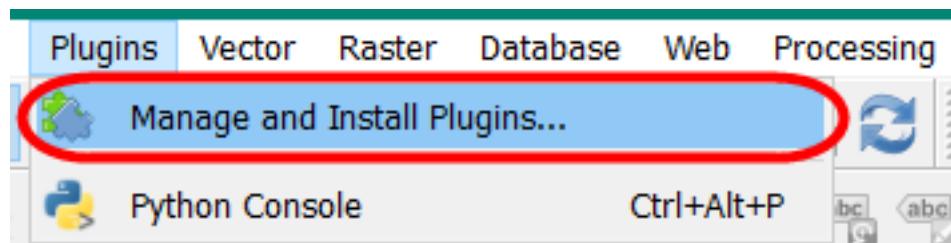
### Objectives:

- To be able to demonstrate how to install a plugin for calculate number of object in QGIS
- To be able to operate the Group Stats plugin for calculate number of OSM Object

The calculation of the quantity of data can be an indicator of the achievement of mapping projects that can be poured into a mapping report. The process of calculating the quantity of OSM data can be done by installing the plugin group stats in QGIS for free, this plugin can use to count the number of objects based on categories.

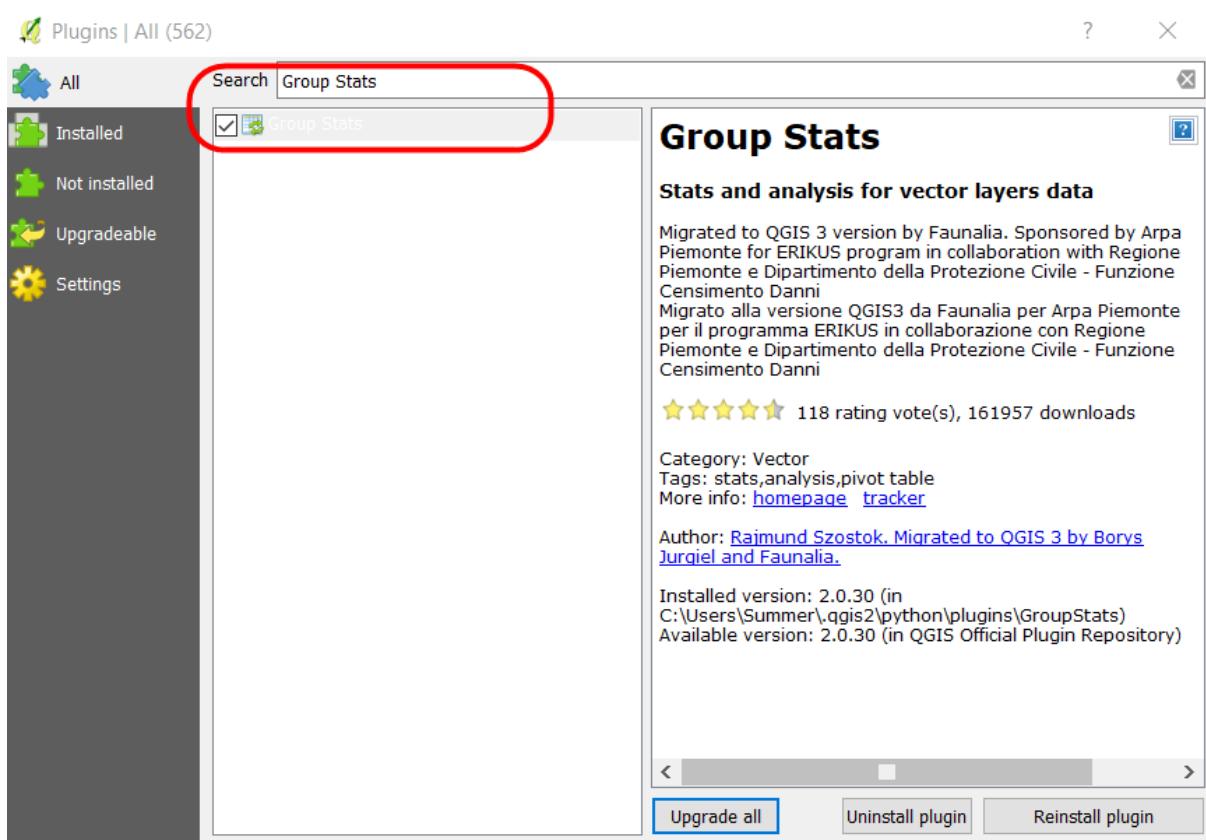
### I. Group Stats Installation

- If you haven't the QGIS application, you can download it in this link and install the QGIS.  
<http://download.osgeo.org/qgis/win64/QGIS-OSGeo4W-2.14.22-1-Setup-x86.exe> for Windows 32 bit and [http://download.osgeo.org/qgis/win64/QGIS-OSGeo4W-2.14.22-1-Setup-x86\\_64.exe](http://download.osgeo.org/qgis/win64/QGIS-OSGeo4W-2.14.22-1-Setup-x86_64.exe) for Windows 64 bit.
- Open QGIS and ensure the internet connection is working. Click on **Plugins Menu → Manage and Install Plugins**



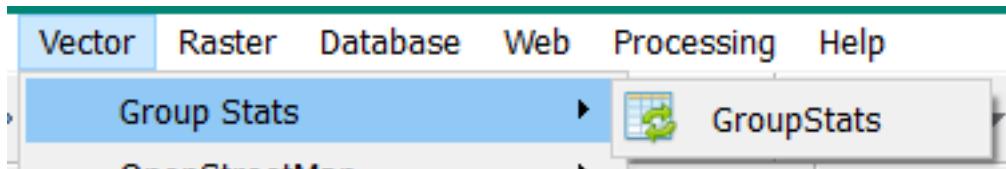
Plugins Menu Interface

- Type **Group Stats** in the Search box and click on **Install Plugin**



Install the plugin

- If the installation has finished, the plugin will show up in **Vector Menu → GroupStats**



GroupStats Interface

## II. Calculate OSM Objects using Group Stats

We can overlay the administrative boundaries and the infrastructures to get the calculate of data quantity. The results of the calculation can be used to create a monthly report and monitor the mapping timeline. Before we starting to calculate the objects, we have to prepare the data in the shapefile format.

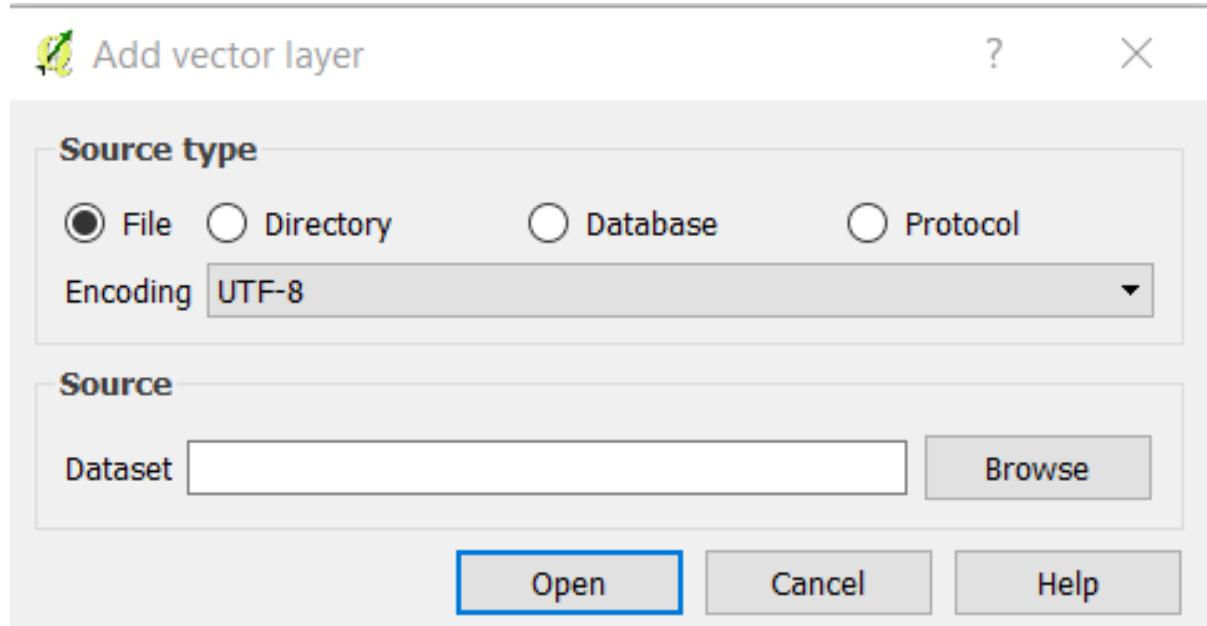
We can use the data form PDC InaWARE project in Semarang City in this chapter, getting the administrative boundary data in this link <https://openstreetmap.id/data-semarang/> and the infrastructures data in <https://export.hotosm.org/en/v3/exports> (follow this chapter **04.Using YAML** to the instructions). The list of the objects in the shapefile:

- Public Facilities: Points and Polygons**
  - All objects in amenity=\*
  - Electrical Facility (power=\*)
  - Park (leisure=\*)
  - Government Office (office=\*)
  - Supermarket (shop=supermarket)
- highways: Lines**  
highway=\*

The next step we will start to calculate the objects:

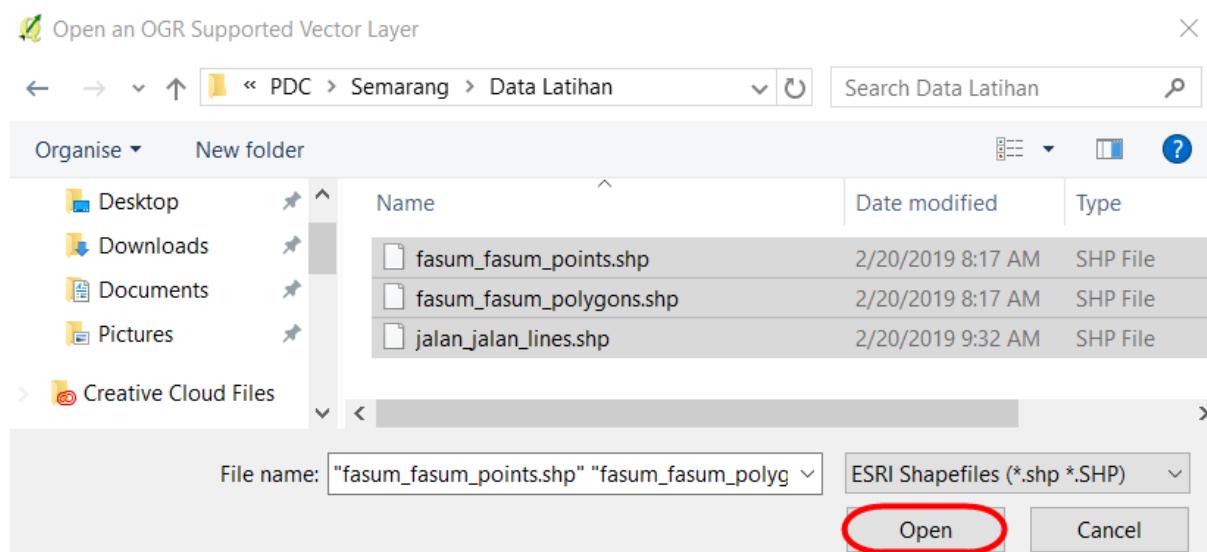
#### a. Preparing the Data

- Open the layer in QGIS with click on **Add Vector Layer → Browse** or click **Layer Menu → Add Layer → Add Vector Layer → Browse**.



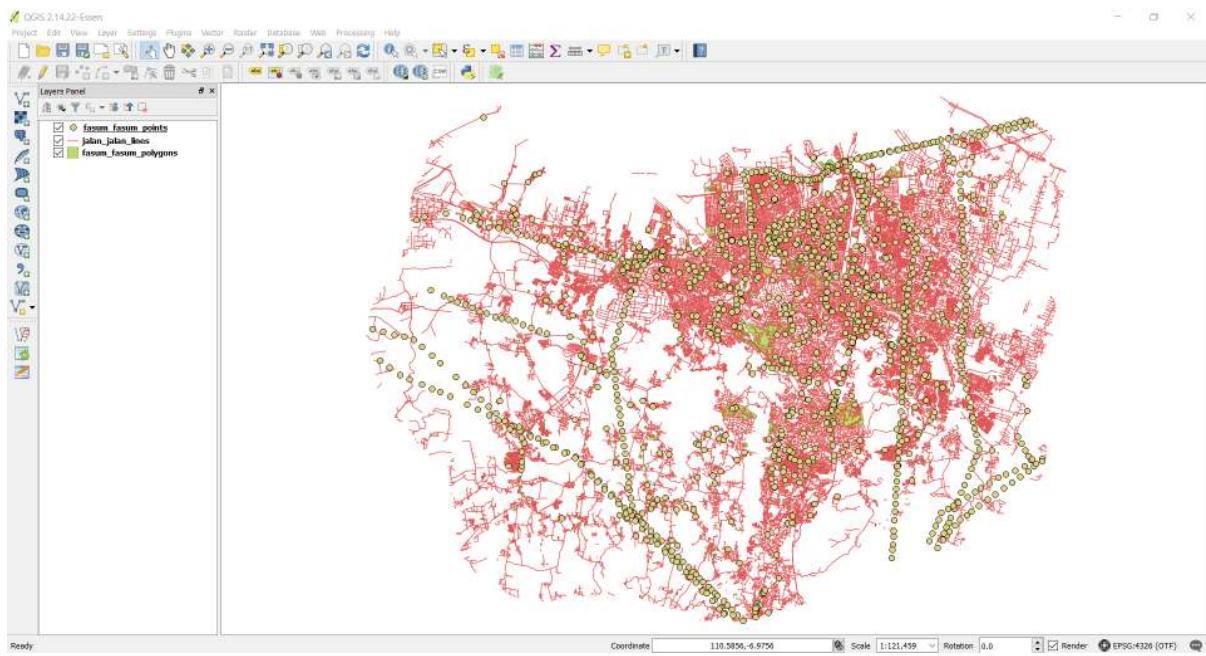
#### Add Vector Layer

- Choose your directory that the objects file is saved → **Select All → Open → Open**



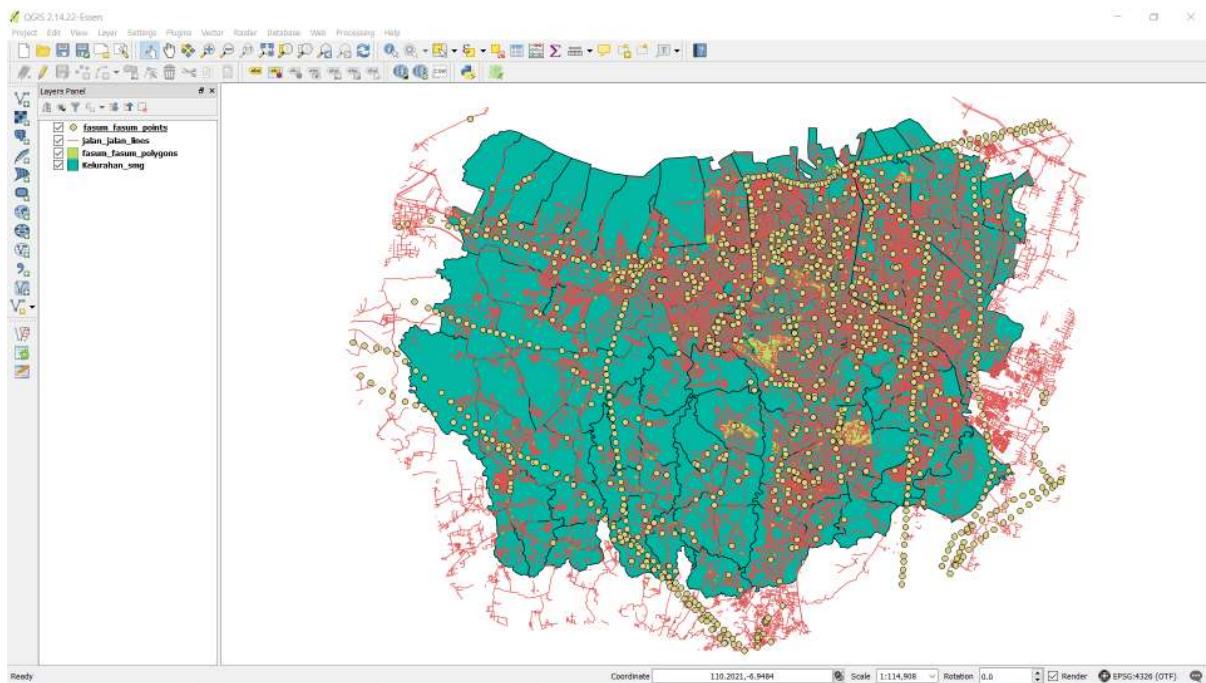
#### Open shapefile from directory

- The layers will appear on map canvas and **Layers Panel**



The Objects layer view on the map canvas

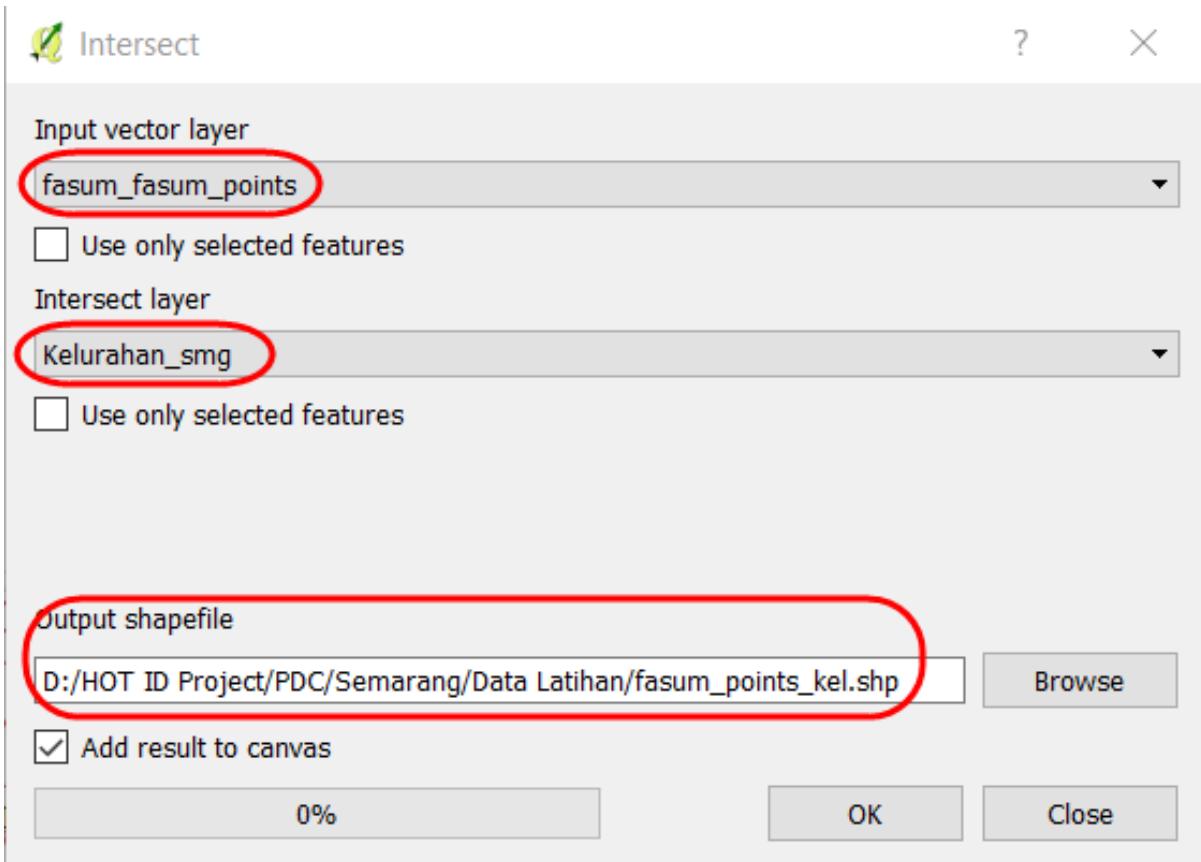
- Add the administrative boundary to QGIS with click on the **Add Vector Layer**



The layer view on the map canvas

#### b. Merge the Objects Layer and Administrative Boundary

- Merge the layer between the objects and administrative boundary so that the objects have a new column from the administrative boundary. Click **Menu Vector → Geoprocessing Tool → Intersect** to merge the layer. In section, **input vector layer** selects the object layer with the **Intersect layer** (administrative boundary layer). Choose **Browse** to save the file **output shapefile** in your directory, and click **OK**.



### Intersect layer

- The results will appear in your map canvas as a new layer. We can get the details of the attribute data from "fasum\_point\_admin" layer with right-click on the layer and click on **Open Attribute Table**. We found at the column **name\_2** the name of a village in each object.

	r_id	source	metu	ref	evacuation	shelter_ty	water_sour	kitchen_fa	toilet_fac	toilets_nu	id	o_id	admin_level	boundary	is_in_ciy	is_in_mari	is_in_prov	name_2	source_2
0	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/811...	relation/811...	7	administrative	Semarang	Semarang Ut...	Jawa Tengah	Tanjungmas	HOT_InWAR...
1	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/829...	relation/829...	7	administrative	Semarang	Pedurungan	Jawa Tengah	Tlegomulyo	HOT_InWAR...
2	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8280...	relation/8280...	7	administrative	Semarang	Pedurungan	Jawa Tengah	Penggaron Kidu	HOT_InWAR...
3	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8181...	relation/8181...	7	administrative	Semarang	Genuk	Jawa Tengah	Terbaya Kulon	HOT_InWAR...
4	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8241...	relation/8241...	7	administrative	Semarang	Genuk	Jawa Tengah	Bangjedewo	HOT_InWAR...
5	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8355...	relation/8355...	7	administrative	Semarang	Tembaling	Jawa Tengah	Rawosari	HOT_InWAR...
6	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8280...	relation/8280...	7	administrative	Semarang	Pedurungan	Jawa Tengah	Penggaron Kidu	HOT_InWAR...
7	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8111...	relation/8111...	7	administrative	Semarang	Semarang Ut...	Jawa Tengah	Tanjungmas	HOT_InWAR...
8	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8181...	relation/8181...	7	administrative	Semarang	Genuk	Jawa Tengah	Terbaya Welan	HOT_InWAR...
9	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8278...	relation/8278...	7	administrative	Semarang	Genuk	Jawa Tengah	Bengdaya Wet...	HOT_InWAR...
10	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8181...	relation/8181...	7	administrative	Semarang	Genuk	Jawa Tengah	Terbaya Kulon	HOT_InWAR...
11	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8192...	relation/8192...	7	administrative	Semarang	Genuk	Jawa Tengah	Trimulyo	HOT_InWAR...
12	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8181...	relation/8181...	7	administrative	Semarang	Genuk	Jawa Tengah	Terbaya Wetan	HOT_InWAR...
13	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8278...	relation/8278...	7	administrative	Semarang	Genuk	Jawa Tengah	Sembungharjo	HOT_InWAR...
14	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8111...	relation/8111...	7	administrative	Semarang	Semarang Ut...	Jawa Tengah	Tanjungmas	HOT_InWAR...
15	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8192...	relation/8192...	7	administrative	Semarang	Genuk	Jawa Tengah	Trimulyo	HOT_InWAR...
16	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8181...	relation/8181...	7	administrative	Semarang	Genuk	Jawa Tengah	Terbaya Kulon	HOT_InWAR...
17	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8241...	relation/8241...	7	administrative	Semarang	Genuk	Jawa Tengah	Bangjedewo	HOT_InWAR...
18	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8355...	relation/8355...	7	administrative	Semarang	Tembaling	Jawa Tengah	Rawosari	HOT_InWAR...
19	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8280...	relation/8280...	7	administrative	Semarang	Pedurungan	Jawa Tengah	Penggaron Kidu	HOT_InWAR...
20	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8181...	relation/8181...	7	administrative	Semarang	Genuk	Jawa Tengah	Terbaya Kulon	HOT_InWAR...
21	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8181...	relation/8181...	7	administrative	Semarang	Genuk	Jawa Tengah	Terbaya Kulon	HOT_InWAR...
22	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8111...	relation/8111...	7	administrative	Semarang	Genuk	Jawa Tengah	Tanjungmas	HOT_InWAR...
23	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8355...	relation/8355...	7	administrative	Semarang	Tembaling	Jawa Tengah	Rawosari	HOT_InWAR...
24	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8192...	relation/8192...	7	administrative	Semarang	Genuk	Jawa Tengah	Trimulyo	HOT_InWAR...
25	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8278...	relation/8278...	7	administrative	Semarang	Genuk	Jawa Tengah	Bengdaya Wet...	HOT_InWAR...
26	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8111...	relation/8111...	7	administrative	Semarang	Semarang Ut...	Jawa Tengah	Tanjungmas	HOT_InWAR...
27	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8192...	relation/8192...	7	administrative	Semarang	Genuk	Jawa Tengah	Trimulyo	HOT_InWAR...
28	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8355...	relation/8355...	7	administrative	Semarang	Tembaling	Jawa Tengah	Rawosari	HOT_InWAR...
29	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8181...	relation/8181...	7	administrative	Semarang	Genuk	Jawa Tengah	Terbaya Kulon	HOT_InWAR...
30	ing	HOT_InWAR...	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	relation/8241...	relation/8241...	7	administrative	Semarang	Genuk	Jawa Tengah	Bangjedewo	HOT_InWAR...

### The attribute table of intersecting result

- We will repeat the process on the highways layer and the polygon public facilities layer. The intersecting results will be three-layer on the QGIS.

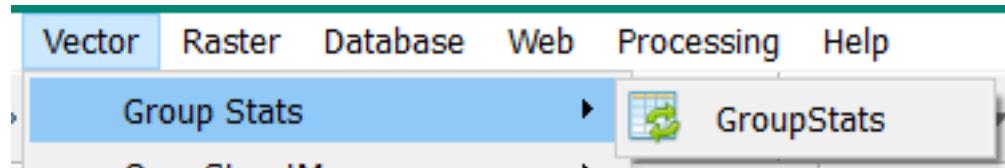
- Open the attribute table in each layer and check the column that it is a reference to calculate the OSM data. The list of the column in attribute table:
  1. Point public facilities = amenity, power, office dan supermarket
  2. Polygon public facilities = amenity, power, office, supermarket, dan leisure
  3. highways = highway

### c. Calculate the Objects using Group Stats Plugin

The mapping results are points, lines, and polygons so that we can calculate with a different formula in Group Stats plugin based on the type of data. OSM data in points and polygons will be calculated with the formula “count” that calculating the number of an attribute in the column. Although, OSM data in lines will be calculated with the formula “sum”, that calculating the number of length segments.

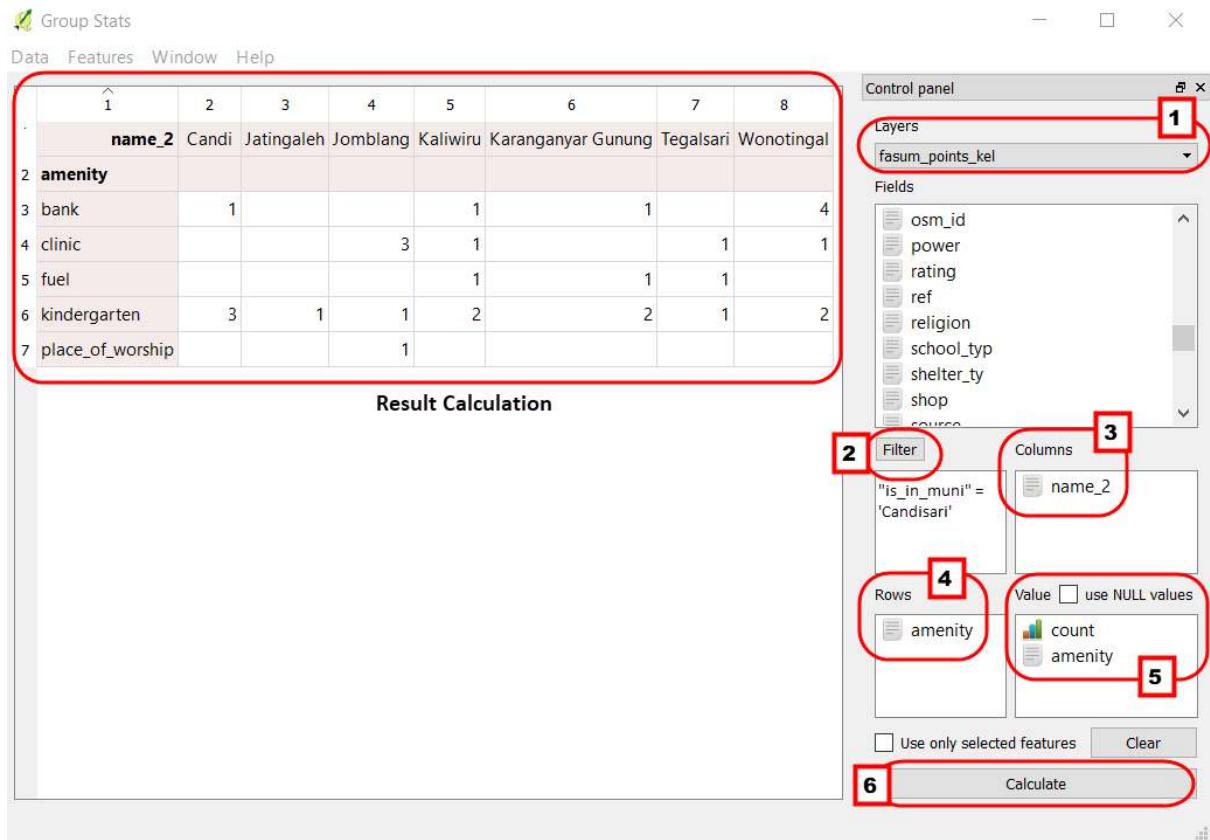
#### 1. The Calculating Points and Polygons

- Open the plugin with Menu Vector → Group Stats → GroupStats



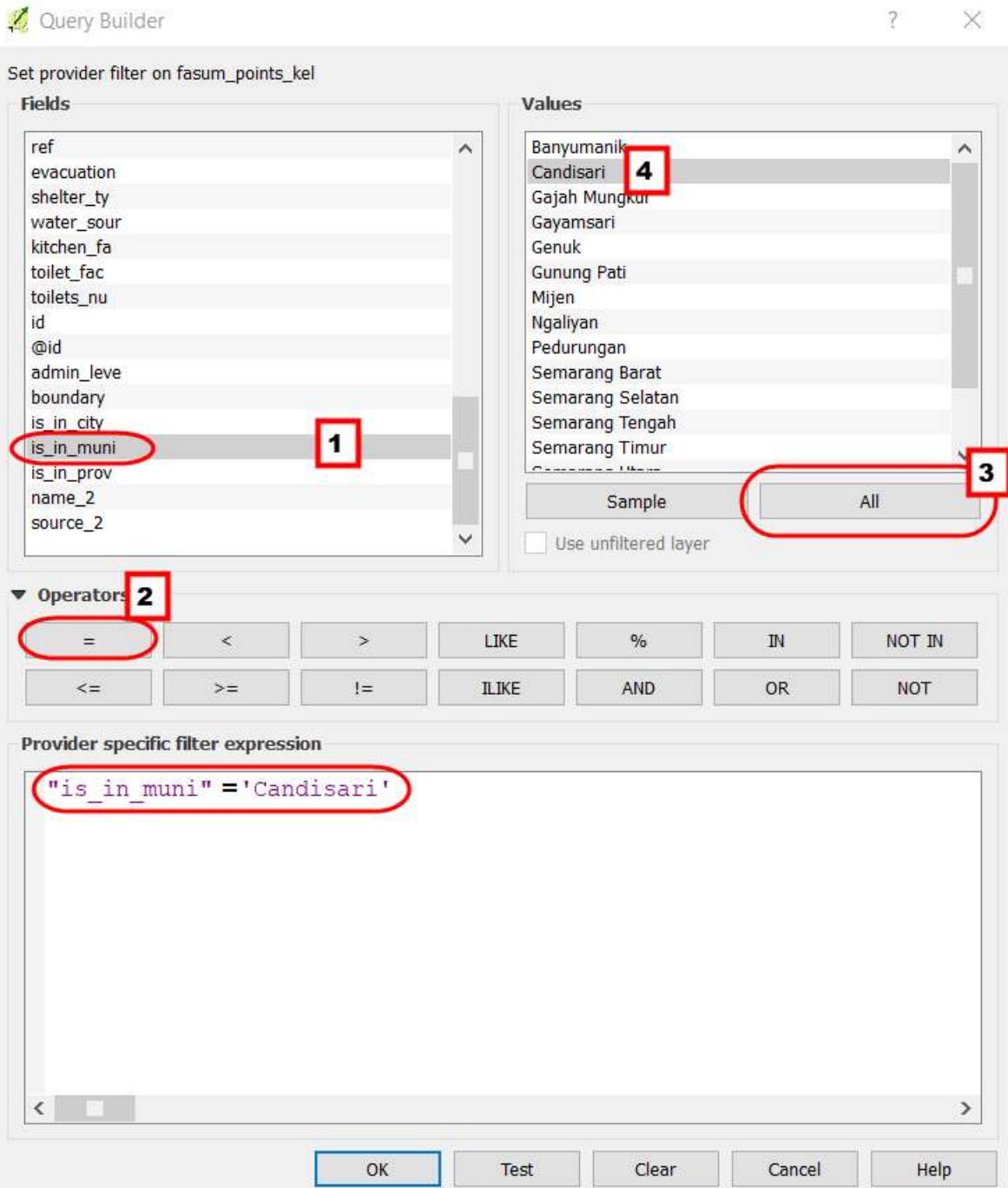
#### Group Stats

- Follow the instructions as below:
  1. **Layers** (1)= show the layer will be calculated. **Fields** = an automatic show the column in attribute table that chooses
  2. **Filter** (2) = use to show objects only in specific administrative boundary
  3. **Columns** (3) = use to become column on the table, fill the column on the Fields, with a click and move the Columns box.
  4. **Rows** (4) = use to become a row in the table, fill the column on the Fields, with a click and move the Row box.
  5. **Value** (5)= use to select the formula
  6. Click on **Calculate** (6) to starting the calculation



### Step by step the Group Stats

- We will use the filter function to select the objects only in specific sub-district. Click on "fasum\_point\_admin", so that the data only show for once sub-districts. Filter data on the "fasum\_point\_admin" layer, and click the **Filter in Group Stats**. The filter window will appear.



#### Filter data

- We will move the result table in group stats to other spreadsheet applications such as Ms.Excel or Google Sheets. So we can change the visual data to become a graph and a diagram. To start the process click on Data → Copy all to clipboard.

Group Stats

Data Features Window Help

Copy all to clipboard  
Copy selected to clipboard  
Save all to CSV file  
Save selected to CSV file

	3	4	5	6	7	8	
	galeh	Jomblang	Kaliwiru	Karanganyar	Gunung	Tegalsari	Wonotingal
3	bank	1		1	1		4
4	clinic			3	1	1	1
5	fuel				1	1	1
6	kindergarten	3	1	1	2	2	1
7	place_of_worship			1			2

Copy and paste the attribute table

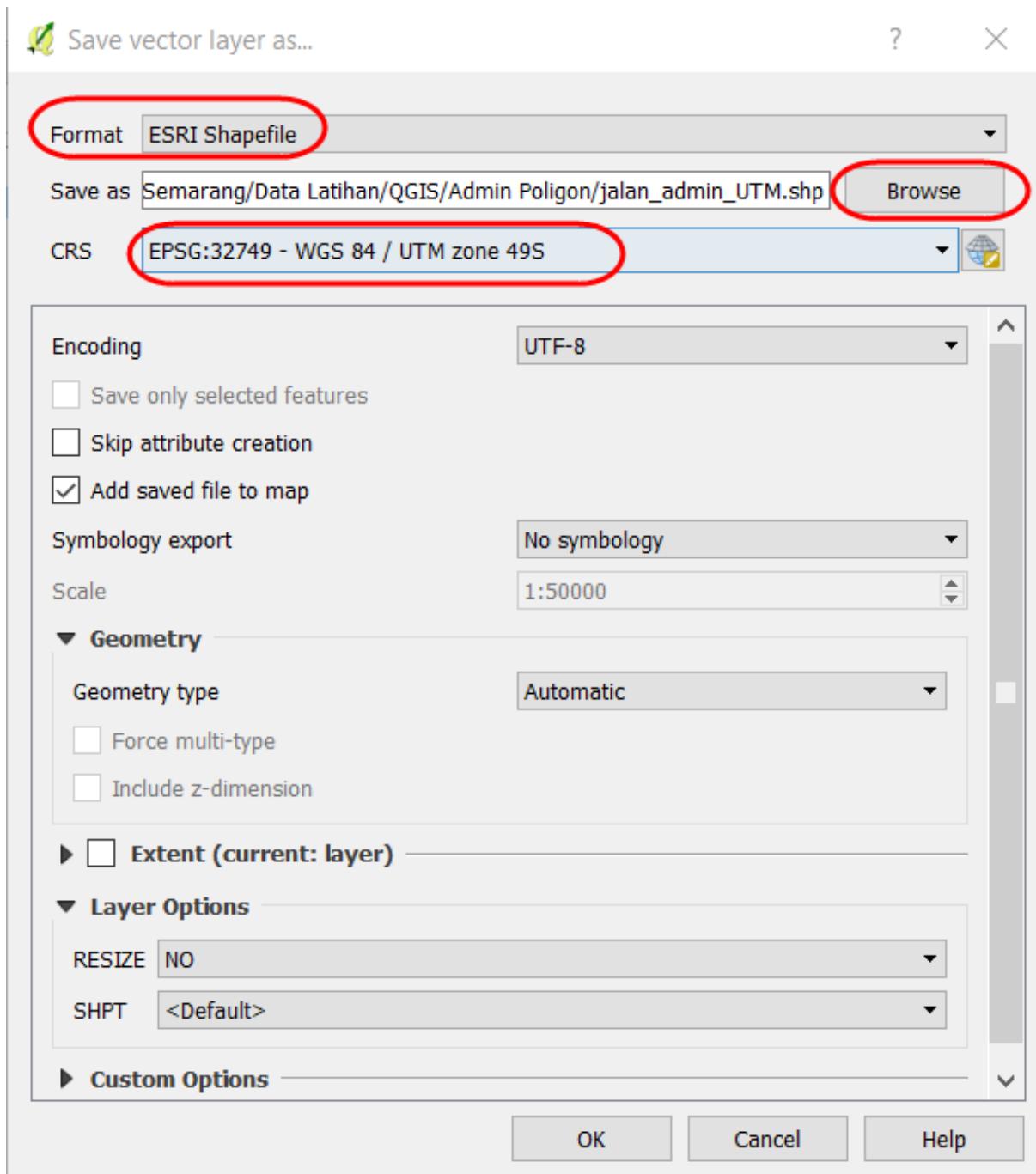
- Open the Microsoft Excel or Google Sheets to move the results table Group Stats.
- We can do the same instructions to calculate the other objects, see the example results from PDC Semarang City in this link <http://tinyurl.com/kuantitas-data>.

## 2. Calculate the Lines Object with Calculation Length Segments.

The Calculation a type of lines different with points and polygon. If we calculate the length segments of highways, the shapefile will be changed in Universal Transverse Mercator (UTM) coordinate system. The steps to calculate the length of the highways:

### a. Change the Coordinate System

- Right-click on highways layer → Save as → choose the Format ESRI Shapefile → Save as in your directory → CRS choose the reference system on your UTM area.

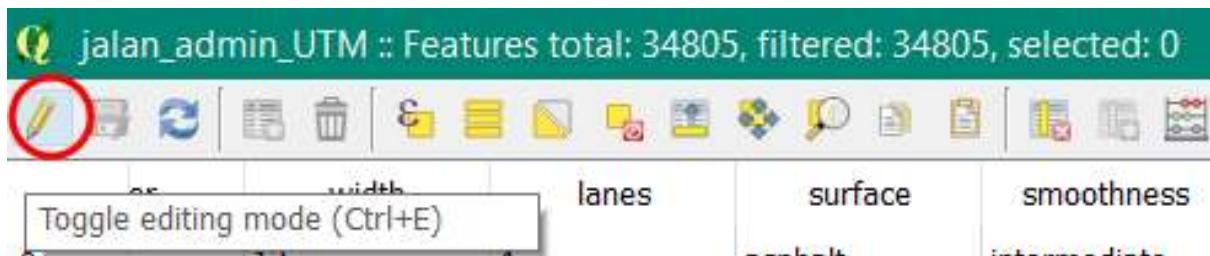


#### Save as with different CRS

- If you give the checkmark on the **Add saved the file to map**, the result will show up in the map canvas and **Layers Panel**.

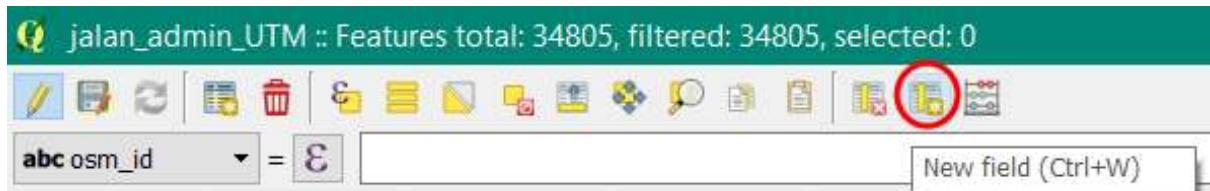
#### b. Create the New Column to Calculation Length of the highways

- Then right-click on the Layers "Jalan\_Admin\_UTM" → Open Attribute Table. Click on the **Toggle editing mode** to activate the attribute toolbar.



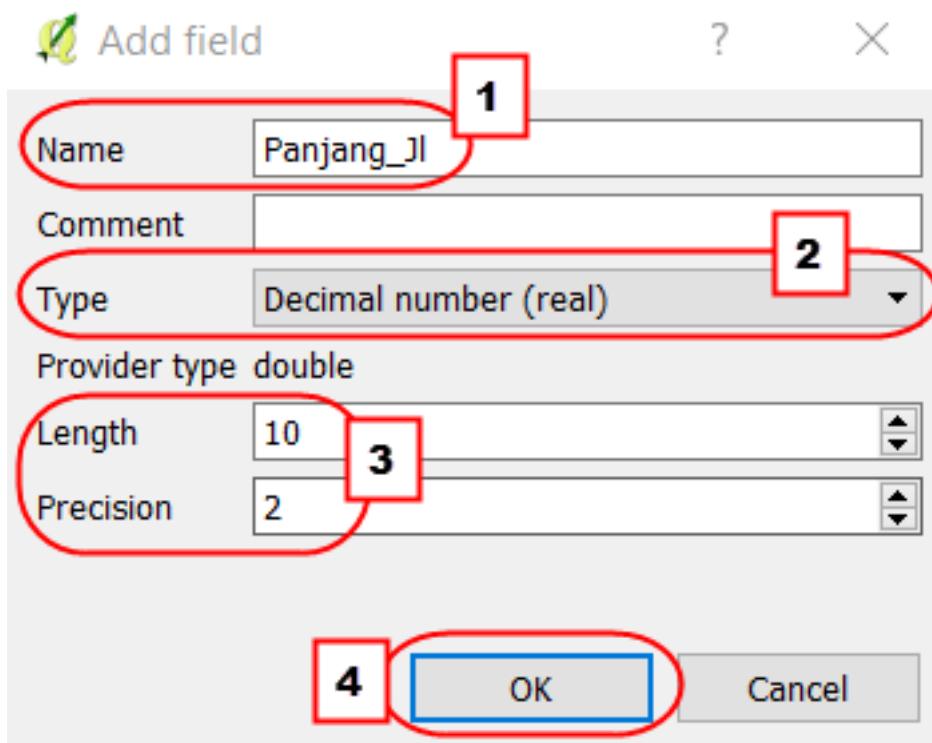
#### Toolbar Toggle editing mode

- To add a new column, click on the New Field in the toolbar.



#### Toolbar New Field

- There are the filled form Add field window
1. **Name** = Title of the column (a maximum of 10 characters)
  2. **Type** = Type of data that you need in the fill of the table. Select the Decimal number (real) to view the length of the segments
  3. **Provider type double** = The length shows the maximum number of columns and precision shows the number of decimal in behind comma.
  4. Click OK

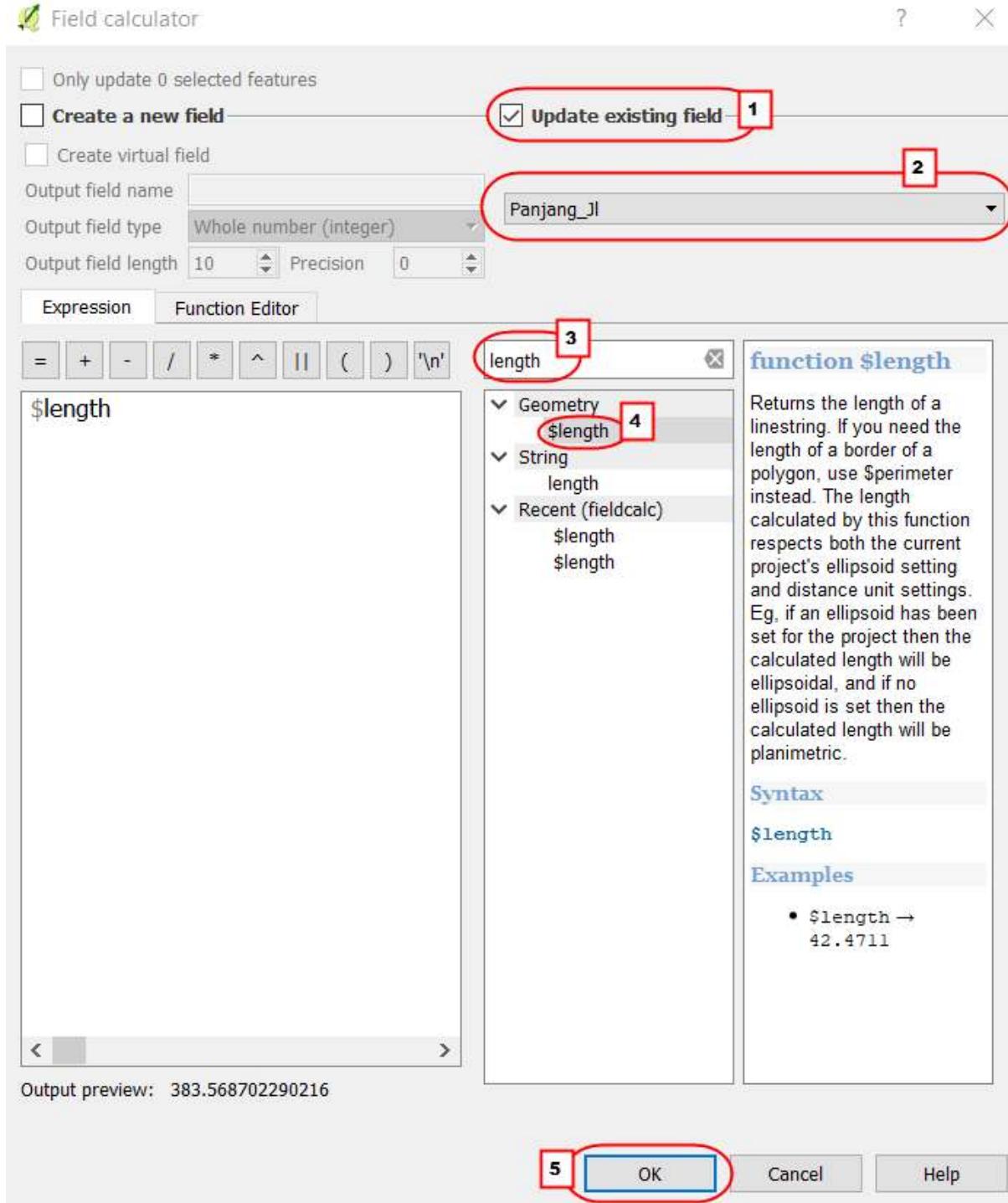


#### Add field setting

##### c. Calculation the Length (meter) with Field Calculator

- To start the process click on Open field calculator
- The settings in the Open field calculator:

1. We can put the checkmark in **Update existing field** to update the existing column.
2. Choose the column that will be updated
3. We can type the “length” to calculate the length of the highway with the formula.
4. Double-click on **Geometry → \$ length** is a formula to calculate the length of segments. After we clicked the formula, **\$length** will appear in the Expression box in the right panel.
5. Click OK



#### The setting of Field Calculator

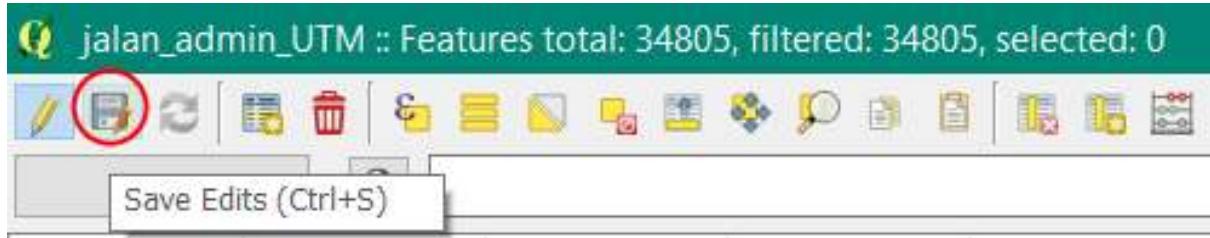
- The results will be displayed in the last column.

jalan\_admin\_UTM :: Features total: 34805, filtered: 34805, selected: 0

th	lanes	surface	smoothness	motorcycle	oneway	ref	source	z_index	id	bid	admin_level	boundary	lt_in_cty	lt_in_muni	lt_in_prov	name_2	source_Z	Perjeng_3
0	4	asphalt	intermediate	yes	yes	HOT_JAWAR...	relation/8087...	7	relation/8087...	relation/8087...	7	administrative	Semarang	Semarang Sel...	Jawa Tengah	Pelururan	HOT_JVA...	383.56870220...
1	4	asphalt	intermediate	yes	yes	HOT_JAWAR...	relation/8089...	7	relation/8089...	relation/8089...	7	administrative	Semarang	Semarang Sel...	Jawa Tengah	Mugasan	HOT_JVA...	133.20542869...
2	4	asphalt	intermediate	yes	yes	HOT_JAWAR...	relation/8174...	7	relation/8174...	relation/8174...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Pekunden	HOT_JVA...	209.12658341...
3	2	asphalt	good	yes	yes	HOT_JAWAR...	relation/8055...	7	relation/8055...	relation/8055...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Sariay	HOT_JVA...	4.724085834...
4	2	asphalt	good	yes	yes	HOT_JAWAR...	relation/8135...	7	relation/8135...	relation/8135...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Miroto	HOT_JVA...	519.38371595...
5	2	asphalt	good	yes	yes	HOT_JAWAR...	relation/8037...	7	relation/8037...	relation/8037...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Brimbungan	HOT_JVA...	732.65268241...
6	2	asphalt	good	yes	yes	HOT_JAWAR...	relation/8058...	7	relation/8058...	relation/8058...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Jagalan	HOT_JVA...	297.58041857...
7	2	concrete	good	yes	yes	HOT_JAWAR...	relation/8103...	7	relation/8103...	relation/8103...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Rajamulyo	HOT_JVA...	118.89615624...
8	2	concrete	good	yes	yes	HOT_JAWAR...	relation/8114...	7	relation/8114...	relation/8114...	7	administrative	Semarang	Semarang Ut...	Jawa Tengah	Tanjungmas	HOT_JVA...	4.9245489627...
9	2	concrete	good	yes	yes	HOT_JAWAR...	relation/8114...	7	relation/8114...	relation/8114...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Kemjen	HOT_JVA...	931.97901107...
10	1	concrete	good	yes	no	HOT_JAWAR...	relation/8103...	7	relation/8103...	relation/8103...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Rajamulyo	HOT_JVA...	120.29741590...
11	1	concrete	good	yes	no	HOT_JAWAR...	relation/8094...	7	relation/8094...	relation/8094...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Purwodidhati	HOT_JVA...	64.3339049452...
12	1	paving_stones	good	yes	yes	HOT_JAWAR...	relation/8103...	7	relation/8103...	relation/8103...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Rajamulyo	HOT_JVA...	1.0493265867...
13	1	paving_stones	good	yes	yes	HOT_JAWAR...	relation/8094...	7	relation/8094...	relation/8094...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Purwodidhati	HOT_JVA...	40.32721403...
14	1	paving_stones	good	yes	yes	HOT_JAWAR...	relation/8114...	7	relation/8114...	relation/8114...	7	administrative	Semarang	Semarang Ut...	Jawa Tengah	Tanjungmas	HOT_JVA...	0.9344163957...
15	1	paving_stones	good	yes	yes	HOT_JAWAR...	relation/8094...	7	relation/8094...	relation/8094...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Purwodidhati	HOT_JVA...	185.98518137...
16	1	paving_stones	good	yes	yes	HOT_JAWAR...	relation/8114...	7	relation/8114...	relation/8114...	7	administrative	Semarang	Semarang Ut...	Jawa Tengah	Tanjungmas	HOT_JVA...	541.90721430...
17	1	paving_stones	good	yes	yes	HOT_JAWAR...	relation/8103...	7	relation/8103...	relation/8103...	7	administrative	Semarang	Semarang Ut...	Jawa Tengah	Bandarharjo	HOT_JVA...	0.8468583829...
18	1	asphalt	good	yes	yes	HOT_JAWAR...	relation/8055...	7	relation/8055...	relation/8055...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Sarieyo	HOT_JVA...	4.3242748116...
19	1	asphalt	good	yes	yes	HOT_JAWAR...	relation/8058...	7	relation/8058...	relation/8058...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Jagalan	HOT_JVA...	271.78147088...
20	1	asphalt	good	yes	no	HOT_JAWAR...	relation/8037...	7	relation/8037...	relation/8037...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Brimbungan	HOT_JVA...	5.1299622095...
21	1	asphalt	good	yes	no	HOT_JAWAR...	relation/8058...	7	relation/8058...	relation/8058...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Jagalan	HOT_JVA...	526.41291270...
22	1	asphalt	good	yes	yes	HOT_JAWAR...	relation/8174...	7	relation/8174...	relation/8174...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Pekunden	HOT_JVA...	48.740322442...
23	1	asphalt	good	yes	yes	HOT_JAWAR...	relation/8211...	7	relation/8211...	relation/8211...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Karangkudul	HOT_JVA...	7.4434860886...
24	1	asphalt	good	yes	yes	HOT_JAWAR...	relation/8211...	7	relation/8211...	relation/8211...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Pekunden	HOT_JVA...	1202.3159623...
25	1	asphalt	good	yes	yes	HOT_JAWAR...	relation/8034...	7	relation/8034...	relation/8034...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Karangkudul	HOT_JVA...	3.24079363994...
26	1	asphalt	good	yes	yes	HOT_JAWAR...	relation/8211...	7	relation/8211...	relation/8211...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Karangkudul	HOT_JVA...	347.130606240...
27	2	asphalt	intermediate	yes	yes	HOT_JAWAR...	relation/8087...	7	relation/8087...	relation/8087...	7	administrative	Semarang	Semarang Sel...	Jawa Tengah	Pelururan	HOT_JVA...	6.7476827296...
28	5	asphalt	intermediate	yes	yes	HOT_JAWAR...	relation/8011...	7	relation/8011...	relation/8011...	7	administrative	Semarang	Semarang T...	Jawa Tengah	Pelururan	HOT_JVA...	1.2476827296...

### The length of highways

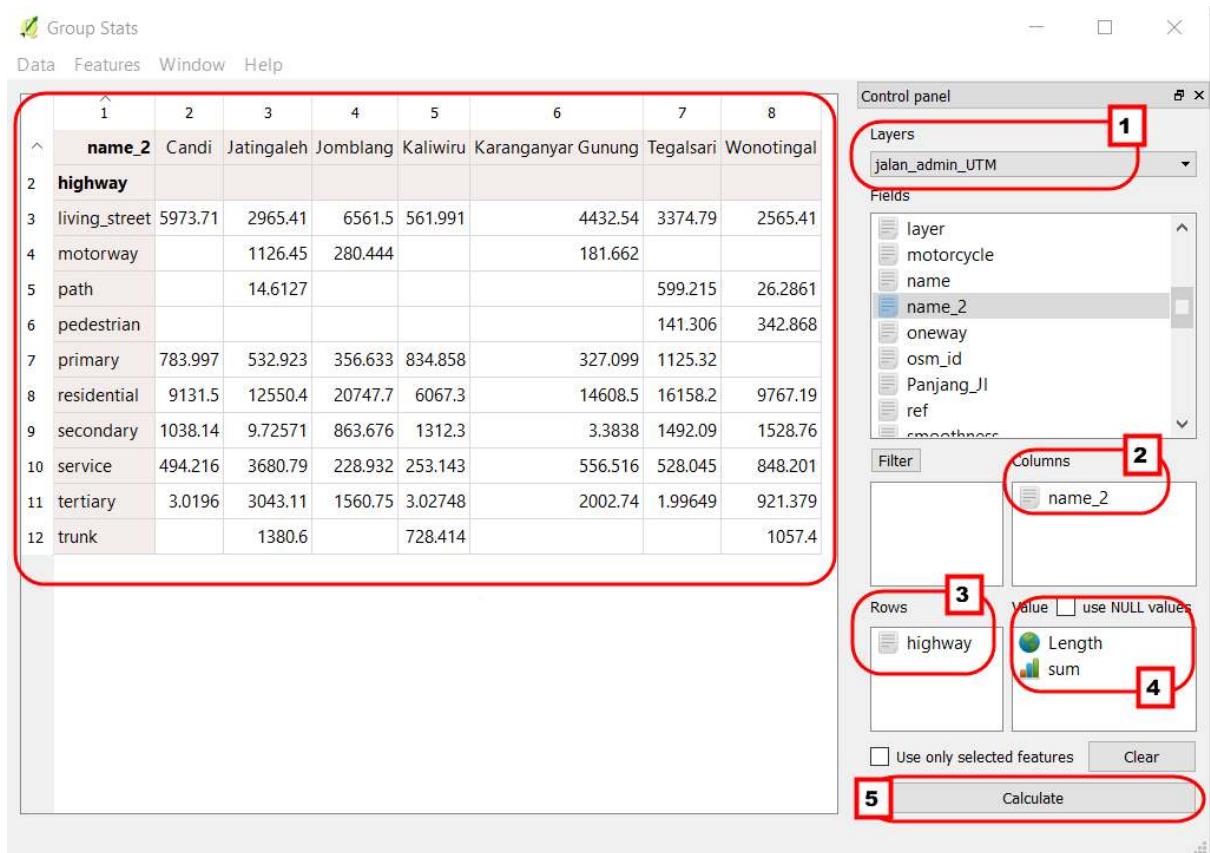
- Save your edit with **Save Edits** in the toolbar. To finish the process click **Toggle Editing**.



### Save edits

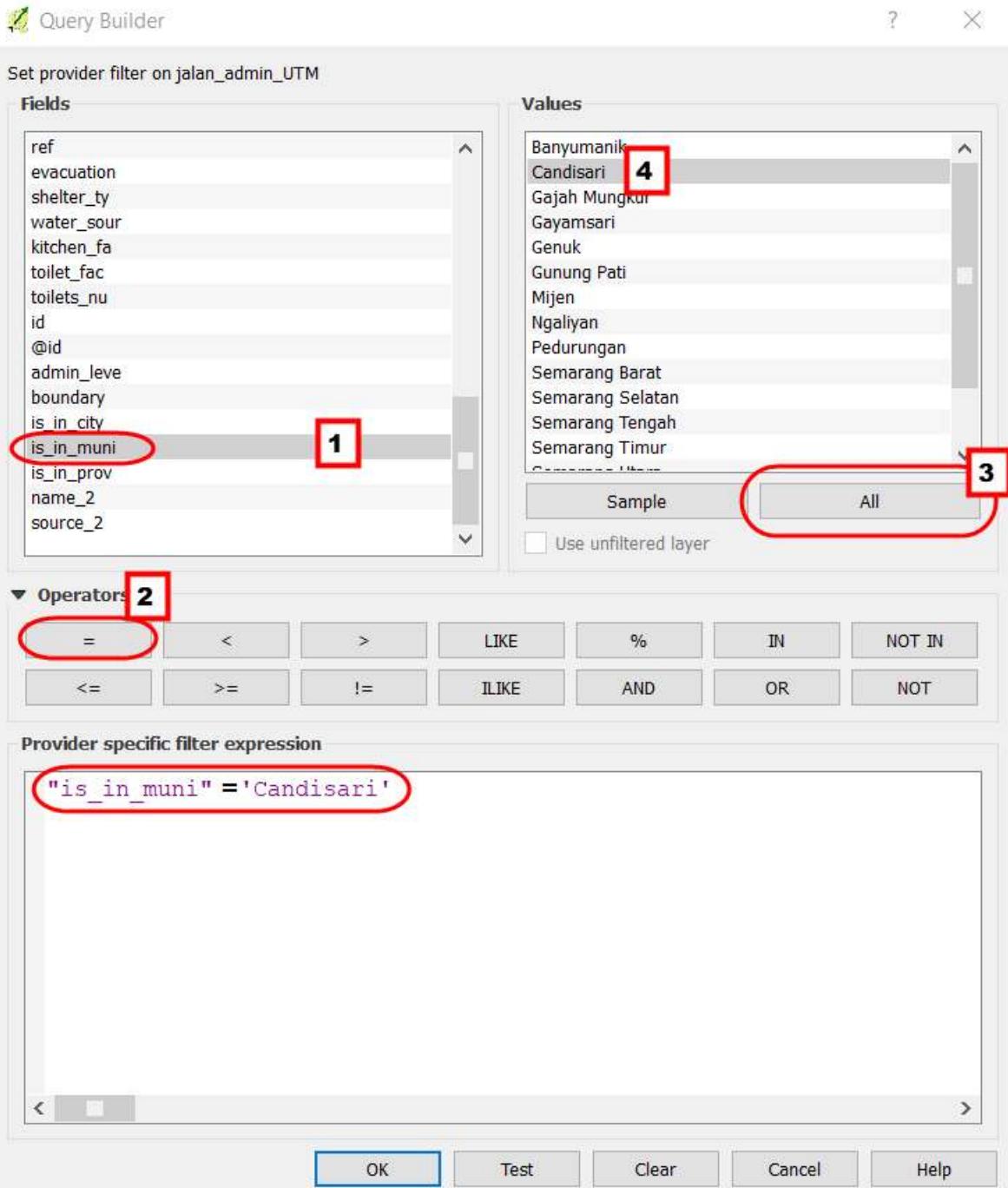
#### d. Calculation the length of highways based on the type of highways with Group Stats

- Open **Group Stats** click on the **Menu Vector → Group Stats → Group Stats**.
- We can use the “sum” and Length formula to calculate the number of length on the **Value box**



### The setting of length segments

- If we want to calculate based on the administrative boundary, we can use the filter function in the Group Stats plugin. Click on Filter and follow the instructions.



#### Filter based on subdistricts

- As explained before, we can move the table to another spreadsheet to create a graph. Click on the Data → Copy all to clipboard.

The screenshot shows the Group Stats software interface. A context menu is open over a table, with the 'Copy all to clipboard' option highlighted. The table displays data for different types of highways across several villages: Jatingaleh, Jomblang, Kaliwiru, Karanganyar Gunung, Tegalsari, and Wonotinggal. The columns are labeled 4, 5, 6, 7, and 8. The rows represent highway types from 3 to 12.

		4	5	6	7	8
3	living_street	5973.71	2965.41	6561.5	561.991	4432.54
4	motorway		1126.45	280.444		181.662
5	path		14.6127			599.215
6	pedestrian					141.306
7	primary	783.997	532.923	356.633	834.858	327.099
8	residential	9131.5	12550.4	20747.7	6067.3	14608.5
9	secondary	1038.14	9.72571	863.676	1312.3	3.3838
10	service	494.216	3680.79	228.932	253.143	556.516
11	tertiary	3.0196	3043.11	1560.75	3.02748	2002.74
12	trunk		1380.6		728.414	

Copy all the clipboard

- Open the spreadsheet and paste the table in there.

The example table of length the highways

Type of highway	Candi	Jatingaleh	Jomblang	Kaliwiru	Karang Gunung	Tegalsari	Wonotinggal
Motorway	-	1313.88	163.85	-	-	-	-
Trunk	-	1571.20	-	1602.19	-	-	-
Primary	-	1389.34	1264.54	-	206.96	-	-
Secondary	1065.13	-	24.17	2353.86	-	-	-
Tertiary	271.49	3920.71	1612.78	-	836.18	-	-
Service	500.24	2567.00	226.11	116.68	150.03	301.93	851.94
Residential	8486.45	14300.66	20972.41	5424.36	13322.03	15234.38	11635.03
Pedestrian	-	1313.88	163.85	-	-	141.93	344.38
Path	-	14.68	-	-	-	601.85	26.40
Living Street	5913.74	2841.22	6588.17	451.66	4401.59	3509.38	2576.71

- We can do the same instructions to calculate the other objects in lines, see the example results from PDC Semarang City in this link <http://tinyurl.com/kuantitas-data>.

## SUMMARY

We have learned about how to calculate the quantities of OSM data using the Group Stats plugin. We can use the statistic data in the report to analysis, mapping progress, and mapping achievement. If you want to create the timeline from the results based on an admin level, we can calculate the data in each village that the village survey has finished.

— title: Creating the Administrative Boundaries in JOSM weight: 9 —

### Objectives:

- To be able to explain the definition and example of relation in OpenStreetMap
- To be able to explain administrative boundary concept in OpenStreetMap
- To be able to explain term and condition to create an administrative boundary in OpenStreetMap
- To be able to create the administrative boundaries in OpenStreetMap

The mapping of administrative boundaries in OpenStreetMap was suggested to an advanced mapper or experienced user with regularly mapping in OpenStreetMap. You can obtain the administrative boundary by government which have authorized with the boundary. In the PDC InAware project, we are associated with village offices and university in the cities. Therefore, we can obtain the administrative boundaries data from village offices, they drawing the boundaries in the paper maps.

The data source very important in administrative boundaries, you can not decide the boundary by yourself. If the data source is unclear and does not have an Open Data Commons Open Database License (ODbL), the data is not allowed to be uploaded into OSM. This can cause problems when other users download and use administrative boundary data freely for their benefit.

## I. Relation in OSM

A relation is a group of elements. To be more exact it is one of the core data elements that consists of one or more tags and also an ordered list of one or more nodes, ways and/or relations as members which is used to define logical or geographic relationships between other elements. A member of a relation can optionally have a role that describes the part that a particular feature plays within a relation. The types of relation the administrative boundary :

### a. Relation Tags

Relation tags to the administrative boundary in Indonesia

Key	Value	Definition
admin_level	(1-11) Adjusted according to administrative boundaries	The admin_level key describes the administrative level of an object within a government hierarchy. A lower level means higher in the hierarchy. Besides others, this tag is used for the borders of territorial political entities (e.g. country, state, municipality) together with boundary=administrative. Due to cultural and political differences, admin levels of different countries only correspond approximately to each other.
boundary	administrative	An administrative boundary. Subdivisions of areas/territories/jurisdictions recognized by governments or other organizations for administrative purposes.
type	boundary	This tag to identify the object in administrative boundary

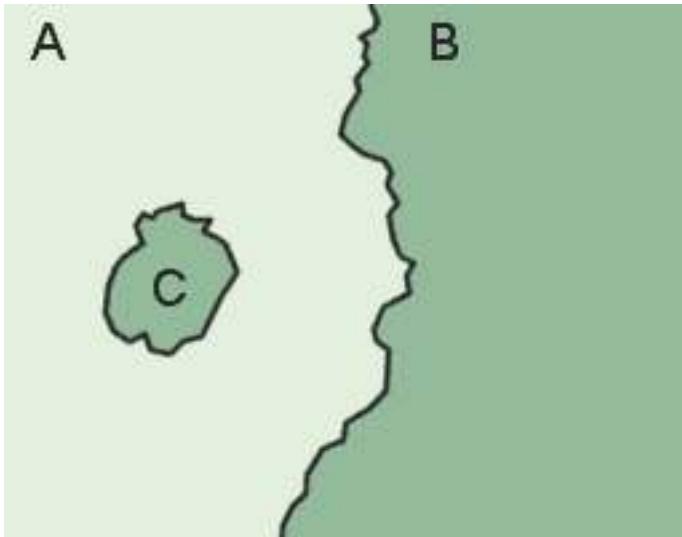
Key	Value	Definition
name	Name of administrative level	This tag to identify the name in administrative boundary, example: RW 03, Candisari Village
place	Example suburb, island	This optional tag, used to indicate that a particular location is known by a particular name, to indicate what sort of “place” it is. A place tag should exist for every significant human settlement (city, town, suburb, etc.) and also for notable unpopulated, named places. <a href="http://wiki.openstreetmap.org/wiki/Key:place">http://wiki.openstreetmap.org/wiki/Key:place</a>
land_area	administrative	Tags to identify a land area boundary
is_in:province	Name of province	Tags to identify the name of the province. This tag must be included in lower-level administrative from (City/Town, Municipality, Village, Community group, Neighborhood Unit)
(City) is_in:city, (Town) is_in:town	Name of City/Town	Tags to identify the name of the city/town. This tag must be included in lower-level administrative from City/Town (Municipality, Village, Community group, Neighborhood Unit)
is_in:municipality	Name of Municipality	Tags to identify the name of the municipality. This tag must be included in lower-level administrative from Municipality (Village, Community group, Neighborhood Unit)
is_in:village	Name of Village	Tags to identify the name of the village. This tag must be included in administrative from Village (Community group, Neighborhood Unit)
is_in:RW	Name of Community group	Tags to identify the name of the community group. This tag must be included in lower-level administrative from Community group (Neighborhood Unit)

## b. Relation Members

- Admin\_centre

The point that represents the centre of administration in one area (a capital, county seat, etc.), usually a town, city or village (depending on the boundary level, see place=“\*”).

- Outer  
The multiple ways that form the closed border
- Inner  
Enclaves of this border - the multiple ways that form the closed inner borders



Area C is inside Area A and Area C is identified as an inner of the relation members ([https://wiki.openstreetmap.org/wiki/Map\\_Features#Administrative\\_Boundaries](https://wiki.openstreetmap.org/wiki/Map_Features#Administrative_Boundaries))  
 Area C is inside Area A and Area C is identified as an inner of the relation members ([https://wiki.openstreetmap.org/wiki/Map\\_Features#Administrative\\_Boundaries](https://wiki.openstreetmap.org/wiki/Map_Features#Administrative_Boundaries))

## II. Understanding Administrative Boundary in OSM

### a. Definition of Administrative Boundary

An administrative boundary. Subdivisions of areas/territories/jurisdictions recognized by governments or other organizations for administrative purposes. These range from large groups of nation-states right down to small administrative districts and suburbs, as indicated by the 'admin\_level='\* combo tag.



Boundary Administrative in Petamburan (openstreetmap.org)

#### b. Admin\_level values for specific countries

Admin\_level=1 to 10 has been introduced in order that different borders can be rendered consistently among countries (doing this based on border\_type would require knowledge of their hierarchy in each country). The lists of admin-level boundary for specific countries: [http://wiki.openstreetmap.org/wiki/Tag:boundary/admin\\_level](http://wiki.openstreetmap.org/wiki/Tag:boundary/admin_level)

boundary%3Dadministrative or <https://tinyurl.com/wiki-batasadm>

### c. Admin\_level values for Indonesia

The division of administrative boundaries in Indonesia is adjusted to the division of regions and divisions in Indonesia which are managed by regional governments based on the principles of autonomy, deconcentration, decentralization and co-administration tasks. The types of administrative boundaries that exist in Indonesia are Provinces, City/Town, Municipality, Village, Hamlet (only rural area), Community group, Neighborhood Unit.

When the types of administrative boundaries in Indonesia are seen in OpenStreetMap, administrative boundaries have different values according to the level of administration. The levels of administration in Indonesia is as follows:

value	Admin Level	Example Rendering	Place
1	-	-	-
2	Country		-
3	-		-
4	Province		Province
5	City/Town		Big City=City, Small City=Town
6	Municipality		Municipality
7	Village		Village
8	Hamlet		Hamlet
9	Community Group		Community Group
10	Neighborhood Unit		Neighborhood Unit

## III. Terms and Condition When Create Administrative Boundary in OSM

### a. Term and Condition to Mapper

As mentioned above, administrative boundaries are a sensitive topic to map. In order to avoid issues in the future, there are specific requirements when it comes to mapping administrative boundaries on OpenStreetMap, they are:

- The mapper has learned the concept relation data in OSM especially for the relation of administrative boundary
- The mapper has learned about how to create the administrative boundary and concern the data source
- The mapper can explain the admin level of the administrative boundary in Indonesia

### b. Term and Condition to Data Source

Term and condition to the data source of the administrative boundary in OSM:

- Data must come from a reliable source, for example the Geospatial Information Agency (BIG)

- Data used must have a permission to use license, to ensure it is legal to be used for public use.
- Data must have clear administration boundaries, as legally acknowledged and approved by the concerned authorities.

#### IV. Adding the Administrative Boundary in OSM

In making administrative borders, it is highly encouraged to use editor Java OpenStreetMap (JOSM) due to the complete tools available to edit and modify are much easier to use than other editors such as iD editor.

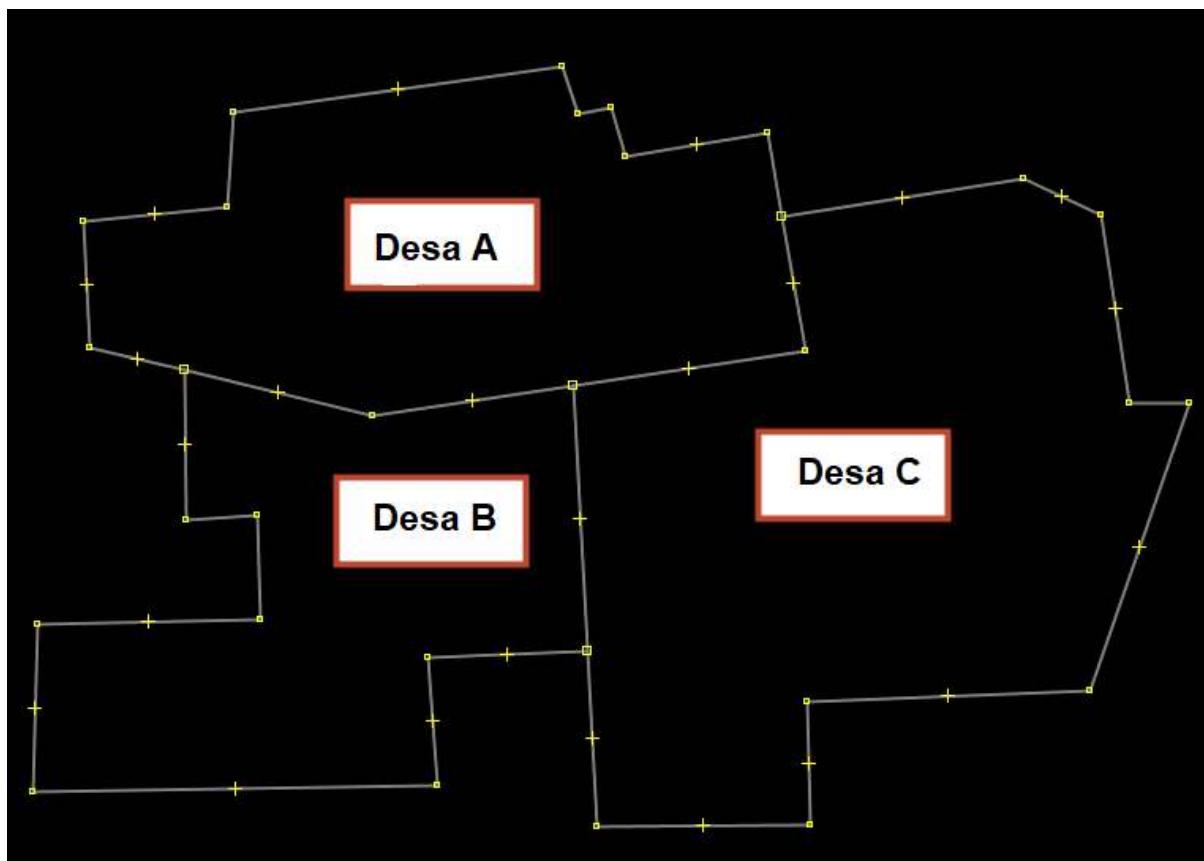
**Note :** Data used in this tutorial are fictitious data to easily help understand and practice creating administrative borders.

Here are the steps in creating administrative boundaries on OpenStreetMap:

- a. **Drawing the Lines of Administrative Boundary** \* Open JOSM editor. \* Then, select that you will make administrative boundaries in, by downloading the OSM data of the specified area. \* If the OSM data has mapped such as buildings and roads, you can use the filter data in JOSM in referring to chapter **Using Filter in JOSM**. The tool filter helps to hide the building and road in OSM data. \* Starting to digitize with Draw Node



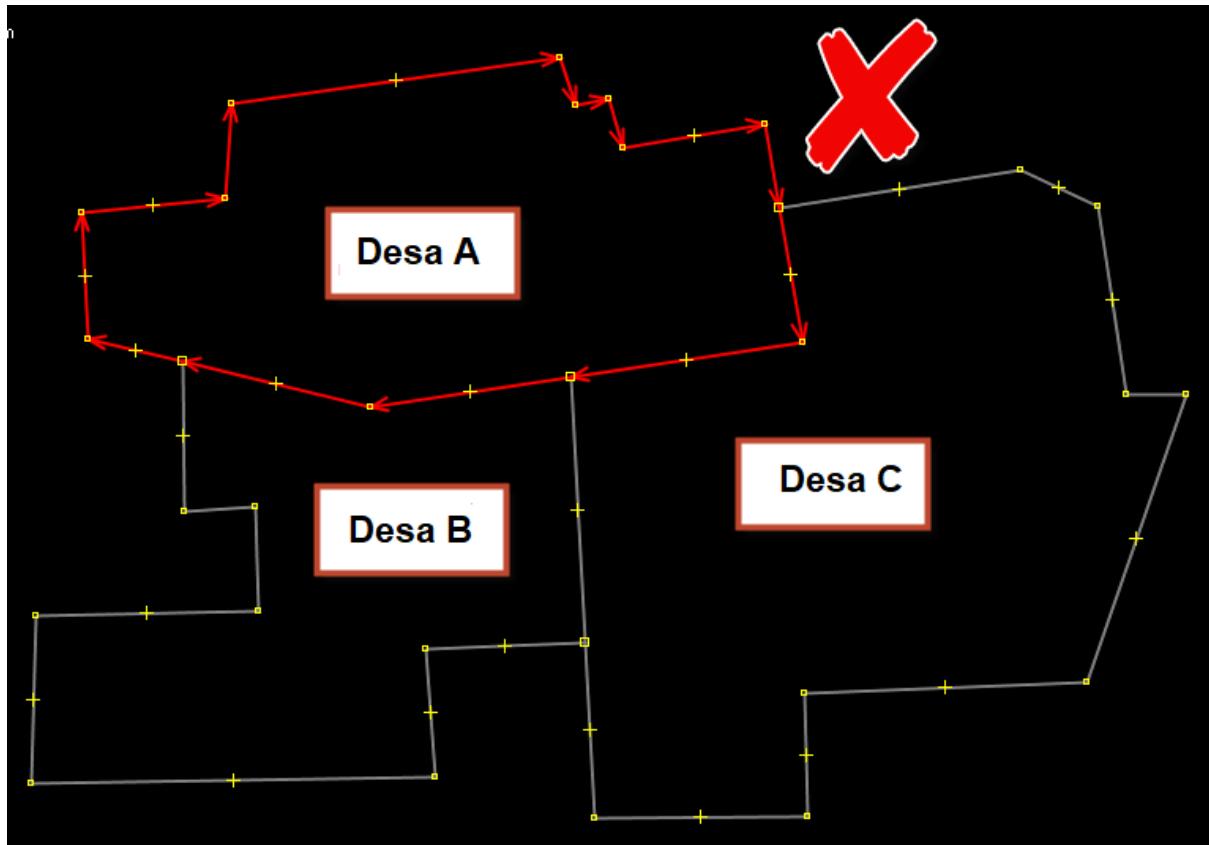
- The image below is an example of digitizing administrative boundaries. We will create three villages that connected in the administrative boundary, there are Desa A (Village A), Desa B (Village B), and Desa C (Village C).



Divide the area

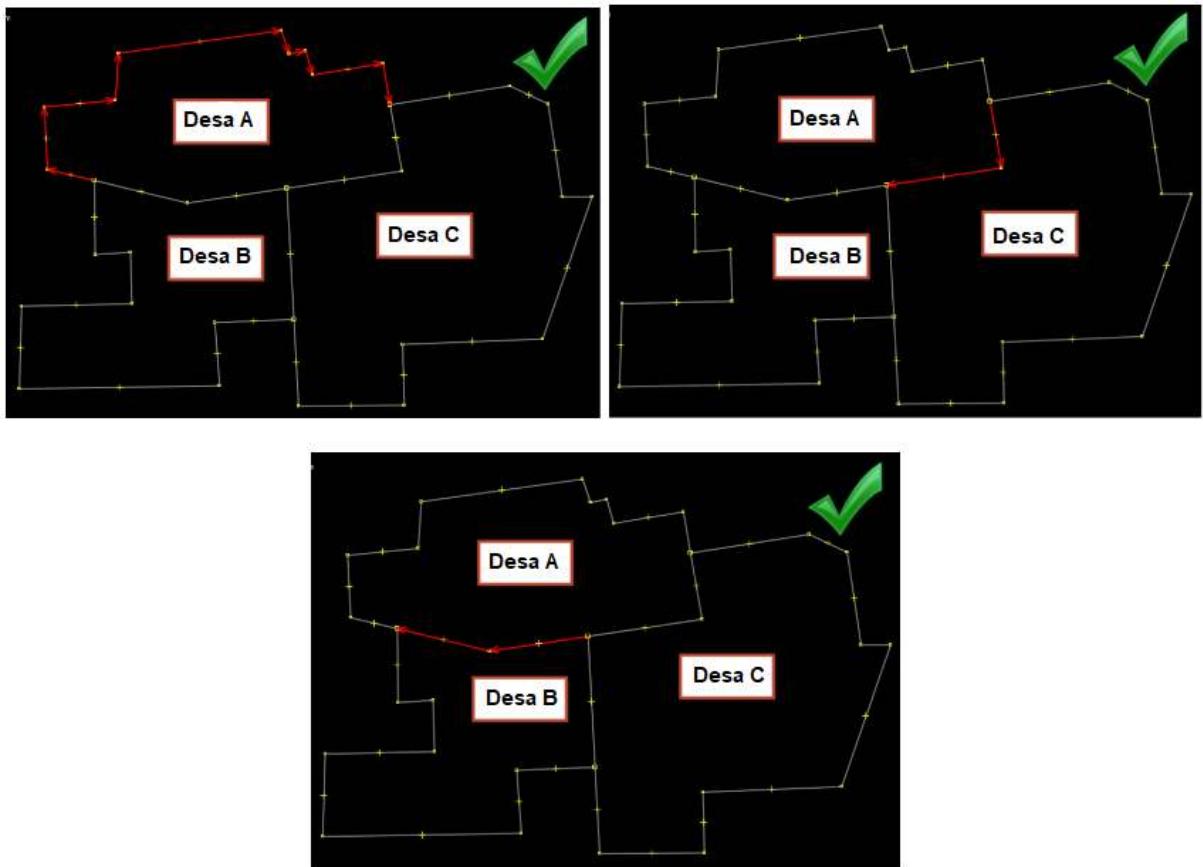
- When drawing administrative boundaries, please consider the following:
  - Drawing lines connects with other lines in administrative boundary

- Ensure that do not overlap lines in administrative boundary and drawn twice
  - Ensure that every interconnected line is drawn its own separate line (in a different segment).
- If the lines look something like this:



The mistake of creating the relation

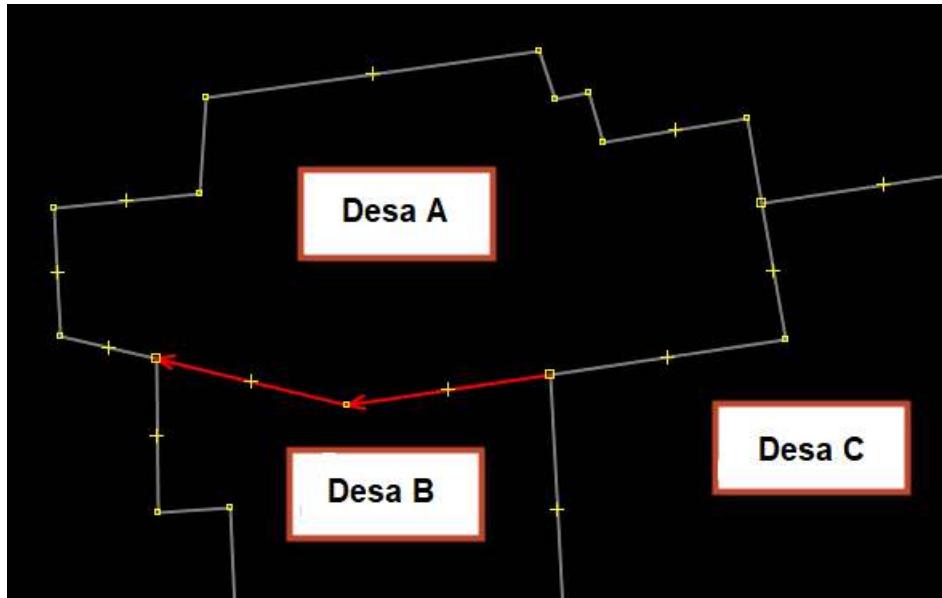
You can separate the lines use **Tools → Split Way** or use the shortcut (**P**) in your keyboard with choosing two-node between lines that separated like this:



The split way in lines administrative

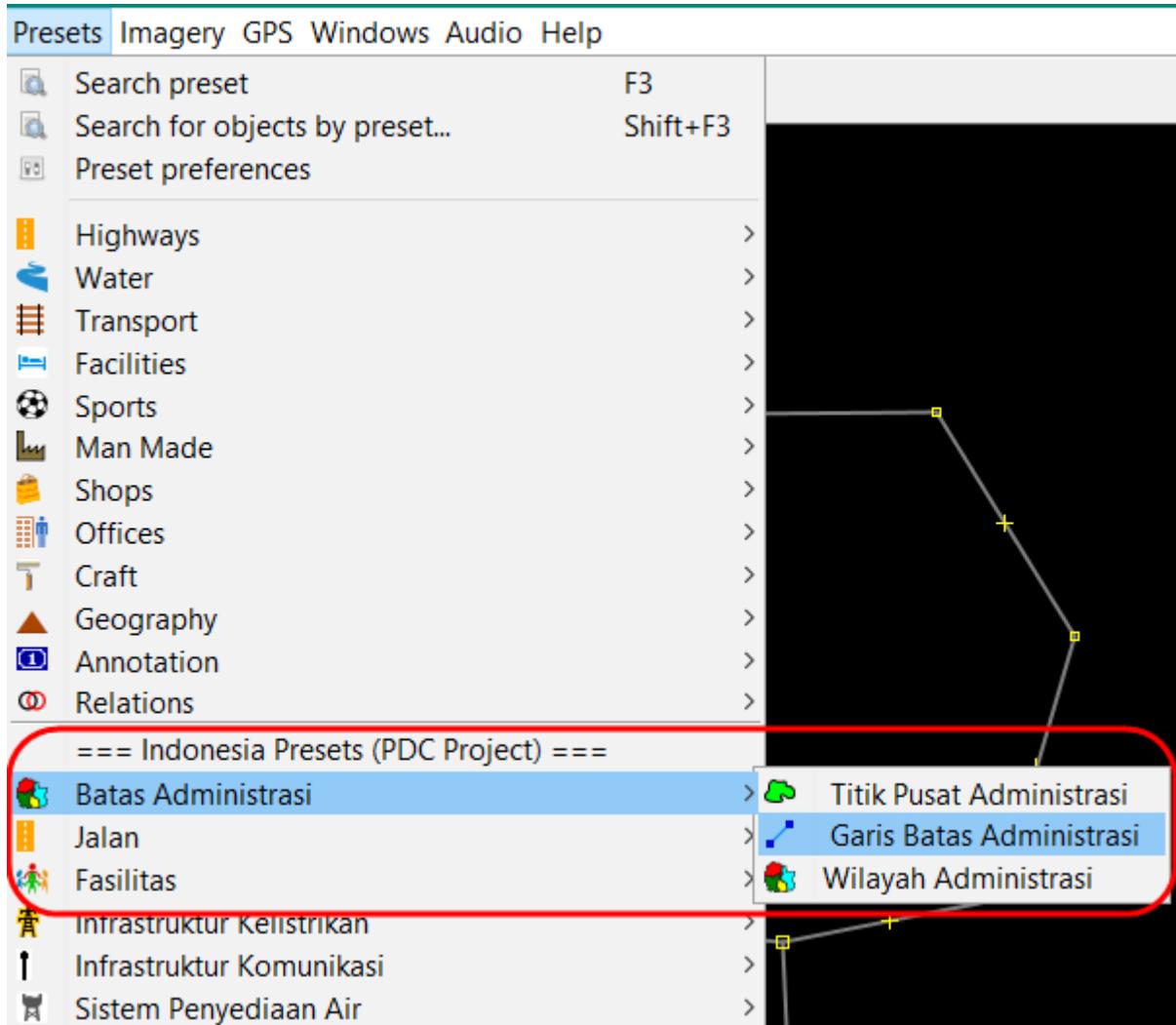
#### b. Assigning Tags on Administrative Boundary Lines

- The next step is to assign a tag on each boundary line made Select one line in a segment from the administrative boundary.



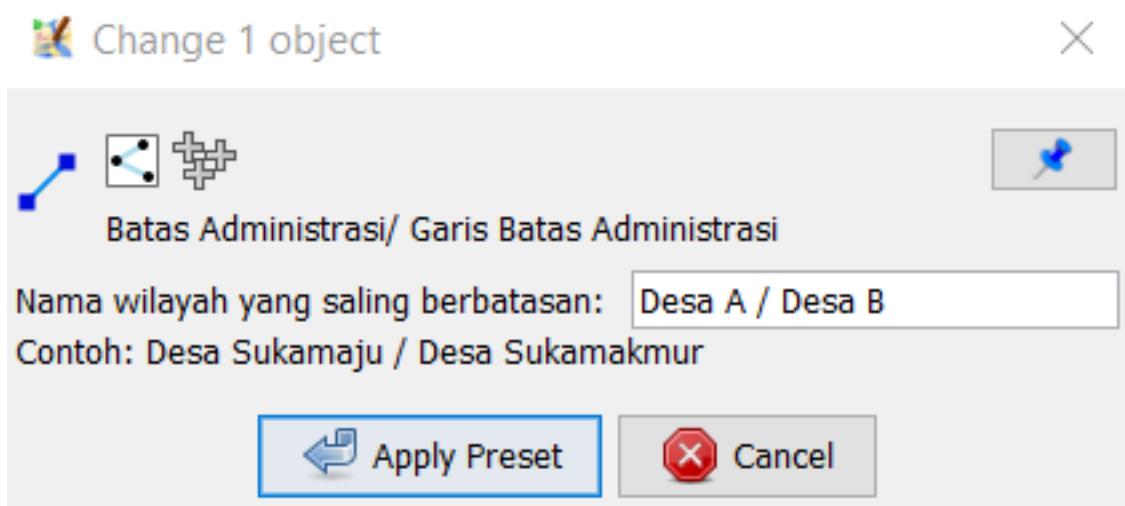
Choose line in administrative boundary

- Then, we will tag the lines with administrative boundary presets with click on **Presets Menu → Batas Administrasi → Garis Batas Administrasi**. If these presets not showing in your Menu Presets, please refer to the chapter **Using JOSM** for adding the “PDC InAware Indonesia preset”. It is only in Bahasa.



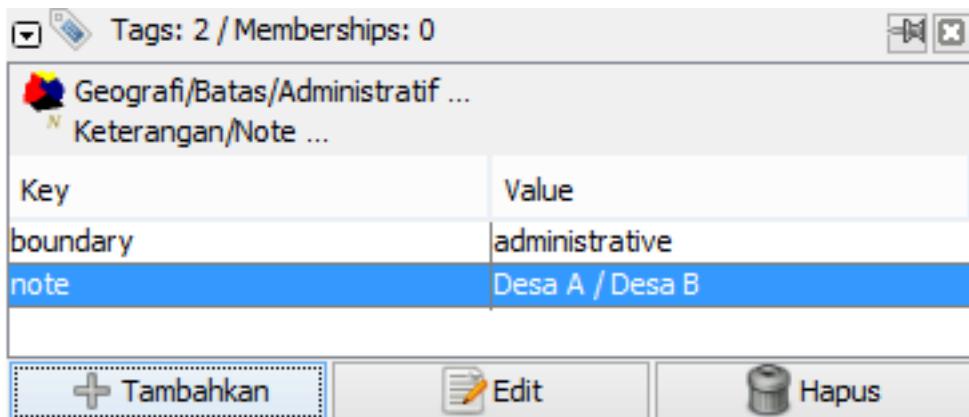
#### Menu Presets

- It will appear the dialog window that you can fill the name according to the name village between boundaries, such as Desa A / Desa B. This tag is intended to explain the line segments as administrative boundaries for Village A (Desa A) and Village B (Desa B). Then click on **Apply preset** to save the result.



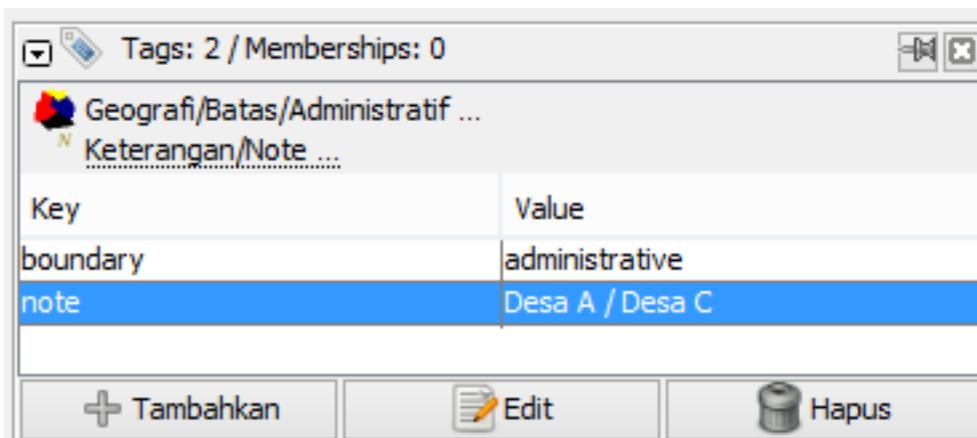
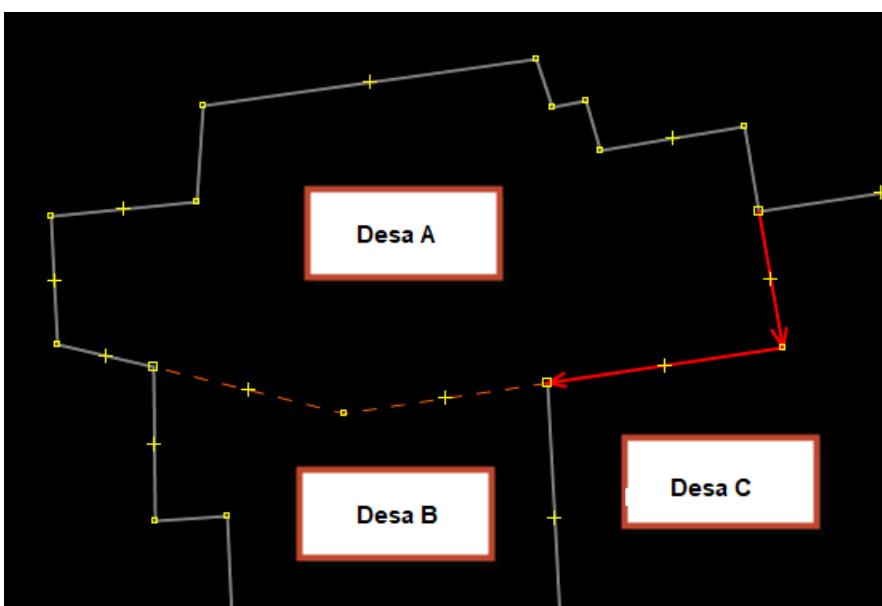
The presets form Administrative Line

- You can see the properties of the tag in line with select the lines using **select tool** and see the information on the right side, like the image below:



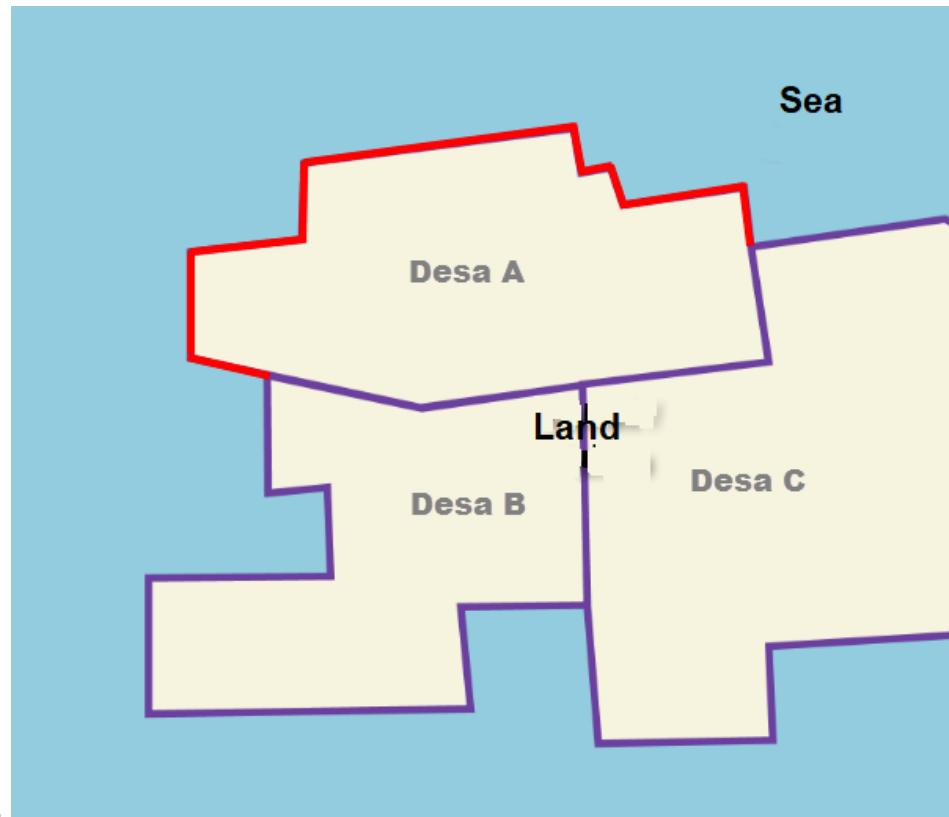
Tagging in administrative line boundary

- In the next step, we will tag on the segments in line administrative boundary Desa A. Select the segment in line between Desa A and Desa C. Tagging in the same way as before.



Tagging in administrative line boundary

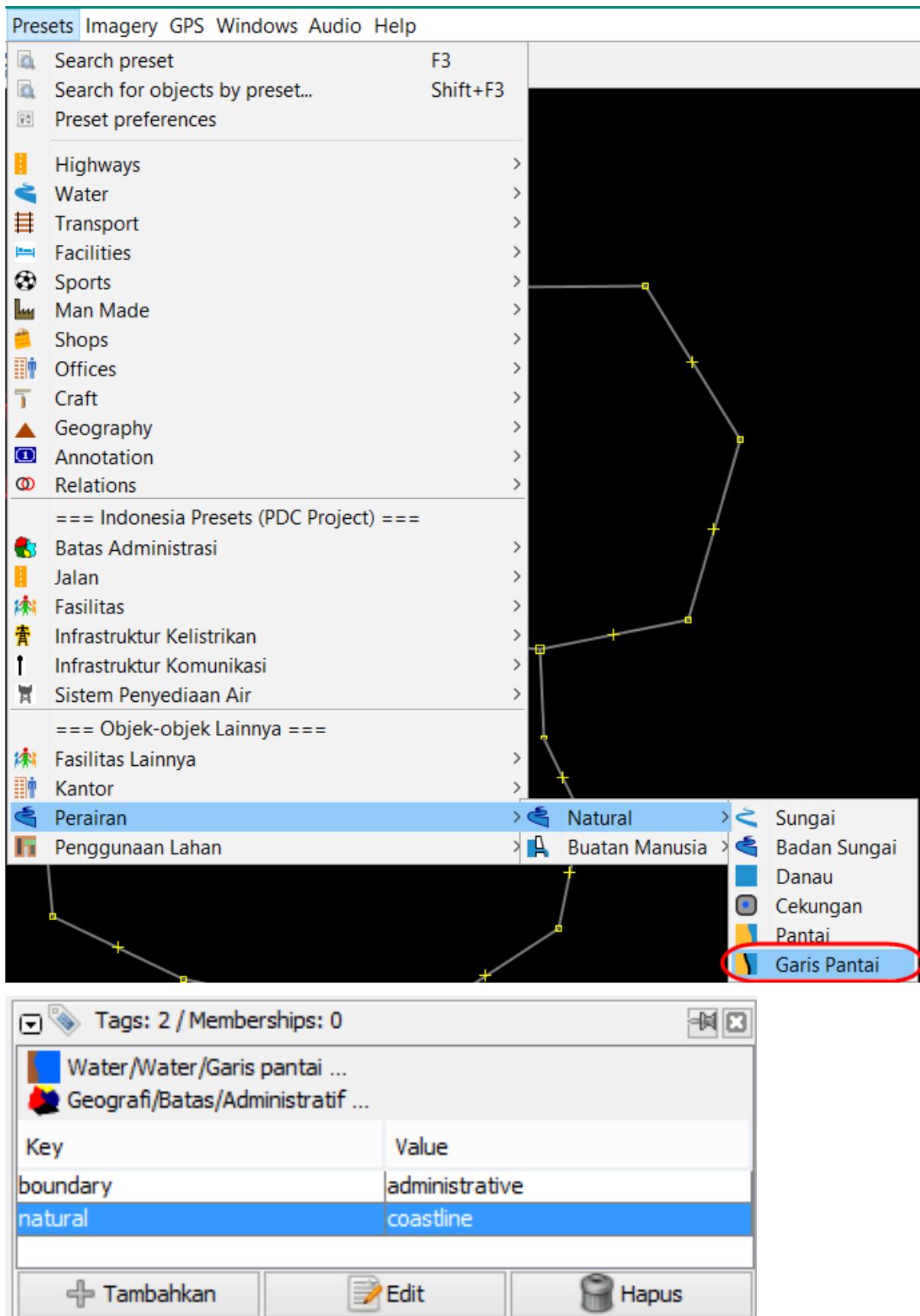
- This part of the tutorial will show how to make village/district administrative boundaries where the village/district are covers the entire mainland/island. In the image below, the red line is the boundary



between Village A and the ocean.

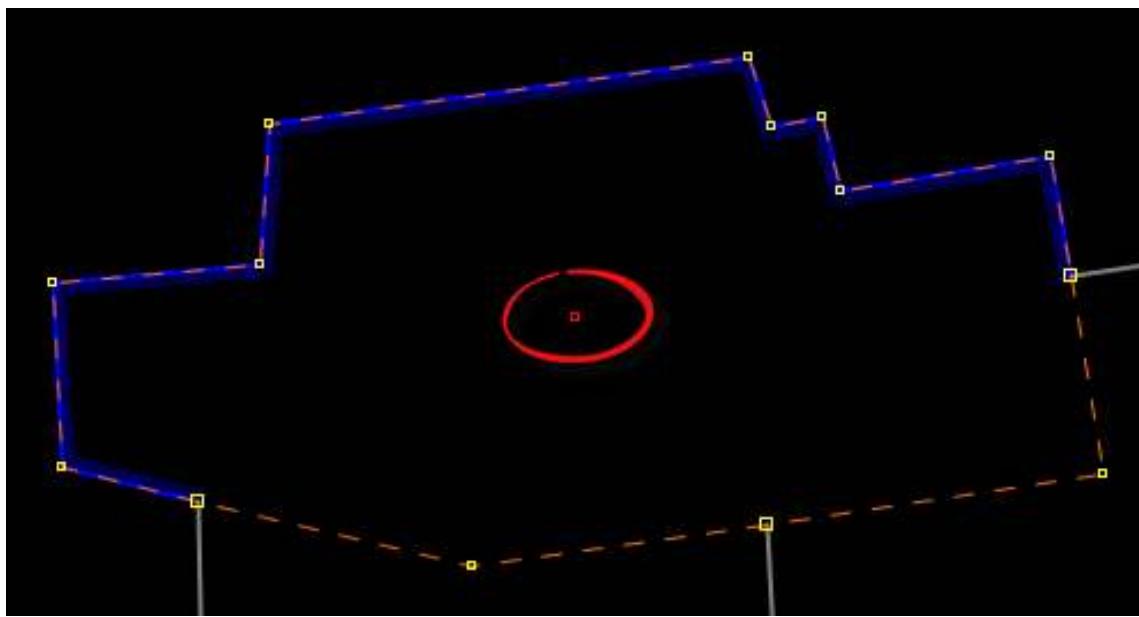
The boundary administrative with coastline

In this case, the tag given is different, where you need to add **key=natural** and **value=coastline**, then remove for tag **key=note**. To add the tagging, click on\*\* Menu Presets → Perairan → Natural → Garis Pantai\*\*.



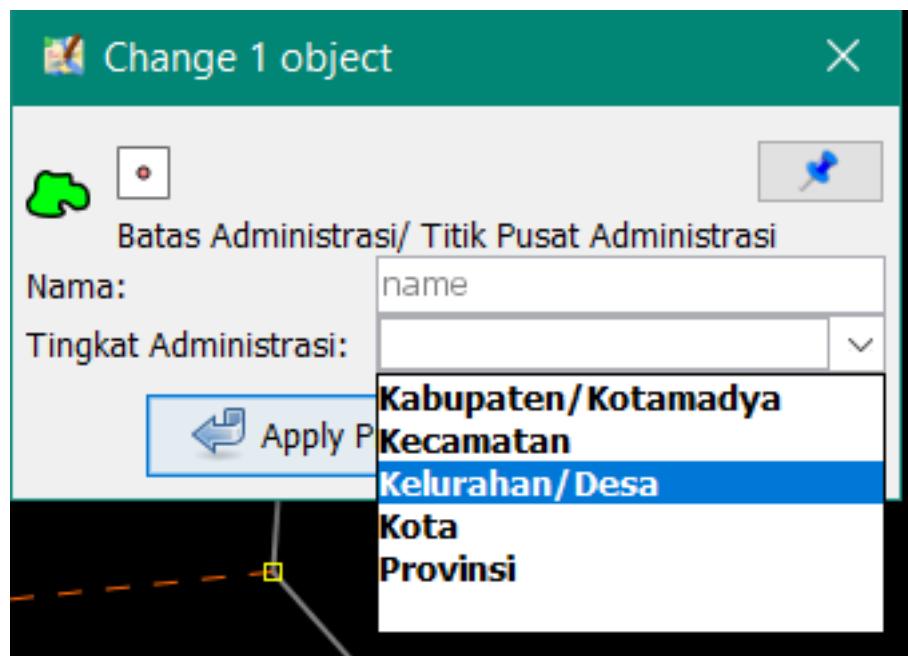
The boundary between line and coastline

- After the segments have tagged in Desa A. Let's draw a node as administrative centre from Desa A.



Digitize a node in Desa A

- Add the presets for the object with Presets Menu → Batas Administrasi → Titik Pusat Administrasi. Fill the properties with the village name according to the admin level.



Add tags in point of village

- The result should be like this:



The result for the village name

#### c. Create Relations Administrative Boundary (example: Desa/Village)

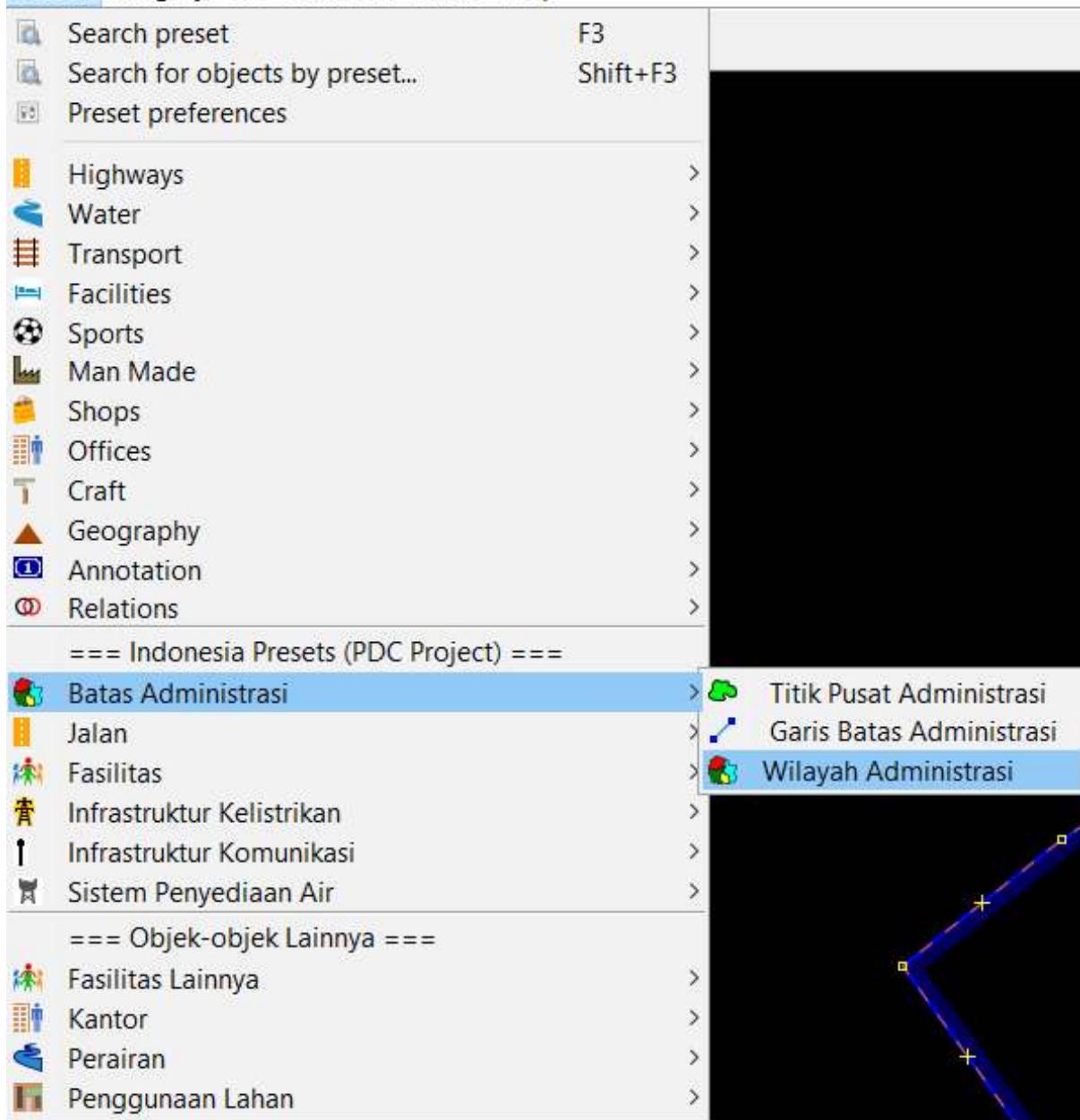
- Next step we will create a relation to the administrative boundary in Desa A. Use the **Select Tool** to select all segments in lines and node in the area Desa A.



Select all lines and point in Desa A

- Add presets for the relations with click on **Presets Menu → Batas Administrasi → Wilayah Administrasi**

Presets Imagery GPS Windows Audio Help



#### Presets for relation tag

- The preset window above should appear. Assign the administrative name (example: Village A), and on the boundary type column select Administrative, and on Administrative level column, select according to the level of administration (example: Village -. Level of Administration = 7). If you find the sign v in the row, please click on it and drop down the row. Click on **New relation** to create a new relation.

Change 0 objects X

+ New Edit Delete

Batas Administrasi/Wilayah Administrasi

Nama:	Desa A
Tingkat Administrasi:	Kelurahan/Desa <span style="float: right;">▼</span>
Provinsi:	Daerah Istimewa Yogyakarta
Kota:	Gunung Kidul
Kecamatan:	Gedangsari
Kelurahan/Desa:	Hargomulyo
Banjir:	Tidak <span style="float: right;">▼</span>
Longsor:	Ya <span style="float: right;">▼</span>
Sumber Data:	Survey_OSM_LSM

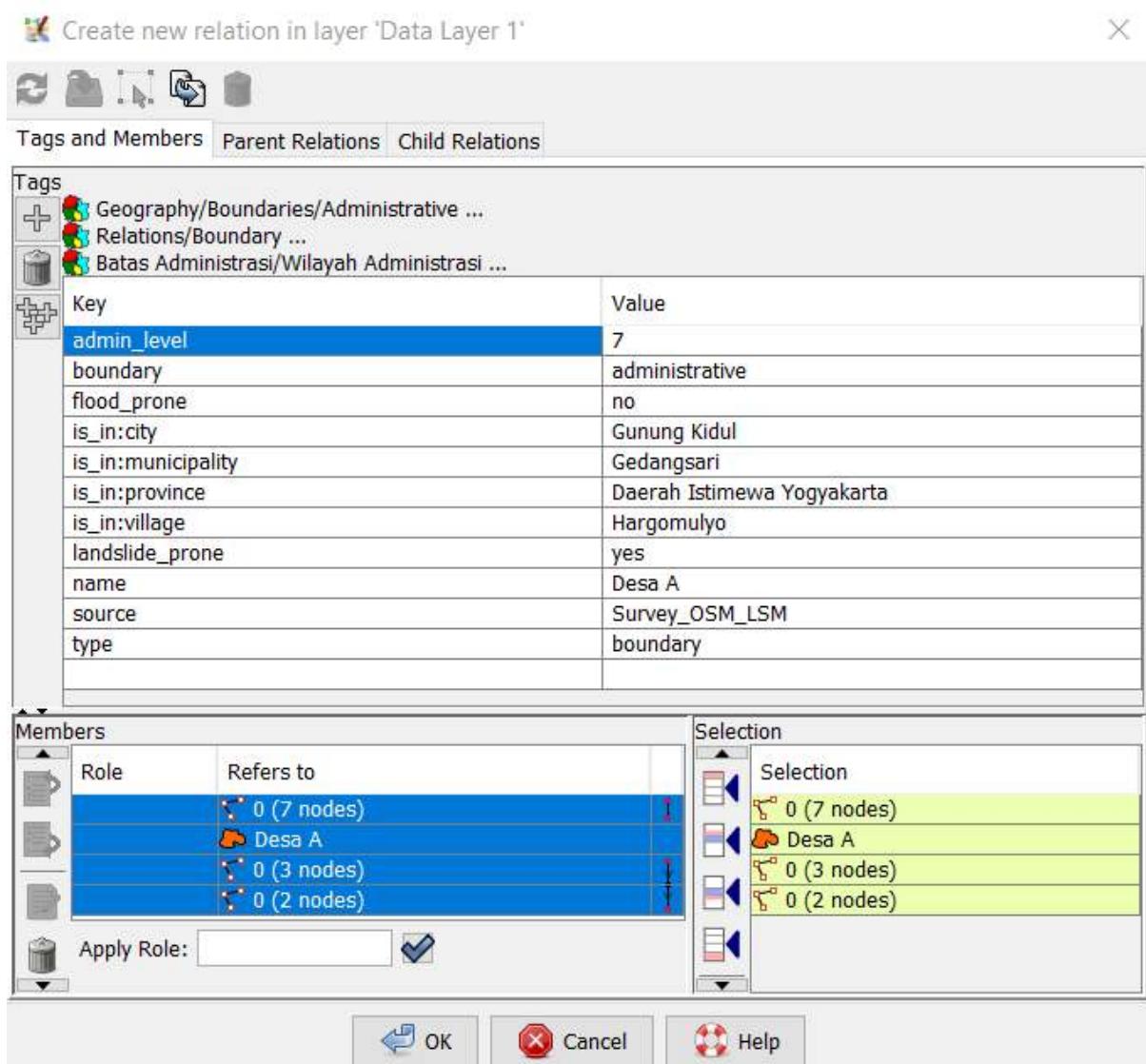
  

Available roles	role	count	elements
outer segment:	outer	1...	
inner segment:	inner	0...	
Sub area:	subarea	0...	
Administration centre:	admin_centre	0,1	
Label point:	label	0,1	

Apply Preset
+
 New relation
 Cancel

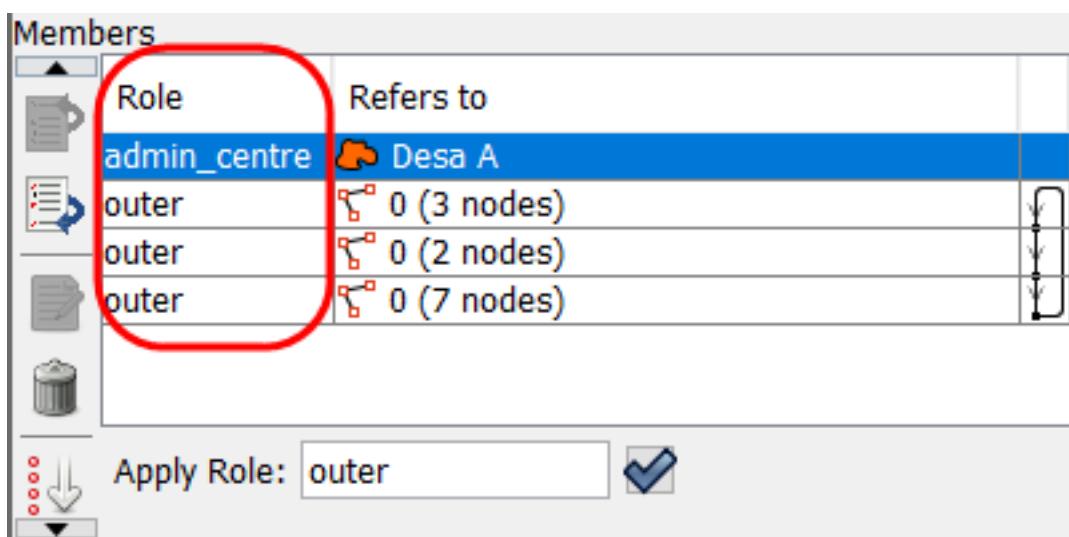
The list the relations tag administrative boundary

- A new relation window should appear:



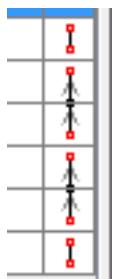
New relation window

- Check on the Role. After relation member Desa A is complete, we can determine the **role** of each member. The line segments Desa A have a role as “**outer**” or an outline from the administrative boundary. Also, add the role to node Desa A with “**admin\_centre**”.



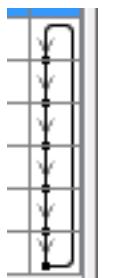
The role of each member

- Ensure the member list of the administrative boundary in order. If it is not ordered, it looks like here:



To organize the line segments, click the **Sort the relation members** icon

- After the line segments are in the correct order, the lines in the right hand side of the window should look like this:



- After assigning the role of each relation as well ensuring the list of administrative boundaries are in order, click **OK**.
- Check on the geometry relation in the data layer with a double-click on the area Desa A. The right relation will be shown in purple color.



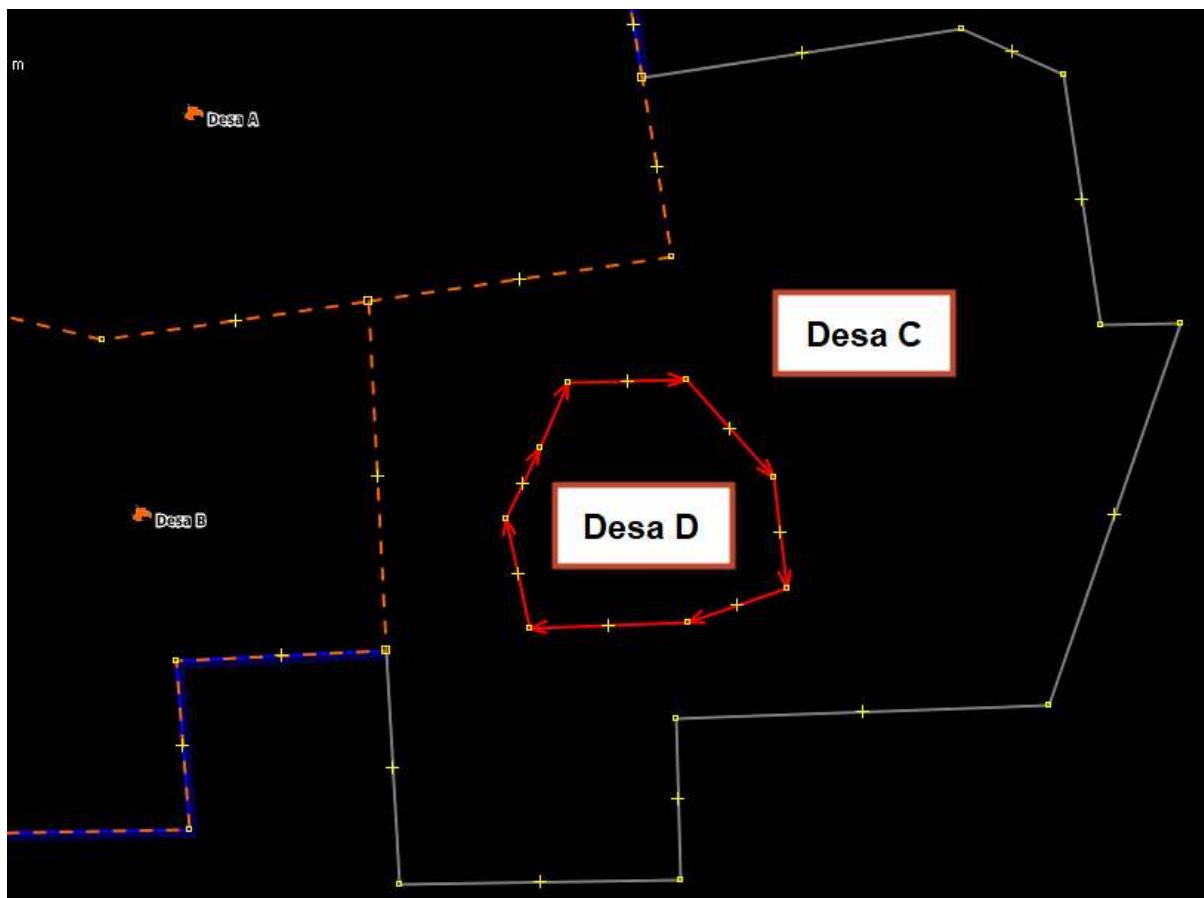
Relation of Desa A/Village A

- Please follow step by step the same with before to create a relation of Desa B/Village B. If you are successful, the result like an image below:



Desa B Area

- Add a new village in your relation boundary, we can named with Desa D/Village D. The village inside the area Desa C



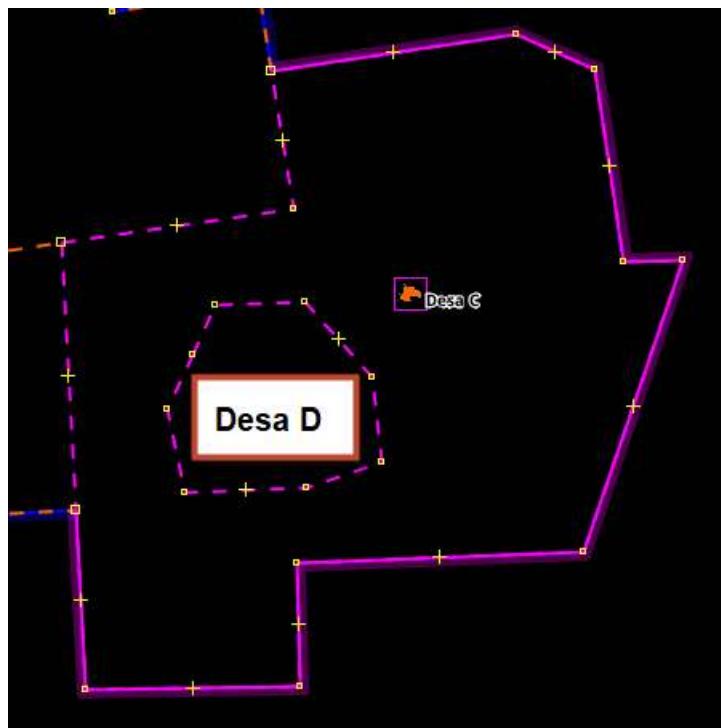
### Add new administrative boundary Desa D

- After assigning relation members of Village C, assign the roles of each relation members.
- Line segments of the **outer layer** of Village C (boundary lines between Village C/A, boundary lines between Village C/B, and boundary lines between Village C/Ocean) -> acts as the “**outer**” boundaries of the administrative area.
- Line segments of the **inner layer** of Village C (boundary lines between Village C/D) -> acts as the “**inner**” boundaries of the administrative area.
- Centre point of Village C -> assign as “**admin\_centre**”

Members		
	Role	Refers to
	admin_centre	Desa C
	inner	0 (10 nodes)
	outer	0 (9 nodes)
	outer	0 (4 nodes)

### The setting of relation Desa C

- Click on icon **Sort the relation members**, to ensure the list of relation members are in order
- Now Double-click in administrative boundary Desa C. If the relation has been made, the area of Desa C should appear purple color like below:



### The result of relation Desa C

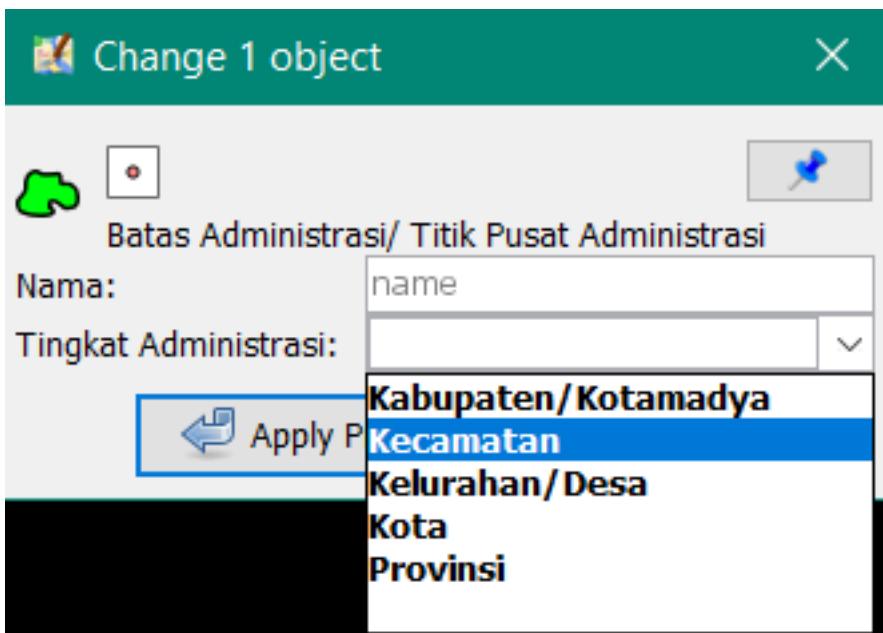
- After creating administrative boundaries for Village C, continue creating boundaries for Village D. **Follow the same steps from Assigning Tags on Administrative Boundaries until Creating Relations of Administrative Boundaries.** The end result should look like this:



The result of relation Desa D

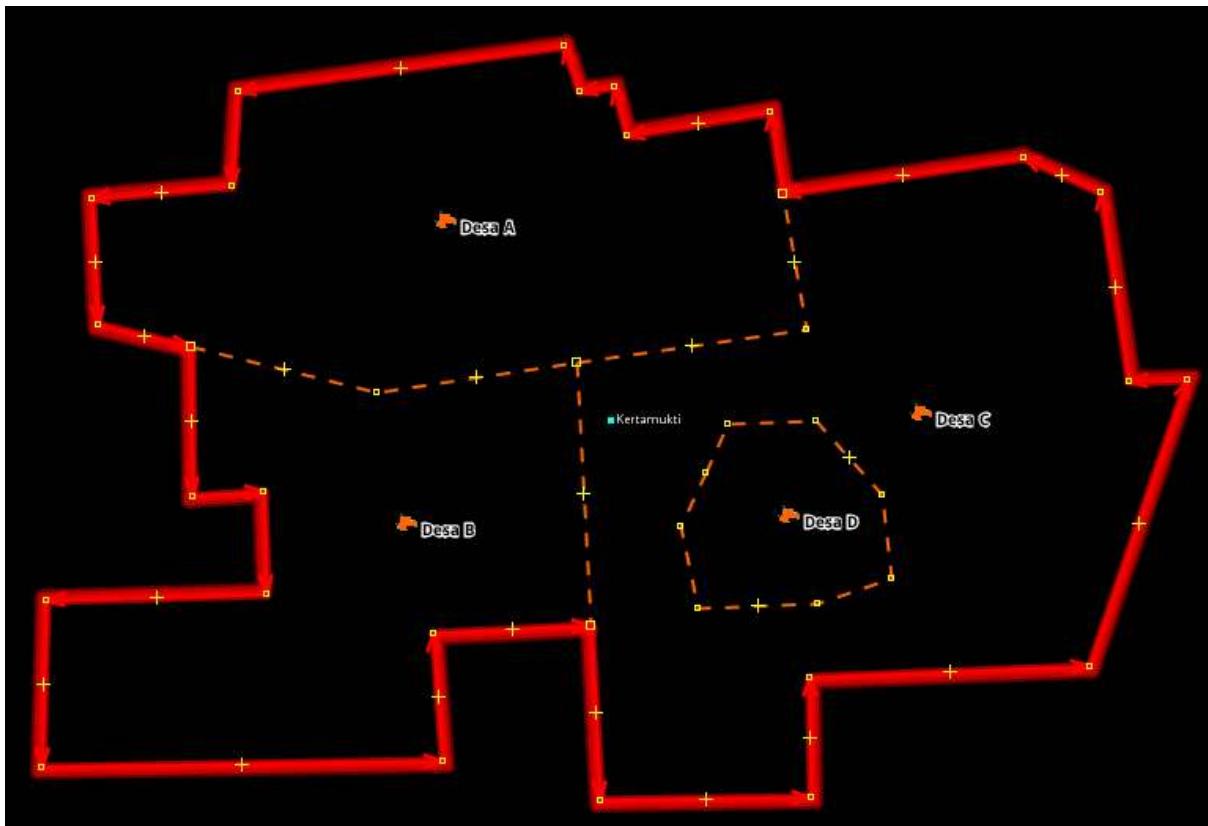
d. Creating the relation of the administrative boundaries (example: Municipality)

- In this section, we will create a boundary in the up-level from the village. The step will be the same to create the relation of the village boundary.
- Let's create a point of administrative centre in Kecamatan Kertamukti, and assign a tag: Click on Preset Menu → Batas Administrasi → Titik Batas Administrasi



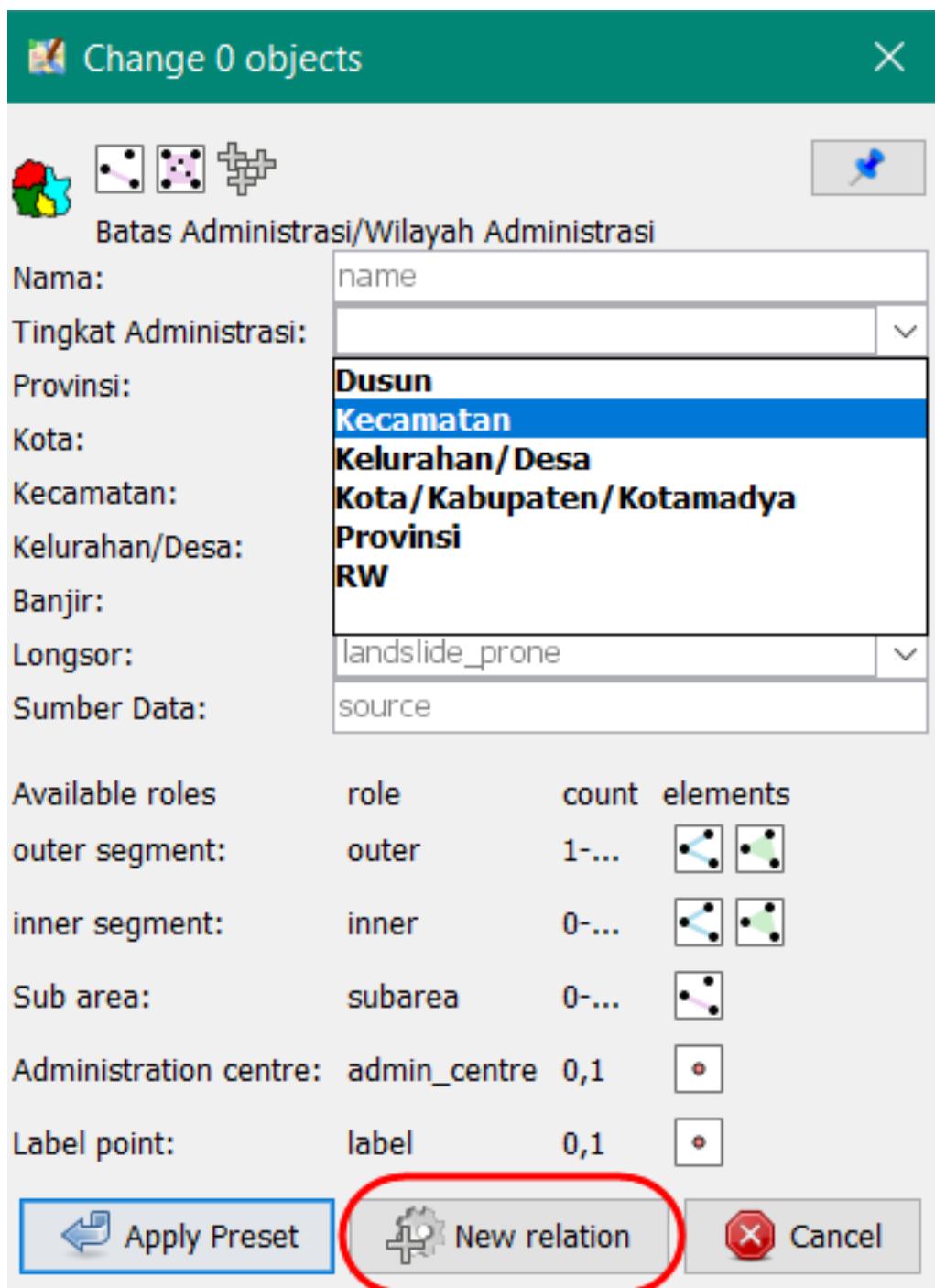
Tagging on admin centre municipality

- Select all segments in an administrative boundary to create a new relation.



Select all lines outer and node of municipality boundary

- Add tagging with click on **Presets Menu** → **Batas Administrasi** → **Wilayah Administrasi**. Please fill the name of municipality, admin-level, and do not fill “Kecamatan”



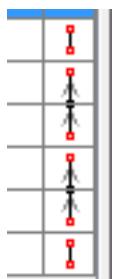
The lists preset of municipality boundary

- We will determine the role of relation members. All segments in Kertamukti municipality (Kecamatan Kertamukti) has a role as outer and the point of the municipality name has a role as admin\_centre.

Members		
	Role	Refers to
admin_centre	admin_centre	Kertamukti
outer	outer	0 (7 nodes)
outer	outer	0 (11 nodes)
outer	outer	0 (6 nodes)

The role of relation member

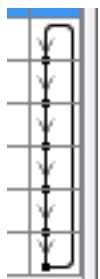
- Ensure the member list of the administrative boundary in order. If it is not ordered, it looks like here:



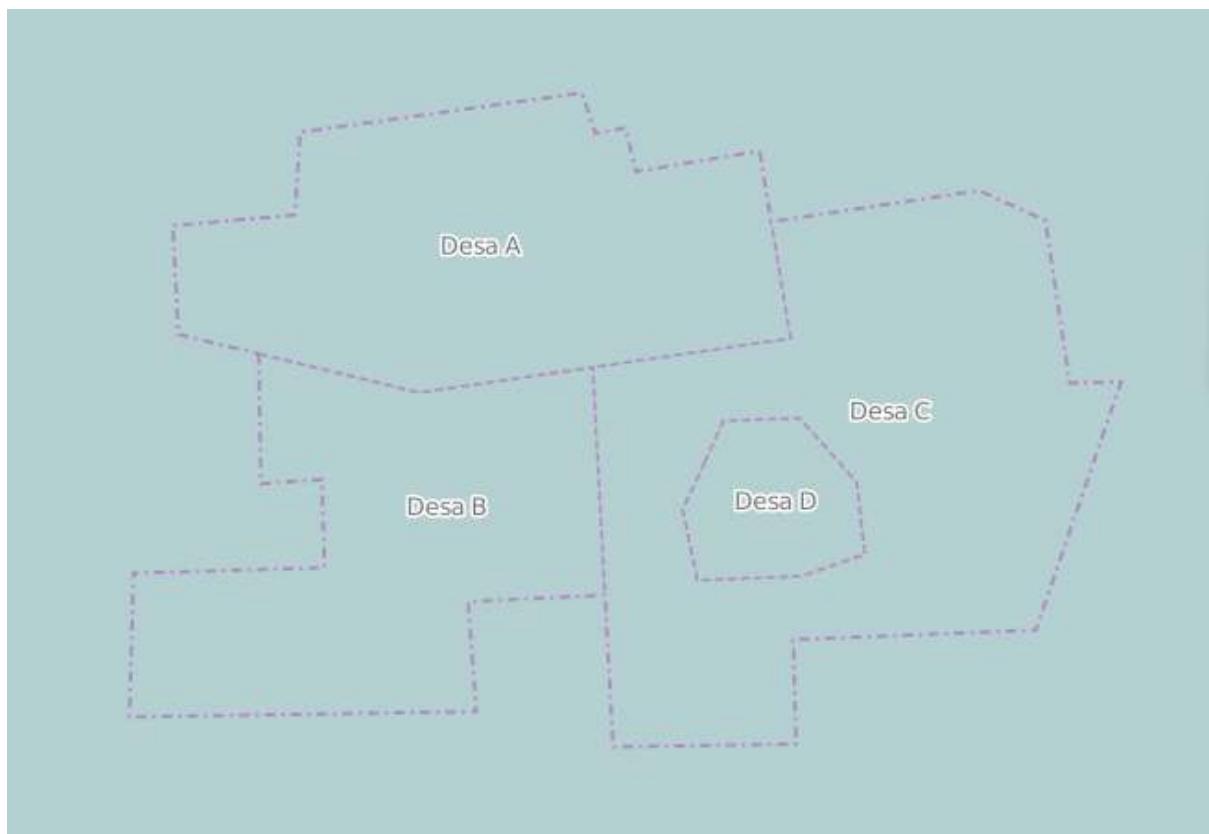
To create the segments in order, click on button **Sort the relation members**



- If the member list of the administrative boundary in order, it looks like here:



- Click **OK**.
- If you need to create the administrative boundary in up-level such as the city and province, you can do the same ways. The different way to add tags on relations and admin centre.
- The result will appear in [www.openstreetmap.org](http://www.openstreetmap.org)



Example the administrative boundary in OSM

## SUMMARY

You have learned about activities to create administrative boundaries with relation concepts in JOSM. A relation is a group of elements. To be more exact, it is one of the core data elements that consists of one or more tags and also an ordered list of one or more nodes, ways and/or relations as members which is used to define logical or geographic relationships between other elements. You can download the administrative boundary in polygons using the Export Tool.

# Converting Shapefile Data to GeoJSON

## Objectives:

- To be able to understand the definition of GeoJSON data
- To be able to convert shapefile to GeoJSON with QGIS
- To be able to download GeoJSON from Overpass Turbo
- To be able to convert shapefile to GeoJSON using GeoData Converter

If you do not have an educational background in geography or you are not too familiar with Geographic Information Systems (GIS), then this GeoJSON format may sound familiar to you. However, you do not need to worry about that because getting spatial data with GeoJSON format is not as difficult as you think. GeoJSON can be obtained by changing or converting from spatial data that you already have such as shapefiles, keyhole markup language (.kml) or GPS results, .gpx. In this module you will learn the definition of GeoJSON data and several tools that can help you to convert spatial data especially shapefiles into GeoJSON format.

## I. The definition of GeoJSON data

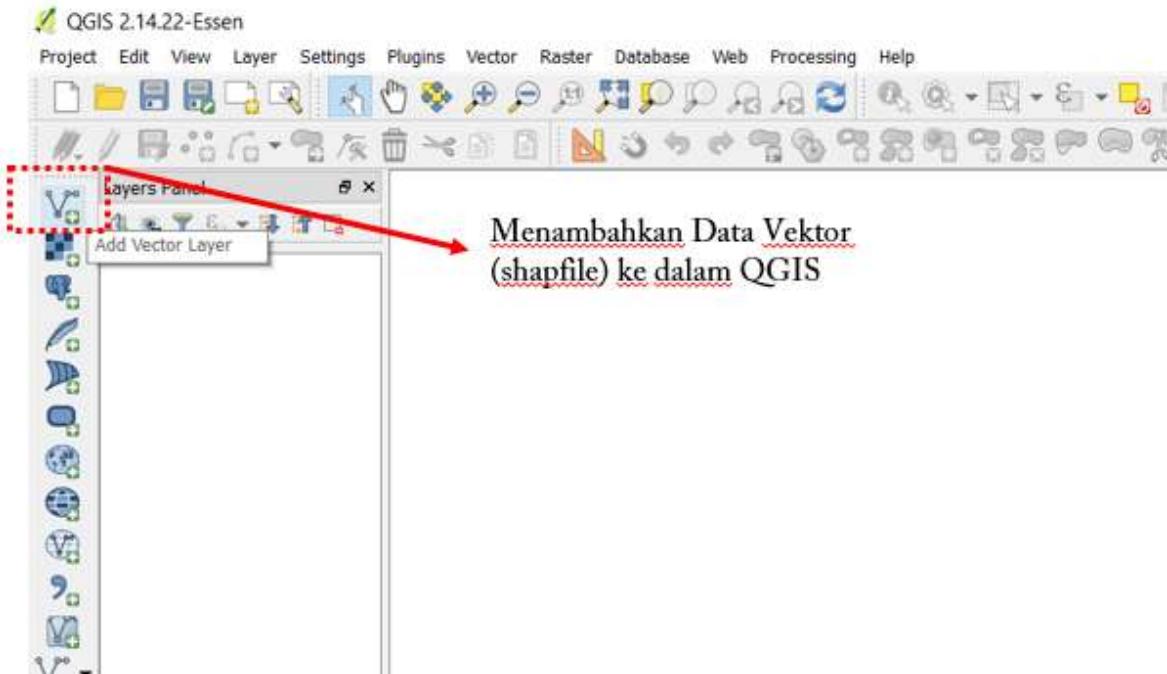
GeoJSON, which is a modification of Java Script Object Notation (JSON), is a simple spatial data format. Unlike other spatial formats such as shapefiles, GeoJSON displays spatial shapes of data with a smaller size but still carries attribute information from the data.

GeoJSON can be a point (point), line (line), area (polygon) which can represent an object on the surface of the earth. Because of its simple nature and is a modification of a program language, GeoJSON is more often used for web-based Geographic Information Systems (GIS) processing or sites that use GIS to visualize spatial data such as Mapboxes, Leaflets, OpenLayer and even some sites provided by the Humanitarian OpenStreetMap Team (HOT) such as HOT Export, Tasking Manager and Map Campaigner.

## II. Converting shapefile to GeoJSON using QGIS

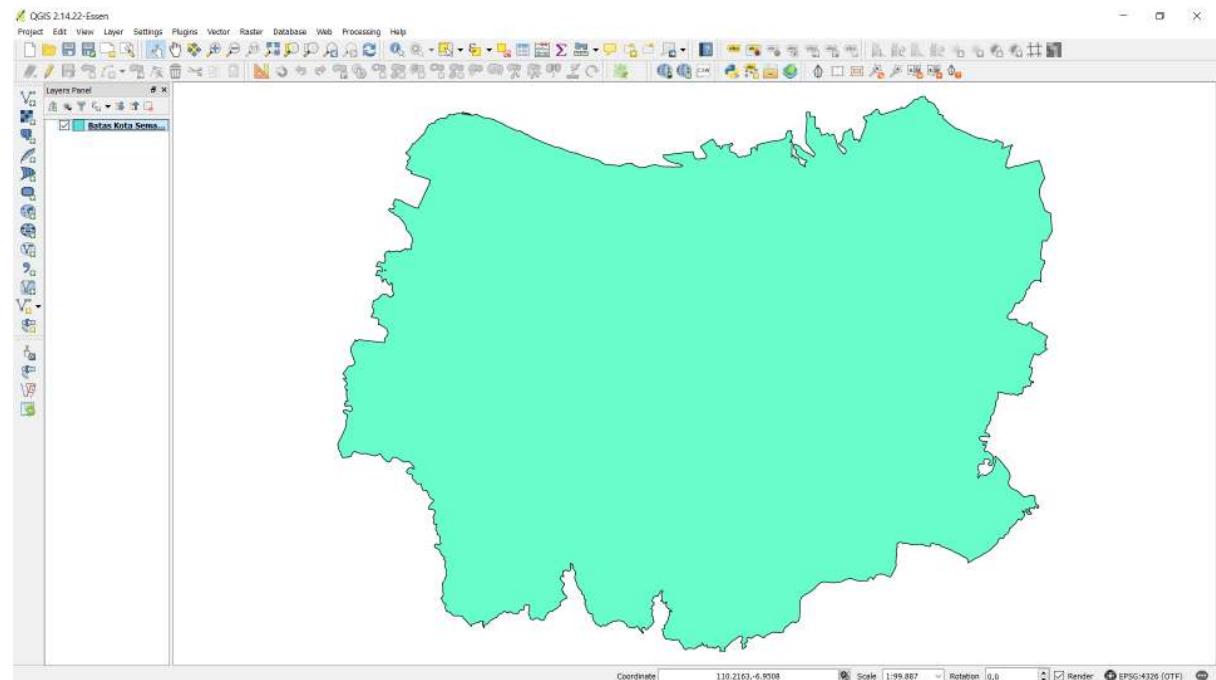
By using QGIS, you can convert shapefile data from both OpenStreetMap (OSM) data and your own spatial data that you have previously had. However, before converting shapefile data you need to download QGIS software on your laptop or computer. You can see the guidelines to download QGIS in **Creating Field Maps using QGIS** module. If you have successfully installed QGIS, please follow the steps below:

- Open QGIS and select **Add Vector Layer** to add your shapefile data to QGIS.



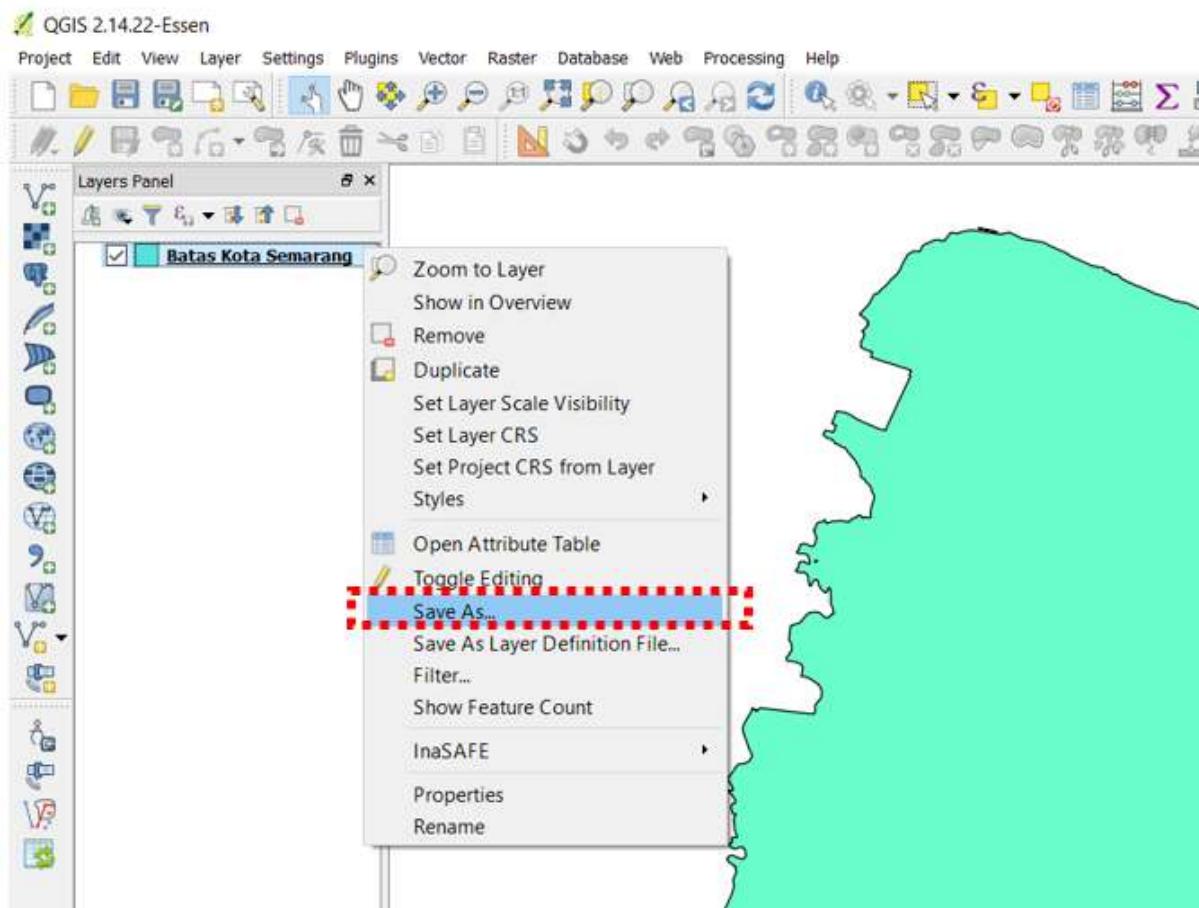
#### Adding shapefile data into QGIS

- Then find and open the shapefile data that you want to convert to GeoJSON in QGIS by clicking **Browse → Open**.



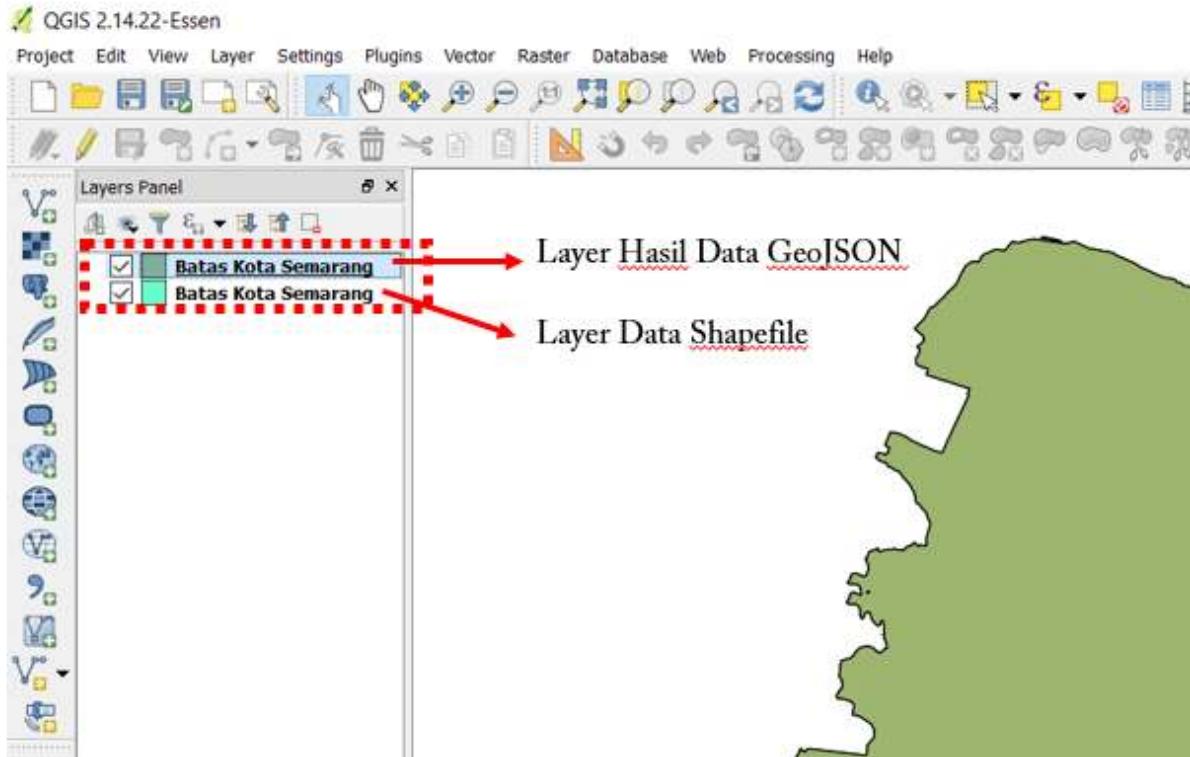
#### The display of shapefile data in QGIS

- Right-click on the shapefile data layer then select **Save As...**



#### Option for shapefile data conversion

- You should see a window and make sure you set it as the picture below:
- [The conversion settings from shapefile to GeoJSON](en/images/06-OSM-Field-Survey-Manager-Guidelines/10-Konversi-Data-Shapefile-ke-GeoJSON/1004\_pengaturan\_geojson\_di\_qgis.png) (The conversion settings from shapefile to GeoJSON)
- **Format:** Choose **GeoJSON** format
- **Save as:** The place in your directory to save GeoJSON data
- **CRS :** Coordinate reference for GeoJSON data result
- **Add saved file to map:** Adding GeoJSON data into QGIS after conversion process finished.
- After that, then click **OK** and you have successfully converted GeoJSON data that will appear in QGIS.



The display of GeoJSON conversion result in QGIS

### III. Downloading GeoJSON Data using Overpass Turbo

If you do not want or can not install QGIS on your laptop / computer but still need to convert data formats to GeoJSON from OpenStreetMap data, Overpass Turbo can be a solution. Overpass Turbo is a website created by OpenStreetMap contributors which allows users to get several spatial data formats from OpenStreetMap including GeoJSON. Please follow the steps below to get GeoJSON from Overpass Turbo website:

- Please open your internet browser then go to the link URL <https://overpass-turbo.eu/>

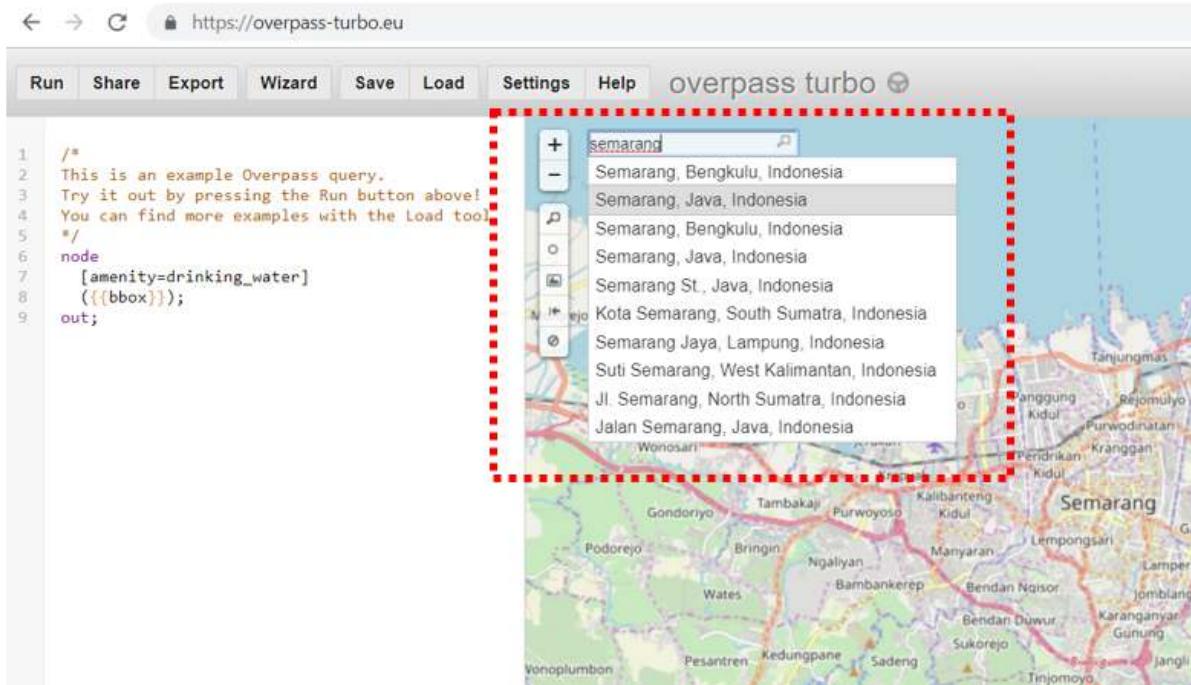
```

1 /*
2 This is an example Overpass query.
3 Try it out by pressing the Run button above!
4 You can find more examples with the Load tool.
5 */
6 node
7 [amenity=drinking_water]
8 [((bbox))];
9 out;

```

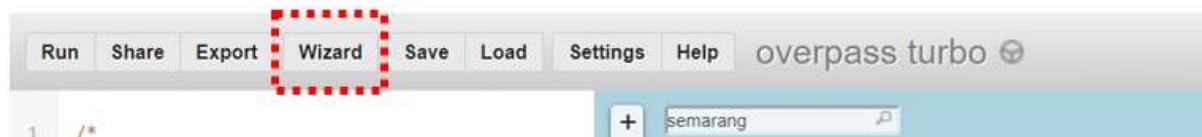
## Overpass Turbo site

- After that, please find the area that you want to download by typing the name of the area in the search box or you can also adjust the map display by zooming in and out the map using '+' and '-' buttons.



## Area search option in Overpass Turbo

- After you found the area, then please select the **Wizard** menu at the top of the Overpass Turbo site.



## Wizard menu wizard in Overpass Turbo site

- After that, type the **query** about the data that you want to get. The query is a tag that has a key and value based on the OpenStreetMap standard. If you do not already know about tags, keys and values, you should refer to **OpenStreetMap Data Model** module. For example, you want to take the administrative boundary of Semarang city so you can write "**admin\_level = 5 and name = Semarang**" in the Query Wizard and click build and run query.

## Query Wizard

admin\_level=5 and name=Semarang

The **wizard** assists you with creating Overpass queries.  
Here are some usage examples:

- Drinking Water
- highway=\* and type:way
- tourism=museum in Vienna

**build query**

**build and run query**

**cancel**

### Query Wizard in Overpass Turbo site

- After that, query result will appear in Overpass Turbo.

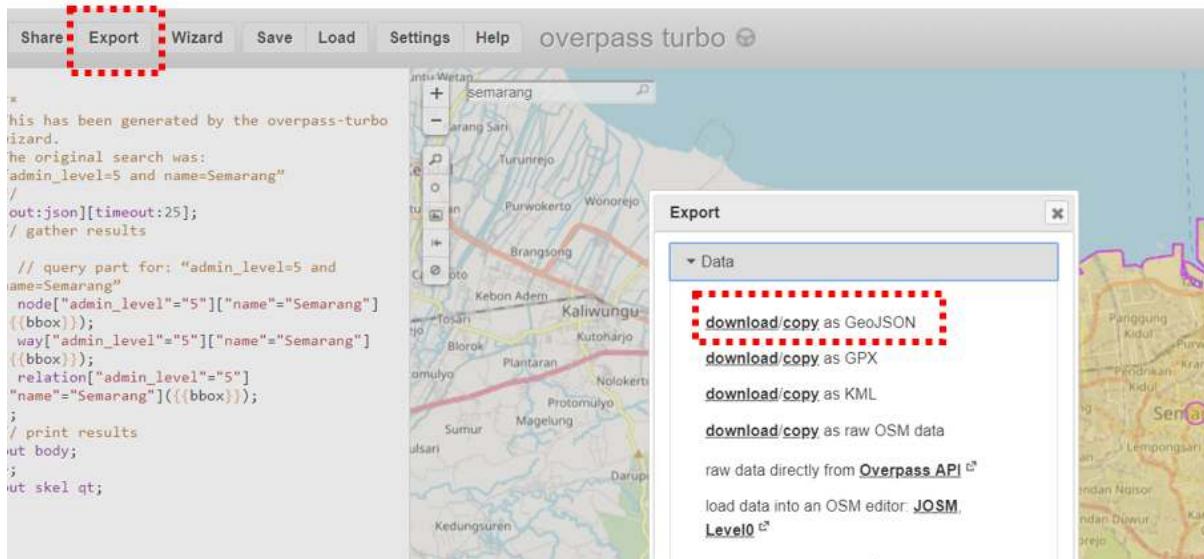
```

1 /* This has been generated by the overpass-turbo
2 wizard.
3 The original search was:
4 "admin_level=5 and name=Semarang"
5 */
6 [out:json][timeout:25];
7 // gather results
8 (
9   // query part for: "admin_level=5 and
10   // name=Semarang"
11   node["admin_level"]="5"]["name"]="Semarang"
12   (bbox());
13   way["admin_level"]="5"]["name"]="Semarang"
14   ((bbox()));
15   relation["admin_level"]="5"
16   ["name"]="Semarang"((bbox()));
17 );
18 // print results
19 out body;
20 >;
21 out skel qt;

```

### Query wizard result of Semarang administrative boundary

- After the query result appear, click **Export** in Overpass Turbo menu then click **download/copy as GeoJSON**.



GeoJSON format export option in Overpass Turbo

#### IV. Converting shapefile to GeoJSON using GeoData Converter

If you want to change your own shapefile data instead of OpenStreetMap data then you do not want or can not install QGIS on your laptop / computer, then you can use one of the sites on the internet that provides shapefile data to GeoJSON conversion functions such as GeoData Converter. To do the conversion on this site, please follow the steps below:

- Please open your internet **browser** then go to the link URL <https://mygeodata.cloud/converter/shp-to-geojson>

**Convert SHP to GeoJSON Online**  
Enjoy fast and easy to use online converter for geospatial data!

Upload your SHP File and Convert

Drag & Drop files here...  
Or browse files to convert

Please note that **your data will not be shared to anybody** without your intervention.

**Conversion from SHP to GeoJSON**

Upload your SHP data (widely used in software like ESRI ArcGIS and ArcView) and convert them by one click to GeoJSON (JSON) format (widely used in software like MongoDB, GeoServer, CartoWeb and FeatureServer).

**Notice to SHP format** - do not forget to upload also associated .dbf and .shx files (and if available also .prj and .cpg files).

**About MyGeodata Converter**

Our online converter of ESRI Shapefile format to JavaScript Object Notation format (SHP to GeoJSON) is fast and easy to use tool for both individual and batch conversions. Converter also supports more than 90 others vector and rasters GIS/CAD formats and more than 3 000 coordinate reference systems. If the coordinate system of your input data is not present or not recognized correctly, it is possible to assign the correct one. Then it is possible to **transform your data to any other coordinate reference system**.

Files can be uploaded by multiple selection or you can pack them to any supported format (ZIP, RAR, 7Z, TAR, GZIP). **If the input format is directory-based, it is necessary to pack whole directory - not only the content.**

**Supported coordinate reference systems**

MyGeodata Converter supports **more than 3 000 coordinate systems** - including:

- WGS 84
- ETRS89 / LAEA Europe
- ETRS89 / UTM zone 30N (N-E)
- ETRS89 / UTM zone 29N
- MGI / Austria Lambert
- GDA94 / MGA zone 54
- GDA94 / MGA zone 55
- RGF93 / Lambert-93
- WGS 84 / UTM zone ...
- ED50 / TM27
- Amersfoort / RD New
- Pulkovo 1942 / Gauss-Kruger
- S-JTSK / Krovak
- NAD27
- NAD83
- Pseudo-Mercator, Spherical Mercator, Google Maps, OpenStreetMap, Bing

The display of MyGeoData Converter site

- Add your shapefile data in the Upload box by clicking **Or browse file to convert** then select + Add Files..

**Convert SHP to GeoJS**

Enjoy fast and easy to use online converter

Upload your SHP File and Convert

Drag & Drop files here...

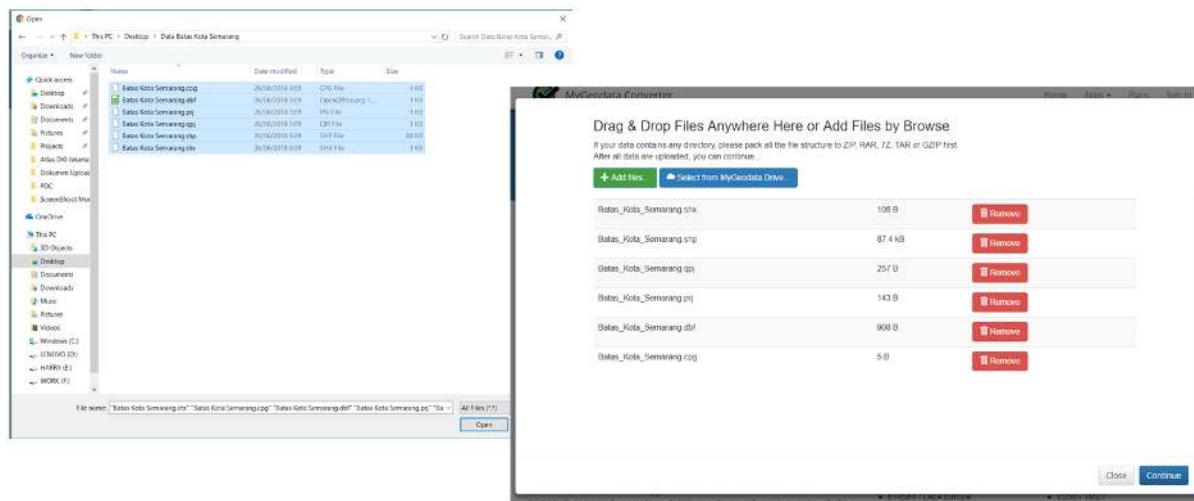
Or browse files to convert

Please note that **your data will not be shared to anybody** without your intervention.

Conversi  
Upload your SHP  
convert them by c  
MongoDB, GeoSe  
**Notice to SHP fo**  
files (and if availat

The box to upload shapefile data

- You need to know when uploading shapefile data, do not forget to include all the associated files with your shapefiles such as .dbf and .shx files so that your shapefile data can be converted perfectly. So, make sure you have selected all the files like the example below:



The result of adding shapefile data into Geodata Converter site

- Then, click **Continue** and you will see a confirmation box for the shapefile data that you want to convert. Make sure the **Output Format** is GeoJSON then click **Convert Now!**

The screenshot shows the MyGeodata Converter interface. It is divided into three main sections:

- 1. Input Data**: Shows a list of selected datasets, including "Batas\_Kota\_Semarang". It also displays the selected dataset count (1) and volume (88.6 kB).
- 2. Output Data**: Set to "GeoJSON". It includes "Output parameters" like "Coordinate system: (the same as input)" and a checkbox for "Merge output files".
- 3. Conversion**: A map titled "Layers Extent Overview Map" showing the area of the selected dataset. Below the map are two buttons: "Show in a Map" and "Convert now!".

The summary window before starting the conversion

- After that, click **Download** in the appeared window. The GeoJSON data result will be automatically downloaded to your laptop/computer.

The screenshot shows the "Conversion Result" window. It contains the following information:

Your data were converted

- Output format: **GeoJSON**
- Output coordinate system: **+proj=longlat +datum=WGS84 +no\_defs**
- Total files: **1**
- Total size: **181.57 kB**

A large green "Download" button is prominently displayed at the bottom.

Window to download GeoJSON conversion result

**SUMMARY** You have learned about spatial data with GeoJSON format and also know how to convert shapefile data to GeoJSON by using several tools such as QGIS, Overpass Turbo, and GeoData Converter. You can use all of these tools according to your needs and the availability of shapefile data that you have. Your GeoJSON data can be used as visualization on WebGIS or sites that can display spatial data such as Mapbox, Leaflets, HOT Export and Tasking Manager.

# Resolving Conflict on OpenStreetMap Data (OSM)

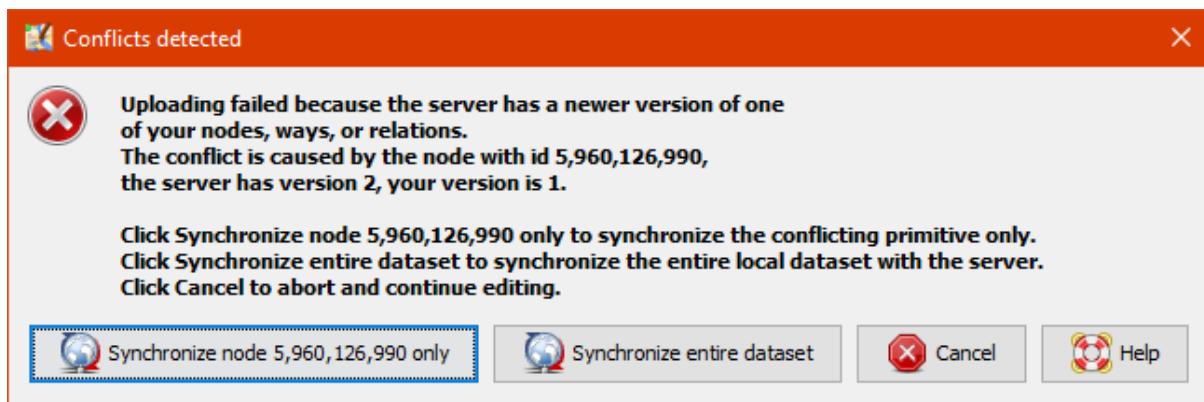
## Objectives:

- 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

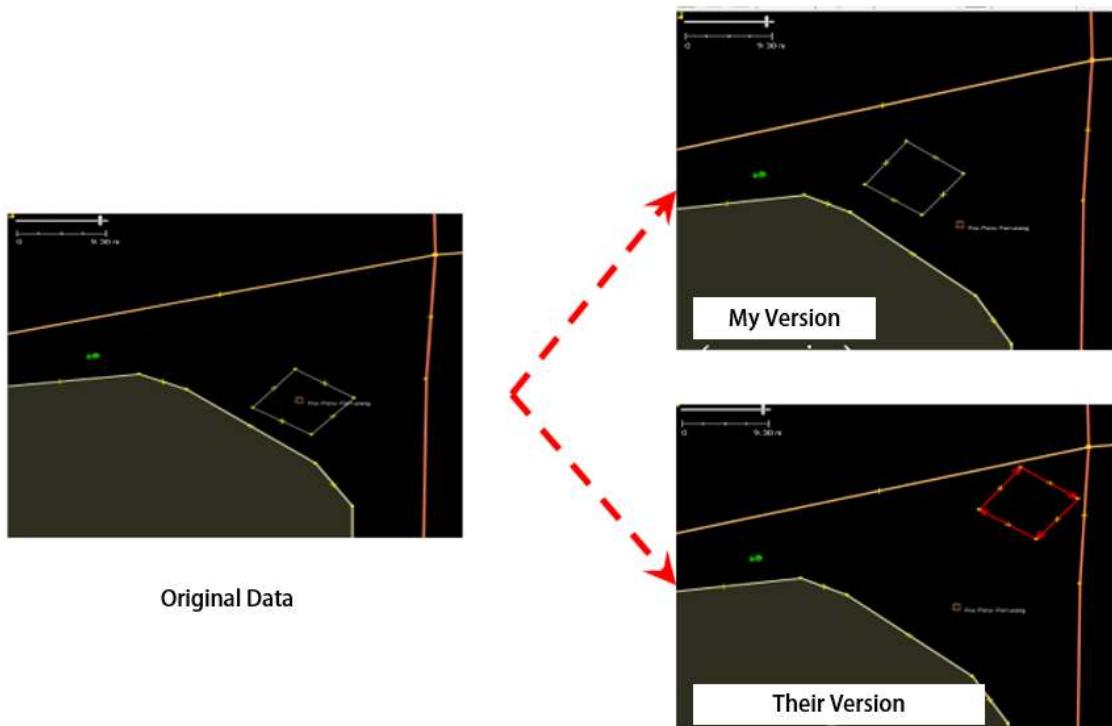
When you have edited your changes and were uploading them in JOSM (learn more about this in [Using JOSM](#) module), maybe you ever received a message like this:



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.



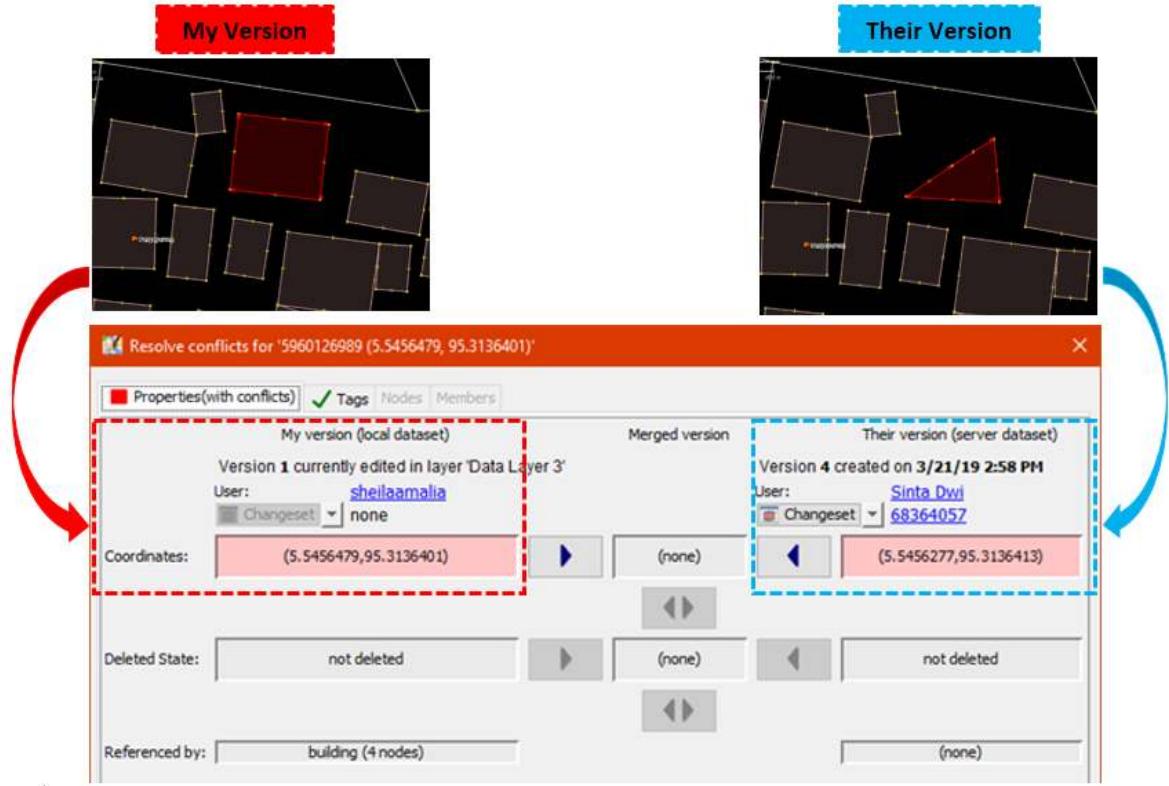
#### Example why conflict happens in JOSM

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

### a. 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.

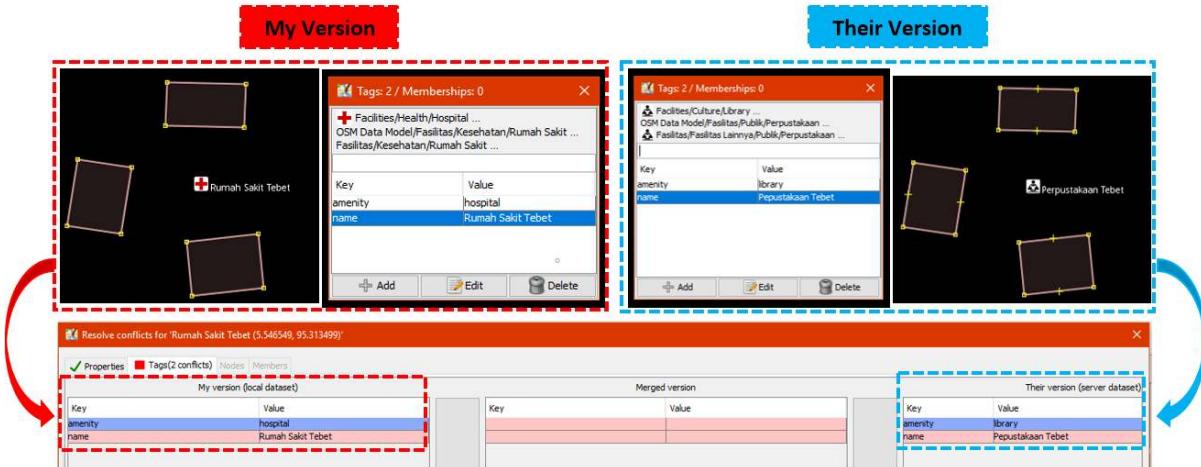


#### Conflict Property Window

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.

#### b. 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.

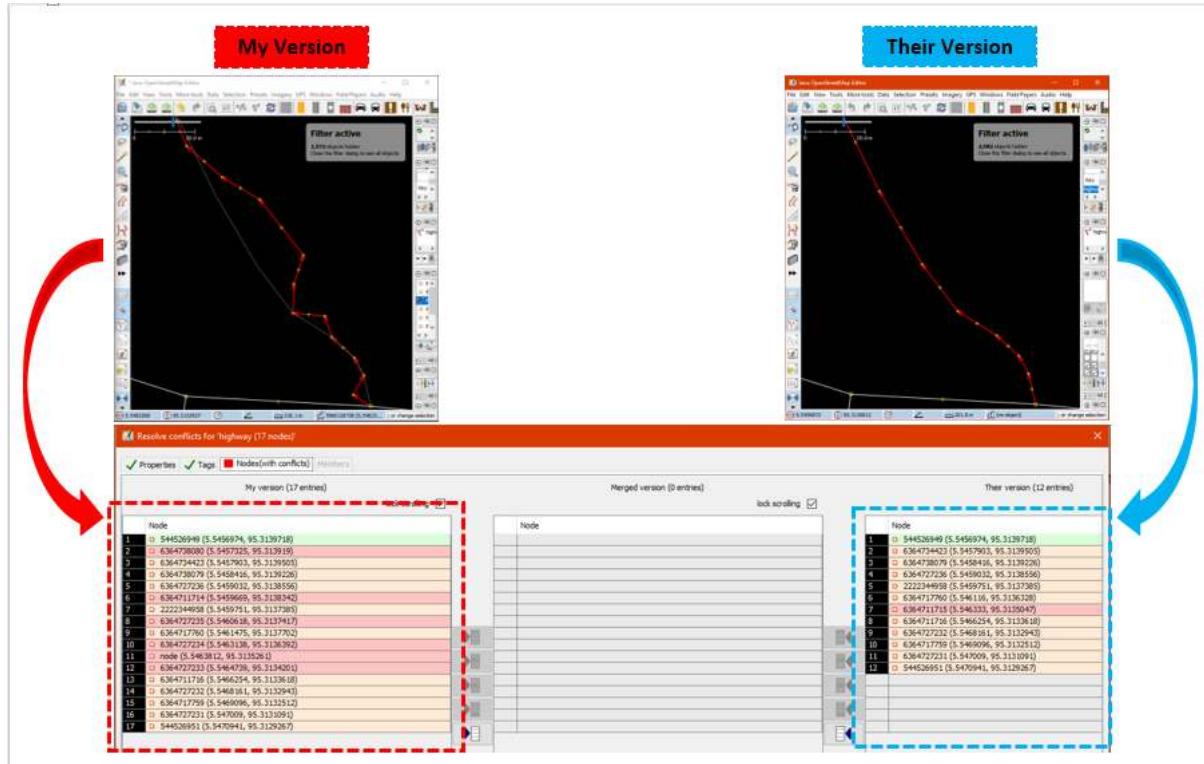


#### Conflict of Tag in JOSM

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.

### c. 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.

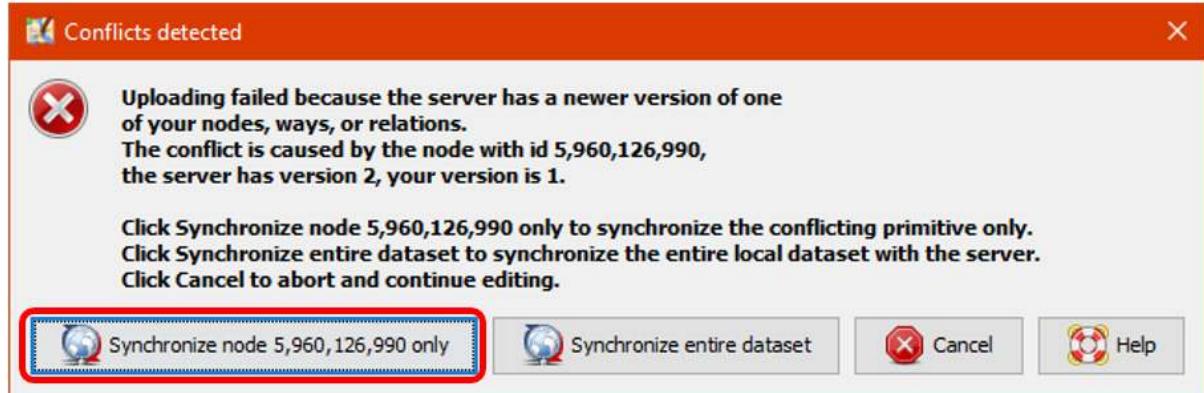


Conflict of Nodes in JOSM

### III. Fix Conflict Data in JOSM

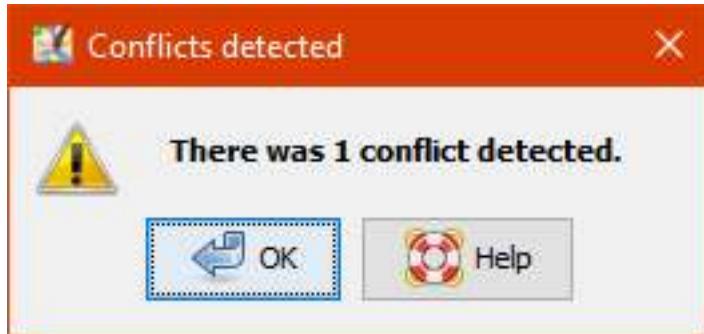
Fixing conflict data in JOSM is quite simple, even though most OSM contributors would have some confusion to do it. Generally, every data conflict fixing in JOSM asks you to choose the correct changes between your version and the other version that have uploaded to the server (their version). You have 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.



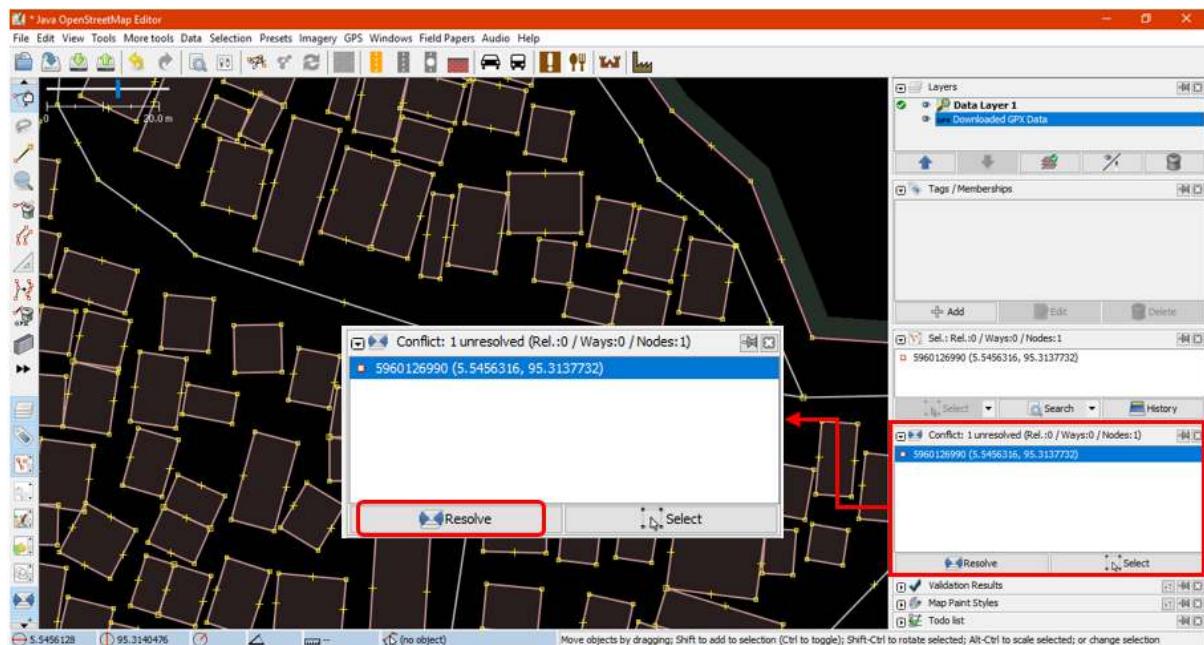
Conflict Detection Window in JOSM

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



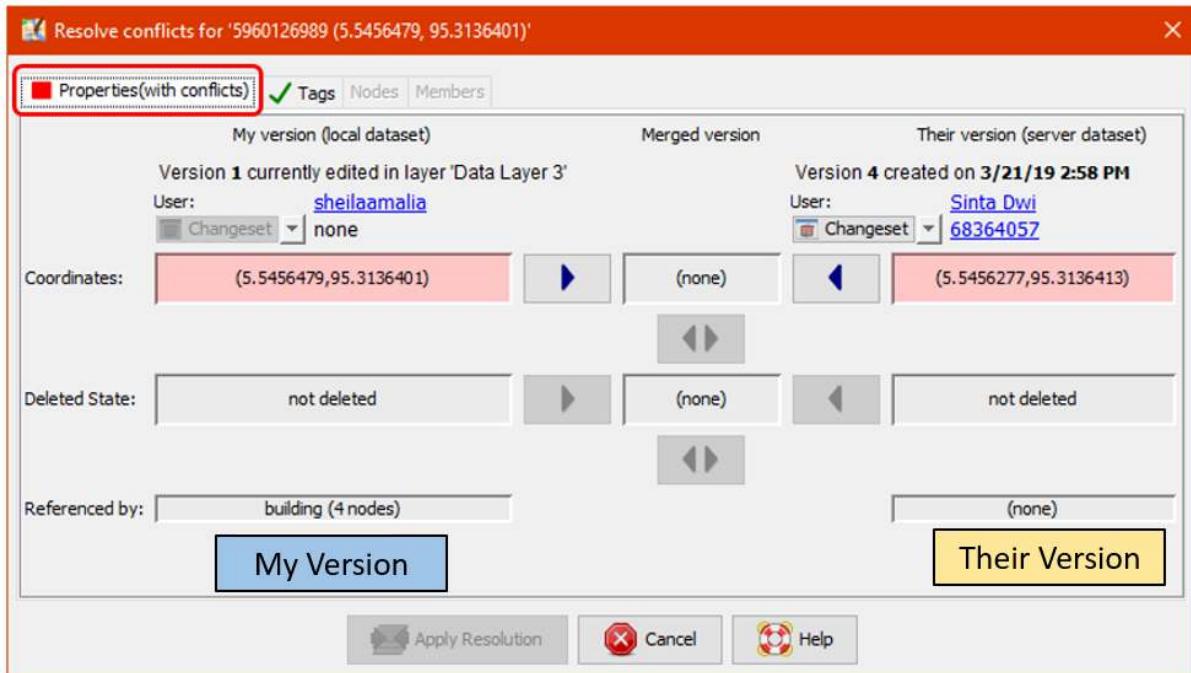
Number of detected conflict

- 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**.



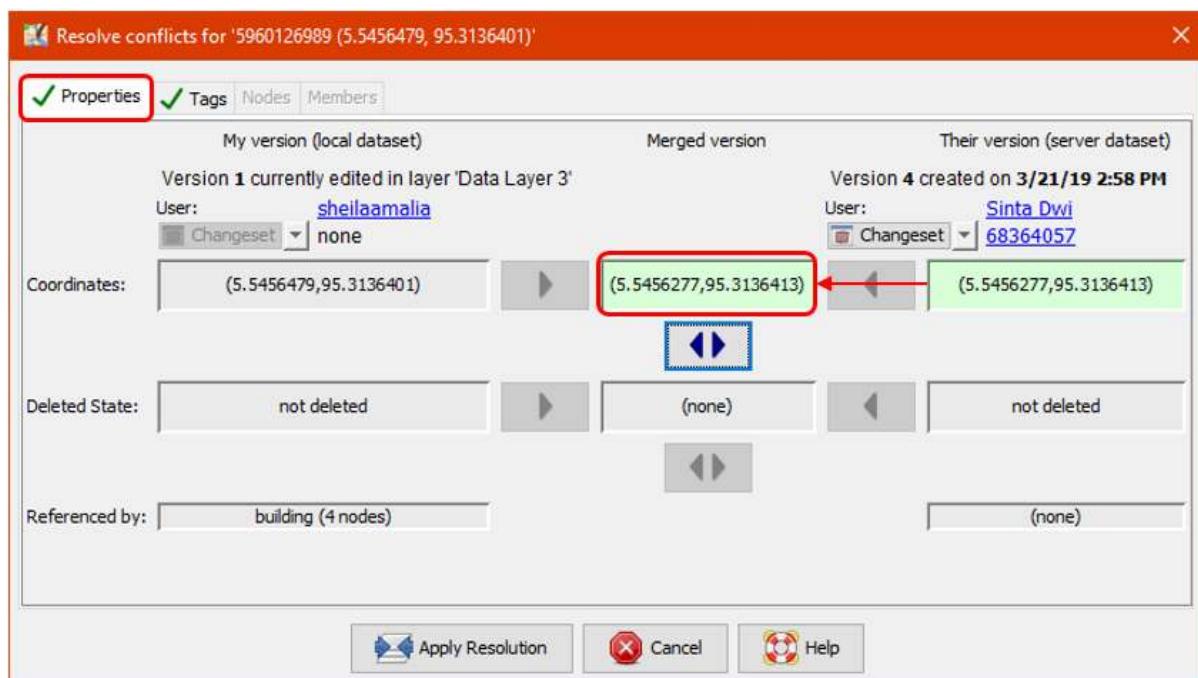
Conflict panel to fix detected conflict

- 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.

**Conflict**

Coordinates:	(5.5456479,95.3136401)		(none)		(5.5456277,95.3136413)
--------------	------------------------	--	--------	--	------------------------

**Resolved Conflict**

Coordinates:	(5.5456479,95.3136401)		(5.5456277,95.3136413)		(5.5456277,95.3136413)
--------------	------------------------	--	------------------------	--	------------------------

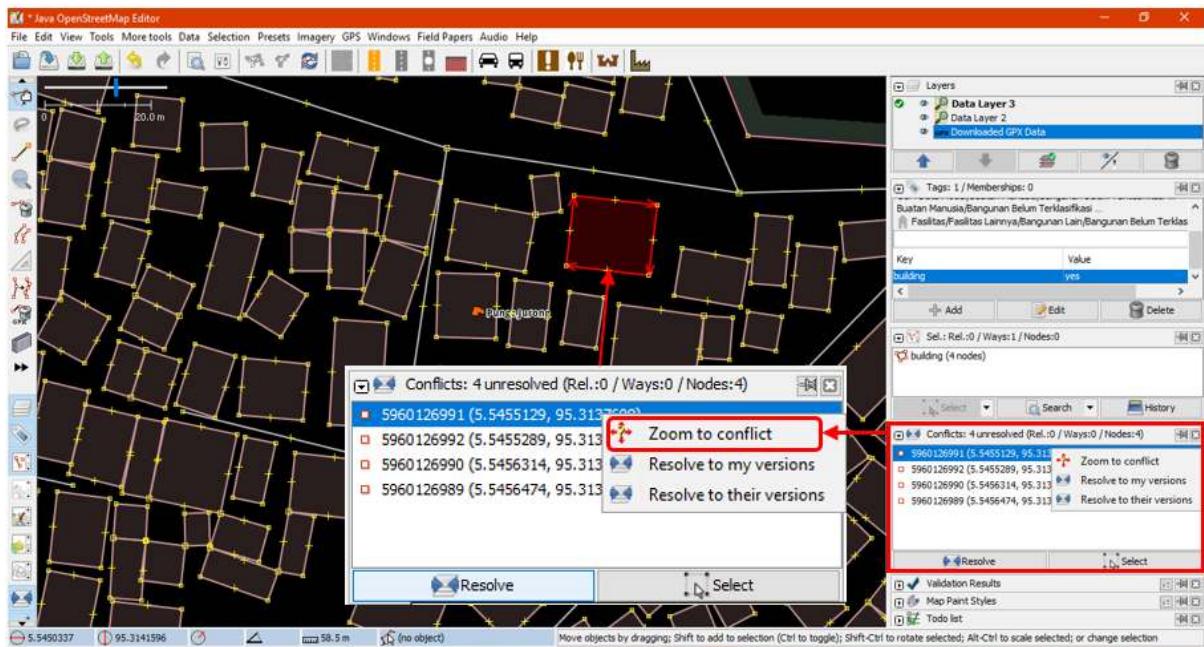
Difference color between original conflict and resolved conflict

- 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

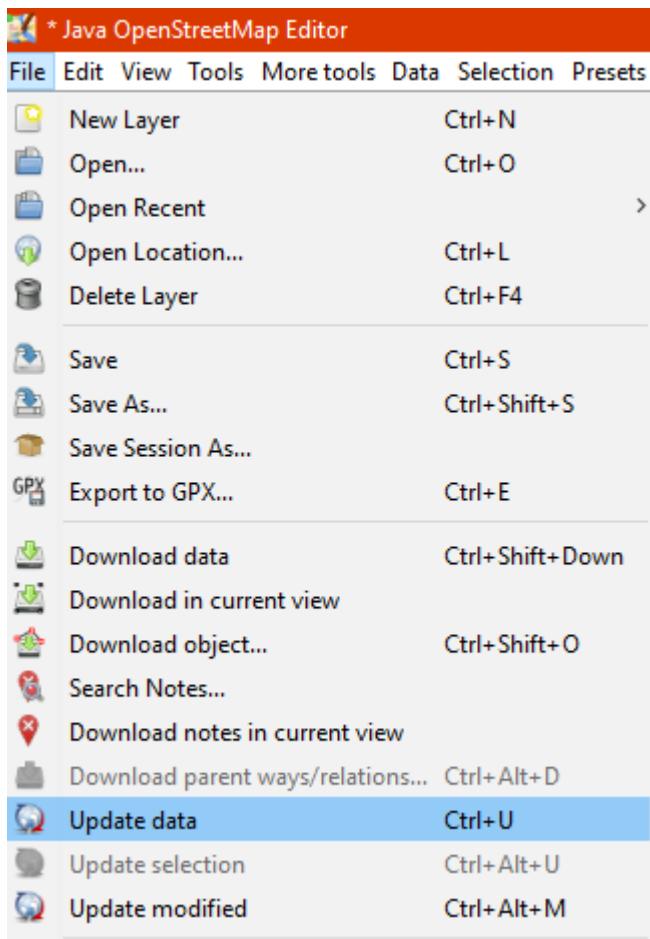
You can do some things to avoid conflict when uploading your data into OSM server, as follows:

##### a. 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



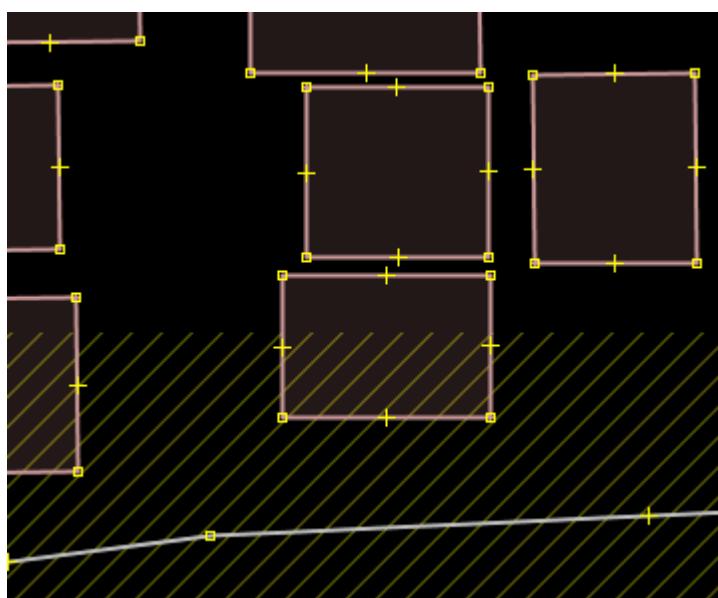
*File* menu or just click  icon on *menu bar*.



Update data options in file menu

#### b. 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.

### c. 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 HOT Tasking Manager interface. At the top, there's a navigation bar with the HOT logo, 'TASKING MANAGER', 'Contribute', 'Learn', 'About', and 'What is New?'. To the right are language and login options. The main area is titled 'Instructions' and lists 'Entities to map: Buildings, roads, waterways'. Below this is a 'Changeset Comment' section with the text '#hotosm-project-5839 #CycloneIdai'. The central part of the interface is a map of an area divided into a grid. The map shows various geographical features like roads, buildings, and waterways. A legend on the left side of the map area defines three states: 'Ready' (green square), 'Mapped' (orange square), and 'Bad imagery' (grey square). A 'Legend' box also provides a key for these colors. In the top right corner of the map area, there's a 'ACTIVITY AND STATS' button. The bottom left of the map area has a small 'Legend' box with the same color-coded categories.

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!

# JOSM for Validating Survey Data

## Objectives:

- To do initial checking on field survey data using JOSM
- To do a quality assurance on field survey data using JOSM
- To understand the type of error and warning on JOSM

JOSM is a software that has a function to do mapping and editing in OpenStreetMap. Why JOSM? Because JOSM has many functions to support your mapping and editing in OpenStreetMap. One of the features is its capability of doing data validation. Data validation is an important thing to do to maintain the quality of OpenStreetMap data.

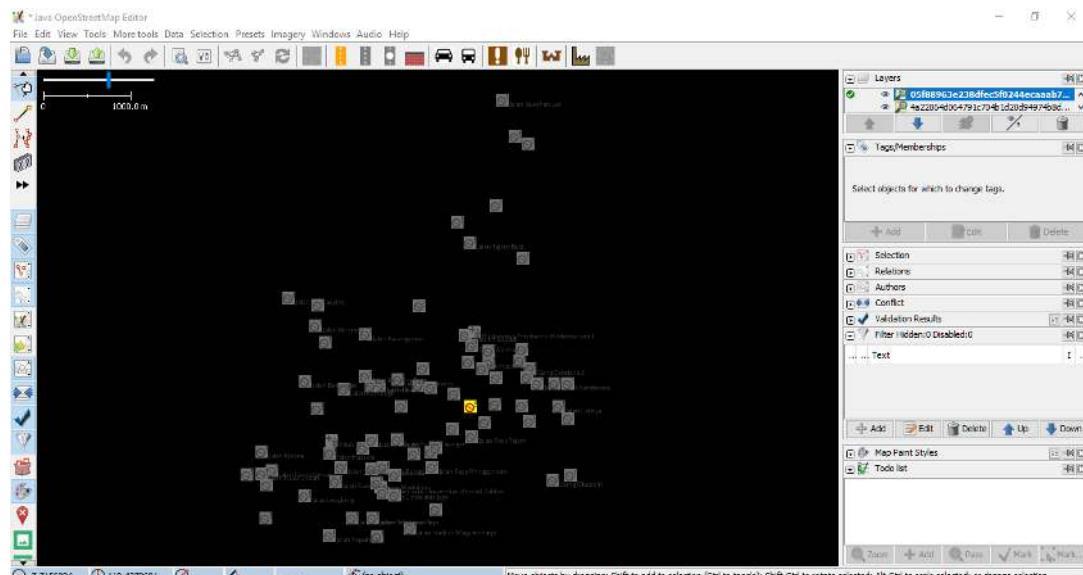
## I. How to do Data Validation on Field Survey Data

In field survey, there are two different types of data needed to be collected, infrastructures and administrative boundary. Before input the data on JOSM, those data needed to be checked by the Quality Assurance to make sure the attribute information is suitable with the **OpenStreetMap Data Model**. Quality Assurance also need to check whether the surveyor was managed to get all the object or not in the field survey area.

### 1. Checking Field Survey Data using Administrative Boundary

You need to check the field survey data using administrative boundary to see whether the surveyor was managed to get all the object or not in certain administrative area. You can use administrative boundary data from BPS (Central Bureau of Statistics) or using the administrative boundary created by the Quality Assurance.

- Open the field survey data you have collected. For example, in this module we will using field survey data from Yogyakarta.



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Data example from Wedomartani Village, Sleman, Yogyakarta

- After that, please open the administrative boundary you have. In this example, we will using the village boundary from BPS. This data still in the .shp data format, so you need to convert the data into GeoJSON file format if you want to open it using JOSM. If you want to see more information about using GeoJSON data format, you can read that on **Using GeoJSON** module.

To open administrative boundary file, select **File → Open**, then insert your selected administrative boundary.

- You can compare between your object distribution and the administrative boundary. If you see there is still some areas needed to be checked and there is still some objects need to be collected, you can ask the surveyor for doing survey again on that area.

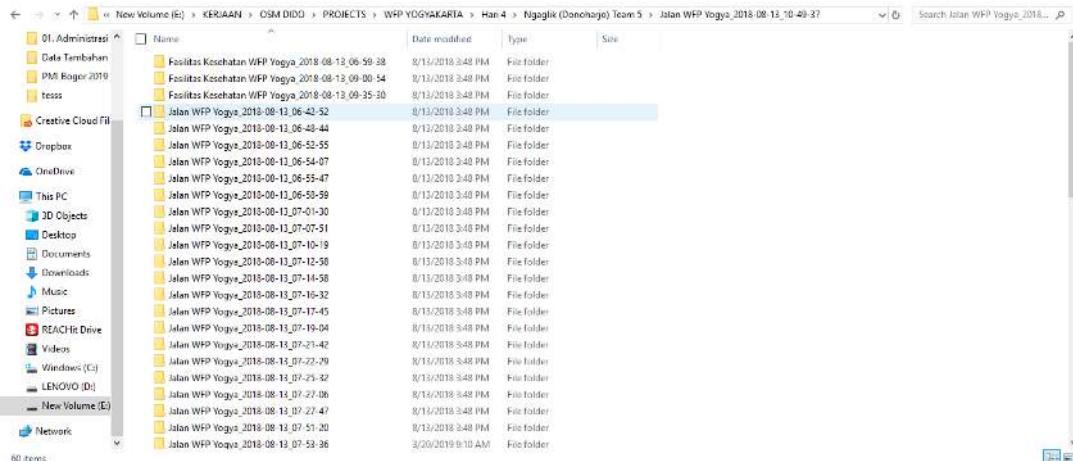
## 2. Checking Boundary Administrative from Field Survey

Data entry using survey map to collect and draw the boundary administrative based on information collected from sub-village staff. You can check how many RW boundaries collected and you can check whether the boundary is clear or not.

## 3. Combine field survey data into one single file

You need to combine all ODK Collect file into one single same file. To combine it, please follow these steps below:

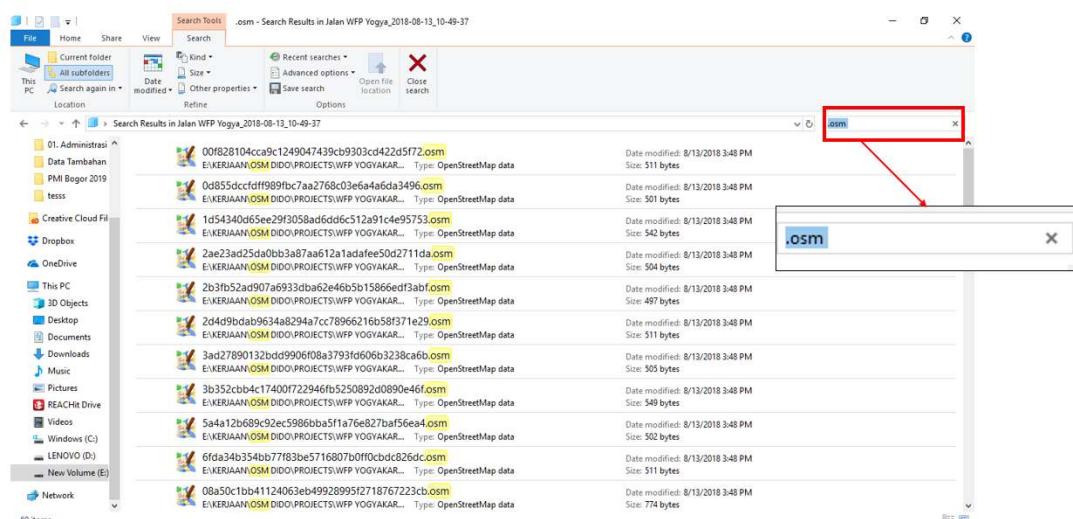
- Once you copied the ODK file from your smartphone into your laptop/computer, then you can search your ODK Collect file using **Windows Explorer**. If you forget how to copy your ODK file, you can read it on **Using ODK Collect**. For example, in this module we using field survey data from Yogyakarta area.



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ODK Collect Data copied in laptop/computer

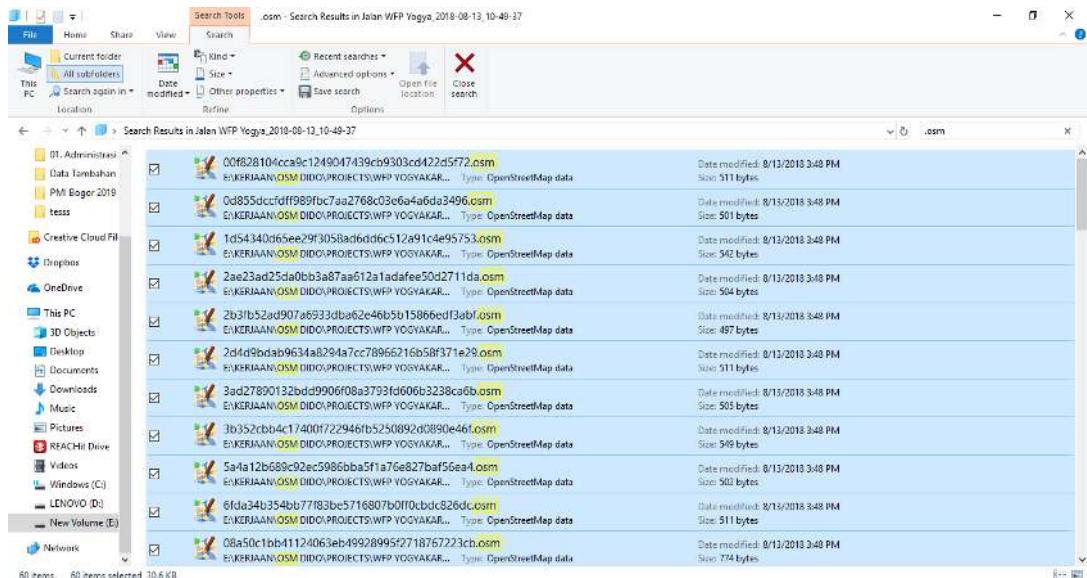
- After that, look over the search box on the top right side of your screen, then type '.osm'. You need to do this so the windows will help you to identify which ODK data has an '.osm' data format.



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## Searching files with '.osm' data format

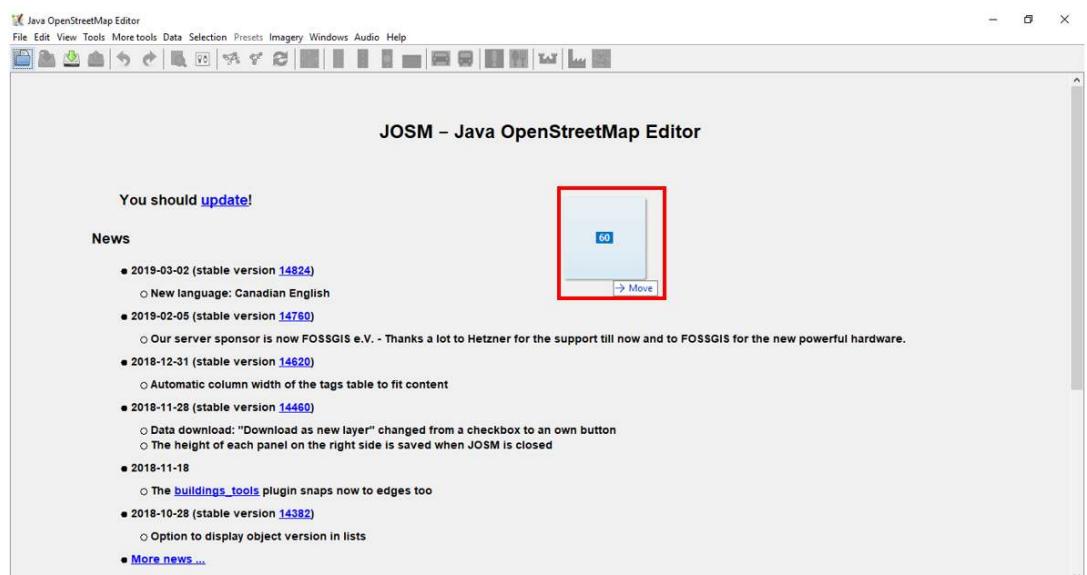
- Select all the data using **Ctrl+A**.



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All files has been selected

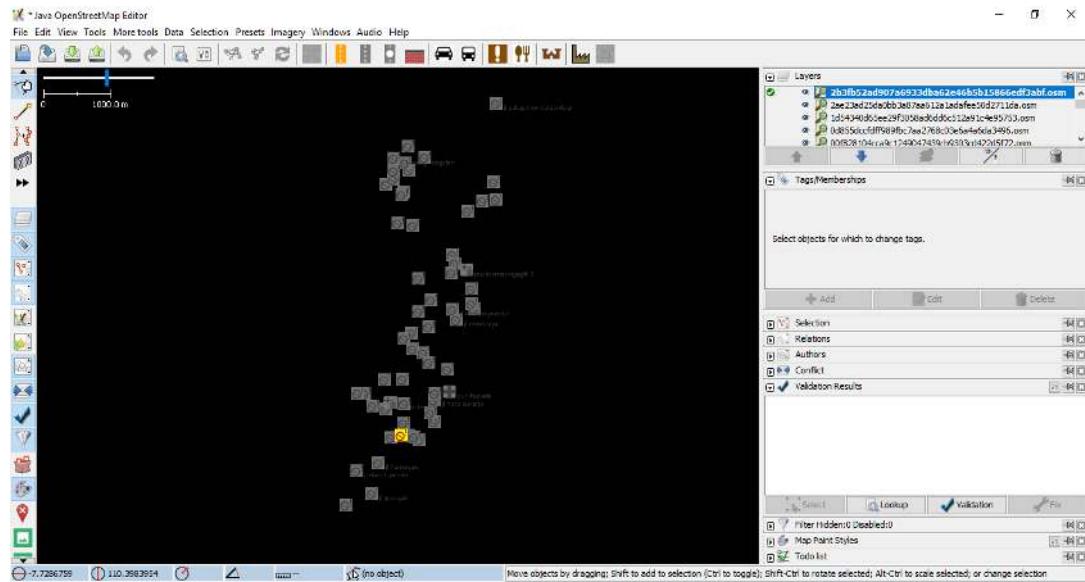
- Then, click and hold on one file, then drag it into your JOSM. Make sure you already opened the JOSM before performing this action.



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Drag and open the .osm file on JOSM

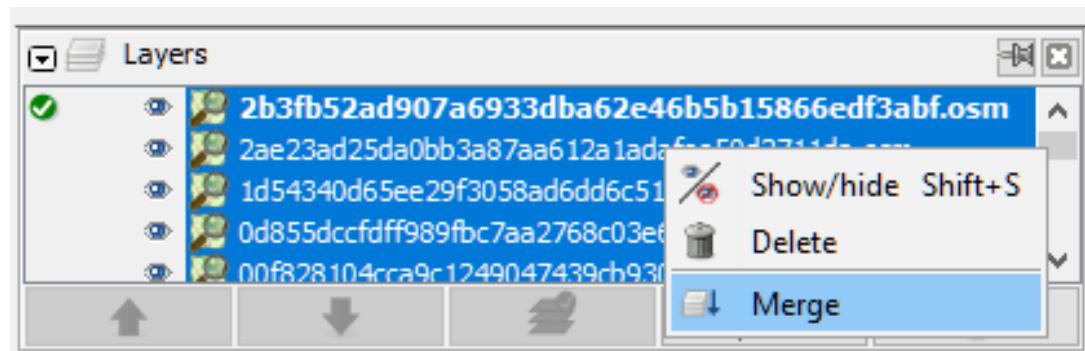
- If it succeed then you will see like this



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All .osm file opened on JOSM

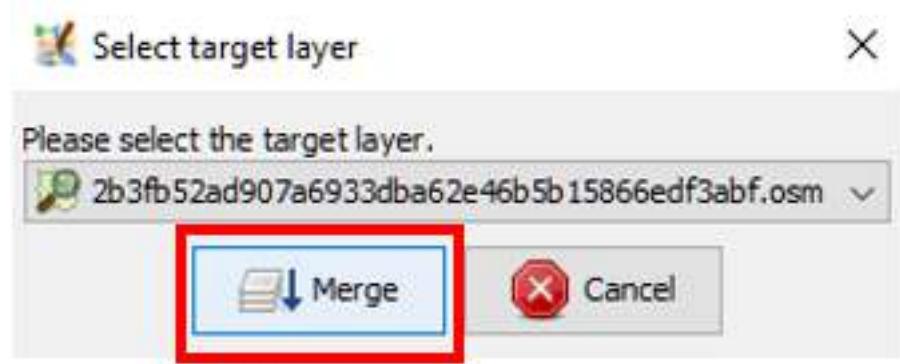
- You can see that your data is currently separated on the different layers. Then, you need to combine it into one single layer file. To combine it, click one of the ODK data in the layer window, then press **Ctrl+A** to select all the objects, then right click and select **Merge**.



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Combine all different layers into one single layer

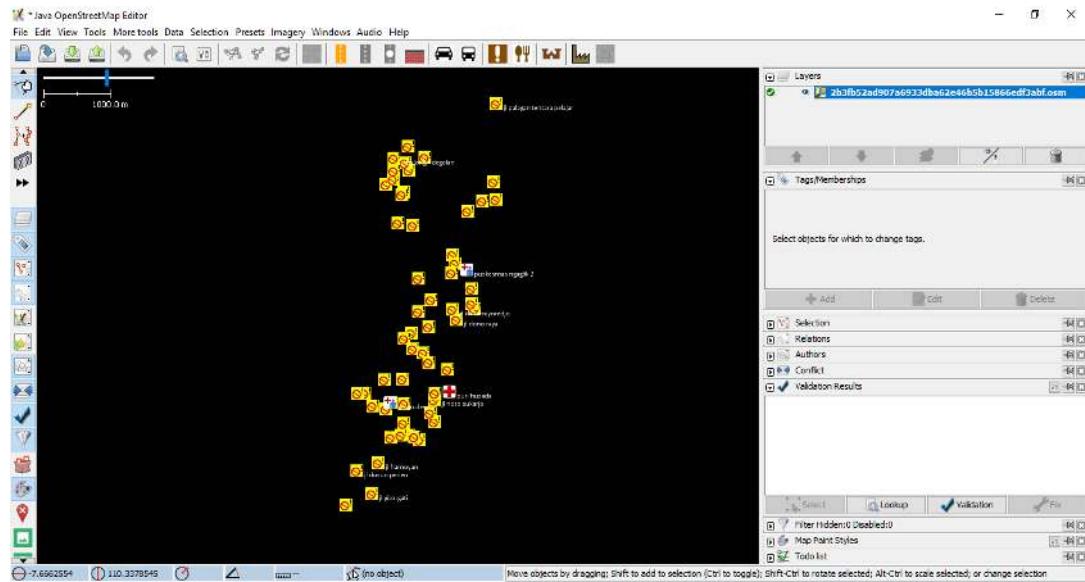
- There will be an option for you to define the target layer. You don't need to change this section and continue to press **Merge**.



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Choose merge to combine all the data

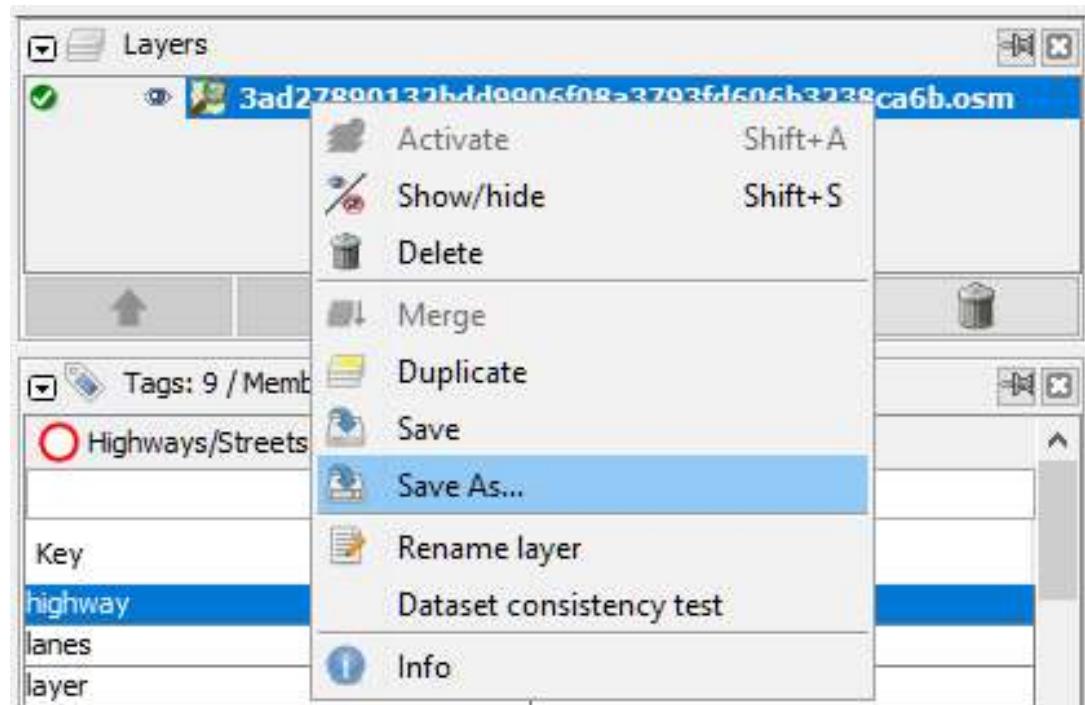
- After that you will see only one merged layer.



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Merged layer

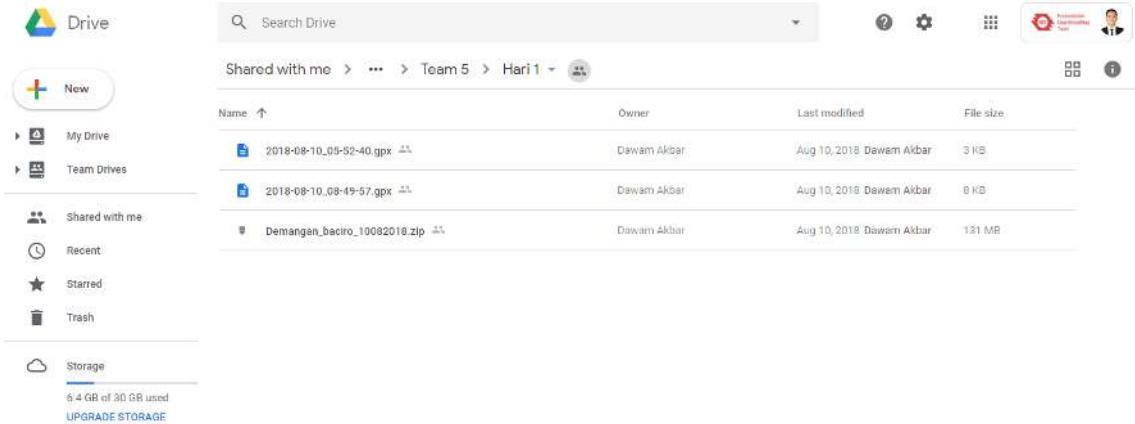
- You can save your data by doing right click on the merged layer, then press **Save as** and you can name it as you like.



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#### 4. Upload your Field Survey Data on Google Drive

After you combine all the data, you need to upload the data into a cloud-sharing-storage platform where all the team members, whether Data Entry or Quality Assurance, can access all the data. You can use a free cloud-sharing-storage like Google Drive.



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## II. Checking Field Survey Data Input

After doing a data validation on your raw data, then you need to do a validation on the OpenStreetMap data in server. You can do this validation using a plugin in JOSM called to do list and validation tool.

### 1. Using to do list plugin

You can use to do list to do a validation on your data. To do list allows you to make a list of

For example, you have a set of data like this:

```
![alt_text](en/images/04-Data-Validation-and-Quality-Assurance/02-Penggunaan-JOSM-untuk-Validasi)
<p align="center"><i>Example of survey data</i></p>
```

Those data collected by using ODK Collect and Open Map Kit (OMK). We need to check whether this

For example, you have an object called Port's Health Office located in North Jakarta. Therefore

```
![alt_text](en/images/04-Data-Validation-and-Quality-Assurance/02-Penggunaan-JOSM-untuk-Validasi)
<p align="center"><i>Comparison between raw data and existing data attribute on OSM</i></p>
```

On the other hand, you can also check the placement for each object. On the picture above, you

```
![alt_text](en/images/04-Data-Validation-and-Quality-Assurance/02-Penggunaan-JOSM-untuk-Validasi)
<p align="center"><i>Node placement difference between raw data and existing OSM data</i></p>
```

### 2. Using Validation Tool

- Download OpenStreetMap data on your selected location

```
![alt_text](en/images/04-Data-Validation-and-Quality-Assurance/02-Penggunaan-JOSM-untuk-Validasi)
<p align="center"><i>Downloaded OpenStreetMap data</i></p>
```

- Validate the data using validation tools on JOSM. for To activate the validation result, select **Window** then **Validation Result**. The validation window will shows up on the right bottom side of your JOSM screen.

```
![alt_text](en/images/04-Data-Validation-and-Quality-Assurance/02-Penggunaan-JOSM-untuk-Validasi)
<p align="center"><i>Activating validation window on JOSM</i></p>
```

- Click **Validation** on validation result window to start your validation. One thing you need to remember, please make sure you are not selecting any object in JOSM when you want to validate your data. If you doing this, JOSM will only validate your currently selected object.

```
![alt_text](en/images/04-Data-Validation-and-Quality-Assurance/02-Penggunaan-JOSM-untuk-Validasi)
```

<p align="center"><i>Validation result using JOSM</i></p>

- You need to fix the data when you find an error and warning on your validation result. After that, don't forget to upload your data into OpenStreetMap server.

### III. Definition of Error and Warning on JOSM

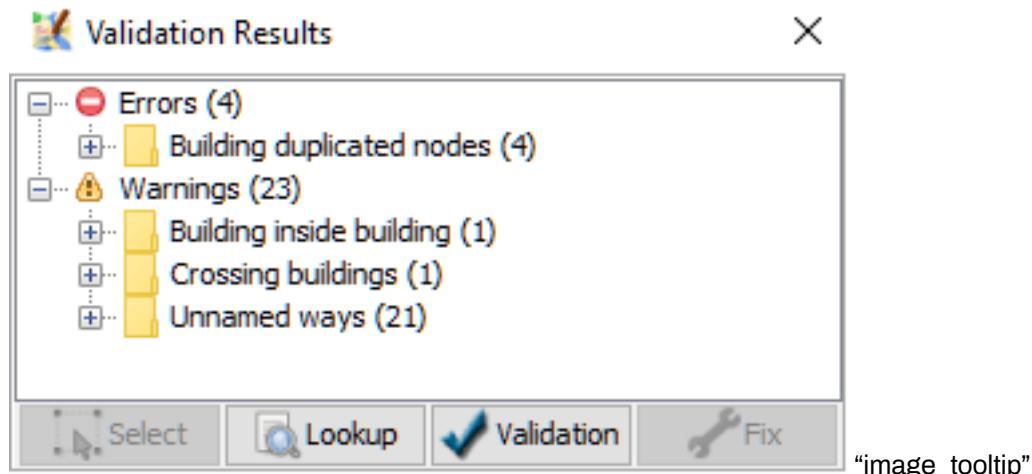
As mentioned before, when you're doing a validation using JOSM, you will find two kinds of validation results:

#### 1. Error

When you find an error on your validation result, you need to fix this as soon as possible. Error means that there are some objects on your data set that violate the regulation of OpenStreetMap mapping regulation. You will not be able to upload your data if you're not finishing the error on your data set/changeset.

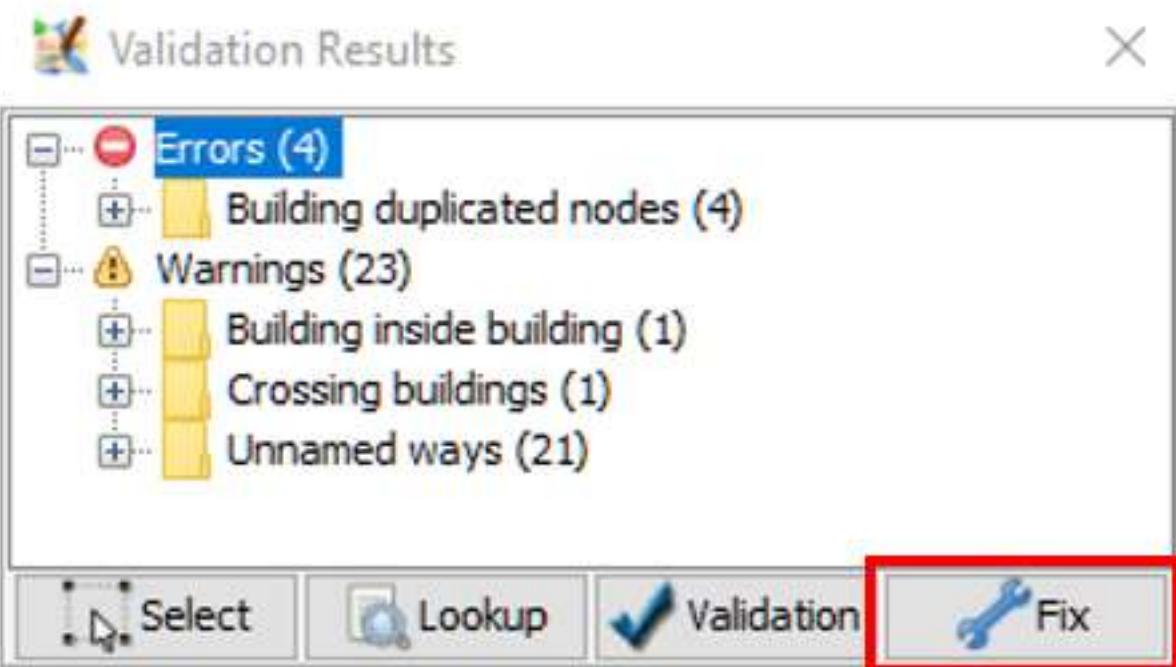
#### 2. Warning

Quite different from error, you don't need to fix the warning when you find it on your validation result. Same with the name, warning give you information that there are some things that needed to be repaired on your data. You can ignore this warning and continue to upload the data. Nevertheless, there are few kinds of warning you need to remember and you should need to fix this mistake. You will learn about it on the next chapter.



Error and warning when doing a validation

You can automatically repair the error data using **Fix** button. For warning type, you need to repair that one by one or manually.



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You can automatically repair errors using Fix button

#### IV. List of Error and Warning needed to be Repair

There are many kinds of error and warning when you doing validation on OpenStreetMap. You can use tool available on JOSM ([Using JOSM module](#)) to fix and repair all error and warning. You don't need to remember all kinds of error and warning that possibly shows up when doing validation. But, you still need to know which kind of error and warning commonly shows and which one you need to repair, like:

##### a. Error

- Duplicated Node

This type of error commonly show up when an object accidentally uploaded twice in the same time. It will cause two or more objects will overlap each other on the same location. This mostly happen when you up-



load the data using a bad and unstable internet connection.  
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Error: Duplicated Node

- Duplicated Ways

This kind of error is similar with duplicated node, where there are two or more ways/line located on the same location/overlap. This error mostly happen for highway object, but this would likely found on same



overlapping building.

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Error: Duplicated ways

**b. Warning**

- Crossing Building

This warning is one of the most commonly found when doing a validation. Mostly OpenStreetMap user draw different building as an overlapping object. To fix this warning, you just need to move or delete one of the overlapping building.



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Warning: Crossing building

- Crossing Ways

This warning will come up when there are two line or highway object without an intersection node between those line or highway. To fix this warning, you just need to add an intersection node between those line/highway.



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Warning: Crossing ways

- Overlapping Highways

This warning will show up when there is an overlapping highway located on the same location. To fix this warning, you just need to move or delete the overlapping highways.



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Warning: Overlapping highways

- Node connect highways and building

This warning will show up when node from building object and node from highway object accidentally connected to each other. To fix this problem, you can separate the connected node using **unglue node**.



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Warning: Node connect highways and building

- Untagged ways

When there is an object drawn in JOSM but don't have any information, JOSM will flagged that object as unidentified object or as untagged ways. This notification is important because when you mapping using JOSM, you need to give the information to your object. If you doing this mistake, your object will not come up on OpenStreetMap website so make sure don't forget to add information/tag on your object.



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#### Warning:Untagged ways

- Way end node near other highways

This warning came up when there are two highways located very close to each other but each node not connected. This object will be identified as an end of the road or it means that the road is impassable. If it say so, please add tag **highway=block** on the object's information. But, if the highway was supposed to be connected, you can combine them using **Merge**.



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Warning: Way end node near other highways

- Building inside building

This is one of the most commonly found when doing validation. This mistake happen when there is a building polygon drawn inside another polygon. To finish this, you can move or delete the building inside another building.



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Warning: Building inside building

- Unnamed ways

Unnamed ways shows there is a highway which don't have name on it. Basically, you can ignore this warning because mostly all mapper do their mapping remotely, so they don't know the name of the street.



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Warning: Unnamed ways

- Similarly named ways

This warning will show up when there is a similar name on different highway. For example, there is a road called Jalan Tebet Timur I, Jalan Tebet Timur IA, Jalan Tebet Timur IAA, and else. You can ignore this warning if you sure the name is similar.



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Warning: Similarly named ways

## SUMMARY

OpenStreetMap as an open source platform causing its data become so vulnerable with data vandalism. Therefore, it is very important to keep the data quality by doing validation. From now on, you have managed to learn about data validation using validation tool on JOSM. You have also learned about error and warning and how to resolve the problem when you doing validation. Hopefully you can understand how important it is to keep the data quality of OpenStreetMap.