Remote Sensing and GIS for Rural Development
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Indian Institute of Technology, Bombay
Week - 11
Lecture No. 03
RS and OSM for Mapping Rural Infrastructures: Schools

Hello, everyone. Welcome to the NPTEL course on remote sensing and GIS for rural development. This is week 11 lecture 3. I am happy to welcome you for the sections where we will be looking at something very normal and unique that we are learning in this course. As I explained in the urban centers and urban regions, there is multiple data that we can readily use. On top of that, the government agencies and private companies collect data. Whereas when it comes to rural regions, there is much less of data that comes in.

Therefore, in this week, we had introduced the concept of synergize mapping, which is very new and unique because either people use only remote sensing or only observation data, and some people do merge them both. But then with crowdsourcing data, we are developing new skills. This is going to be the future because a lot of people depend on crowdsourcing for updating the data at a very high speed, both spatially and temporally. Now, think about adding another layer on this, when it comes free open source, then the potential benefits are a lot and very enticing for everyone to use.

On that note, we had looked about the concept of synergize mapping in the previous lectures. And we found that only OSM open street map has been widely used across regions across the countries globally for crowdsourcing of data. So, you do not have to maintain a database, you do not have to maintain servers for the data to come in and use by users. Because all of this has been funded and operation till date from 2009. Slowly it has grown to a very robust system.

And while it seems that I am we are promoting this particular app, it is not for their benefit, but it is for everyone's benefit. Think about an open-source system where we have data and updated regularly. The last slide we looked at someone just entering data 11 hours ago. So, spatially and temporally, also, it had been one of the best data. And if there is some kind of schematic system that encourages people to participate, then more and more data will come.

In this world of data as everywhere, it is very important to have a system and a platform where data can be easily seamlessly coming in and use for benefits after we merge it with

couple of data. What is missing in the OSM part is the remote sensing applications, which we will be doing in our current class. We will be using the benefits of multiple systems remote sensing, GIS, OSM and then merging them all into GIS platform and then checking on how the research can be done further.

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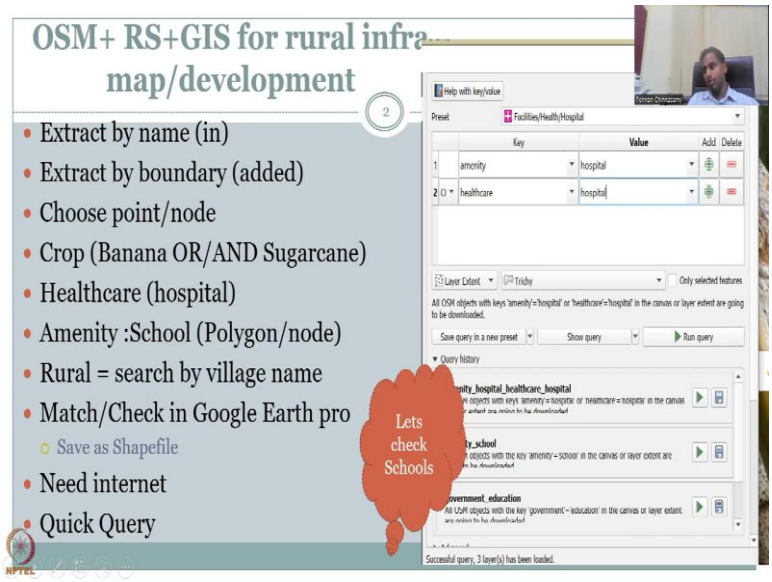

On this note, in week 11 and lecture 3, what we will be doing is seeing how we could combine OSM, RS and GIS, OpenStreetMap, remote sensing and GIS interfaces for rural infra mapping and development. Please remember that a lot of people do ask more on water aspects for this course, this is not a rural development for water, it is also for other resources. And while agriculture is the key dominant livelihood, I had put more time on agricultural resources, land, soil, water, vegetation. But we cannot neglect the other infrastructures because the reviewers of this course while they said it is very good. They also wanted these to be reflected.

So, as a whole, I am going to give the next 3 sections for it. And some case studies and references on how these case studies have been done will be conducted in week 12, we are coming to the end. And you would have seen that I do not have much summary for each topic, because you can always go back to the lectures and review it. But if I use summary, then I am losing a couple of lectures. So, I encourage you to go back, I can give a hint of summary at week 12.

But at week 11, what I am proposing is please go back to the lessons, I have seen a couple of students sending uploading their materials on the forum, which is very, very useful, which is

very much making us happy, because they are putting so much time on this work. So, we are very happy for that. And we would like to say that even though some of your comments I could not readily address because of the need of the course, we have made it more robust. There will be some updates in the columns of data that we want to see now.

So, let us see how we are going to map OSM plus RS plus GIS infra map plus development. So, how we will do is I will just go through the steps, and then we will follow the same steps in the OSM platform. So, we will first extract by name, name of the attribute and then the boundary. So, OSM is mostly for extracting shapefiles vector shapefiles, not for raster, because you would not expect people to share raster for a particular area let us say a school boundary.

We will be discussing more about the rural infrastructures that I have given you introduction in the previous initial slides, because when we talked about rural development, we talked about water, soil, nutrients, forest cover, agroforestry, which are all we have covered. But we also mentioned about education, access to schools, access to health care, these kinds of attributes. And these are not raster these are vectors.

So, these are vectors that are stored as attributes in the system. And we will be accessing them through these OSM. The point of introducing this software is also for you to put in the data. So, it is not only one way it is not only that I should be using this data, I can also contribute to this data by having a login and then putting in the attributes. We will show you how this content come in play, especially for the reasons that we have already looked at.

So, we can choose what type of attributes we would like we can choose points, nodes, both are kind of similar, because those are point shapefiles. We can choose a point shapefile for location of schools, hospitals, educational institutions, kindergartens, anganwadis, et cetera, ration shops, all these other points because the location. We can also have other shapefiles with which are in under the vector columns, which is one as points we have already seen.

Then we have lines and polylines, we have multiple lines that can be connected. One good example is your waterways in rural areas, streams, springs, et cetera. And more importantly your road networks because we want to connect the livelihoods to the market. We also have the last one which is polygons and the polygons are very important because parcels of land can be mapped, you can map the size of schools will show you how the school size will be

different both as a point and as a small area polygon. And we will go through these exercises together.

So, there are 3 types of shapefiles that can be generated through this lesson. Very focused on rural development, which is points, multi points. And then we have lines, polylines. And we have polygons that can be shared. An example will be you can also have queries for crop selection. It can be banana, or sugarcane. Or you can do banana and sugarcane. So, how will this be helpful? Let us say I am going to map cash crops in Pune region.

When I went recently to Pune, I was shocked to see a lot of people converting from sugarcane to banana because they have been good market in the Middle East. So, this banana can be taken as a crop or it can be combined with sugarcane as a cash crop and then searched. So, in OSM, we will be doing a lot of queries. We will search for data and then plot the data using Internet access.

Healthcare also we will be doing in this section. And schools will be doing as a polygon and the node. And we can also search by village name. Only problem here is make sure that the village name is same as what the OSM software might have. So, OSM is you can imagine as database sitting in a cloud. And what you will be doing is while running the QGIS program to connect with OSM and you will be building a query to download the data, when you download the data, it will talk to the cloud bring the data.

So, in the cloud, there are a lot of databases, and the spelling might be very different. So, for example, India spelling is India only, where the spelling is correct, you will bring India's data like if you write like West Indies, in the West Indies, you will put West India, then it would not go to West Indies, it will go to West part of India. So, now you have a hint how these names came into existence. So, naming is very, very important. And you will be very cautious in putting the correct spelling, otherwise, it will be difficult. And to beat this, we always use shapefiles. I will show you how to do both.

So, that you can quickly do queries the next 3 lectures on schools with certain schools today, then colleges, and then we will also look at health care institutions, and then finally go to the location of the crops. It is also important to understand that there are limitations. Because it is free, because open source, there is a lot of quality checks that we need to do, because not all would be doing it for accurate quality both happens in proprietary and open source, we

cannot say that since people get a salary, they go and do it correctly. Nor we can say that since it is free, it is correct.

So, there could be some issues and errors, we should be able to check it. And what we will be doing is we will be using Google Earth Pro as a means to check on the data. And then save a shapefile all the data searches that we do and populate in QGIS, we can save as a shapefile. For all this unique internet, this OSM package runs on internet because the database is so big, and it gets updated. Often you cannot keep it outside, in a server and then connect to it or on your laptop and connect to it. You need a cloud or a server which is connected to high-speed internet.

So, your internet will talk to the server, collect the data and market it is not like you download all the data. So, when you download the plugin, which we did in the last course, you only download the interface to the plugin, not the datasets. So, what we will be doing is we will start the interface and show how we will be using a quick query tool to assess these different datasets that we want. So, quick query looks like this. You have the preset, which is already set conditions to search for data.

And then you have the data that you want to extract, the key variable the key column is what is the variable about on the OSM database and what is the value? So, here you can look at it as key is the overall theme and the value is the attribute name. So, the overall theme is amenity and then you have hospital. The overall theme is hospital healthcare and then you have valuers' hospital. So, sometimes why this is needed is sometimes there will be different names given instead of in India, let us say we will put all hospital data and health care not in amenity.

But maybe in Nepal, you will be putting it in amenities and not in healthcare. So, what happens is when you are doing a mapping of the Ganges health care facilities, the ones in Nepal will be omitted. So, that is why you can have one query built and add other queries to it, you can strictly make it as a condition as and, or you can make it a condition as or which means so for example, if I put and here so the after the query, the results for wherever amenity is equal to Hospital and Healthcare is equal to hospital only.

And if the amenity hospital is not the healthcare hospitals it is not done, it would not come, it would not be populated. Whereas if you see or, then both will come. Amenities that are labelled under Hospital and Healthcare, which are labelled as hospitals will also be populated

in the page. So, let us look at one query and then we will come back to the next slide, which talks about it we will be talking about the quality checks.

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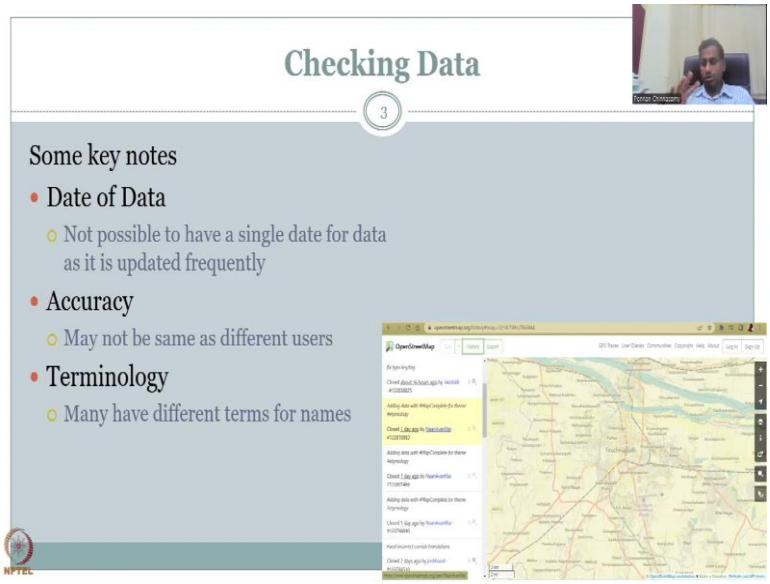

So, I will just introduce this slide but we will come back again. We will be looking at checking the data, how to check the data? Some key notes is the date of the data is not possible to have for every single data because it is updated for quickly, which means that the temporal resolution is very, very high, it cannot be updated equally. For example, you can see here for the Trichy region that we will be doing today, someone has input data just hours ago, 16 hours, 1 day ago, et cetera.

So, in that note, we cannot keep on updating the temporal cycle. And also, we are not sure like every day the data will come. So, you cannot guarantee it, but you can see that it is the most updated data because people do put in data, accuracy may not be the same as different users. So, as I said, all volunteers may not be trained in the current level, but all volunteers have equal access to this website. And they can contribute equally.

There is some clearances of data, you cannot put wrong information in it, there is some checks and all, but it would not check for more, more accuracy. For example, if you are taking a building from the top aerial view, and then say it is a school, it may be a school, it may be a hospital, it may be a shop, no one knows, except the user has put it in. There is no one who on the ground who goes and checks it. Maybe a concept that can come with voting, like people can vote, they are on there and say, yes, that is a school, yes, there is a hospital or a mall, then that voting system can create confidence.

Like for example, you have a hotel, how do you choose a hotel on your app, you will say, how many people have had food, how many orders and how many good reviews have been there? 5 stars, 4 stars, et cetera. The same like that, we can map it here, and then say that how many people have actually verified it. And based on it, the star ratings will go up. Most of the time, in all regions, this will not be working, because you do not have that much people contributing anyways. So, we will have a very less amount of data.

The terminology is many have different terms for names. So, for example, someone will call a school, a school, someone will call it as an anganwadi, someone will call it as a kindergarten. So, you will have to be careful enough to negotiate these names, and then pick the data and then make your own database through the Google checking, which we will be doing.

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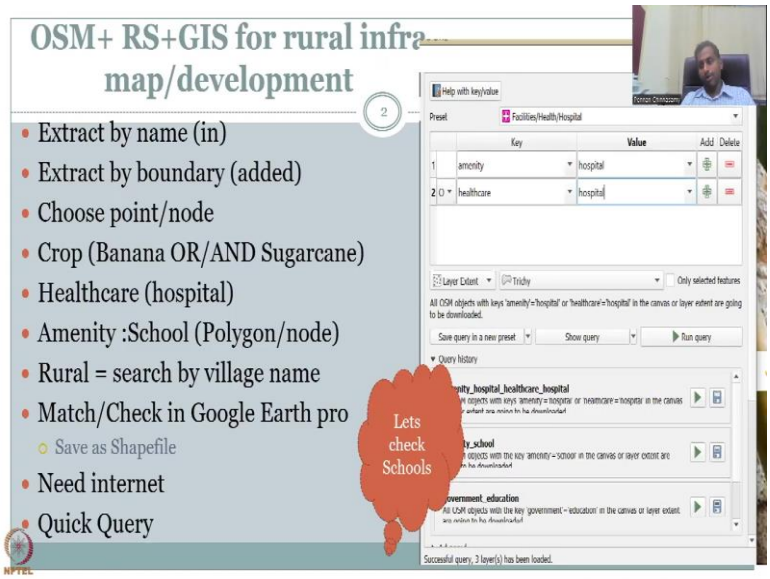

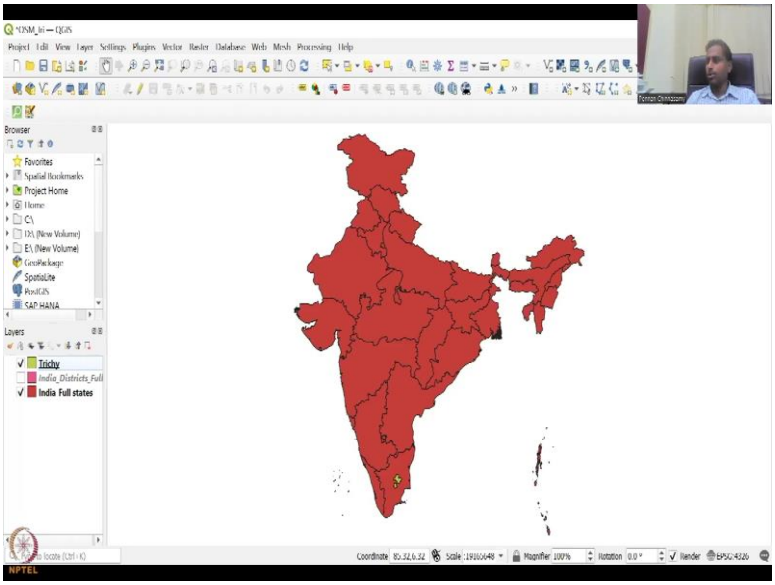
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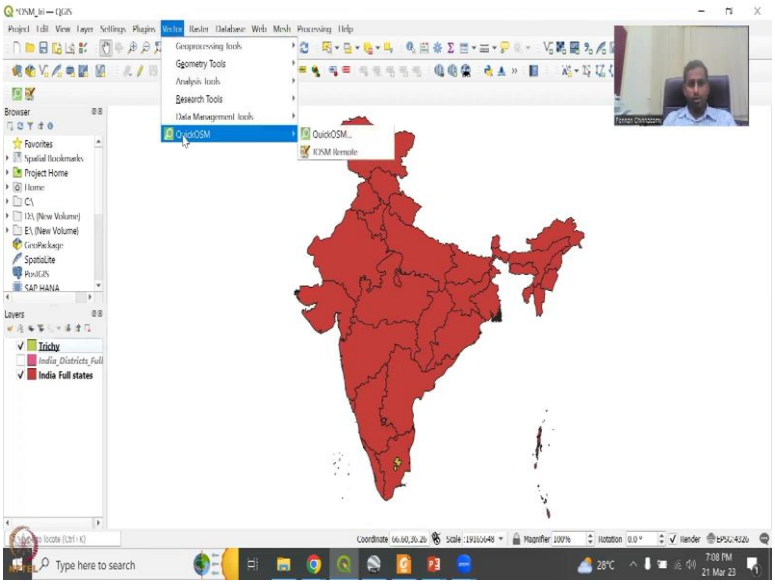
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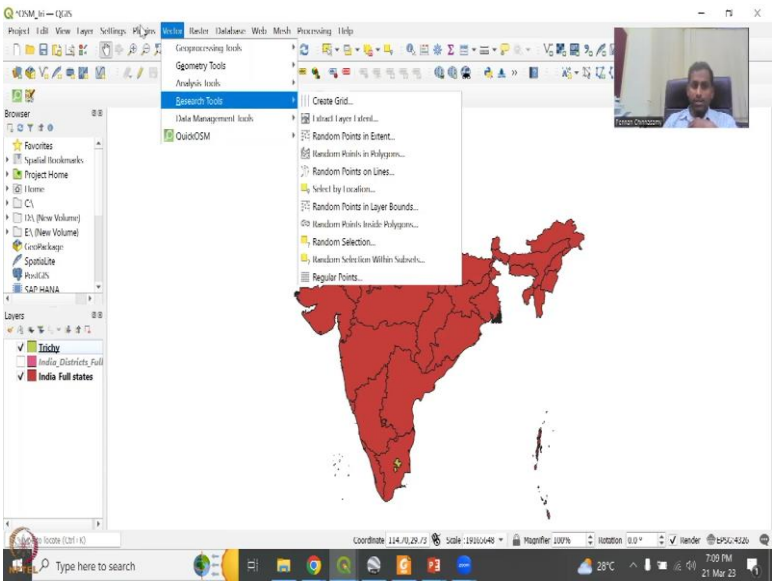
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So, with this, as promised, let us get into the schools checking for which you will need to have your QGIS up, which we already have. And I will be sharing the window space here. So, that we will be looking at the QGIS plus the plugin page. So, I will share the entire screen that you can see. And what we will be doing now is we will be looking at the plugin. So, how do you open the plugin, you will go to vector or Q OSM. And then you will see it here.

Sometimes what happens is you will have the data being mapped at regular intervals, and the software gets updated frequently. So, you will need to make sure that the data comes in regular intervals, and you keep on updating also the software gets updated. So, I had run into this issue. So, I am putting it up here while recording in this happened. So, the software start stopped to communicate. Why? Because it was being updated.

So, always get the software, the plugin crashes, go to the plugins and then see if you need to update them.

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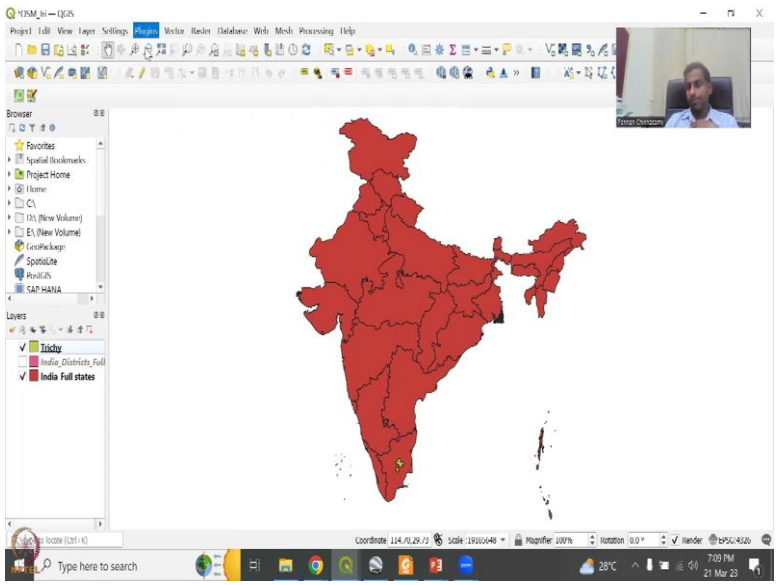

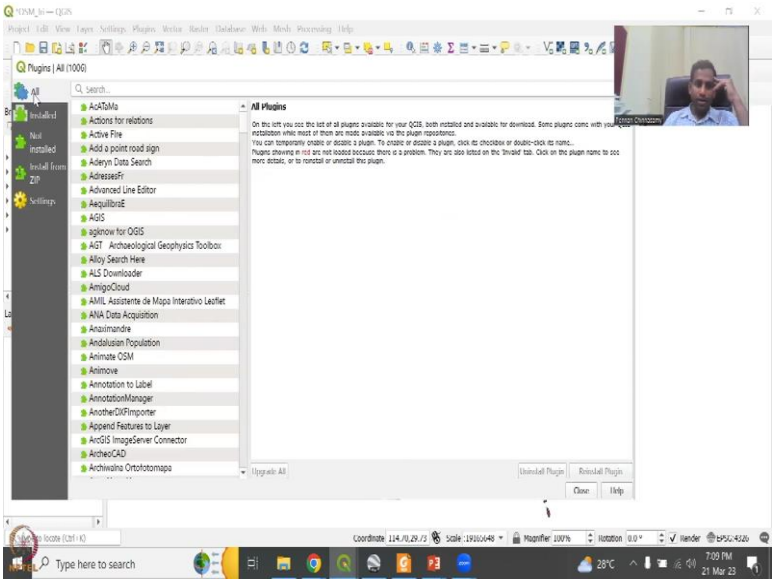
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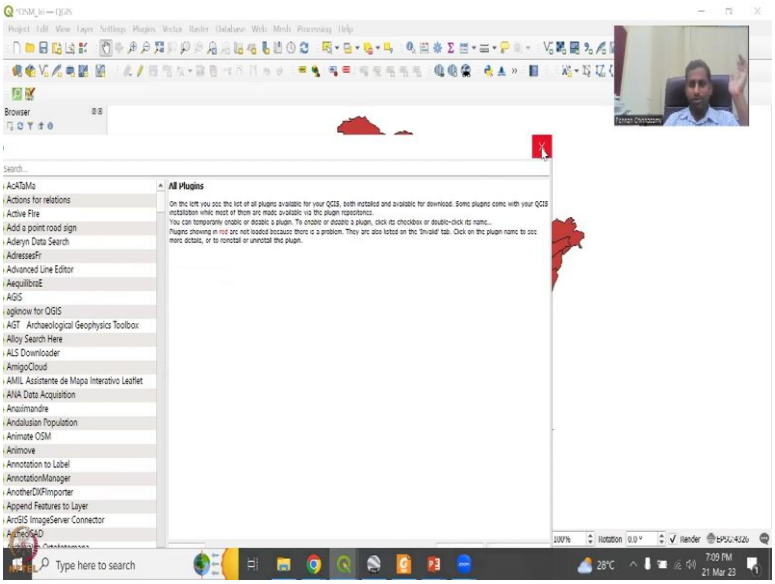
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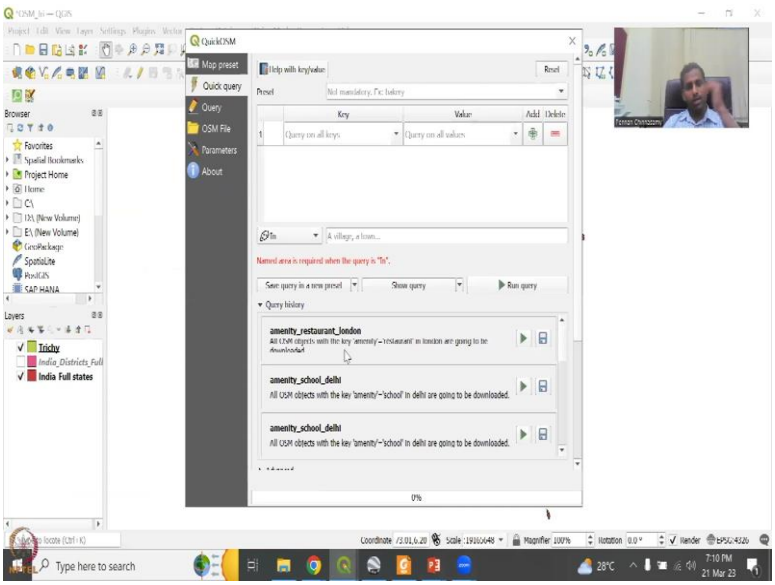
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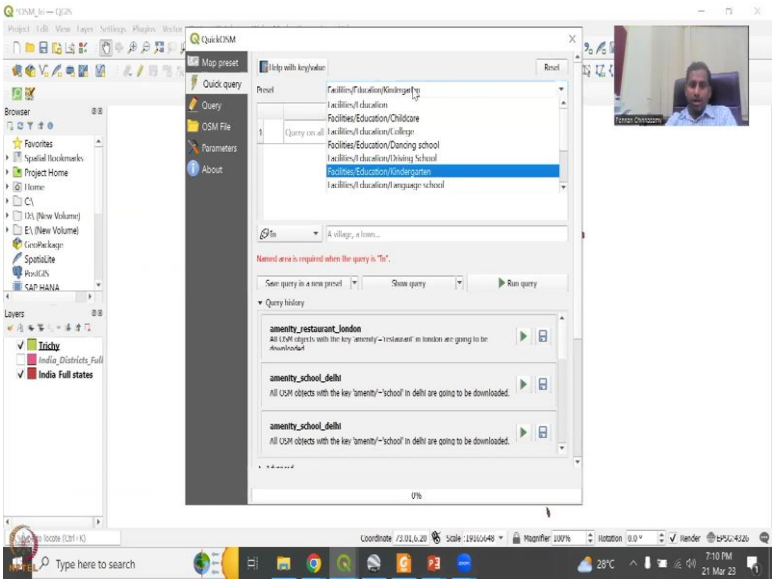
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Facilities/Education/Childcare
Facilities/Education/College
Facilities/Education/Dancing school
Facilities/Education/Driving School
Facilities/Education/Kindergarten
Facilities/Education/Language school
In
A village, a town...
Named area is required when the query is "In".
Save query in a new preset
Show query
Run query
Query history
amenity_restaurant_london
All OSM objects with the key 'amenity'='restaurant' in london are going to be downloaded.
amenity_school_delhi
All OSM objects with the key 'amenity'='school' in delhi are going to be downloaded.
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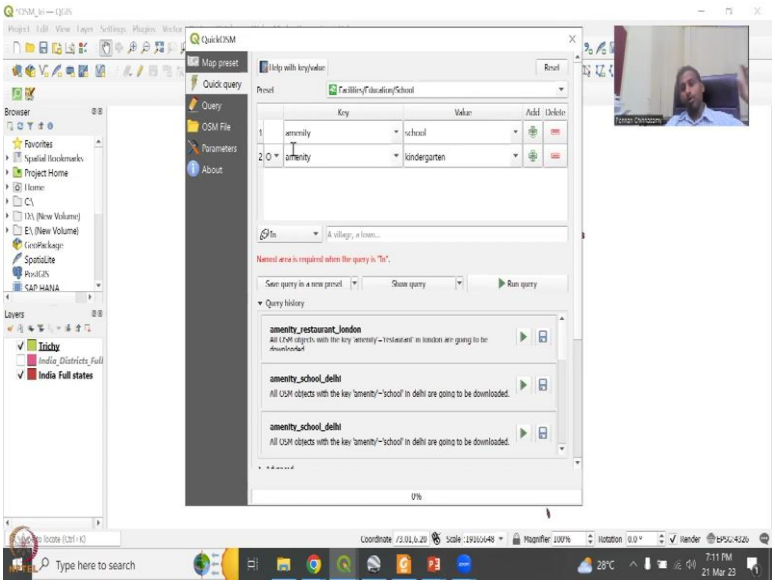
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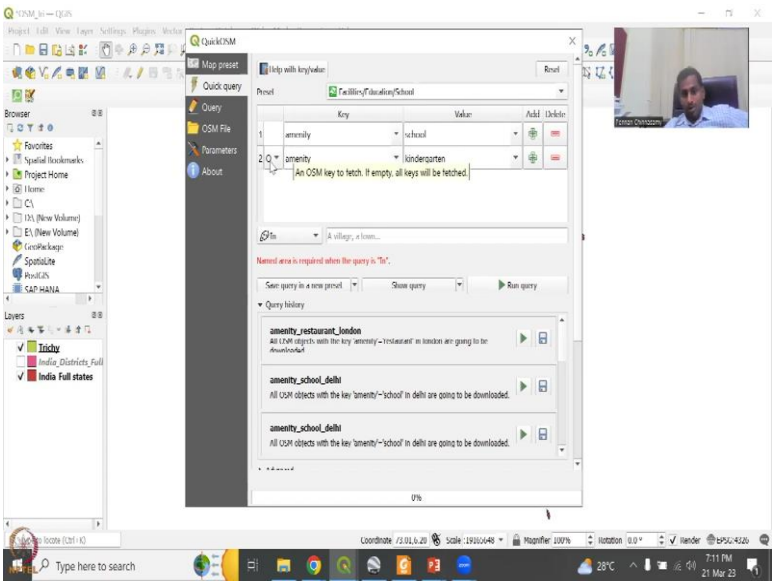
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Facilities/Education/School
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school
amenity
kindergarten
An OSM key to fetch. If empty, all keys will be fetched.
In
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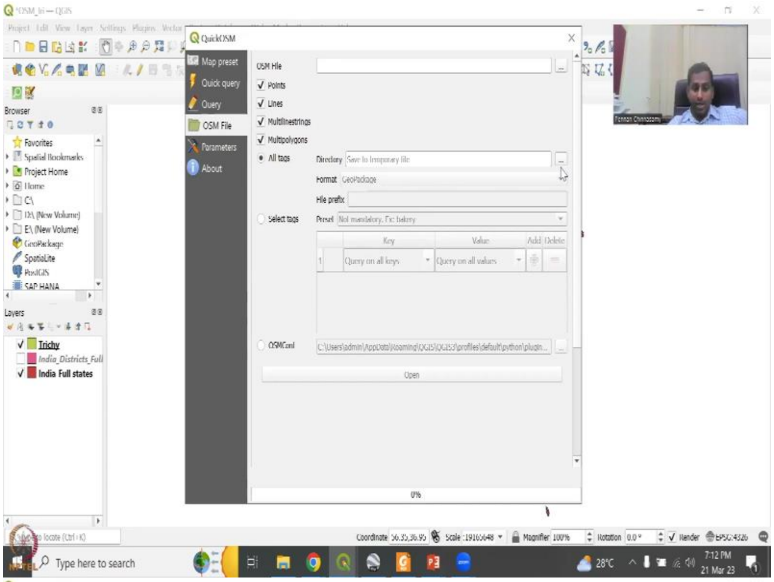
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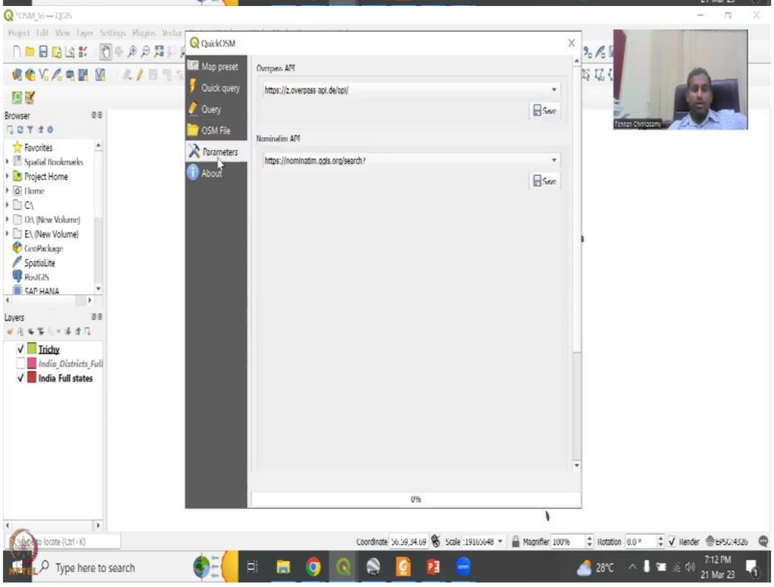
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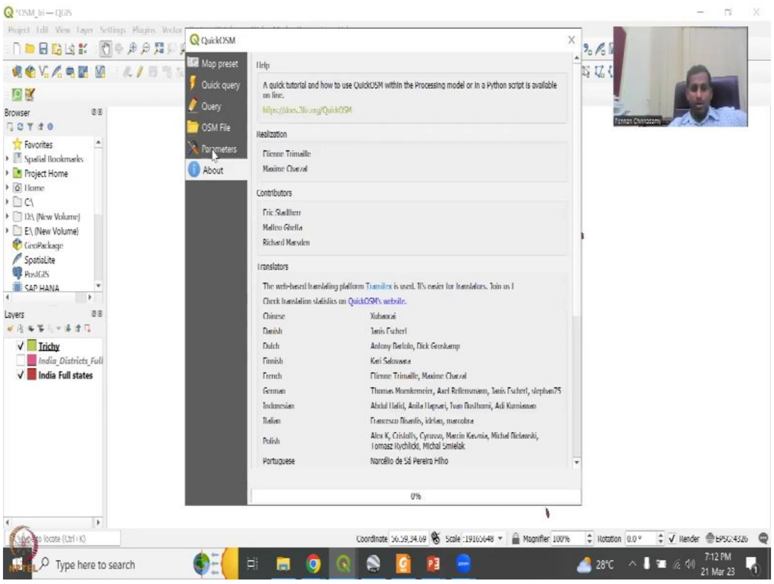
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A quick tutorial and how to use QuickOSM within the Processing model or in a Python script is available on line.
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Contributors
Translators
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Portuguese
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I will show you quickly. So, the Quick OSM, you could see that in the last lecture, it was 20, 20, 1, 2, 2, 1 which is 2.2.2.1.1 version we use, but just now. So, today's date is when it was March 23. Just last night or the morning today, because of the European time they updated. So, once they update, this will stop working until you update it. And it will not tell you that you need to update like your other apps, because there is not a paid version. They will not force you to update it. So, I had that issue. And I had run again and again and finally found out that you have to update it.

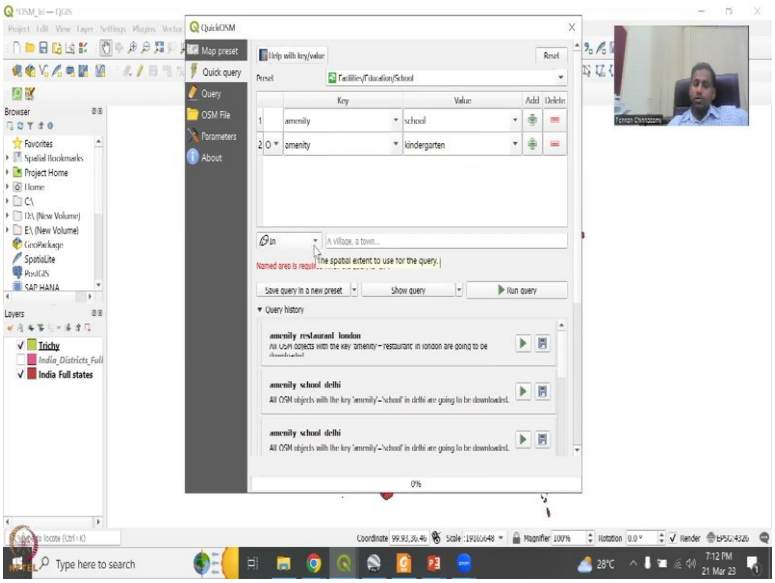
So, whenever there is an issue just quickly updated, it will work. So, as I said, I have opened the Q OSM app. And when it comes to plugin, you will have this big query already loaded. Go to quick query. And then you have the preset values. I will show you an example of preset. We will compare that soon. But let us say education and then you have education, kindergarten or facilities education, college or school. We can have some schools a key will have education school.

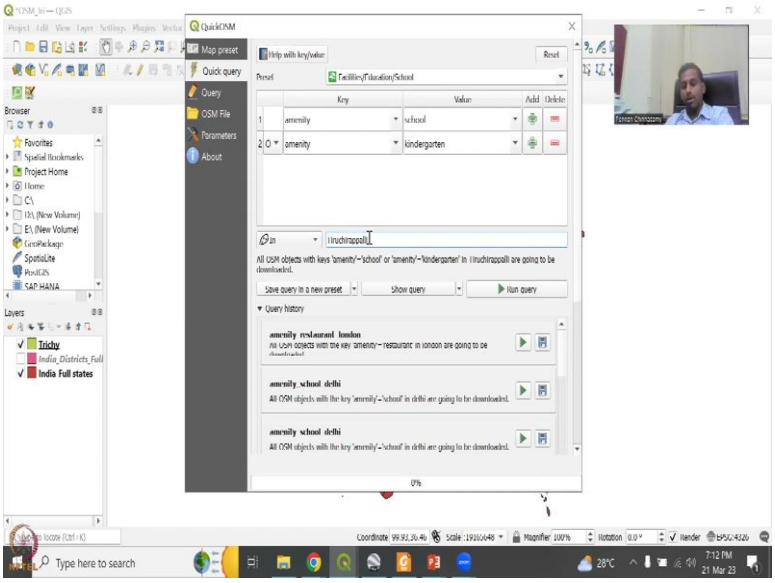
Once you say school, what it does automatically it says amenity schools will come. This is a preset search. So, for this thing, the key themes amenity and under the value it is school. You can add another one because it is just amenity. So, you can add another one say or and then it could be you can go here and say kindergarten, it would not populate because you have to populate the key. So, let us populate education will not be the amenity and kindergarten. So, kindergarteners Come on.

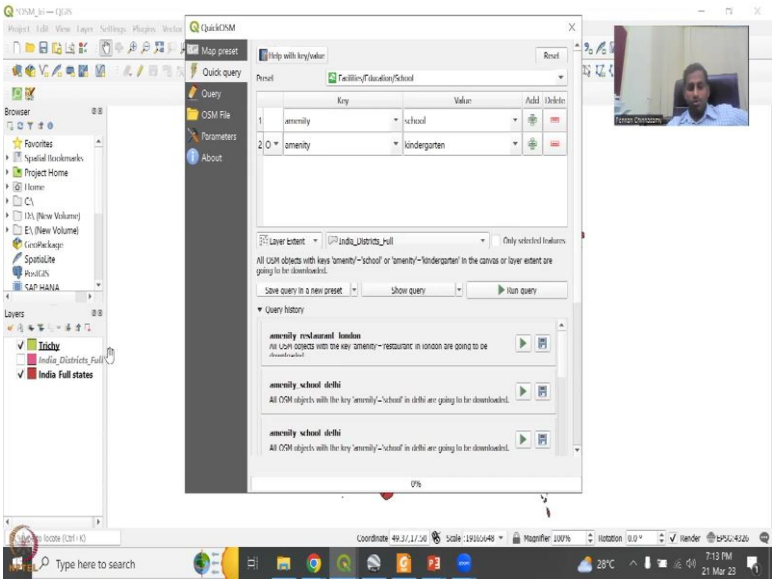
So, now we have 2 questions, it is amenities should be equal to school plus and or ability will be kindergarten or if you say and then both have to be yes, yes, both have to be true for the output to come. Like for example, the school in IIT Bombay does not have a kindergarten, it has only 1 to 12. So, only that school will come up. But the IIT public school will not come up in this map because it has no kindergarten. If you take my school that I will do in Chennai, yes, it will come up because it has schooling from LKG, UKG to plus 2. So, you see how one search you have to be careful about it.

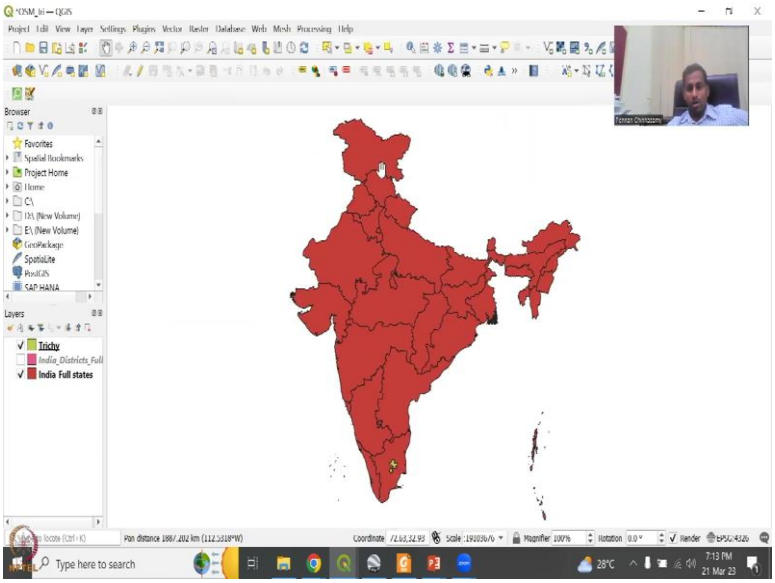
The query button is if how to do Python coding, you can type the query but that is what quick query does, it creates this interface so that you can populate the query automatically. And these are other OSM file where you want to save it, what type of OSM files do you want, that we can be temporarily keep it temporary for now, because you will be saving it only if you like the data. And then you have parameters about extra. Parameters, you need to have this over pass access to API, which we will be doing. So, now we have the search things selected.

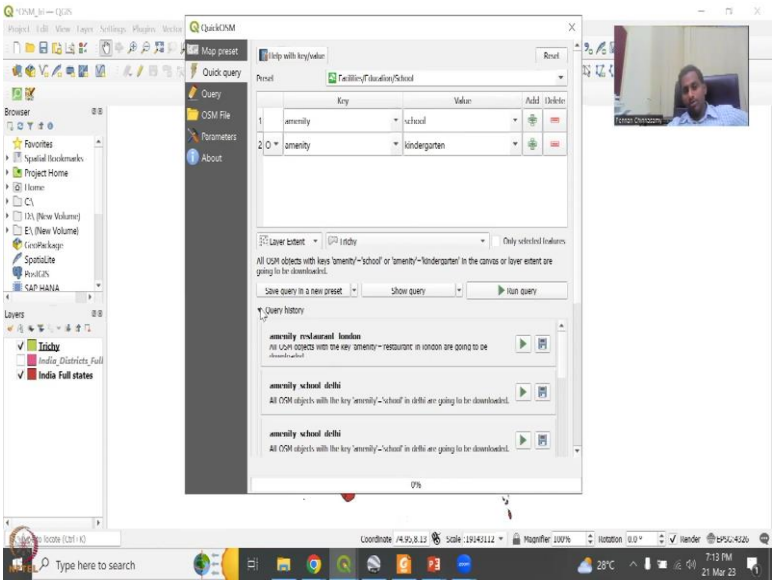
(Refer Slide Time: 21:53)

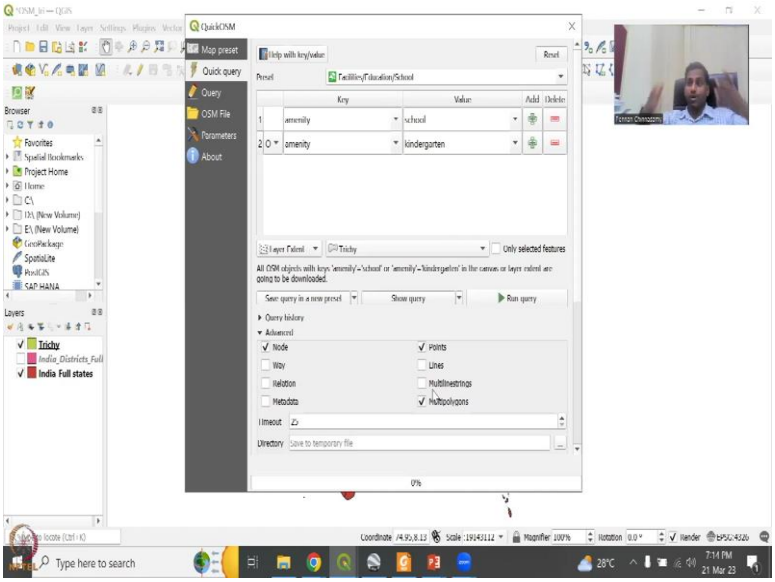


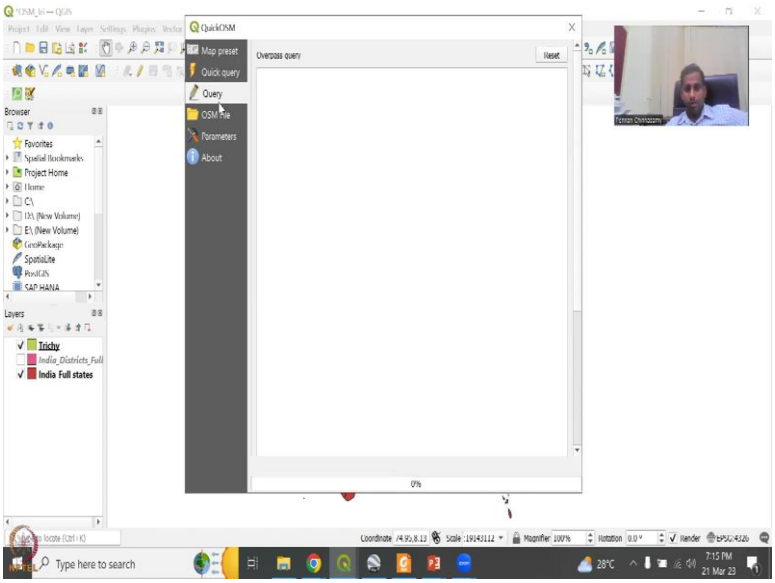





Browser
Favorites
Spatial Bookmarks
Project Home
Home
C:\
D:\ (New Volume)
E:\ (New Volume)
GeoPackage
SpatiaLite
PostGIS
SAP HANA
Layers
Trichy
India_Districts_Full
India Full states
Type here to search
28°C
7:13 PM
21 Mar 23


QuickOSM
Map preset
Quick query
Query
OSM File
Parameters
About
Reset
Preset
Facilities/Education/School
Key
Value
Add
Delete
amenity
school
amenity
kindergarten
Layer extent
Trichy
Only selected features
All OSM objects with keys 'amenity'='school' or 'amenity'='kindergarten' in the canvas or layer extent are going to be downloaded.
Save query in a new preset
Show query
Run query
Query history
amenity restaurant london
All OSM objects with the key 'amenity'='restaurant' in london are going to be
amenity school delhi
All OSM objects with the key 'amenity'='school' in delhi are going to be downloaded.
amenity school delhi
All OSM objects with the key 'amenity'='school' in delhi are going to be downloaded.
0%
Type here to search
28°C
7:13 PM
21 Mar 23


QuickOSM
Map preset
Quick query
Query
OSM File
Parameters
About
Reset
Preset
Facilities/Education/School
Key
Value
Add
Delete
amenity
school
amenity
kindergarten
Layer extent
Trichy
Only selected features
All OSM objects with keys 'amenity'='school' or 'amenity'='kindergarten' in the canvas or layer extent are going to be downloaded.
Save query in a new preset
Show query
Run query
Query history
Advanced
Node
Points
Way
Lines
Relation
Multilinestrings
Metadata
Multipolygons
Timeout
Directory
Save to temporary file
0%
Type here to search
28°C
7:14 PM
21 Mar 23



And what we will do now is in where do you want is it within a village, you can give a village name, or a district. So, I am going to say Tiruchirappalli here. Now, what happens is if the spelling is different, it will not pick. So, make sure that if the area, I have already shared all the data with you in terms of the links, where to get data, where to get district boundaries, block boundaries, use the boundary use the spatial boundary rather than this. So, I will show you that. What I have done is I have already loaded Trichy, which is a short form of the Tiruchirappalli. And a lot of people still use that in official names when they write.

So, it is still usable. Let us say layer extent, and the layer extent are these one of these 3 files, I am going to say Trichy. And then I have showed you how to do extract that from the overall shapefile. Also, you can do this. So, for example, if you have this selected Tamil Nadu, which we will do later, as an exercise, so then only Tamil Nadu will come up. So, because of this open box, we cannot do the select tool now, because it is already selected. But let us show you the other way.

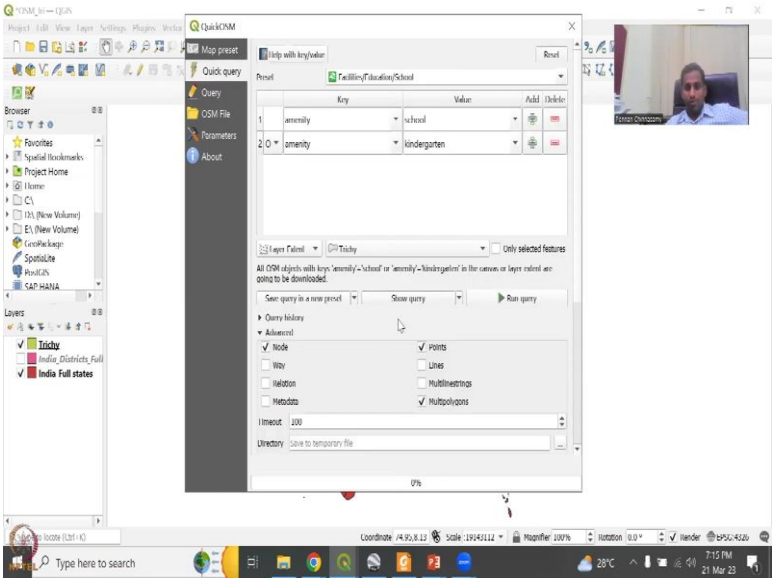
This is your history; it gives you the history of what you have searched and collected data and the advanced part is where you will have to tell do you want the boundaries? Do you want the lines or notes this will take too much time? If you have everything. So, let us look keep notes and points. We want the location of the schools. And then we will say ways and lines we can keep that. Node and points will keep, ways and lines is paths way is a path.

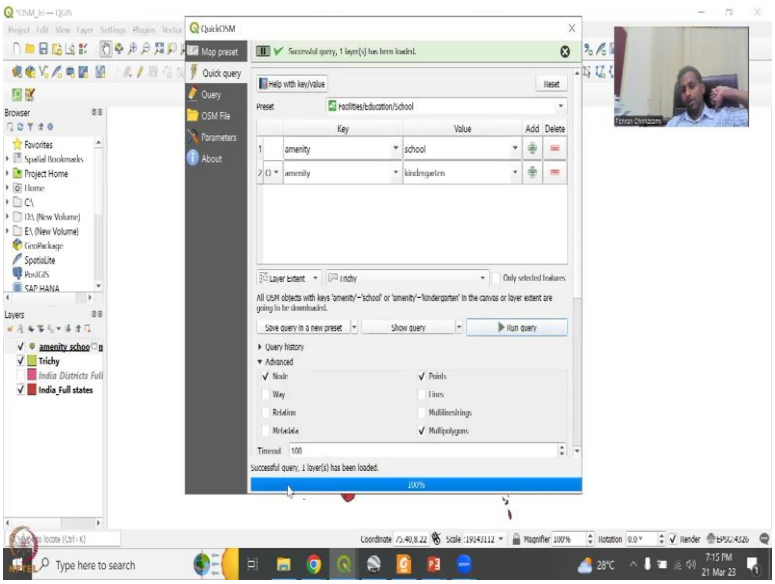
Do you want the way a pathway to the school? We do not need it. Do you want a road line to the school? We do not need it. Do you want a relationship to the school, multi strings? We do not want it. Do you want a polygon? It gives the area of the school? Yes, let us keep it. So,

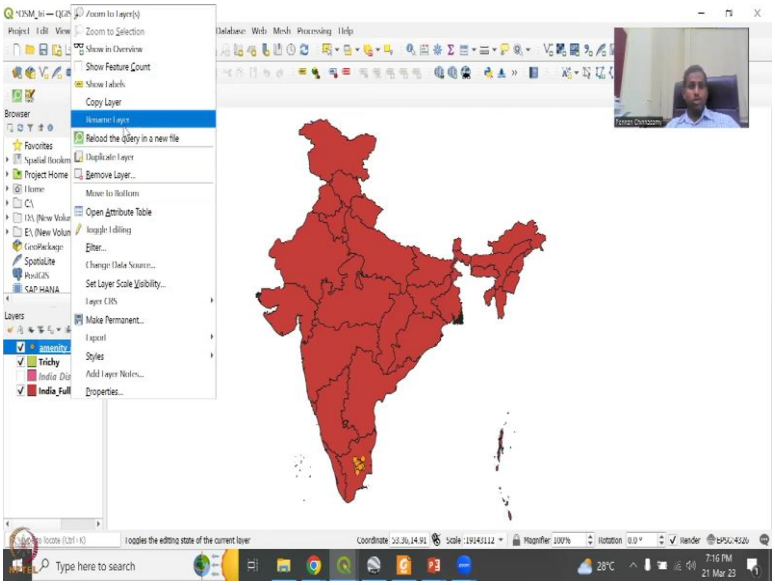
some data could have come as polygon. Suppose I am a user I gave a data for the school I would have given it as a polygon or a point. So, this aspect is where you will be careful to negotiate how to bring the data in.

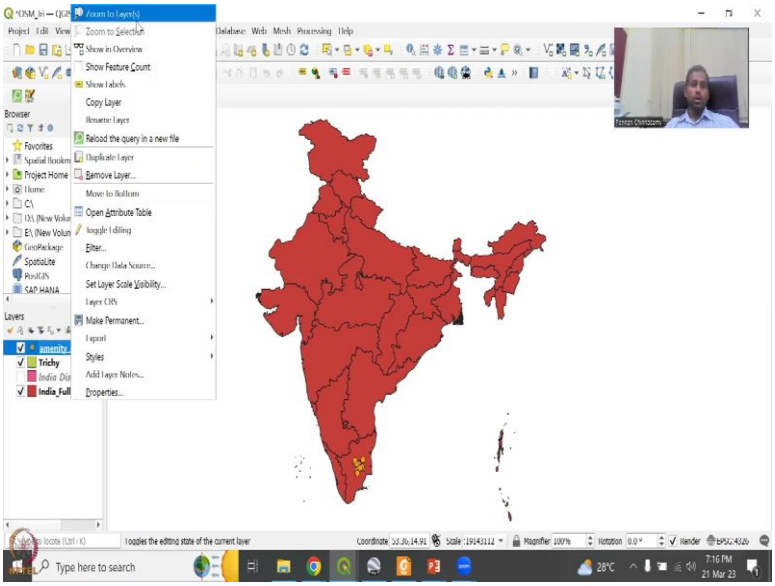
So, I will just say both, it will take some more extra time maybe a couple of seconds from my system because my area is small. If you use a big state, then lot of data has to be given a lot of time has to be given. So, all this is enough always keep a default and then go back here and say run very. If you say show query, like if you go here now nothing is populated.

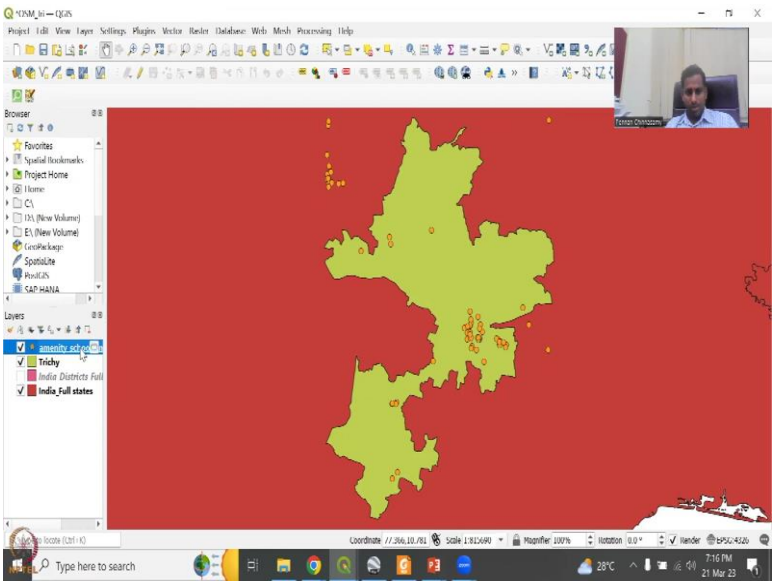
(Refer Slide Time: 24:36)






Zoom In Layer(s)
Zoom to Selection
Show in Overview
Show Feature Count
Show Labels
Copy Layer
Rename Layer
Reload the query in a new file
Duplicate Layer
Remove Layer...
Move to Bottom
Open Attribute Table
Toggle Editing
Filter...
Change Data Source...
Set Layer Scale Visibility...
Layer CRS
Make Permanent...
Export
Styles
Add Layer Notes...
Properties...
Type here to search


Zoom In Layer(s)
Zoom to Selection
Show in Overview
Show Feature Count
Show Labels
Copy Layer
Rename Layer
Reload the query in a new file
Duplicate Layer
Remove Layer...
Move to Bottom
Open Attribute Table
Toggle Editing
Filter...
Change Data Source...
Set Layer Scale Visibility...
Layer CRS
Make Permanent...
Export
Styles
Add Layer Notes...
Properties...
Type here to search

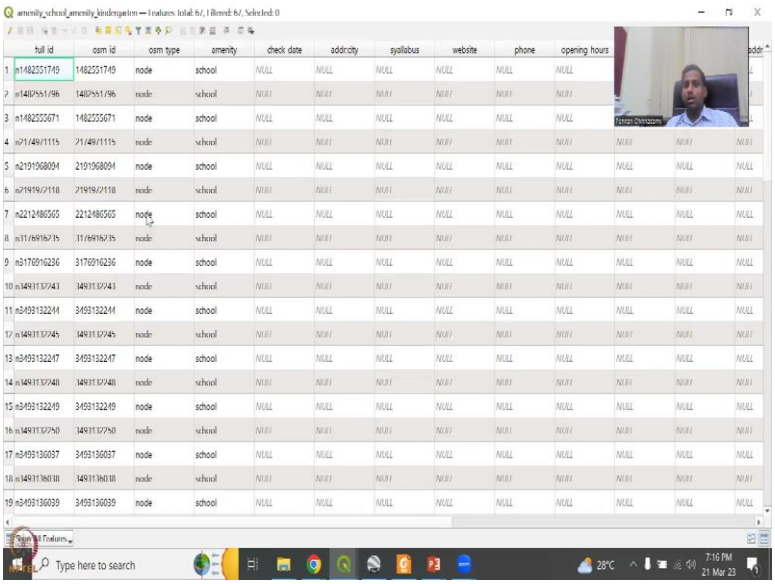

Trichy
India Districts Full
India_Full states
Type here to search

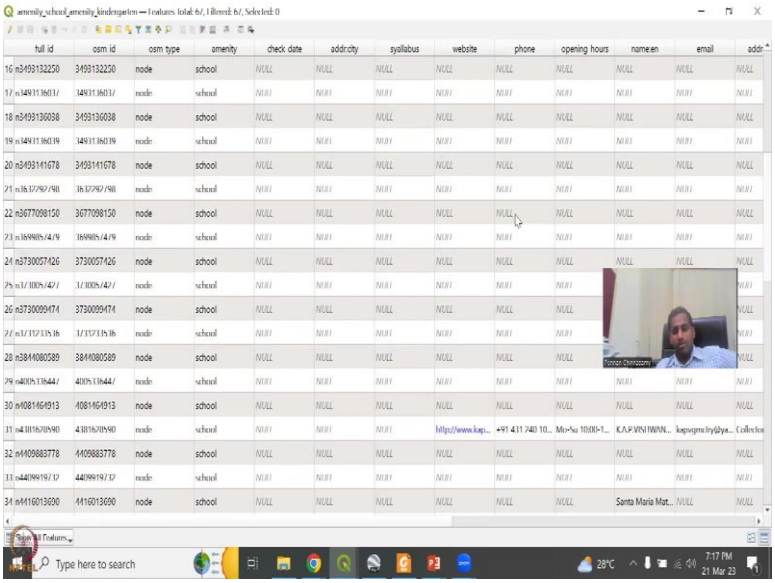
But if you say show the query now it gets populated. So, the code that you gave in quick query is automatically converted to a Python the selections you are given. All these selections have converted to a query and it says school or kindergarten for a particular thing. And it says you need to timeout for a particular time, and then it says, for the particular extent, so everything is coded. Now, all we have to do is run the query and running the query. Here on the bottom, it says running the query, one layer has been uploaded.

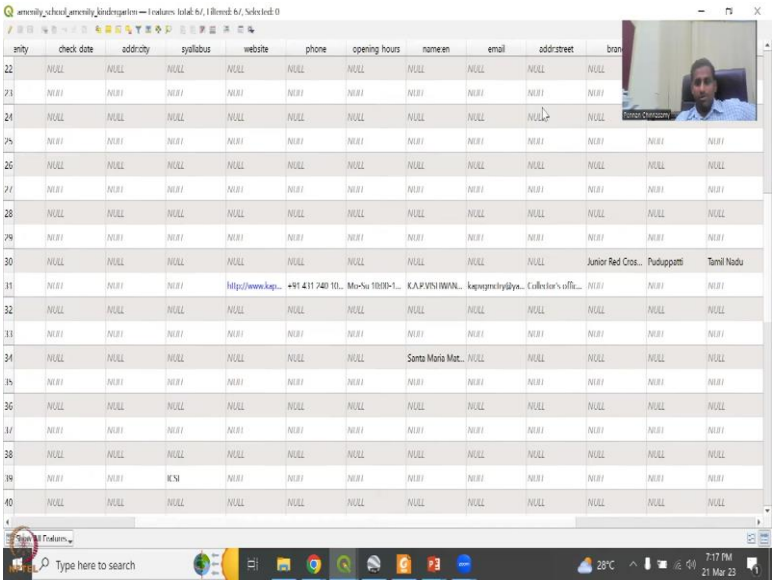
Let us see what layer has been uploaded? And it has been the locations, amenities is school, kindergarten. Let me zoom into that layer, click, zoom. So, once you zoom in, you can see that this is the quality issue I was talking about. Some have been labelled as Trichy schools, but they are outside the boundary. You cannot blame them, maybe their location, the phone, or the GPS unit they were using has that big of an error which is possible, or and or they would have done wrong spelling and stuff.

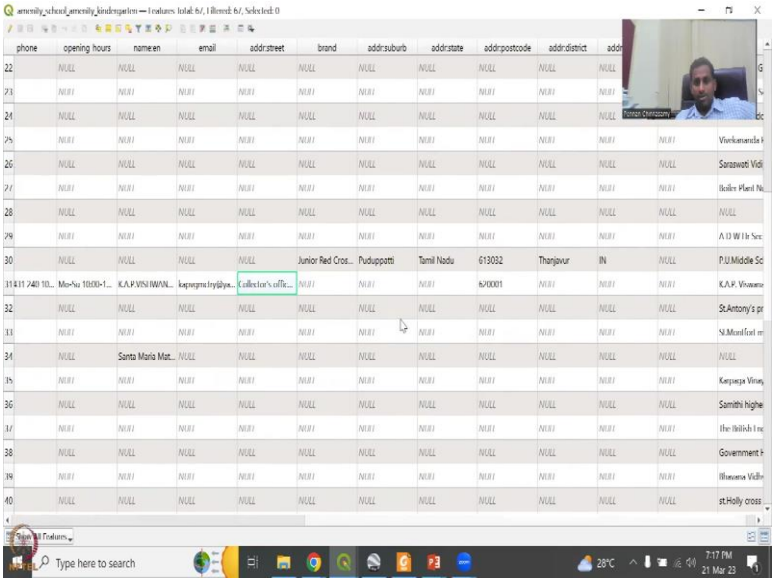
So, as I said, it is our duty to check the data before you use it. Any student, anyone who is using this, for research purposes, needs to look at the data. So, I am going to zoom in to the Trichy boundary. And you will see that both these are outside, there are clusters outside, but there are good clusters inside also. So, let us open this amenity schools. Then we will say Open Attribute Table.

(Refer Slide Time: 26:23)




amenity_school_amenity_kindergarten — Features total: 67, Filtered: 67, Selected: 0
full id
osm id
osm type
amenity
check date
addr:city
syllabus
website
phone
opening hours
name:en
email
addr:
Type here to search
28°C
7:17 PM
21 Mar 23

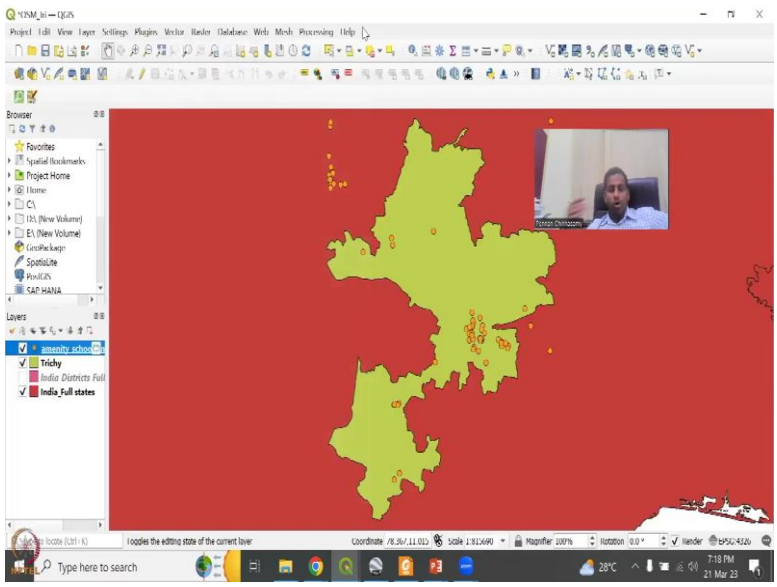

amenity_school_amenity_kindergarten — Features total: 67, Filtered: 67, Selected: 0
anity
check date
addr:city
syllabus
website
phone
opening hours
name:en
email
addr:street
Junior Red Cros...
Pudupppatti
Tamil Nadu
Santa Maria Mat...
ICSI
Type here to search
28°C
7:17 PM
21 Mar 23

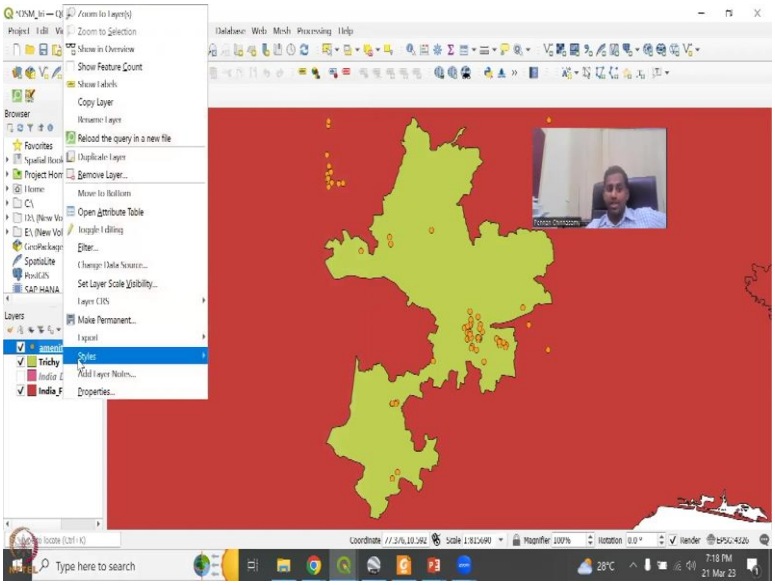

amenity_school_amenity_kindergarten — Features total: 67, Filtered: 67, Selected: 0
phone
opening hours
name:en
email
addr:street
brand
addr:suburb
addr:state
addr:postcode
addr:district
Junior Red Cros...
Pudupppatti
Tamil Nadu
613032
Thanjavur
IN
Collector's offic...
Santa Maria Mat...
Type here to search
28°C
7:17 PM
21 Mar 23

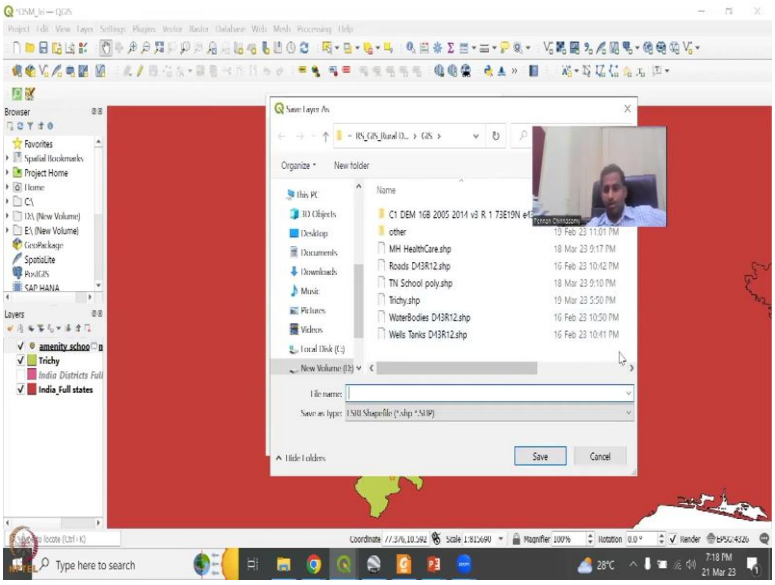
And you have this beautiful table coming up with random IDs, no ID name, no school name, but just a school. At least you know, like it is a school, and under that there is no city syllabus, only some habit. For example, this has kpadmgac.in. It is a school name with the opening hours. So, only some people like it is probably a good business for them to put it on the map so, that people understand where school is. And then you have the maybe the principal's name, the email, Street, office address. And then what are the brands they have suburbs, state, postal code, Thanjavur.

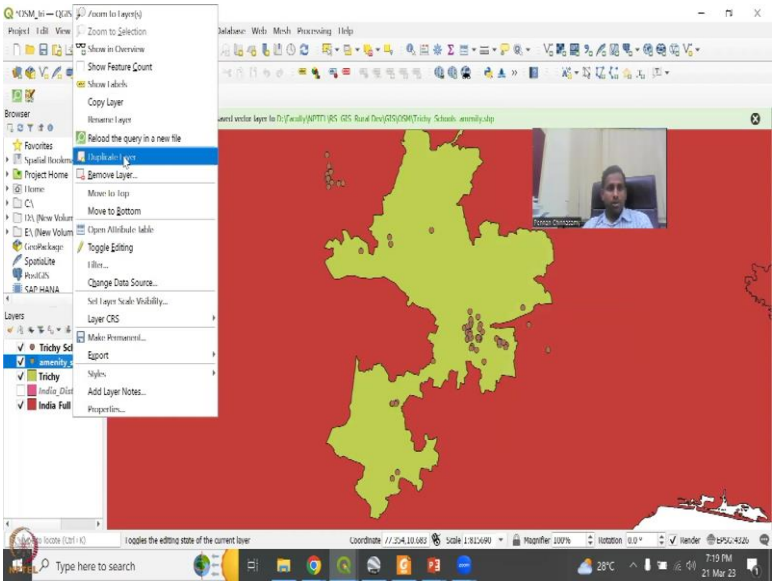
So, here is that it is a Thanjavur district, but why is it in Trichy? We do not know. So, these are the outliers. So, when they typed it, they put the Thanjavur but the location geolocation is somewhere else. Or when they did the geolocation, it is in Trichy, but the name was Thanjavur. So, all this should be Trichy Tiruchirappalli but it is not there. The school names are pretty good at least the names they have put and some random is nothing no data there but the point is there so some data errors are there. So, it is our duty to filter it and use it.

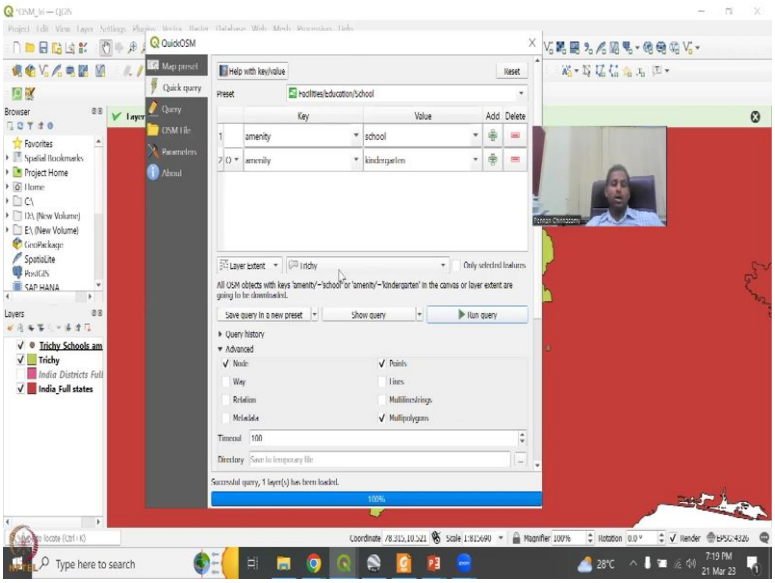
(Refer Slide Time: 27:37)

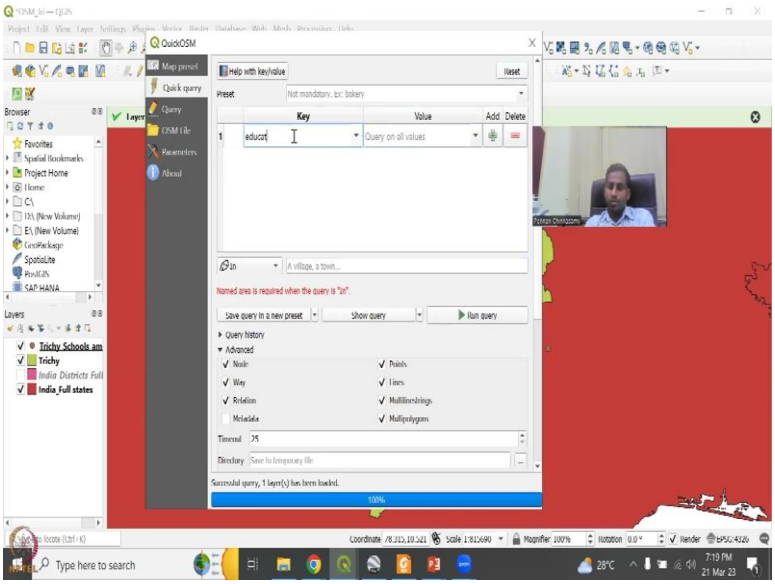


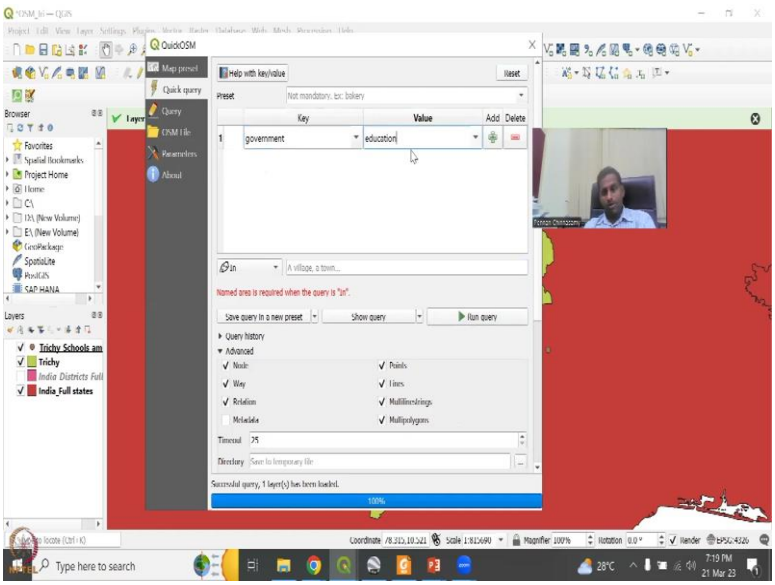

Zoom to Layer(s)
Zoom to Selection
Show in Overview
Show Feature Count
Show Labels
Copy Layer
Rename Layer
Reload the query in a new file
Duplicate Layer
Remove Layer...
Move to Bottom
Open Attribute Table
Toggle Editing
Filter...
Change Data Source...
Set Layer Scale Visibility...
Layer CRS
Make Permanent...
Export
Styles
Add Layer Notes...
Properties...
Type here to search

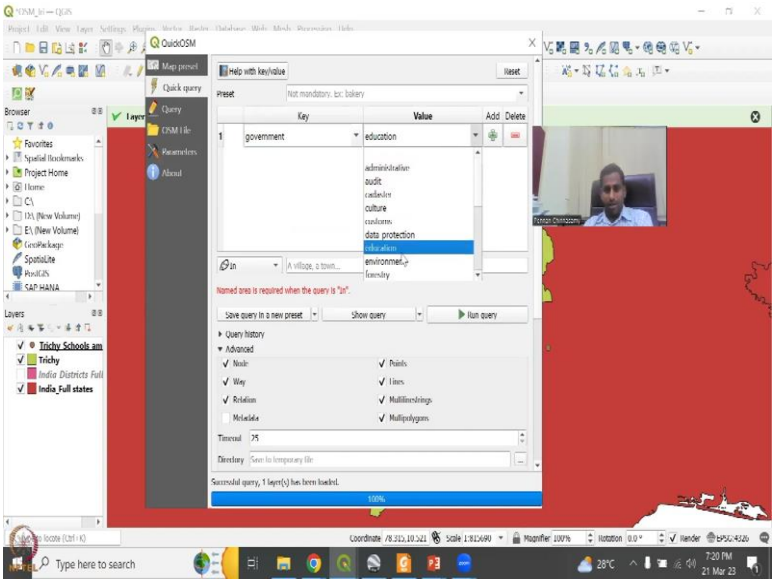

Save Layer As
Organize
New folder
Name
Save
Cancel
Type here to search

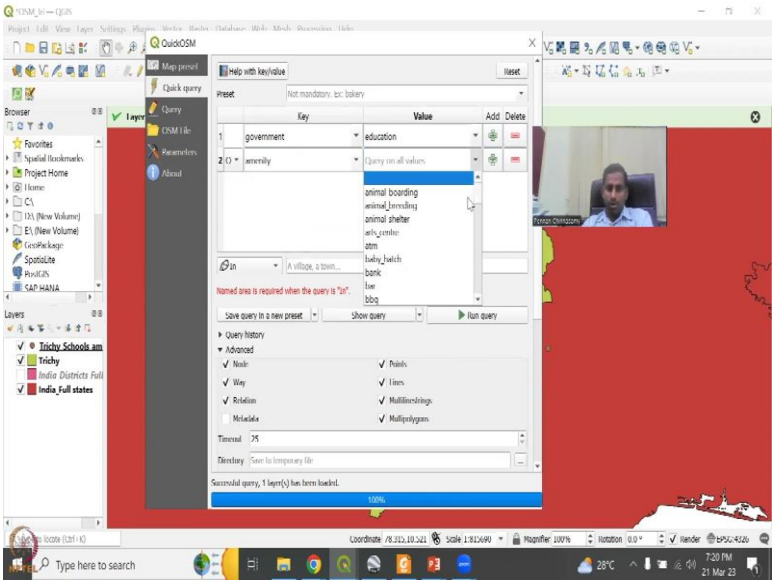

Zoom to Layer(s)
Zoom to Selection
Show in Overview
Show Feature Count
Show Labels
Copy Layer
Rename Layer
Reload the query in a new file
Duplicate Layer
Remove Layer...
Move to Top
Move to Bottom
Open Attribute Table
Toggle Editing
Filter...
Change Data Source...
Set Layer Scale Visibility...
Layer CRS
Make Permanent...
Export
Styles
Add Layer Notes...
Properties...
Type here to search

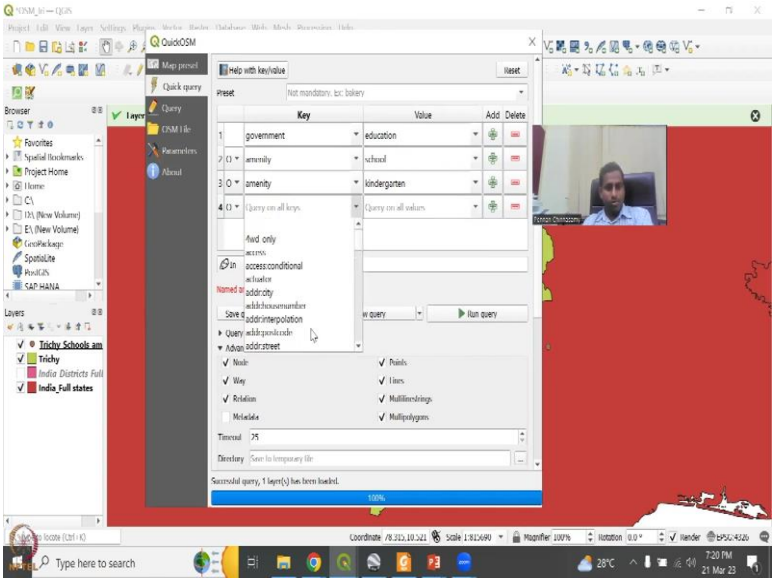

QuickOSM
Help with key/value
Reset
Preset
facilities/education/school
Key
Value
Add
Delete
amenity
school
amenity
kindergarten
Layer extent
trichy
Only selected features
All OSM objects with keys 'amenity'='school' or 'amenity'='kindergarten' in the canvas or layer extent are going to be downloaded.
Save query in a new preset
Show query
Run query
Query history
Advanced
Node
Points
Way
Lines
Relation
Multilinestrings
Metadata
Multipolygons
Timeout
100
Directory
Save to temporary file
Successful query, 1 layer(s) has been loaded.
100%
Trichy Schools am
Trichy
India Districts Full
India_Full states
Type here to search
28°C
7:19 PM
21 Mar 23

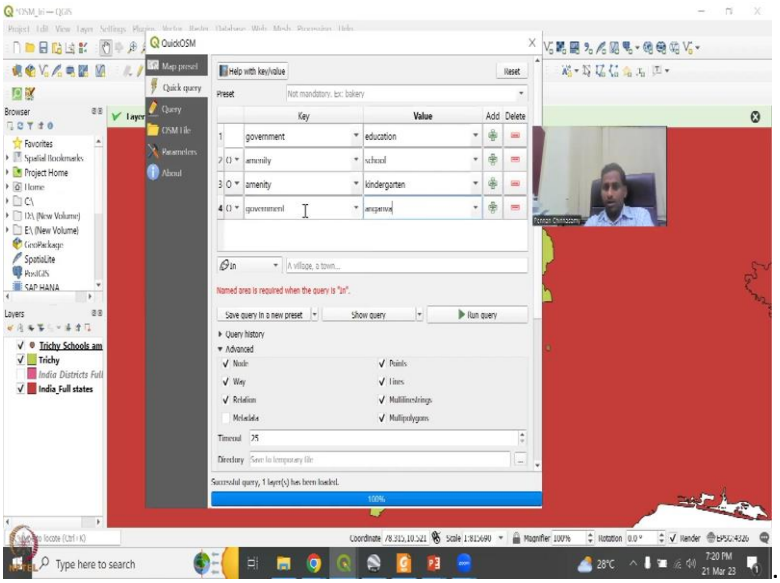

QuickOSM
Help with key/value
Reset
Preset
Not mandatory, ex: bakery
Key
Value
Add
Delete
educat
Query on all values
in
A village, a town...
Named area is required when the query is "in".
Save query in a new preset
Show query
Run query
Query history
Advanced
Node
Points
Way
Lines
Relation
Multilinestrings
Metadata
Multipolygons
Timeout
25
Directory
Save to temporary file
Successful query, 1 layer(s) has been loaded.
100%
Trichy Schools am
Trichy
India Districts Full
India_Full states
Type here to search
28°C
7:19 PM
21 Mar 23

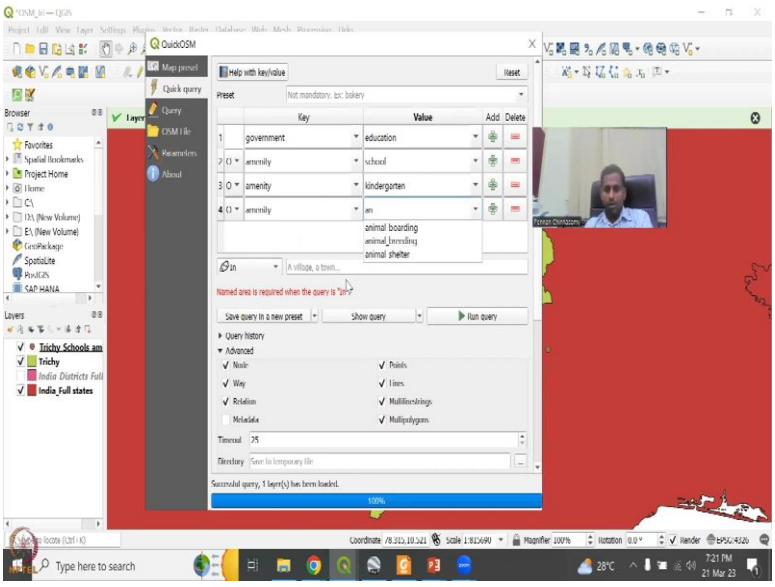

QuickOSM
Help with key/value
Reset
Preset
Not mandatory, ex: bakery
Key
Value
Add
Delete
government
education
in
A village, a town...
Named area is required when the query is "in".
Save query in a new preset
Show query
Run query
Query history
Advanced
Node
Points
Way
Lines
Relation
Multilinestrings
Metadata
Multipolygons
Timeout
25
Directory
Save to temporary file
Successful query, 1 layer(s) has been loaded.
100%
Trichy Schools am
Trichy
India Districts Full
India_Full states
Type here to search
28°C
7:19 PM
21 Mar 23


QuickOSM
Help with key/value
Reset
Preset
Not mandatory. ex: bakery
Key
Value
Add
Delete
government
education
administrative
audit
cadastre
culture
customs
data_protection
education
environment
forestry
Named area is required when the query is "in".
Save query in a new preset
Show query
Run query
Query history
Advanced
Node
Points
Way
Lines
Relation
Multilinestrings
Metadata
Multipolygons
Timeout
25
Directory
Save to temporary file
Successful query, 1 layer(s) has been loaded.
100%
Trichy Schools am
Trichy
India Districts Full
India_Full states
Type here to search
28°C
7:20 PM
21 Mar 23


QuickOSM
Help with key/value
Reset
Preset
Not mandatory. ex: bakery
Key
Value
Add
Delete
government
education
amenity
Query on all values
animal boarding
animal_breeding
animal shelter
arts_centre
atm
baby_hatch
bank
bar
bbq
Named area is required when the query is "in".
Save query in a new preset
Show query
Run query
Query history
Advanced
Node
Points
Way
Lines
Relation
Multilinestrings
Metadata
Multipolygons
Timeout
25
Directory
Save to temporary file
Successful query, 1 layer(s) has been loaded.
100%
Trichy Schools am
Trichy
India Districts Full
India_Full states
Type here to search
28°C
7:20 PM
21 Mar 23


QuickOSM
Help with key/value
Reset
Preset
Not mandatory. ex: bakery
Key
Value
Add
Delete
government
education
amenity
school
amenity
kindergarten
Query on all keys
Query on all values
4wd_only
access
access:conditional
actuator
addr:city
addr:housenumber
addr:interpolation
addr:postcode
addr:street
Named area is required when the query is "in".
Save query in a new preset
Run query
Query history
Advanced
Node
Points
Way
Lines
Relation
Multilinestrings
Metadata
Multipolygons
Timeout
25
Directory
Save to temporary file
Successful query, 1 layer(s) has been loaded.
100%
Trichy Schools am
Trichy
India Districts Full
India_Full states
Type here to search
28°C
7:20 PM
21 Mar 23





So, now beautifully we have done this part and as I always say we are going to we need to this is a temporary file. So, we need to save it export the save feature as amenities schools will go here to see where we want. So, let us create a folder for this. This is all our materials that we have for this course I said OSM test and we are going to say Trichy amenities we will just say is it is schools under amenity. So, I am going to save it as a shapefile and save and then add the file to the thing, yes, we can add and now this has been added so you can remove this file which is temporary, we can remove the layer.

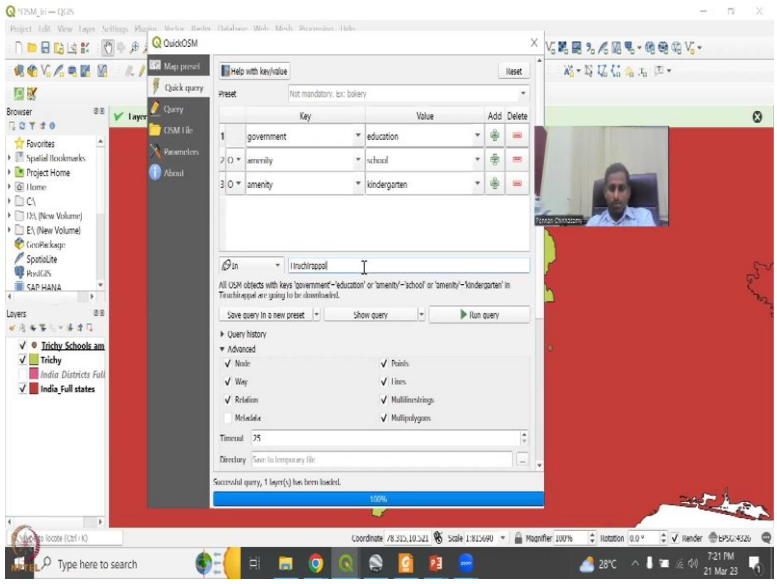
So, what I have also done is I have also done behind this another file with a different set of search. So, I will add that too or we could do another quick search, so here we are the quick query is there I have said to Trichy boundary is fine. Let us do one with the name, so in and around Tiruchirappalli. I am going to remove the preset so I am going to reset the preset and

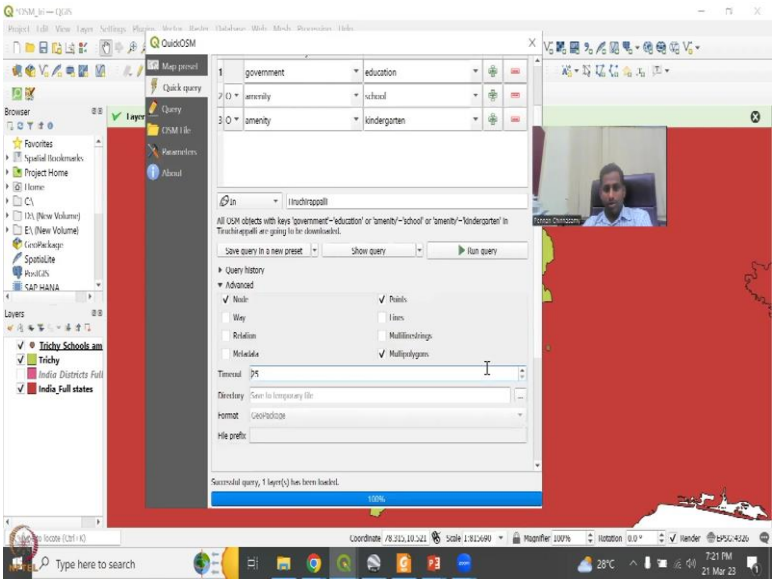
then I am going to go to education not there, government, yes. The government is there let us make government supports, there it is.

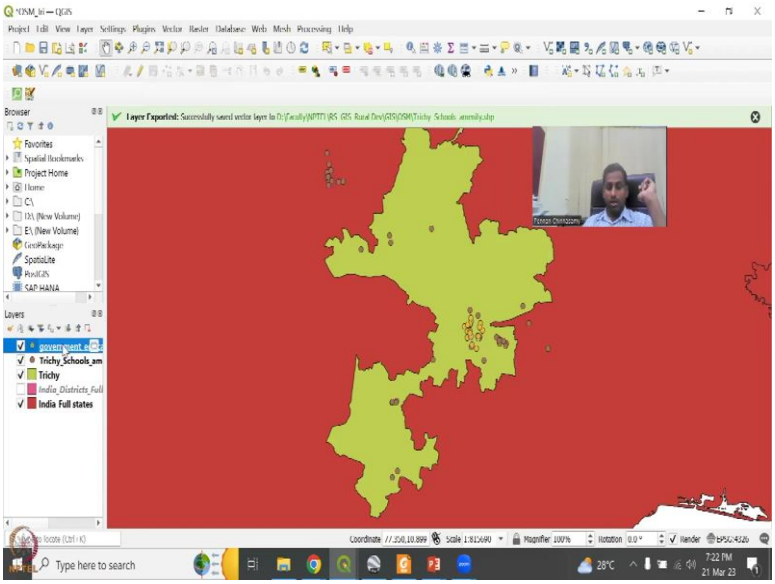
So, if you click here, you will find all the different keys that are available so we will click government and under the government what are there? So, I have clicked education you can also search for it. I am going to add another layer saying that amenity or and then in the amenity there is all these things. So, let us say school, plus, or, let us say amenity kindergarten plus private schools. We do not want colleges. So, we will just keep like we can say government. Kindergarten, you do not have Kindergarten, anganwadi does not come.

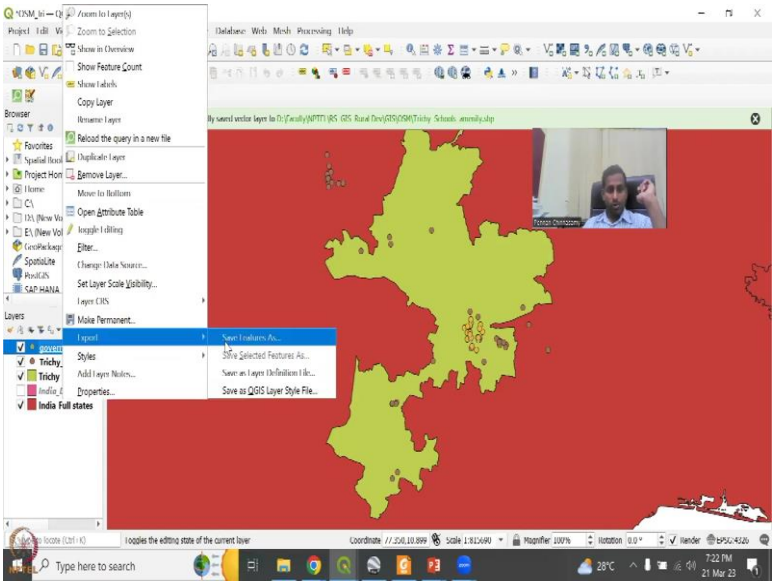
So, this is where we do not have the names. And I purposely wanted to show you I have already tried this. It does not work. So, we can have tutorial college under amenities, but not under government. So, government is only schools are there. So, let us try another amenity here, which could be only animal boarding and breeding. So, we can also remove the layer if we do not want. So, 3 layers is enough.

(Refer Slide Time: 30:48)




QuickOSM
government
education
amenity
school
amenity
kindergarten
Map preset
Quick query
Query
OSM File
Parameters
About
in
Tiruchirappalli
All OSM objects with keys 'government'='education' or 'amenity'='school' or 'amenity'='kindergarten' in Tiruchirappalli are going to be downloaded.
Save query in a new preset
Show query
Run query
Query history
Advanced
Node
Points
Way
Lines
Relation
Multilinestrings
Metadata
Multipolygons
Timeout
25
Directory
Save to temporary file
Format
GeoPackage
File prefix
Succesful query, 1 layer(s) has been loaded.
100%
Browser
Layers
Trichy Schools am
Trichy
India_Districts_Full
India_Full states
Type here to search
28°C
7:21 PM
21 Mar 23


Layer Exported: Successfully saved vector layer to D:\Faculty\NPTTI\RS GIS Rural Dev\GIS\OSM\Trichy Schools_amenity.shp
Browser
Layers
government
Trichy_Schools_am
Trichy
India_Districts_Full
India Full states
Type here to search
28°C
7:22 PM
21 Mar 23


Zoom to Layer(s)
Zoom to Selection
Show in Overview
Show Feature Count
Show Labels
Copy Layer
Rename Layer
Reload the query in a new file
Duplicate Layer
Remove Layer...
Move to Bottom
Open Attribute Table
Toggle Editing
Filter...
Change Data Source...
Set Layer Scale Visibility...
Layer CRS
Make Permanent...
Export
Styles
Add Layer Notes...
Properties...
Save Features As...
Save Selected Features As...
Save as Layer Definition File...
Save as QGIS Layer Style File...
Browser
Layers
India Full states
Type here to search
28°C
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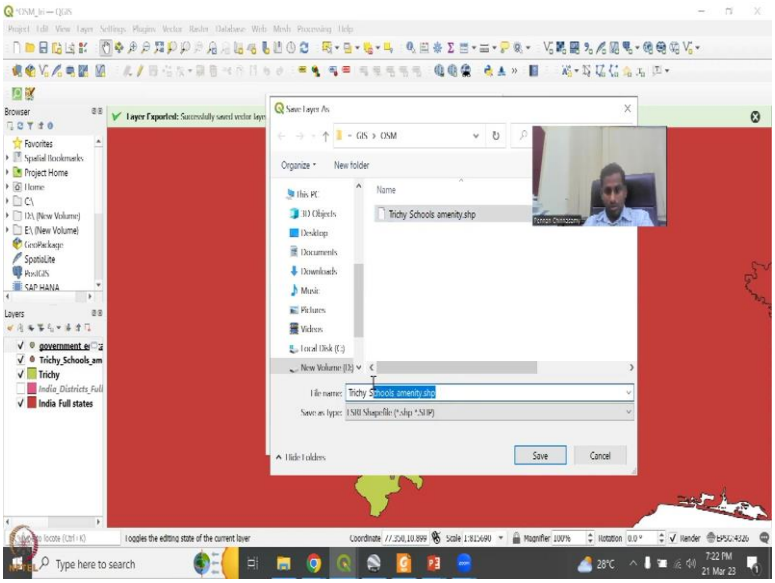
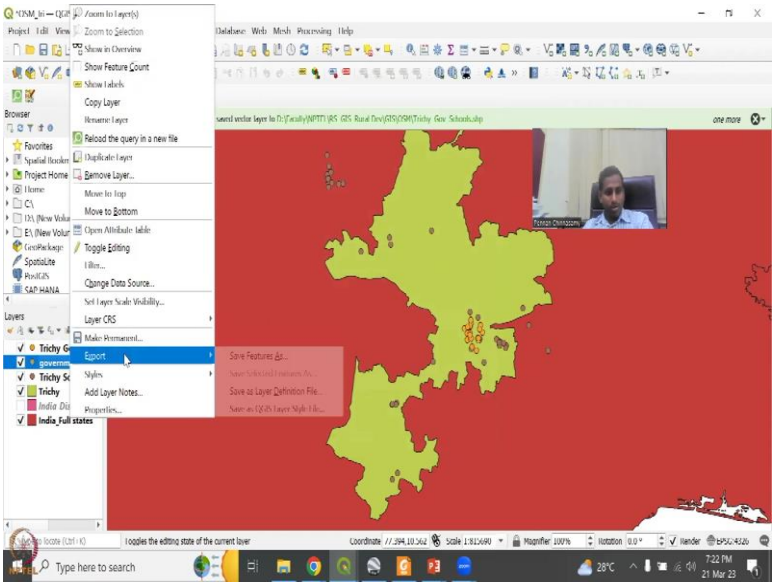
21 Mar 23





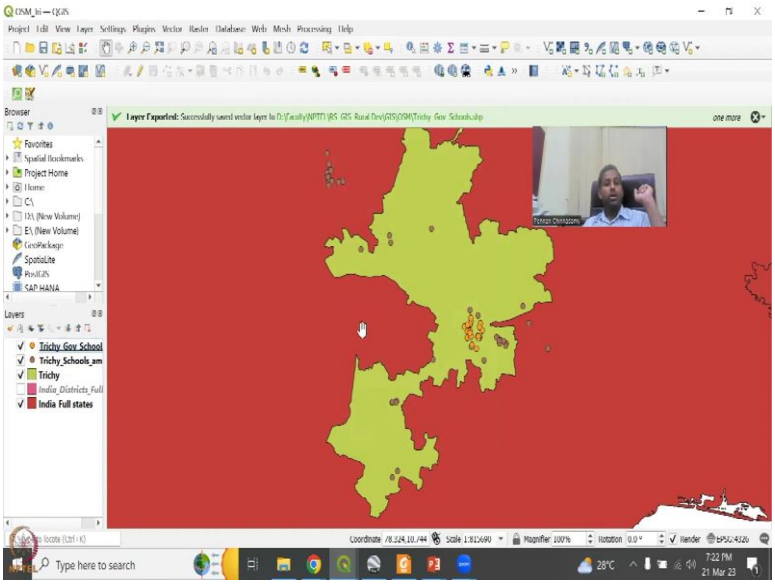
And as I said, I am going to do Tiruchirappalli. You want to save that in the new, you can save it in the new plus you want to preset like this, if you want to preset you can save otherwise, it is fine. Again, I will remove the ways, lines, relation, multi strings, I will keep the polygons. I will show you why? And then we will do it. So, this can be default. And then I am going to run query. So, it is to keep it into the column. The layer has been added. Apparently there has not has been only points, there is no polygons, which is okay.

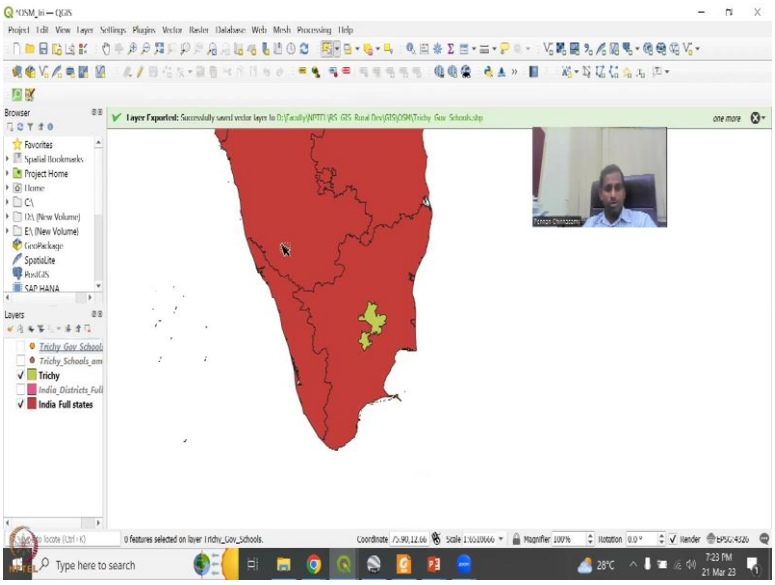
But for Tamil Nādu you can get polygons I will show you in the next clip schools. So, now we have Trichy schools just by preset condition by in this condition, and then we have the government entities let us say this also export save feature as. And then I will go here in the same Trichy and this is not a preset, this was just a government schools. You cannot add

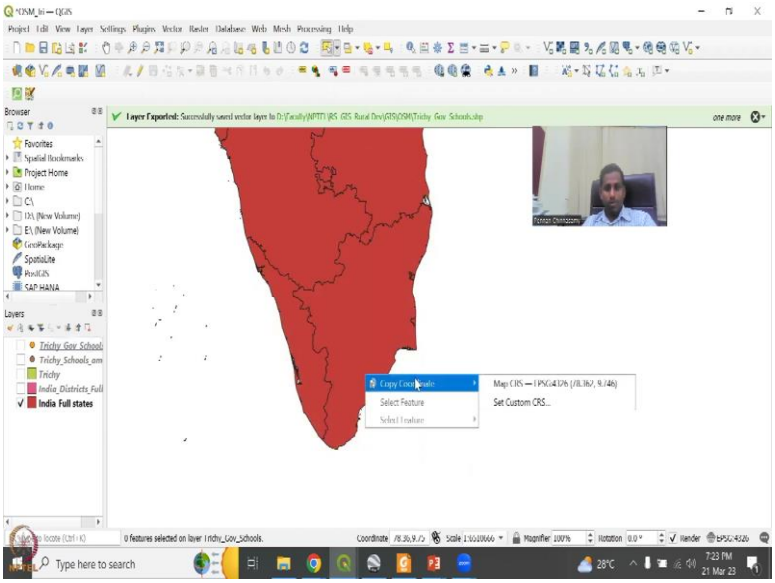
symbols. So, do not add symbols, this is fine. So, I am just going to say okay, as the map, and then I am going to remove this amenity location, remove it. Yes.

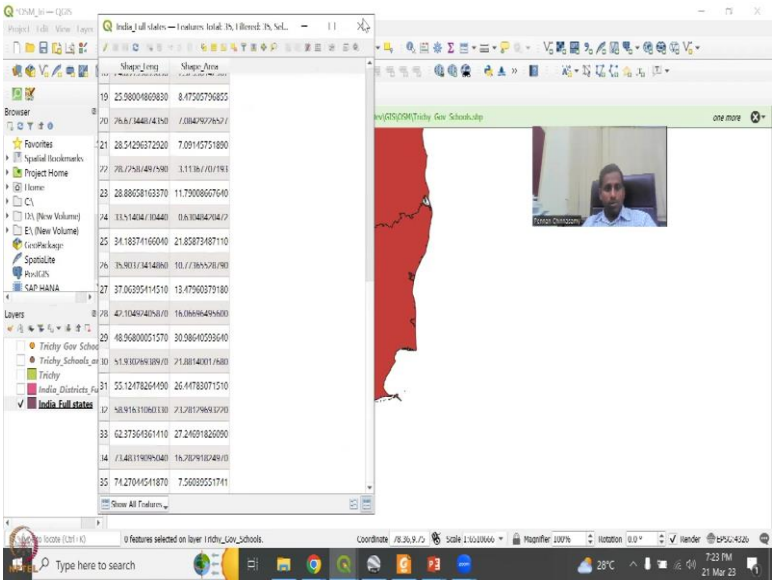
And we have always, always save your work. So, now we have 2 shapefiles, I am going to add another shapefile for Tamil Nādu. We will see why?

(Refer Slide Time: 32:23)






Layer Exported: Successfully saved vector layer to D:\Faculty\NPTTI\RS GIS Rural Dev\GIS\QSM\Trichy Gov Schools.shp
Copy Coordinate
Select Feature
Set Custom CRS...
India Full states
Type here to search
28°C
7:23 PM
21 Mar 23


India_Full states — Features Total: 35, Filtered: 35, Sel...
Shape_Leng
Shape_Area
Show All Features
India Full states
Type here to search
28°C
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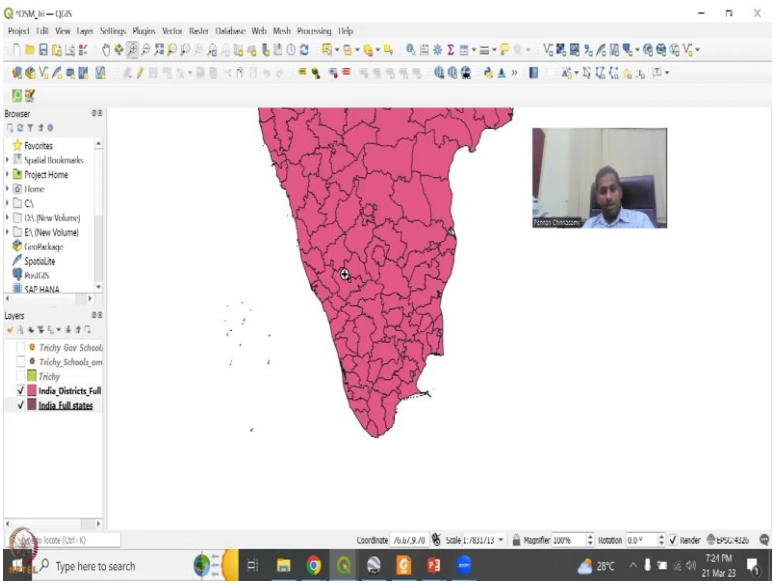
21 Mar 23


India_Districts_Full
India Full states
Type here to search
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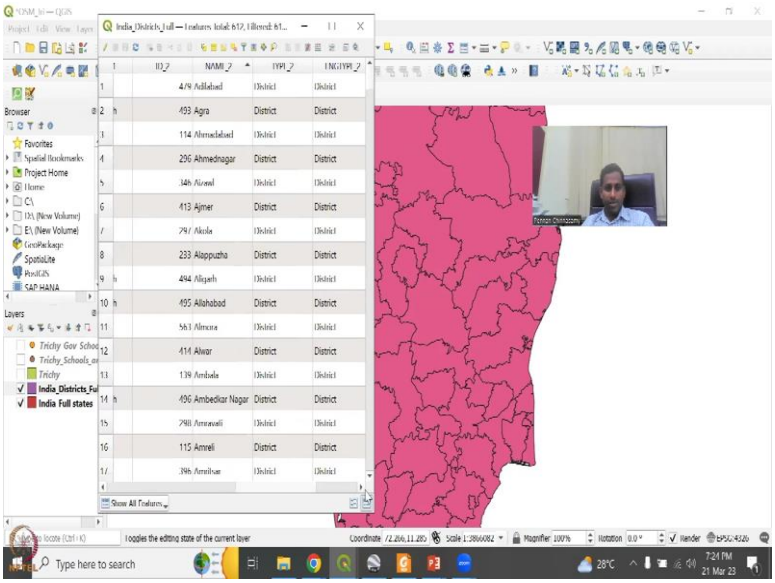
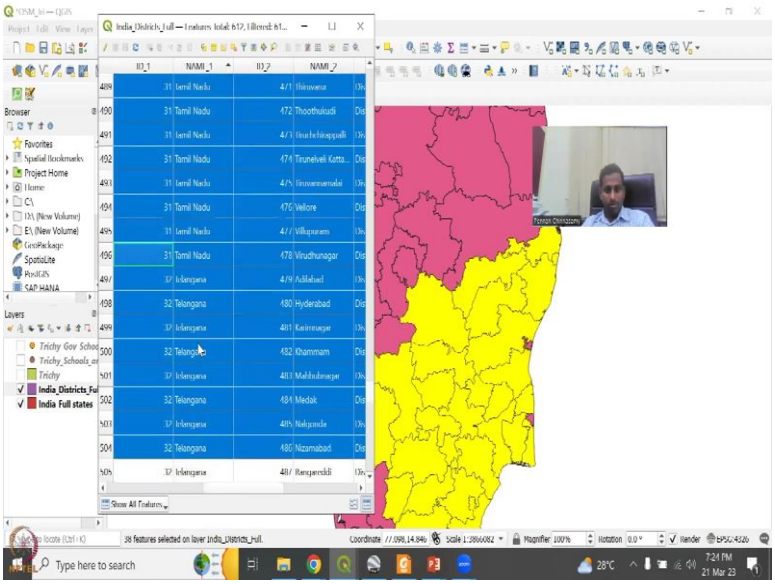
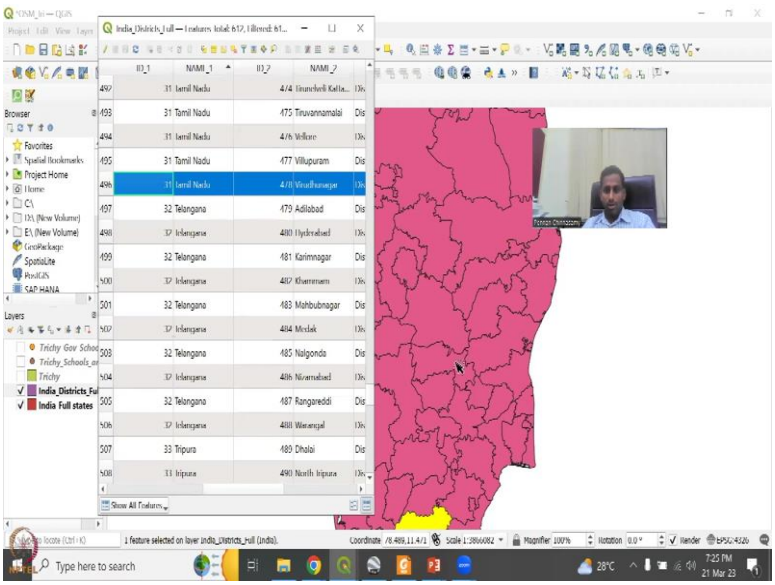
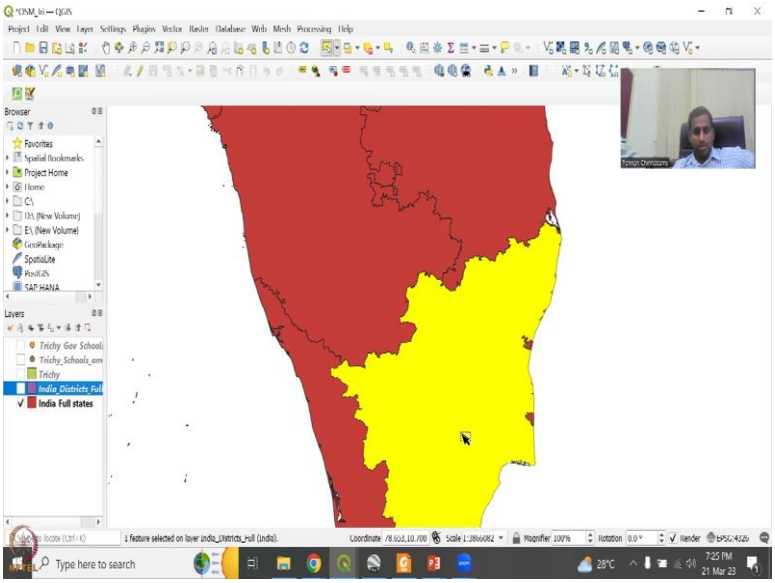
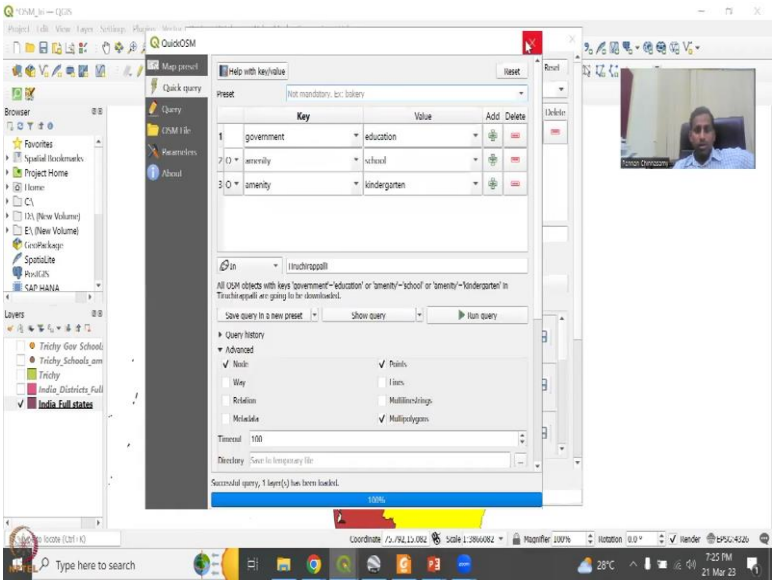
21 Mar 23











I am going to zoom out a bit. So, now Tamil Nadu, I want to take the schools. So, what I am going to do, I am going to do a select button, sometimes you can make a shapefile. Suppose you do not know you do not want to make a shapefile. You just want this. So, what do you do this is you can click you can clear the selection. So, for now, let us take these points out, and then even put it out and then just keep the states. You can copy the coordinate, but let me go to Open Table. It is not allowing me because the name is not there. There is no create an identifier, so it is fine.

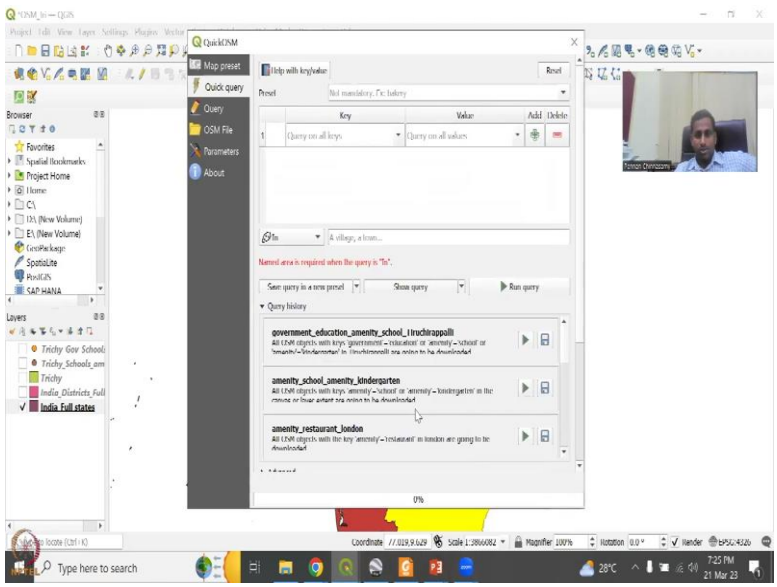
So, let us go to the table. If you double click on this, it can also show you if you want to, you can close this because it is disturbing your screen. And then you can select a particular state, and then make a copy of it. Let us say like this, you can zoom in, I think the other one can be corrupted. I will show you why? So, now I have selected this and then I can you can select

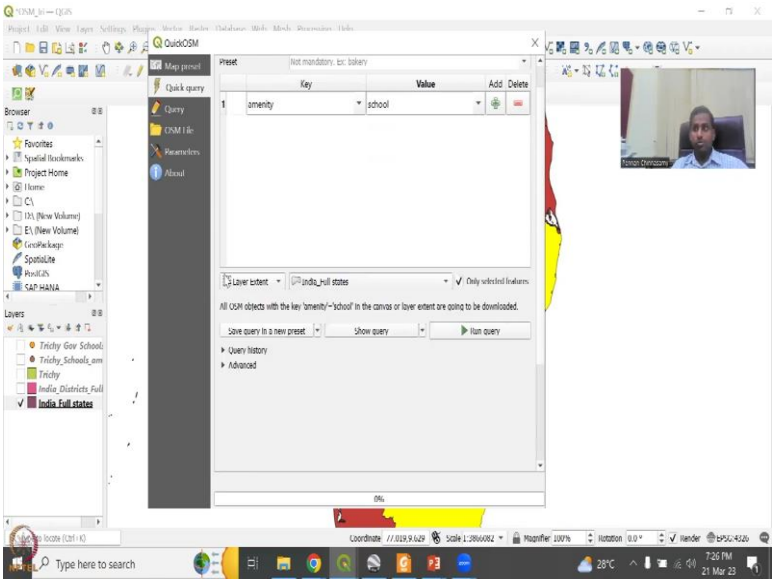
this tool, and then click on this. So, when you click on a particular file, what happens is you can select a particular district, I am going to show you by Tamil Nādu region. So, for example, here, it as I said, we can do state, district, this is the second name, the state name.

So, you can click on top, and then all Tamil Nādu I can select so you have here Tamil Nādu. And then if you click from here to here, all Tamil Nādu selecting so you can have the Tamil Nādu map coming up. So, both you can do if you want or you can just select one. So, now my select tool is opening up for some reason, the selection and now it is opened up. So, the select tool was kind of hiding behind. Now, it is good. So, what are these so these are Pondicherry territory so some part of it is wrongly named by the dataset that is fine, because we are going to go look at this part.

So, now Tamil Nādu is selected. And what name I have given is I will show you again, just delete this and then I am selecting Tamil Nadu. So, just click this button, click on the state you want to get selected, then you go to vector Q OSM, open the Q OSM box. The multiple tourisms are opening. We do not want that. So, we have already selected this. So, let us close this.

(Refer Slide Time: 35:14)




QuickOSM
Preset
Not mandatory. Ex: bakery
Key
Value
Add
Delete
amenity
school
Layer extent
India_full states
Only selected features
All OSM objects with the key 'amenity'='school' in the canvas or layer extent are going to be downloaded.
Save query in a new preset
Show query
Run query
Query history
Advanced
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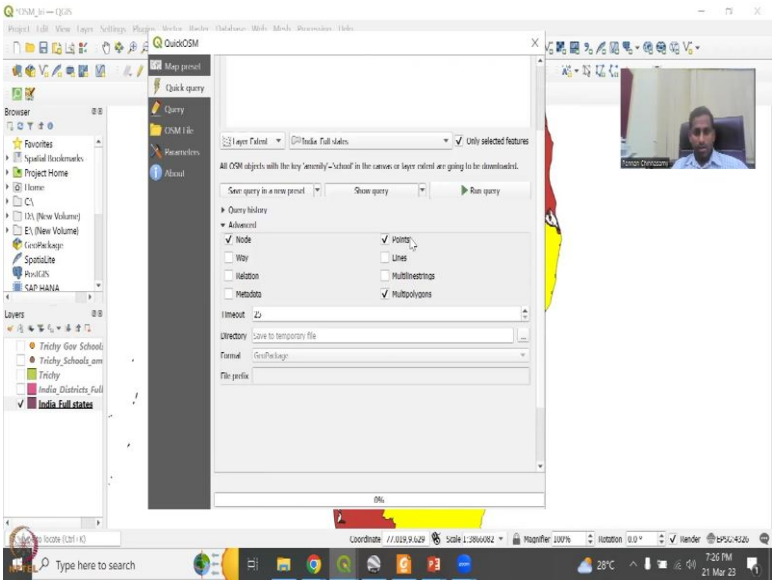
Type here to search
28°C
7:26 PM
21 Mar 23


QuickOSM
Layer extent
India_full states
Only selected features
All OSM objects with the key 'amenity'='school' in the canvas or layer extent are going to be downloaded.
Save query in a new preset
Show query
Run query
Query history
Advanced
Node
Points
Way
Lines
Relation
Multilinestrings
Metadata
Multipolygons
Timeout
25
Directory
Save to temporary file
Format
GeoPackage
File prefix
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Type here to search
28°C
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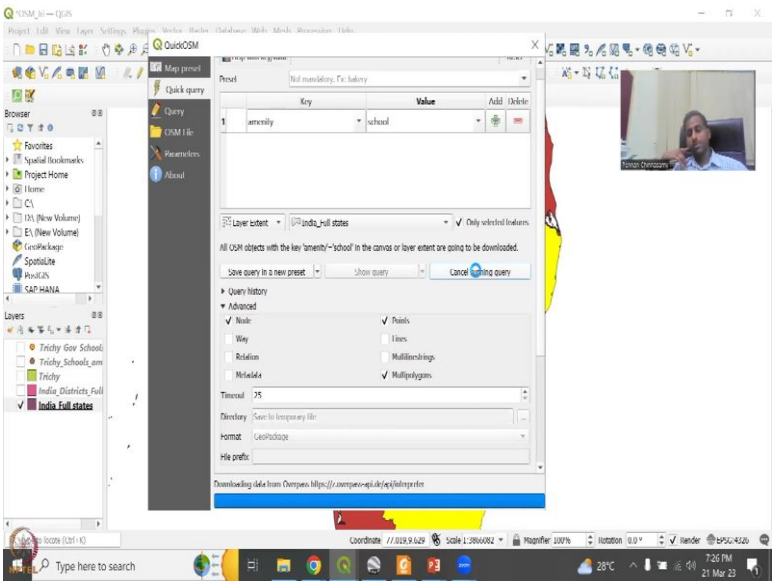
21 Mar 23


QuickOSM
Preset
Not mandatory. Ex: bakery
Key
Value
Add
Delete
amenity
school
Layer extent
India_full states
Only selected features
All OSM objects with the key 'amenity'='school' in the canvas or layer extent are going to be downloaded.
Save query in a new preset
Show query
Query history
Advanced
Node
Points
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Lines
Relation
Multilinestrings
Metadata
Multipolygons
Timeout
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Directory
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File prefix
Downloading data from Overpass: https://z.overpass-api.de/api/interpreter
Type here to search
28°C
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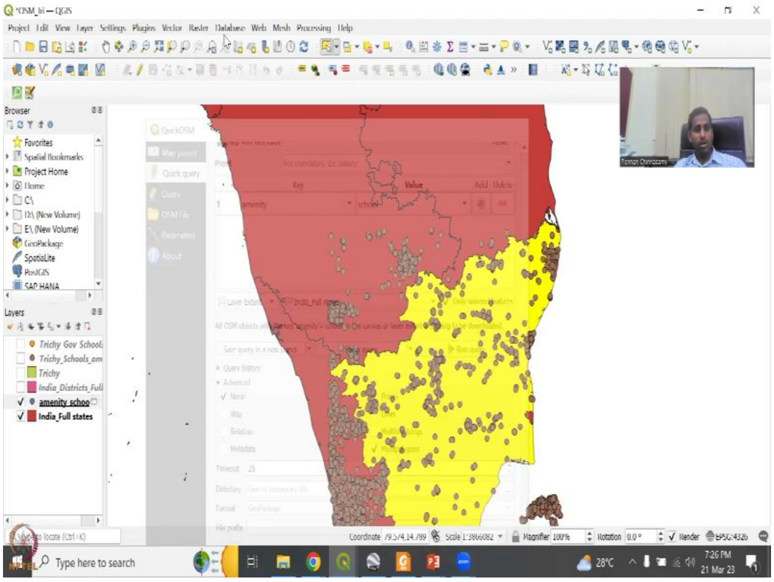
21 Mar 23


*OSM_tri — QGIS
Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help
Browser
Favorites
Spatial Bookmarks
Project Home
Home
C:\
D:\ (New Volume)
E:\ (New Volume)
GeoPackage
SpatiaLite
PostGIS
SAP HANA
Layers
Trichy Gov School
Trichy_Schools_am
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India_Districts_Full
amenity_schoo
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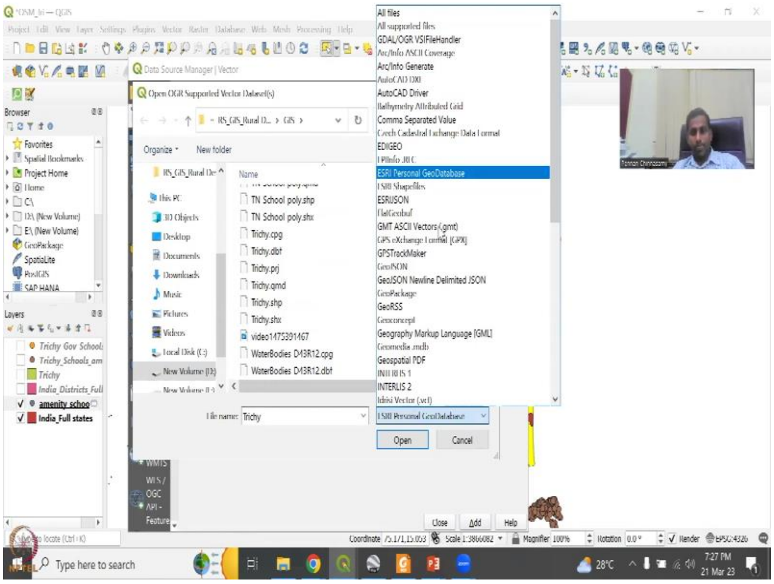
21 Mar 23


*OSM_tri — QGIS
Data Source Manager | Vector
Open OGR Supported Vector Dataset(s)
Organize
New folder
Name
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
New Volume (D:)
TN School poly.shp
TN School poly.shx
Trichy.cpg
Trichy.dbf
Trichy.prj
Trichy.qmd
Trichy.shp
Trichy.shx
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WaterBodies D43R12.cpg
WaterBodies D43R12.dbf
File name: Trichy
All files
All supported files
GDAL/OGR VSIFileHandler
Arc/Info ASCII Coverage
Arc/Info Generate
AutoCAD DXF
AutoCAD Driver
Bathymetry Attributed Grid
Comma Separated Value
Czech Cadastral Exchange Data Format
EDIGEO
ESRI Personal GeoDatabase
ESRI Shapefiles
ESRIJSON
FlatGeobuf
GMT ASCII Vectors (.gmt)
GPS eXchange Format [GPX]
GPSTrackMaker
GeoJSON
GeoJSON Newline Delimited JSON
GeoPackage
GeoRSS
Geoconcept
Geography Markup Language [GML]
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INTERLIS 2
Idrisi Vector (.vct)
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Cancel
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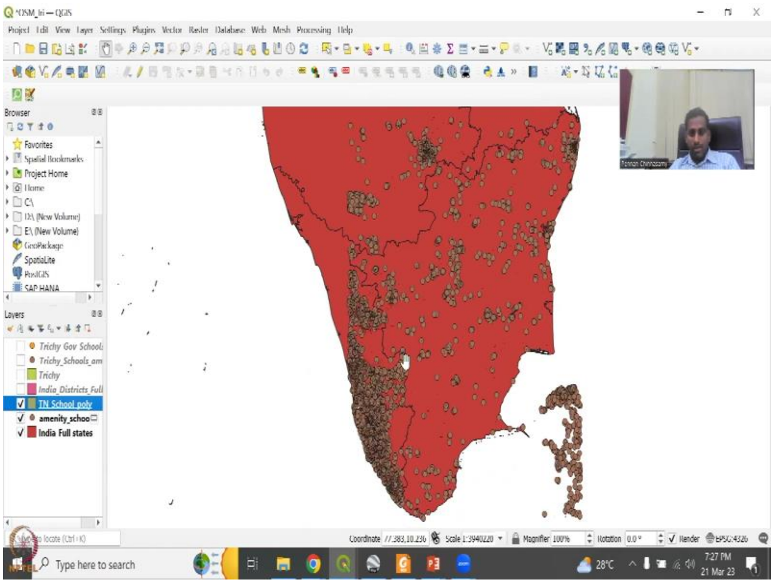
21 Mar 23


*OSM_tri — QGIS
Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help
Browser
Favorites
Spatial Bookmarks
Project Home
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D:\ (New Volume)
E:\ (New Volume)
GeoPackage
SpatiaLite
PostGIS
SAP HANA
Layers
Trichy Gov School
Trichy_Schools_am
Trichy
India_Districts_Full
TN School poly
amenity_schoo
India_Full states
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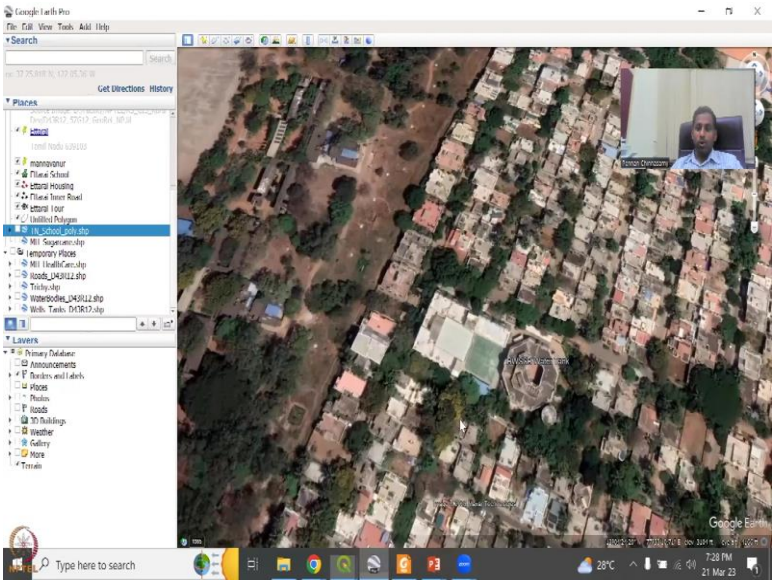
21 Mar 23

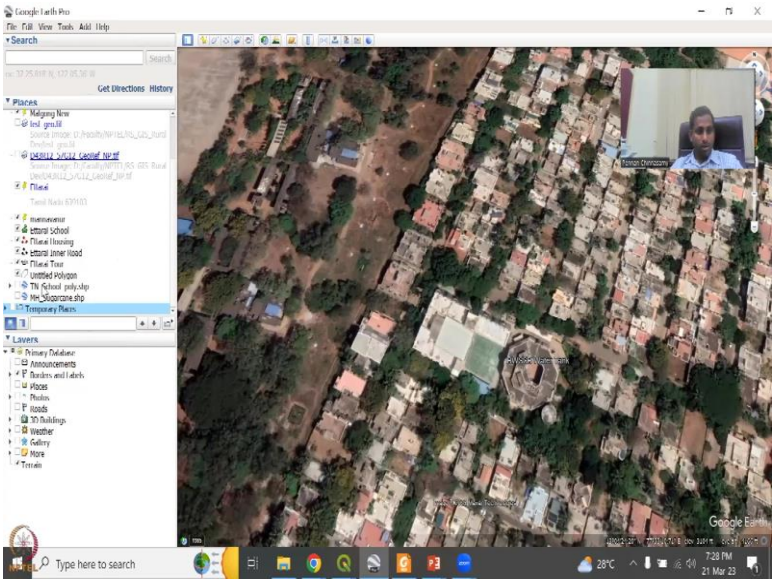
Now, we are here and then we will say education amenities school and here I am going to say that I wanted in my layer extent, India states, India full states, but only the selected. So, I do not want the entire country I want to leave a selector and I am going to do the advanced, I am taking the ways out, relations out, only the polygons and points. So, it is going to be big but quickly it will run at least in my system.

So, I am going to run this now, we have 3 shapefiles one as a basic condition, but Trichy 2 as a search Trichy box using government and amenity data and number 3 for Tamil Nadu with the polygons also included. So, now what we have done is we will be able to reload it, let me reload it here by selecting this, which I have already shown, and then I have saved it here as a shapefile. So, TN schools poly open it. So, now we have the TN school's poly which has been selected and you could see that when I say Tamil Nadu it not only selects Tamil Nadu but all the other reasons also I am just going to clear this and keep this as we said there is a lot of data issues.

So, these are not definitely Tamil Nadu these are the Kerala and these are outside. So, there are a lot of data issues and errors, but never mind you will be able to look at it differently. So, what happens here is this amenity this amenity has been created, but it also has something inside I will show you. So, it is also a polygon not only a point. So, within the point there are multiple polygons also store that is what is happening. So, I have extracted the polygons on the map and then kept it here. So, now we have Tamil Nādu polygons, Tamil Nādu locations are through tool searches, we are going to open Google Earth Pro and then put the data in.

(Refer Slide Time: 37:34)




Google Earth Pro
File Edit View Tools Add Help
Search
Get Directions History
Places
Layers
Type here to search
28°C
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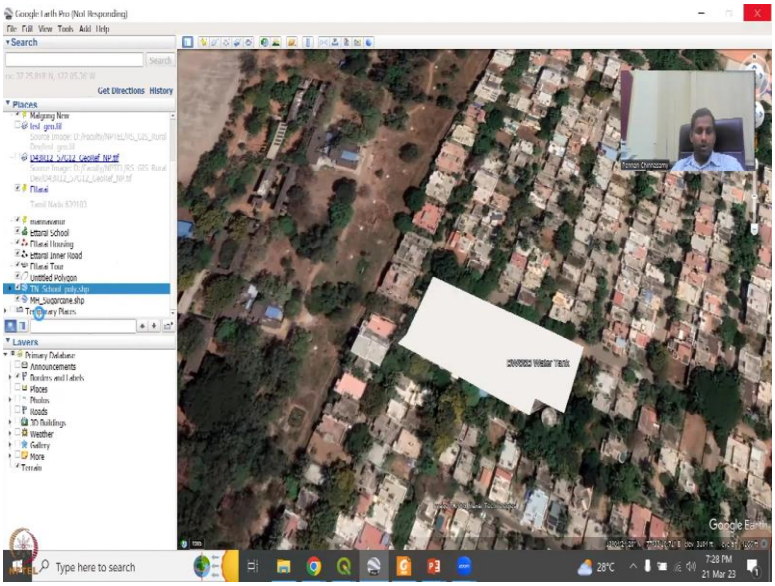
21 Mar 23
Google Earth


Google Earth Pro (Not Responding)
File Edit View Tools Add Help
Search
Get Directions History
Places
Layers
Type here to search
28°C
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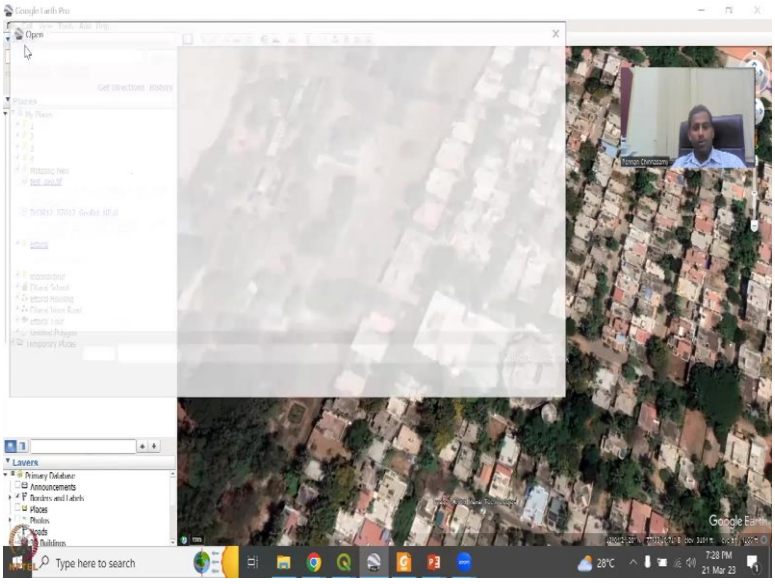
21 Mar 23
Google Earth


Google Earth Pro
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Layers
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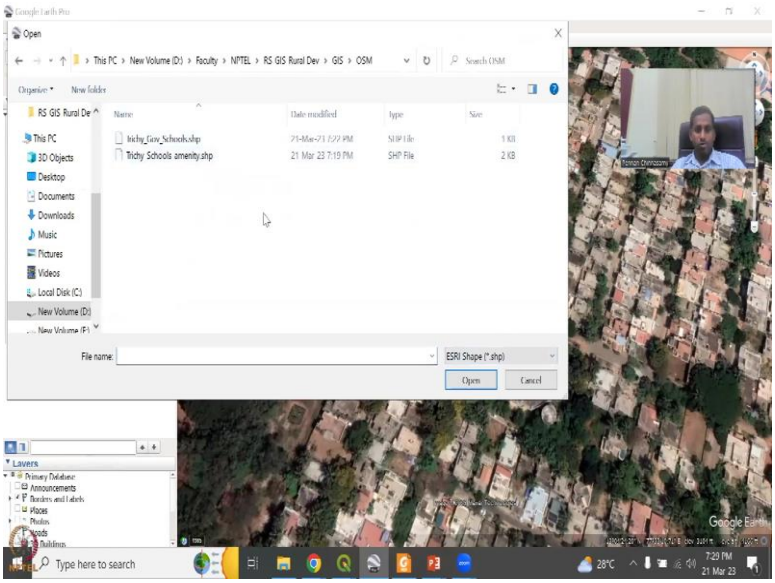
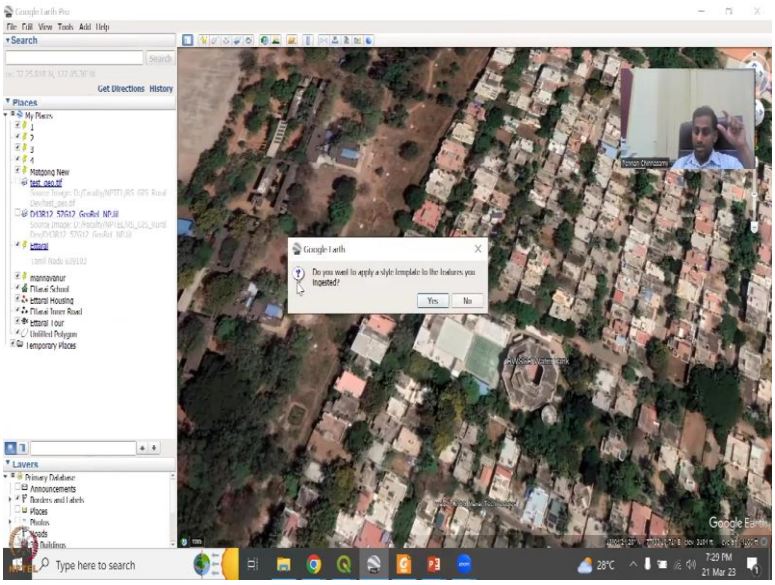
Google Earth

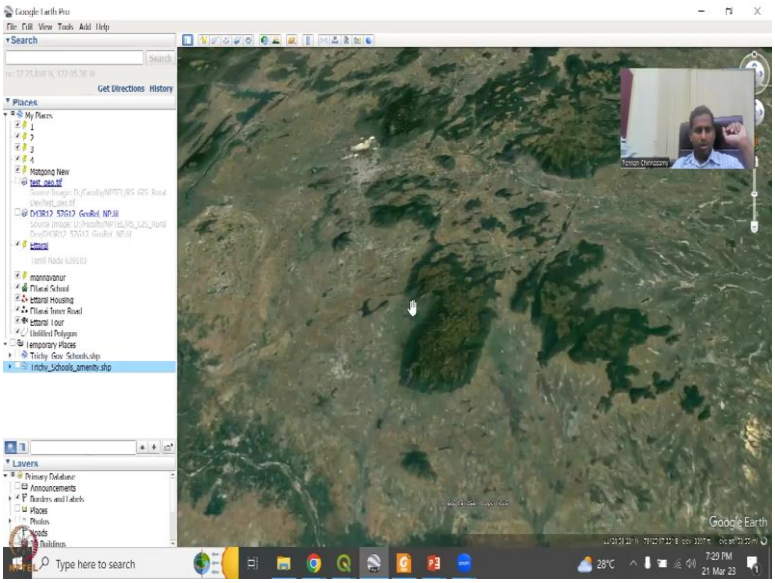


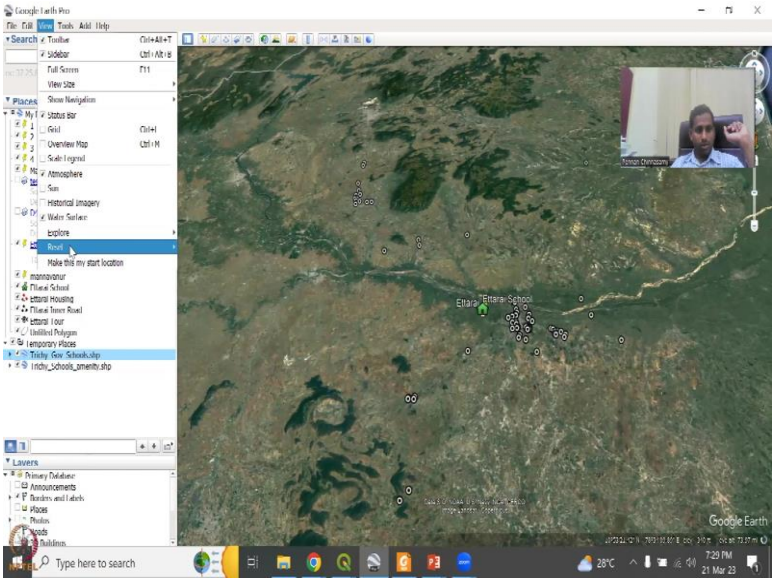


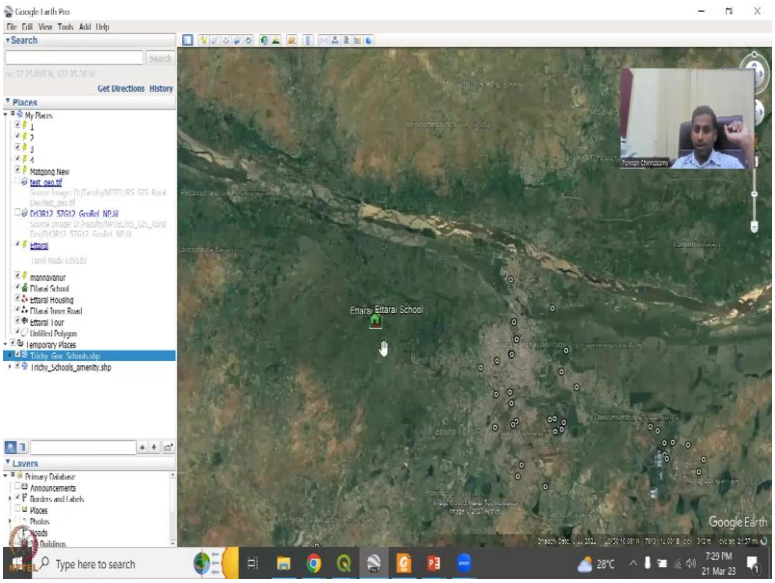
So, for example, let me just hide this for now. And then remove these because I just tested before we show these in the class for you also it is necessary to know how to remove these because it will just cause a lot of errors if you have both of them opening at the same time. So, let us remove your history a bit. And then let us say delete contents, yes, it will just keep on deleting the contents.

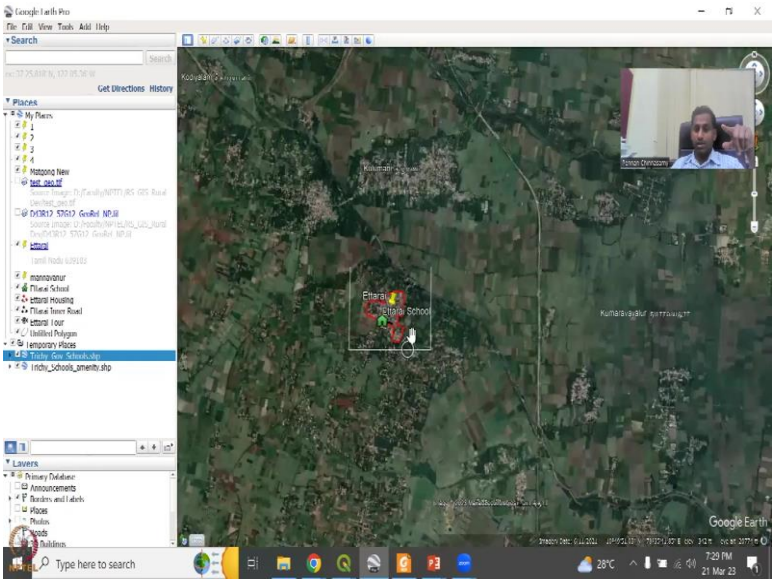
So, that now we are free to use and we can also delete or remove these. So, now what do you do is you go to file you say open, you want only the shapefile in the OSM thing we have these 2 schools and stuff. So, let us open them. Once you open them it says do you want to apply the same style? Say no. Why? Because when you apply the same style, you are limited for putting the same style location so I will say no. And then do you want to apply same for a second one you say no again and it is going to go to the Trichy location.

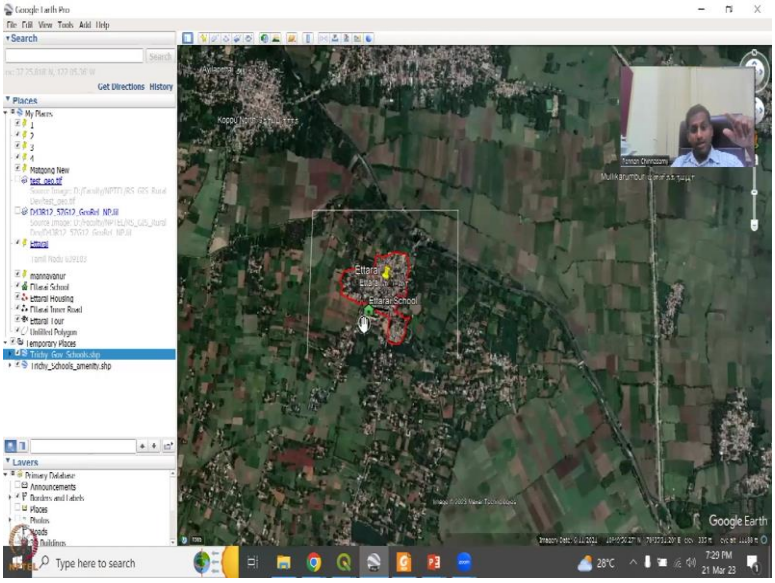
(Refer Slide Time: 38:47)








Ettarai
Ettarai School
Google Earth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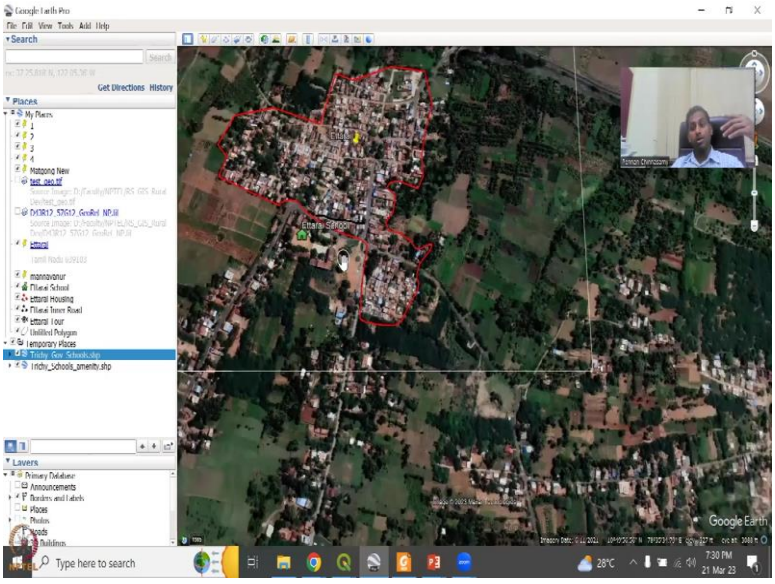
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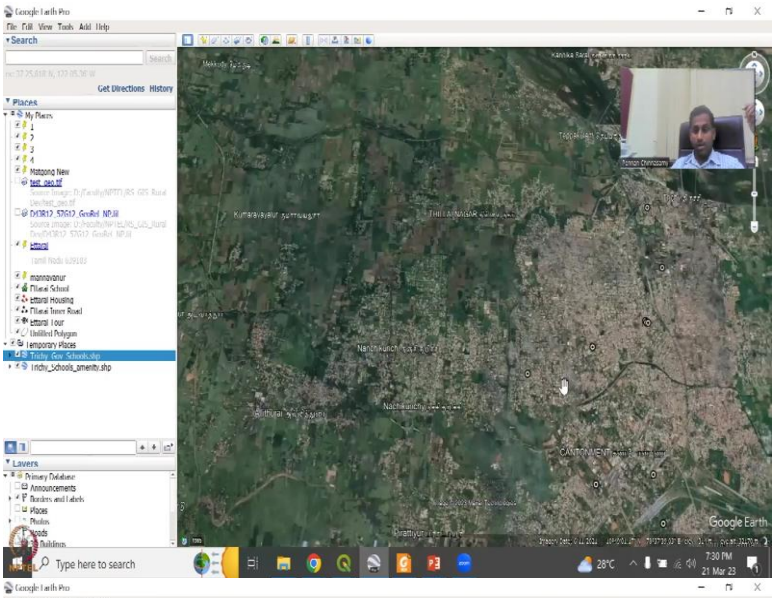
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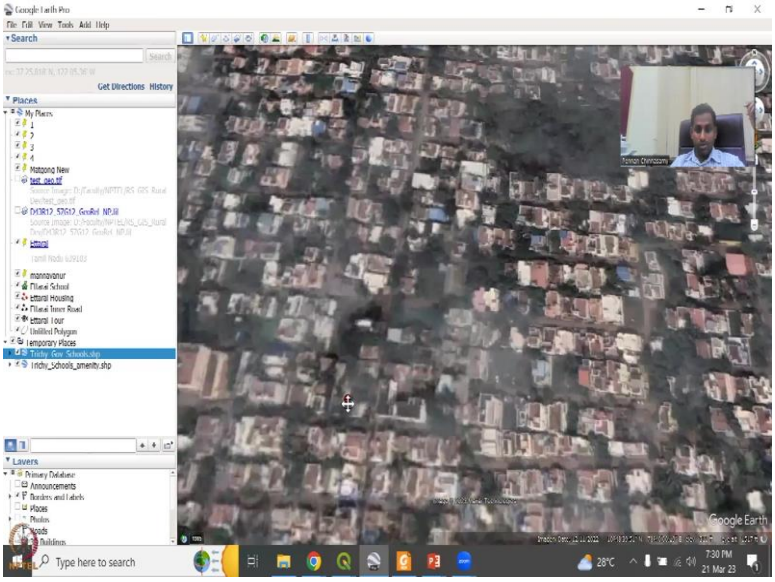
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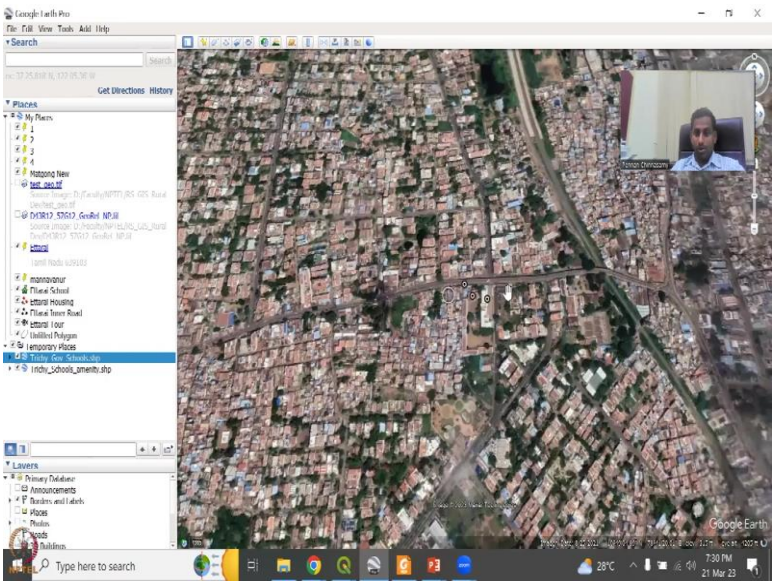
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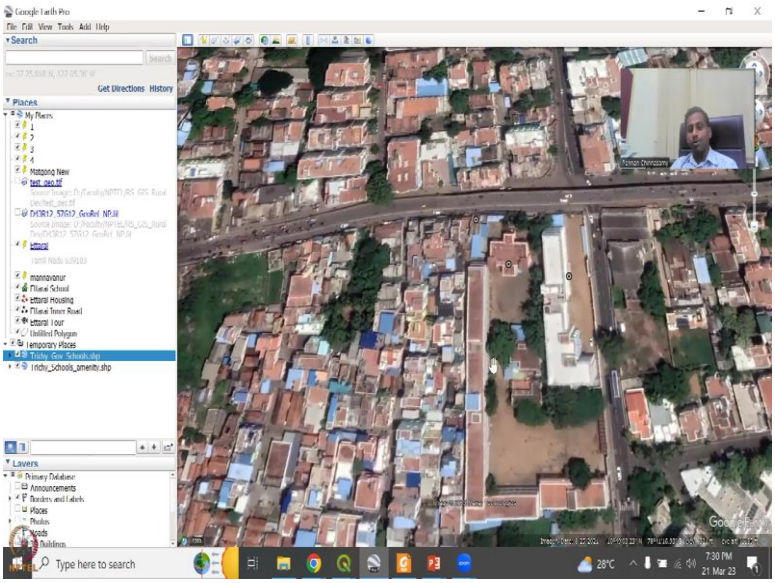

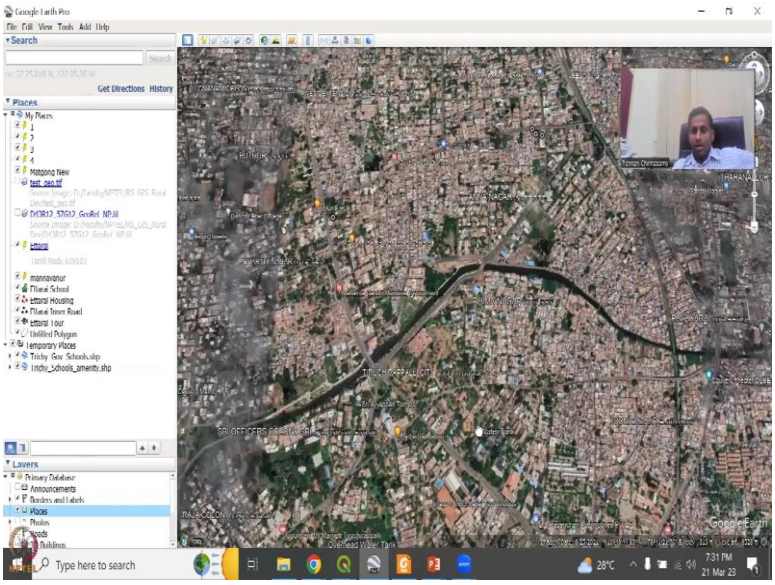

So, now these are the schools into Trichy. Again, you have to go to view reset tilt. So, now it has come on. So, if you remember one of the previous classes, we made a plug point for my village school at right school has been marked. However, it is not in the OSM database. You can see here from the previous thing we have drawn the boundary we have set Etarai as the village but there is no school there even though I said that yes, there is a school.

So, this is the school. I told my parents went and I visited the school area a lot but it is not marked because the data has not been input by any user. So, maybe after this course we will be inputting that. But if you go to other places in Trichy, the city places you will see the school so you can see the school here. So, one of the schools is there, you can click on that. It will give the properties and then say that, the school is there.

The school name may not be there. That is why it is not populating. It depends on where the school is and if they have given the names. We have seen that in the list. Not all schools are having the proper data entry. So, these are schools. So, now if you go in and see so these are 3 points for the same school, it is not 3 schools. Can you see it like a school? Beautifully the data has captured the location of the school without any government record it this is open source, people are put in, you can see that you can enter here, maybe there is a parking you have this ground.

How do you know it is a school? Because the construction, the construction is normally long classrooms and a central ground where students play. So, you have big ground, you have this assembly area, the assembly, main building, admin Building, and then the classrooms. So, this is how you could see that there is a lot of names. How do you know you can check? You can also click one of these places, and then see if as you zoom in, if some schools are like famous schools are there they will populate.

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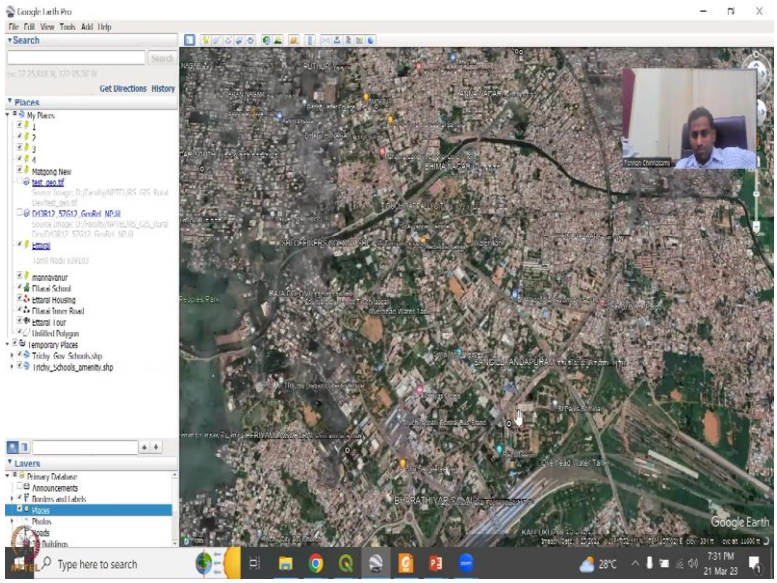

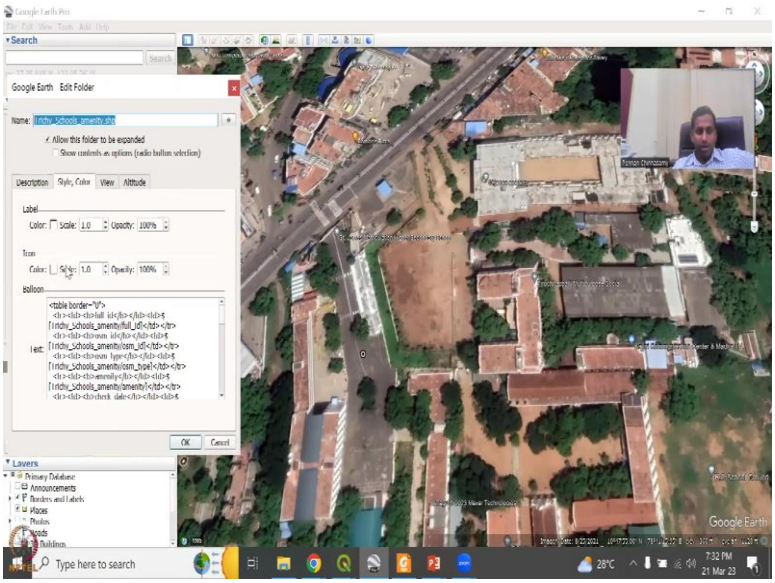
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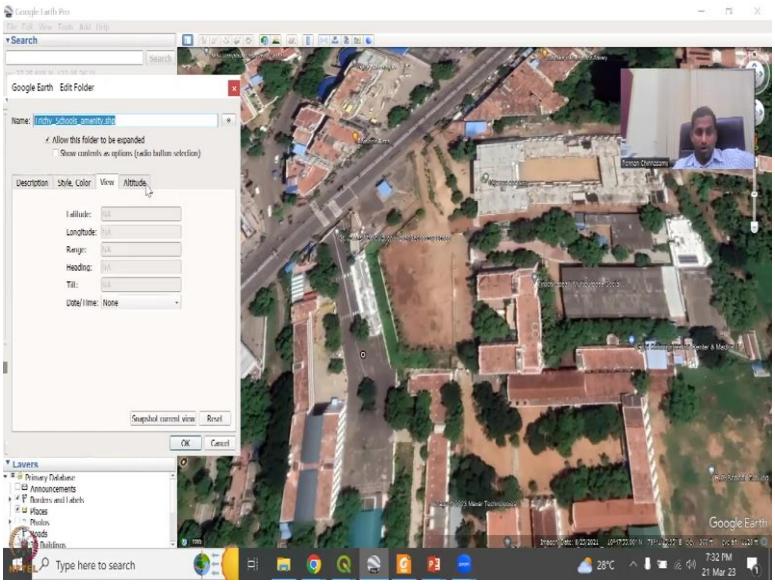
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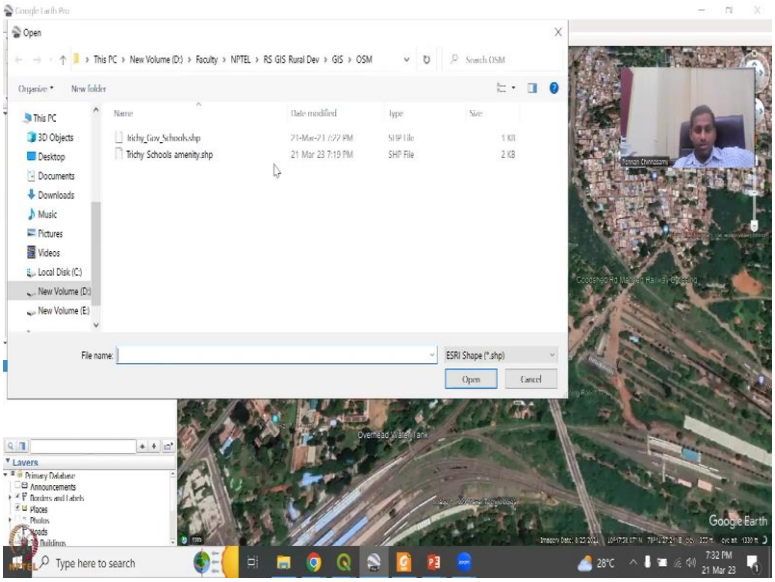
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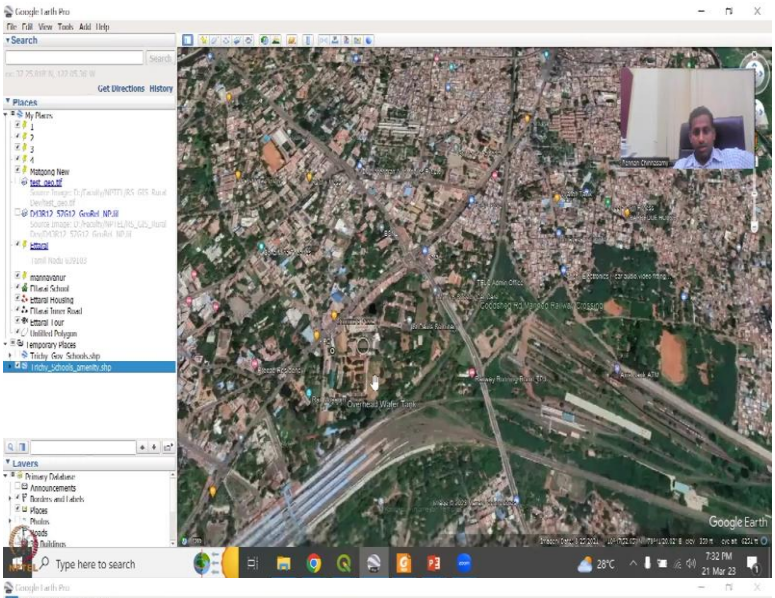
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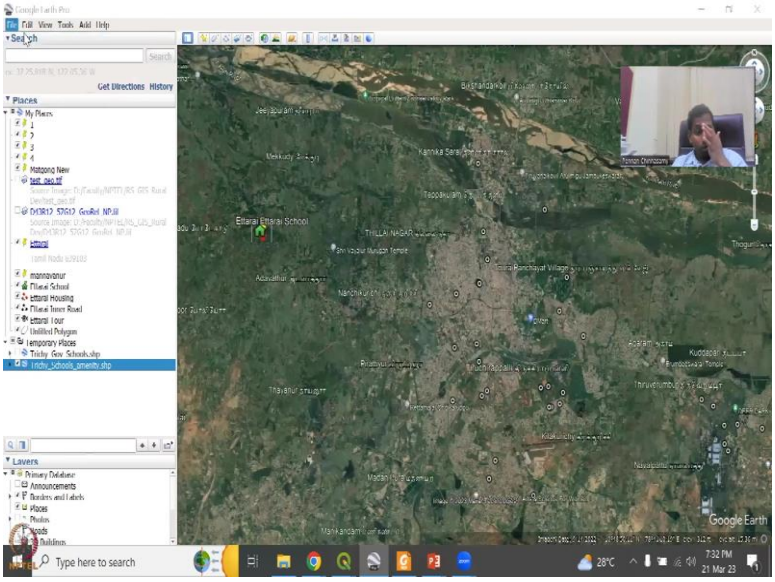
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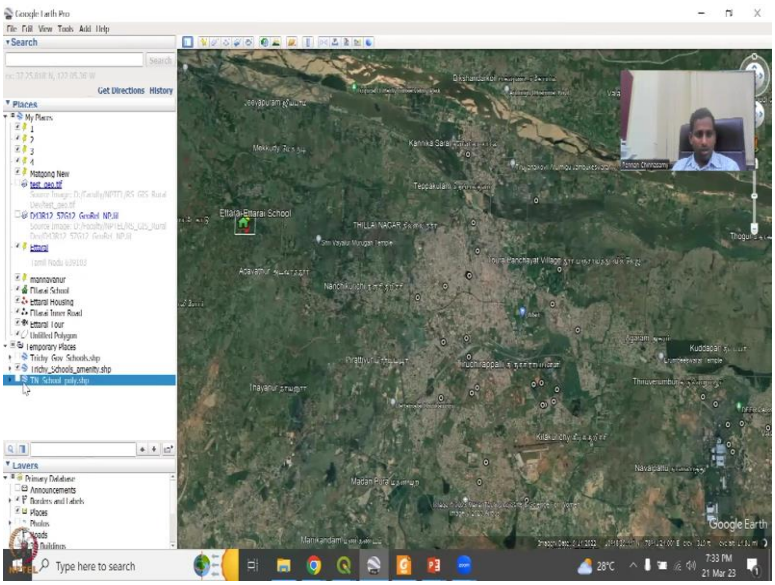
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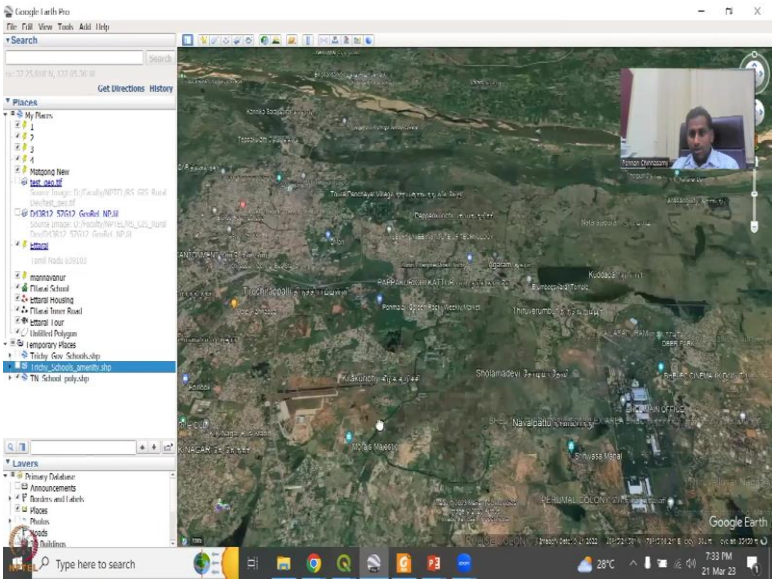

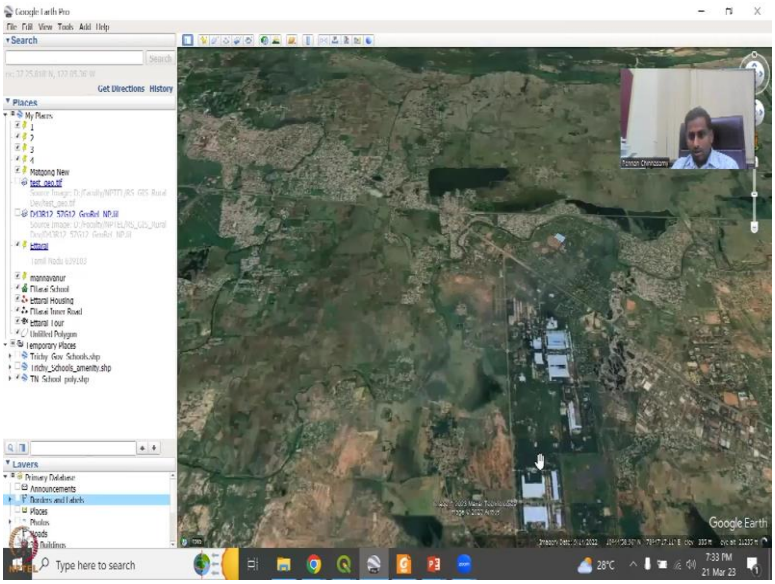

So, for example, this looks like a small school. This is on the road. So, maybe it is not a school, but this could be a school. Opposite this is a big school. Oh, there it is. So, Tiruchirappalli multipurpose school, the point is outside the road, but this is a small error, you can push it inside. So, in your analysis, so now you save the shapefile, you can just edit the shapefile here, you can, for example, go to properties in this part, and then move it. I do not know which one that data is.

So, we can quickly check here is this one. So, you can go to properties. And then physically move them if needed. But it is going to take a lot of time, but at least you know which ones are there. And you can put a point now for example, you can put a point saying, there is a school that has is a name, it has been checked, et cetera. So, now think about it. So, starting blindly, you have all the data to start and put these locations. So, this is about schools.

I will also add the other shapefile, which is the polygon, we will be stopping soon because of the time. But when we add the Tamil Nadu polygon it will say it is too much do you want all of it? No, I am just going to say restrict the view, because we cannot plot thousands. Zero features important because there is no features there. So, I had to zoom out for this region. Let us zoom like this. And then reload it again. There will be 1000 features. So, 1000 attributes, we do not want that. So, let us say restrict the view only for this, 12 are imported.

Same thing I do not want the same template. I want this. So, now you are going to see area, this is a polygon, I am just going to zoom out. And then let us see where this so angle will be the loser or places and borders so that we can see the buildings. There is one. Got one.

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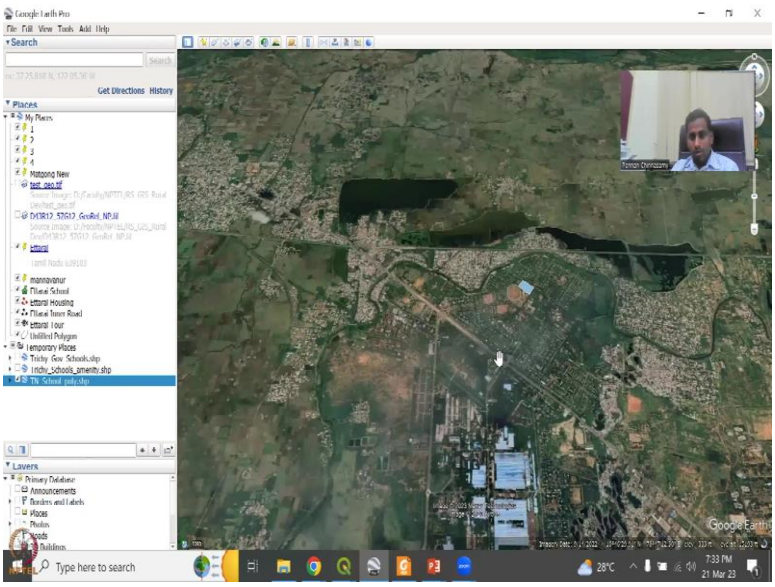

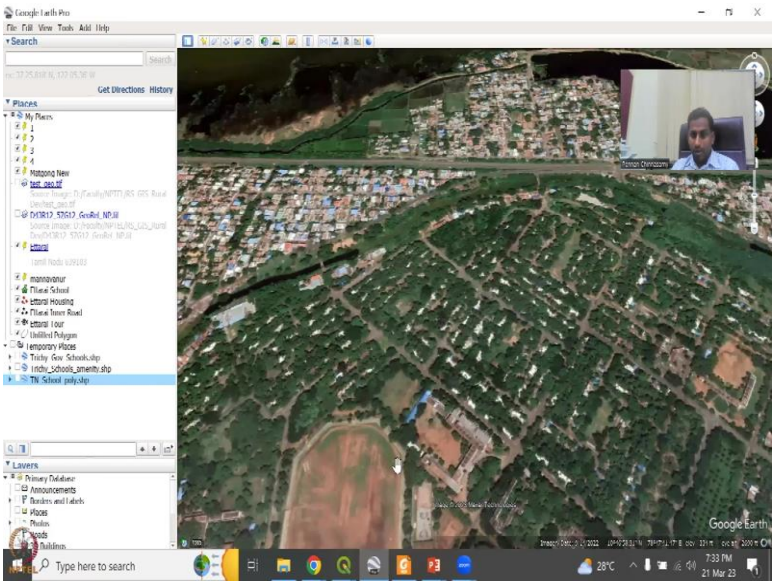

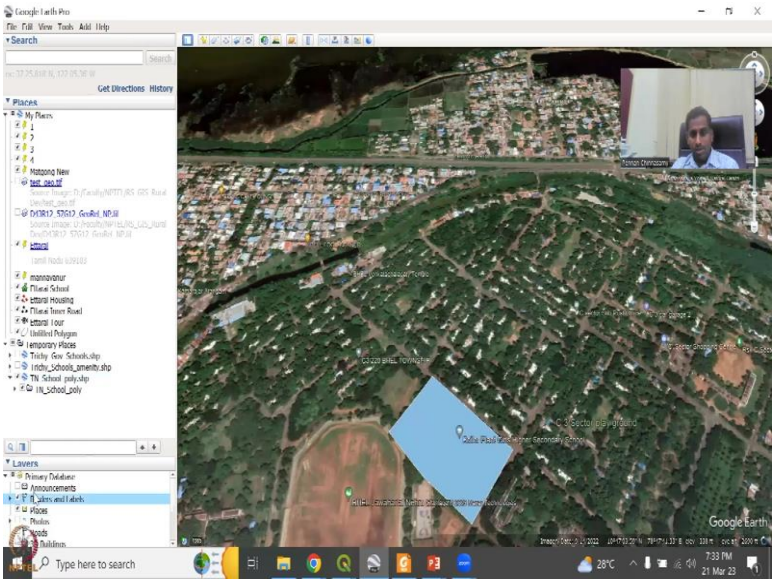
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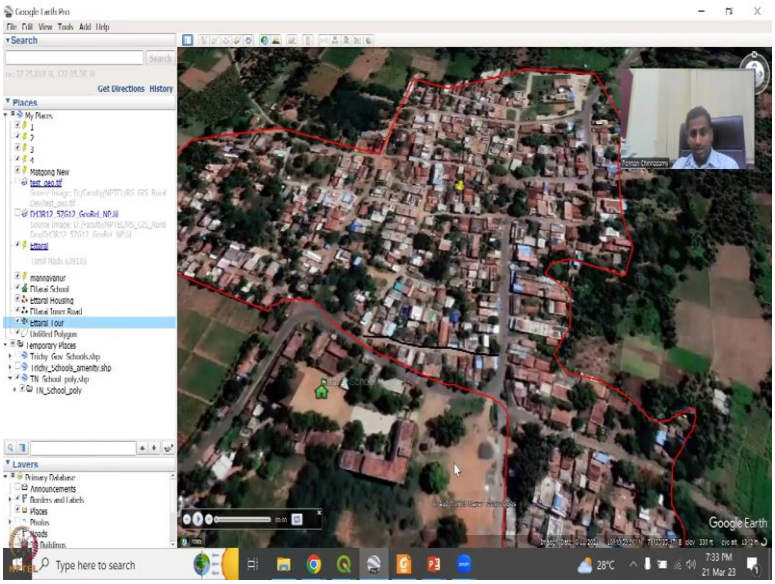
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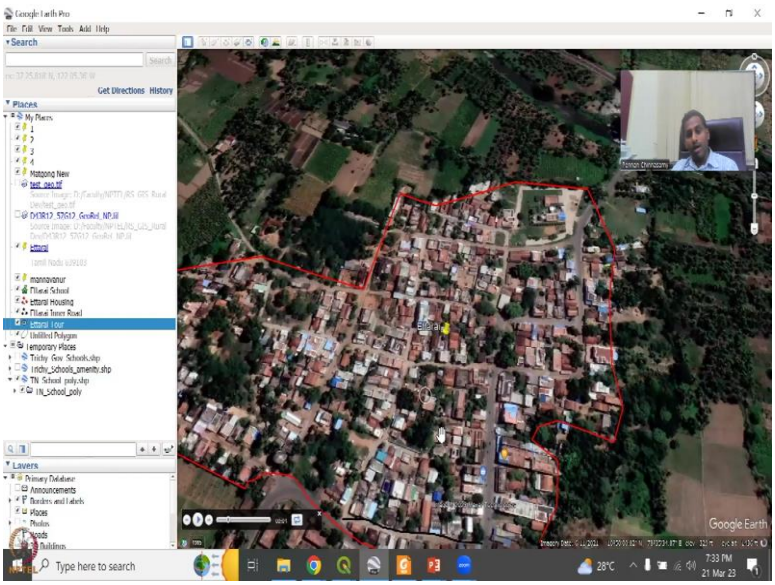
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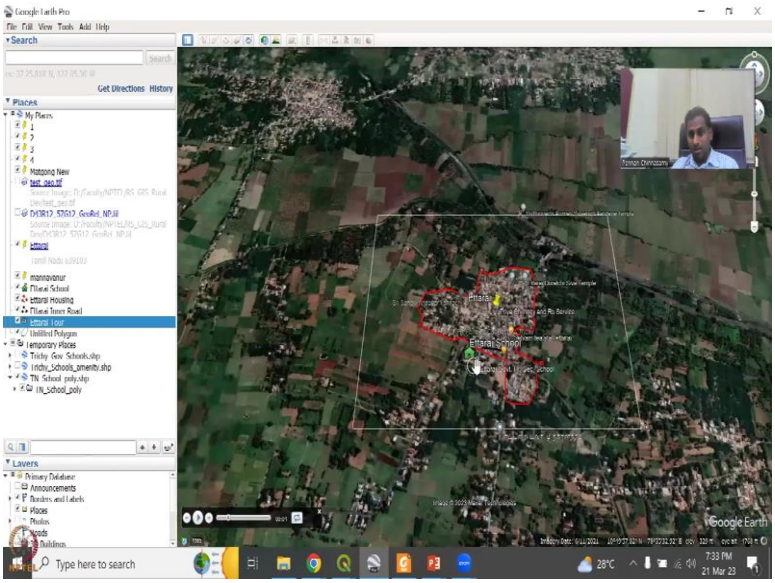
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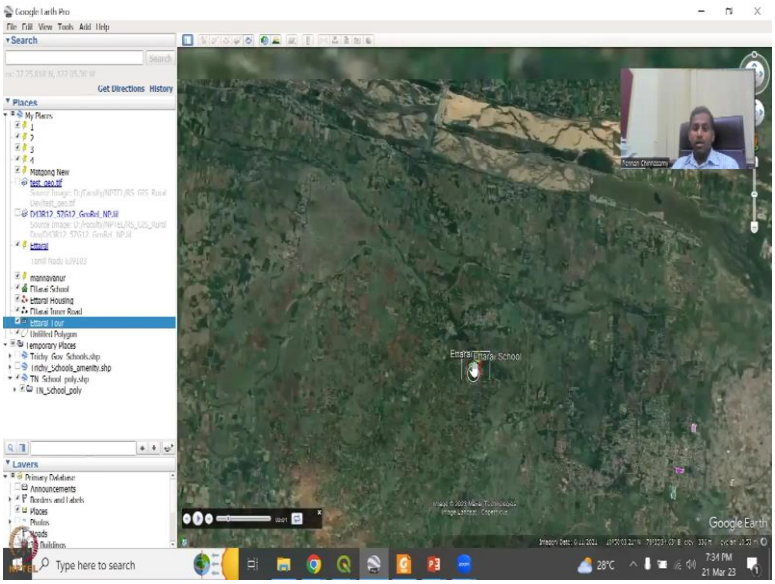
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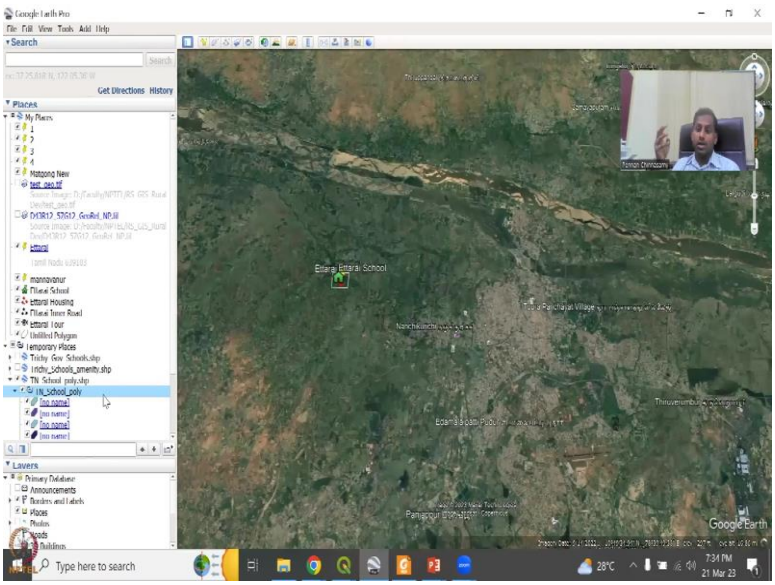
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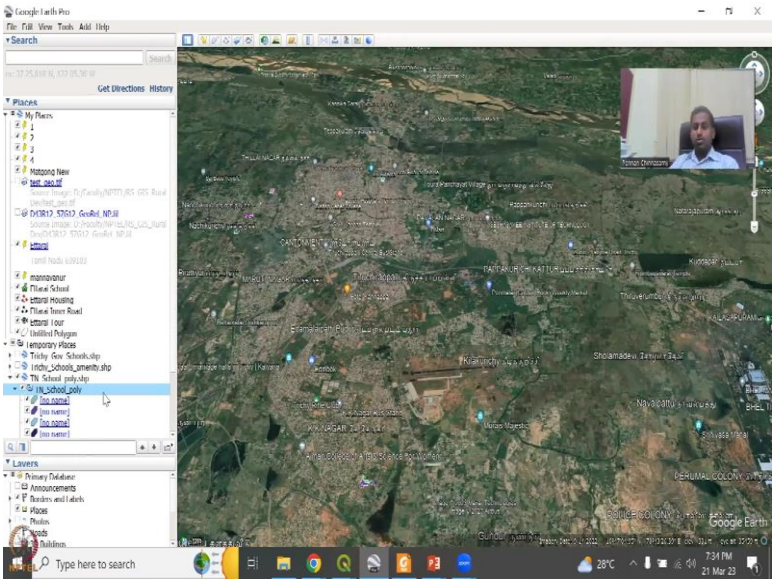

So, this has been labelled as a school, you can click open, and you can see the school there. So, someone has detailed it very nicely, the school location with a polygon, and you can actually add places and borders here to find what is our school's name Morpher plan girl higher secondary school. So, you could see even now, if I go back to my Etarai, it is not marked. Because that is a problem in rural India, we do not have much of the data mark, whereas an urban center, yes, it has been marked widely.

So, here I have shown you how to come to a particular area, and then mark schools based on points and polygons from an open-source system and then you put it in Google Earth and check. We will revisit this in the next class while we do other attributes. So, here in this today, we will stop here with an attribute on schools. We have checked the data. We have also done some minor edits if needed, and then we will be able to create a database. I will see you in the next class. Thank you.