

***IQRA NATIONAL UNIVERSITY***

**GIS PROJECT REPORT**

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**Section : A**

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# *Geological Information System Project Report*

## *On Peshawar Meteorological Department*

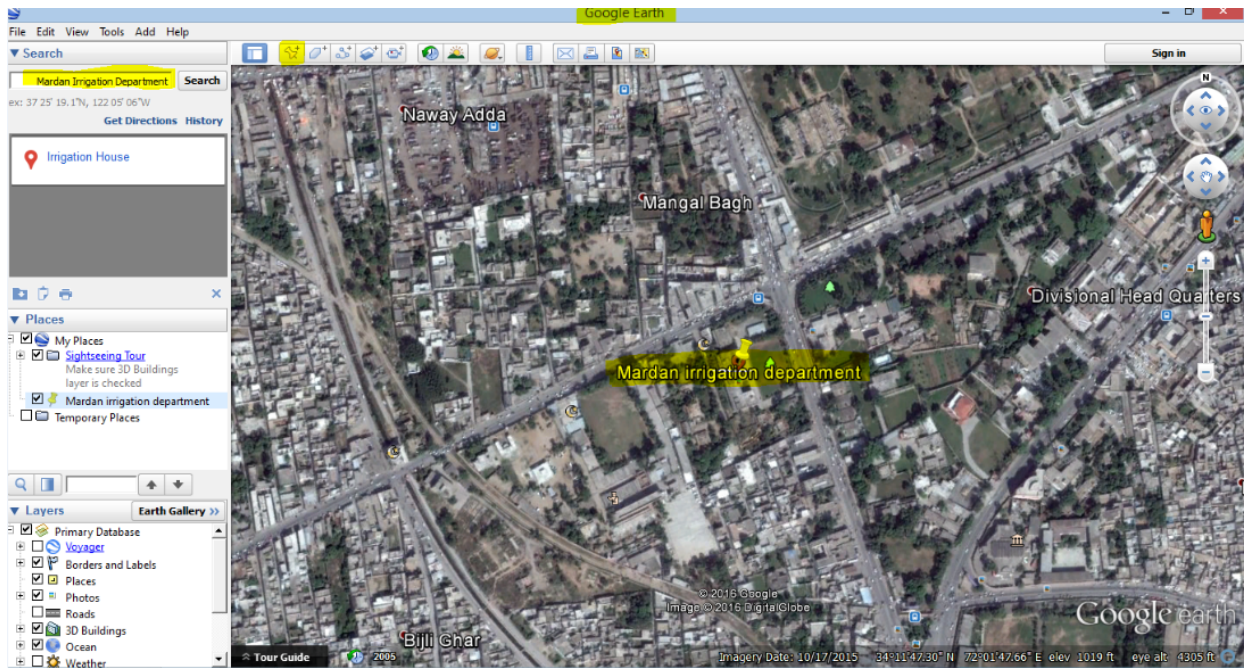
### Steps :

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I solved these problems by using QGIS method. We have many methods for using this.

### Step 1 :

Open google earth software and locate the respective points on it one by one and mark them with the help of google earth pointer, as shown in the figure,

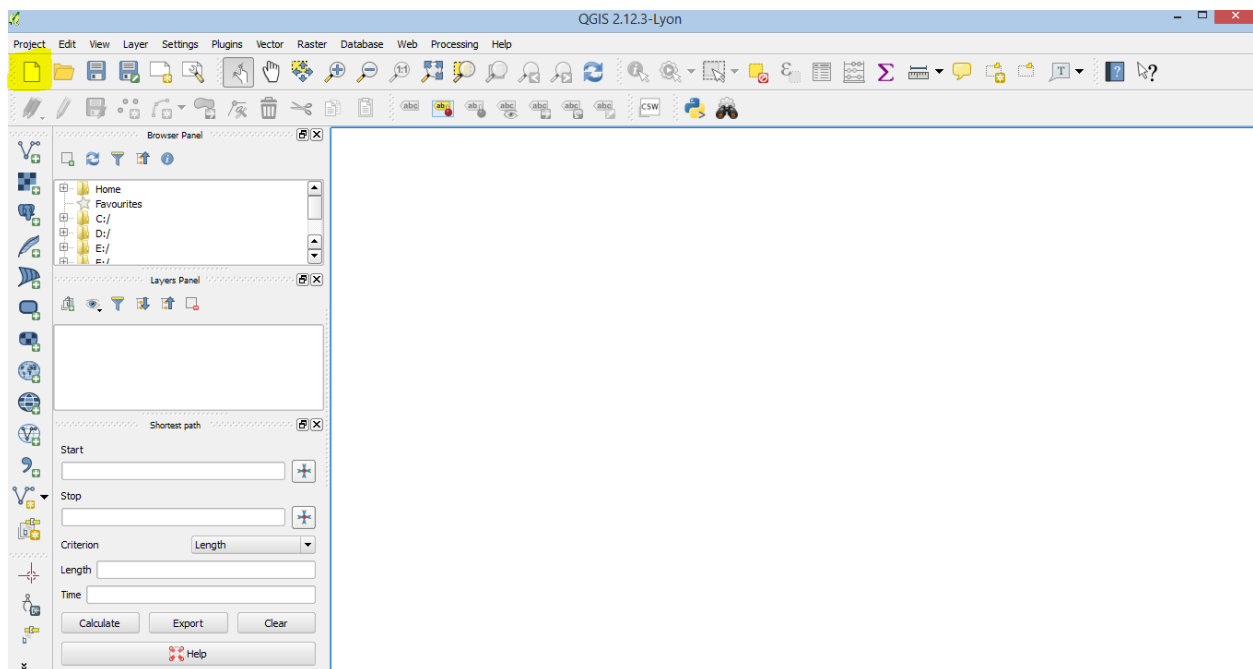


Then i saved them as Kml file of all all the located places.



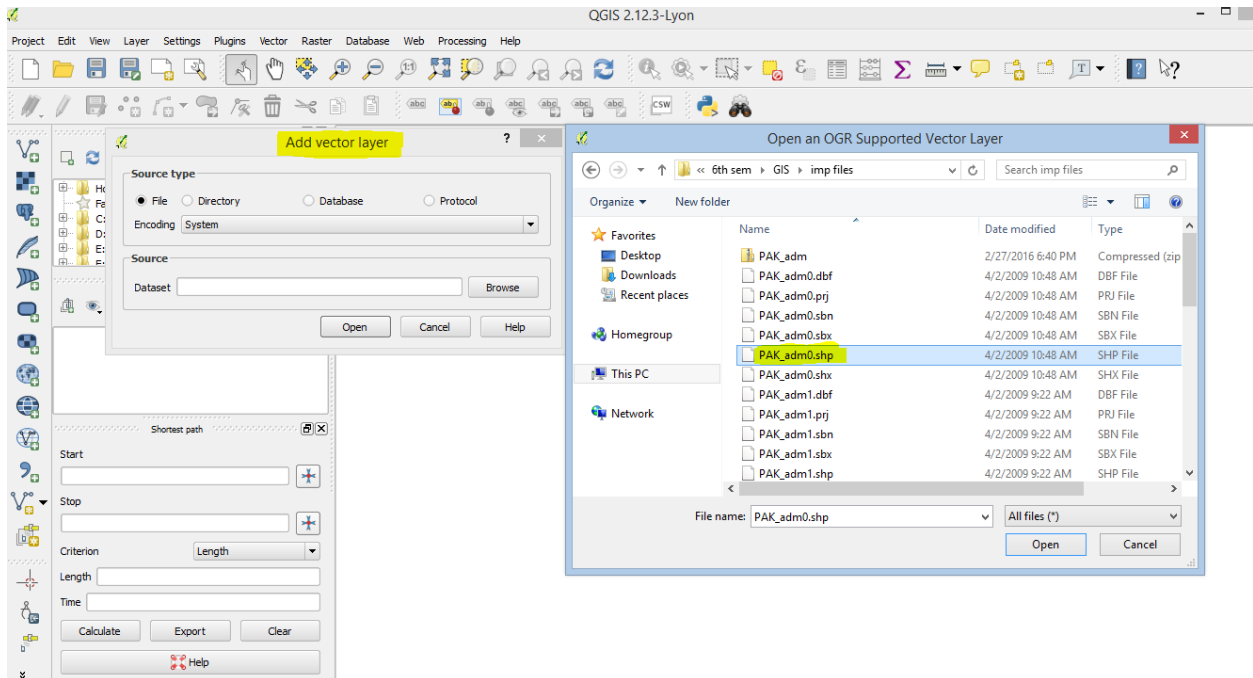
## Step 2:

Open the QGIS software and then by clicking on the new file icon open a new blank file in the software.

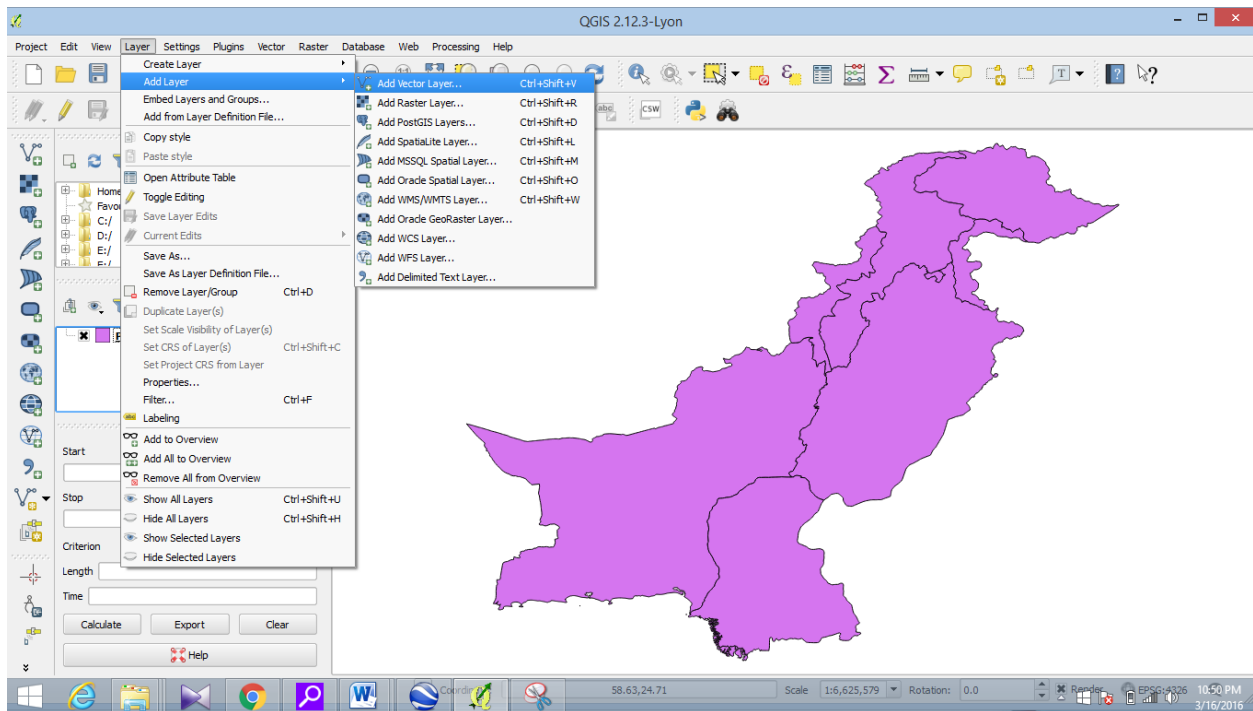


## Step 3:

I opened reference map, that is the map of Pakistan so that the area of the respected location can be found easily in the respected province that is KPK. Open the reference map by adding a Vector layer of a saved shape file which can be done by (Ctrl + shift + V) and then select the respected file from the system.



This will appear as follows in GIS



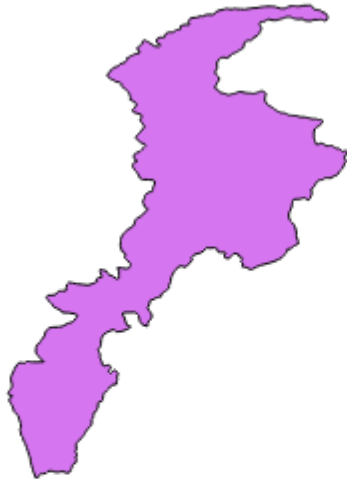
## Step 4 :

For the specific area, like in this case we are concerned with KPK Precipitation so we use a

command in GIS so that only KPK will appear on the screen, and we will then specify the rainfall only for KPK province the command is done by (Ctrl + F) or this can be done by going to layer then filter then here type this command ((Ctrl + F) type "Name\_1"="N.W.F.P."

Shown below

And the shape file will appear as in the GIS showing only the KPK on the map



## Step 5 :

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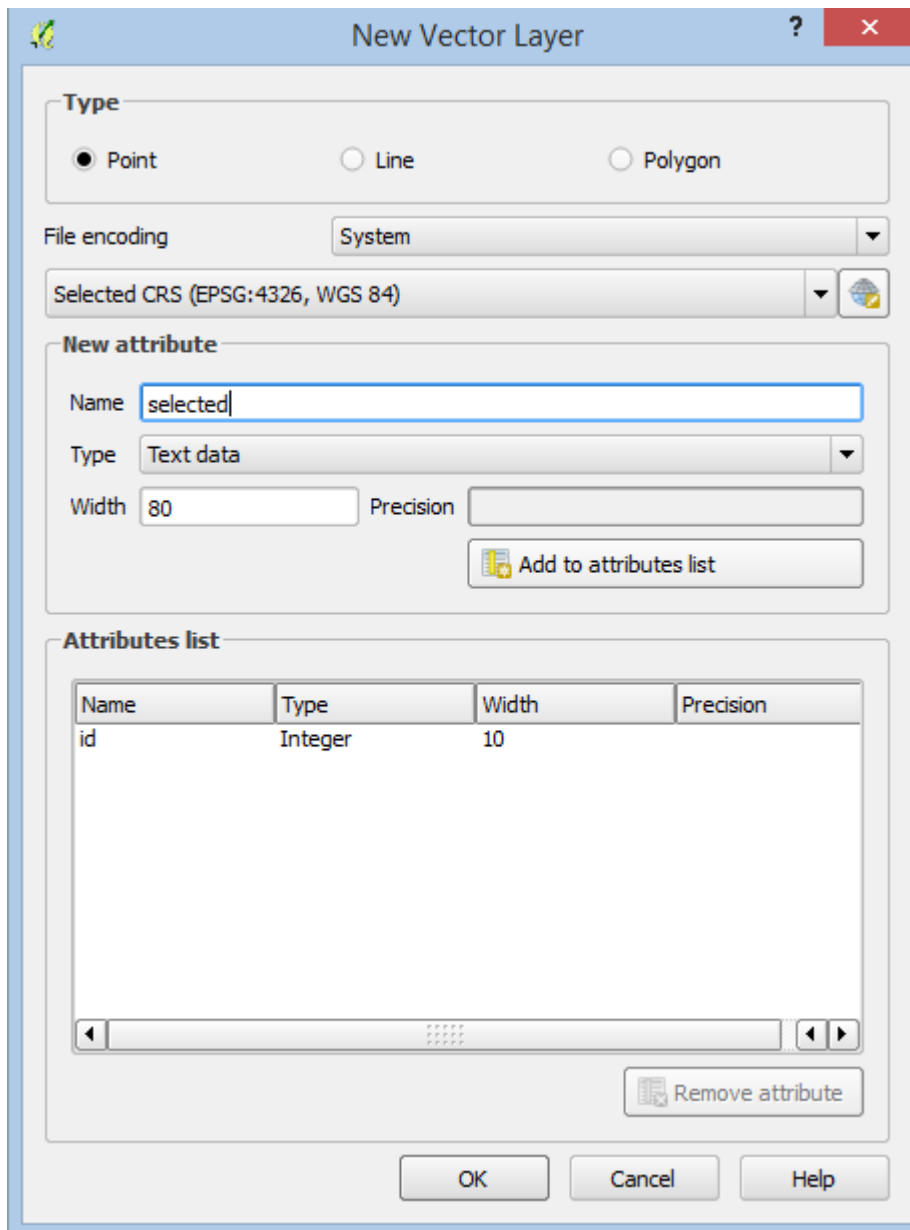
Now open the selected shape files in the QGIS , which were saved from the google earth for the respected locations of irrigation. And the select those points.

## Step 6:

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Now add a new vector layer in GIS and add point layer and then save this file and and then enable toggle editing and then mark the respected points present on the map of the irrigation departments . All this is shown in the figure below that how to create a new vector or file and

then selecting of the points.



step 7 :

Now mark these points on the GIS by toggle editing the layer and then mark these points on the GIS after that go to vector > geometry tools > voronoi polygons and then save this file as shape file taking buffer region more than or equal to 100 % .

## Step 8 :

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Now to verify the polygon method used about use the triangulation method this can be done by going to vector > geometry tools > Delaunay triangulation. Then select the shape file and save it as a shape file. This will form triangles connecting the different points. Now the polygons whether they are formed on the right area or not for this another method is used.

## Step 9 :

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The Polygon form may not cover the whole area for this another method is employed for the polygon to cover the whole area. For this go to vector > geometry tools > densify and then selecting the nodes of the polygon to cover the whole area by dragging.

Now crop the extra area of extended polygon by the command Vector > Geoprocessing Tools > Intersect. The required area containing all the locations will be shown on the intersected map.

## Step 10 :

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The desired locations are present in this map , Now to calculate area we will use the command

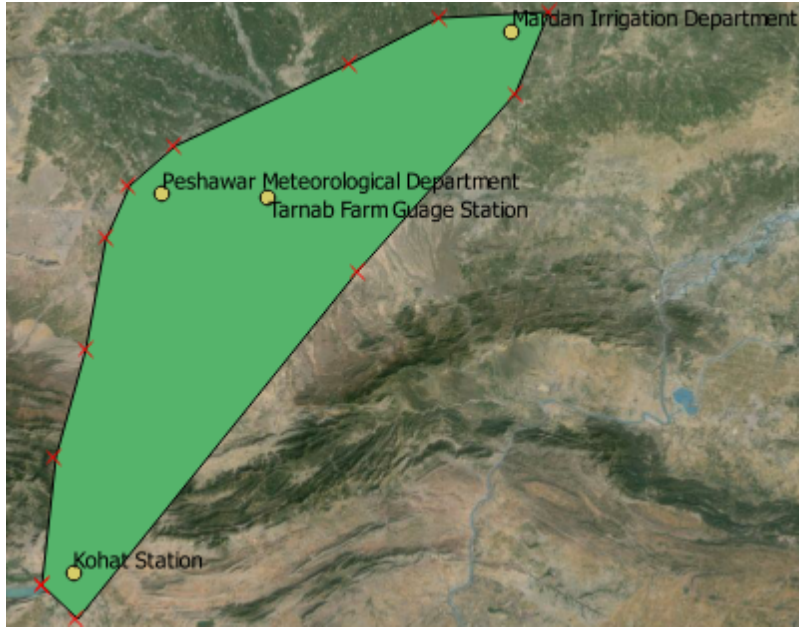
Vector > Geoprocessing Tools > Intersect

Then obtain the full area under concentration so that the respective area of the polygon may be find out.

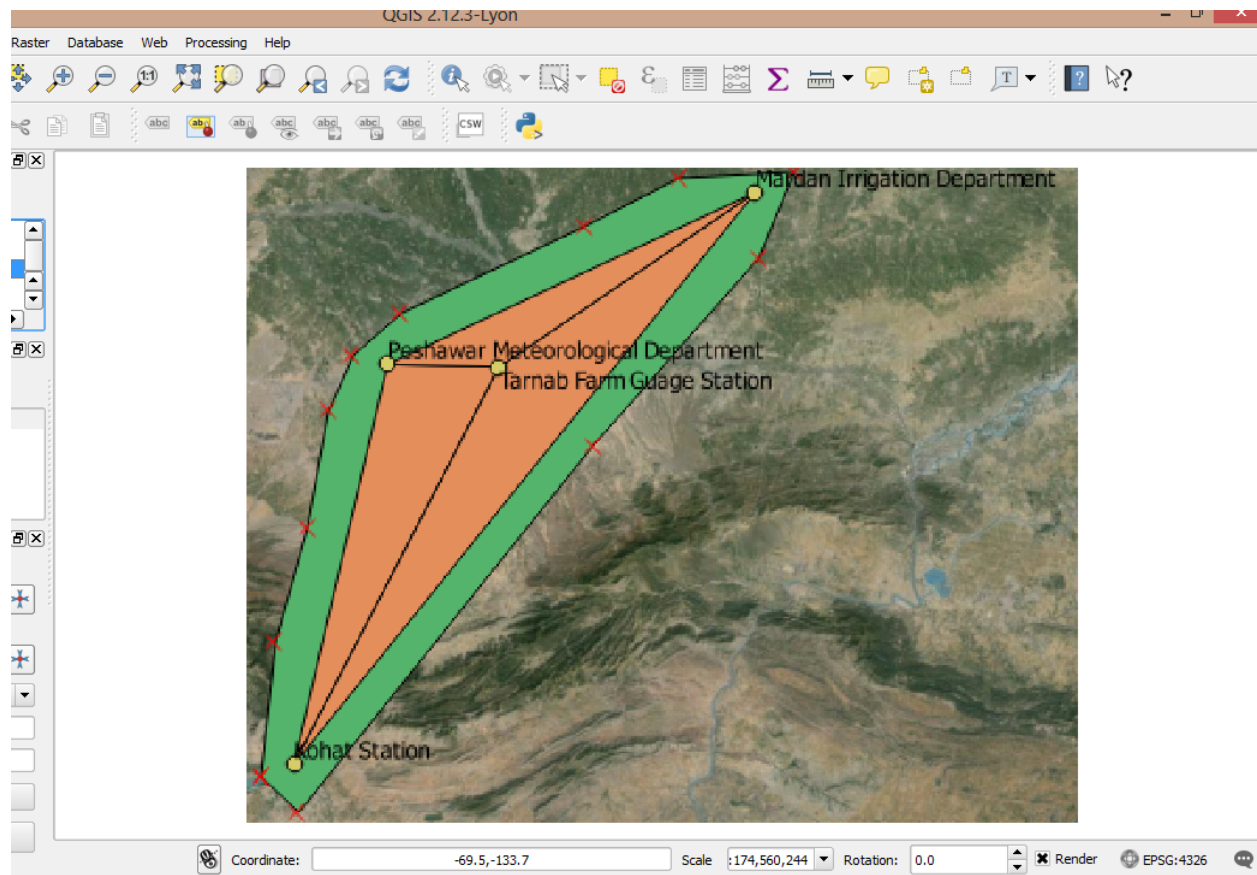
Now to find the Area we use the command vector > geometry tools > export/Add geometry columns .Then select the final layer and then calculating using ellipsoid to calculate area.

The following image shows the catchment area: It is the approx. area drawn using: vector layer> polyline.

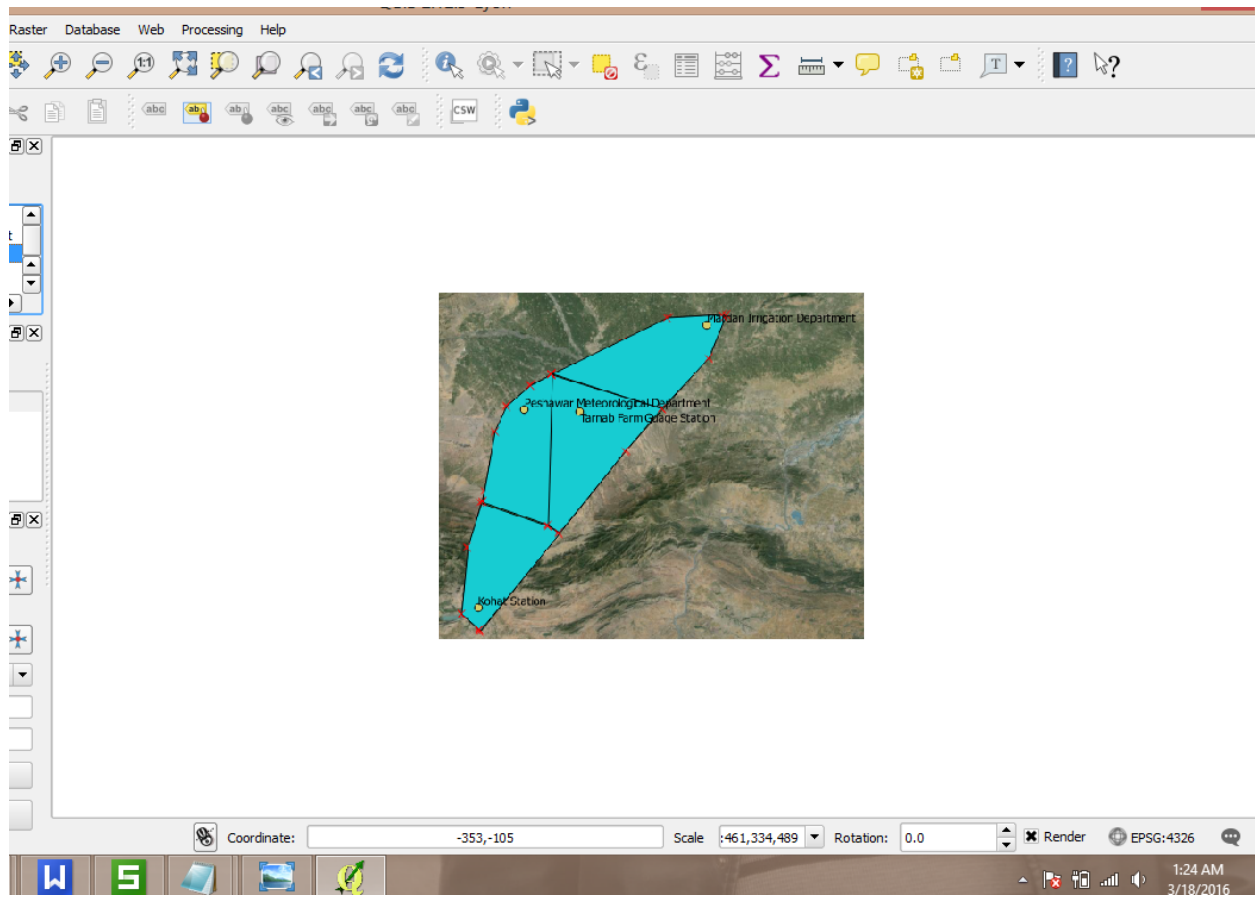




The following image shows the veraunay triangulation step which is available under: Vector> Geometry tools>veraunay triangulation.



In the image shown below: we can see that the thiessen polygon is drawn using the Vector> geometry processing tools> voronoi polygon



Now go to excel and find the required calculations using thissen polygon method

I D	Data station	LONGITUD E (E)	LATITUD E (N)	AREA Pi(m m)	AREA (Ai) (KM <sup>2</sup> )	Wi =Ai/A	P =Pi*Wi
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1	Mardan Irrigation Department	72.032433	34.1950 37	100.4	434.583	0.2076360 1	20.846655 43
2	Tarnab Farm Guage Station	71.707378	34.0123 27	129.5	703.782	0.3362544 94	43.544956 91
3	Peshawar Meteorological Department	71.565516	34.0150 2	474.9	518.038	0.2475093 22	117.54217 68
4	Kohat Station	71.446801	33.5946 41	625.8	436.601	0.2086001 75	130.54198 93
TOTAL =				1330. 6	2093.00 4		312.47577 85
	Arithmetic method =	332.65					
	Difference =	20.174221 55					

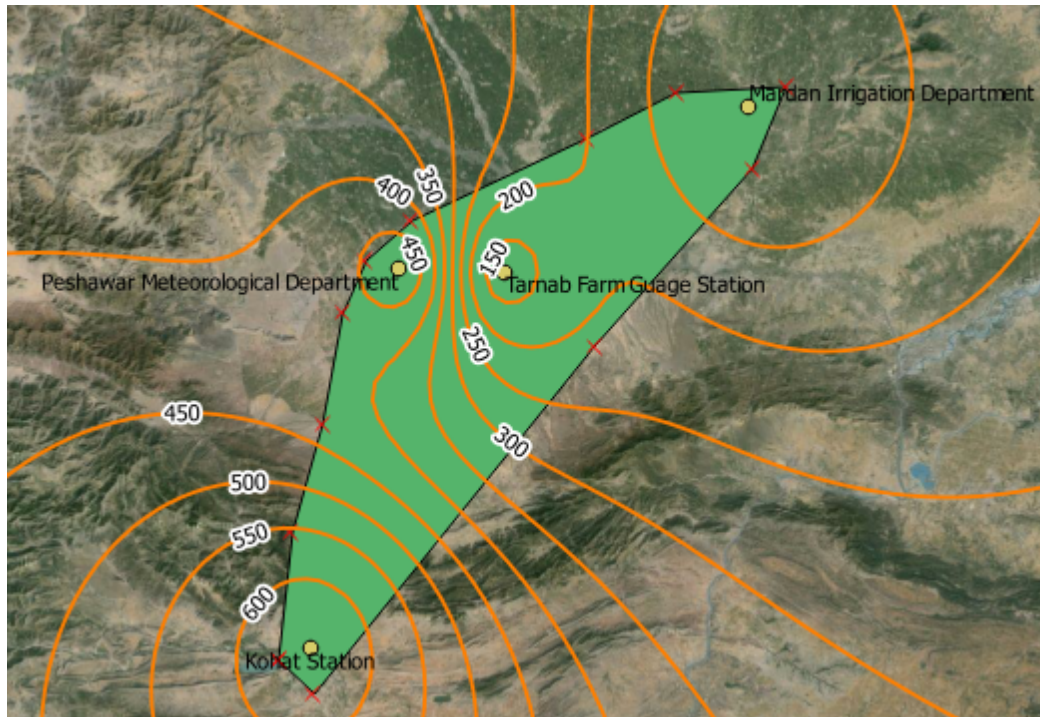
According to the Thiessen polygon Method the annual Precipitation of the given Areas is equal to  
 $P=312.47.. \text{ mm}$

And according to Arithmetic mean method the precipitation is

$P = 332.65 \text{ mm}$

After this do interpolation and contouring by raster>interpolation and raster> extraction> contour and take contour interval as 50:

All the detail can be shown in the image below:



Step 8:

Precipitation calculation details can be seen in the table below:

Contour	Pi		Xavg	Area (Km <sup>2</sup> )	Pi*Ai	
600-550	600	550	575	105.232	60508.4	
550-500	550	500	525	96.828	50834.7	
500-450	500	450	475	110.732	52597.7	
450-400	450	400	425	300.937	127898.2	
400-350	400	350	375	227.379	85267.13	
350-300	350	300	325	157.021	51031.83	
250-	250	200	225	166.130	37379.25	

200						
200-150	200	150	175	586.164	102578.7	
				1750.423	$\sum P_i * A_i =$	568095.9
total precipitation calculated					324.55	