

### Problem Description

Donation Boxes are one of the non-profit and charity organization's activities.

Usually these organizations put and distribute boxes near mosques, schools or public places, where people can donate their used cloths, books, and other belonging.

Some recent challenges were facing both donors and charity organizations:

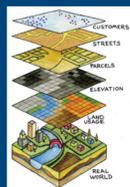
such as the increase in the number of Donation Boxes in difference places while some places don't have any.

For donors the lack of knowledge of finding the nearest places where the Donation Boxes are located which causes donors to destroy what they are donating or throw them out in the garbage. Also for charities due to lack of info about Donation Boxes location they end up putting boxes close to each other while there are no boxes in some other places in Riyadh.

Therefore, and by using GIS and allocating Donation Boxes locations:

This would help both donors & charities solving their problems and challenges.

Donors will find the nearest places of the donation boxes and charities can find boxes location make sure to place them not next to each other and distribute them wisely in Riyadh.



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### Data Description

#### 1 Collecting Coordinates:

I targeted few districts in Riyadh City to go to in order to allocate and collect Donation Boxes coordination.

Coordinates were collected by using Pure-GPS-APP.

(WGS84) is the coordinate reference system (CRS) of the data that was used .

When reaching each Boxe's location I open the Pure-GPS-APP and write a name that indicates its address.

I display it on the map to make sure I have the right location, then I save it in Pure-GPS-APP.

Finally, once All 50 coordinates are collected I copied all in an excel sheet.

#### 2 Attributes Collections:

All Attributes were gathered and a photograph was also taken for each Donation Box.

These attribute were, names of the charities ,number of boxes, types of Donation, boxes colors, conditions and its door type.

I wrote all attributes for each location on a separate page on my notebook.

Then the picture of each Box was sent to my WhatsApp so I can name it by its location, this was done to ensure the accuracy of not mixing picture with deferent location.

Finally, Once I am done with All 50 boxes I copied all in an excel sheet with all attributes and boxes pictures.

### Tool and Application

I have to record Boxes 's location name then displays it on the map to make sure I have the right location, then it will be saved in Pure-GPS-APP.

### Analysis steps

#### Preprocessing performed on the data before using QGIS:

I copied all coordinates from Pure-GPS-APP to an excel sheet with naming each one by its location. And When entering these coordinates into QGIS I had to convert these data from current Degree, Minutes, Seconds (DMS) to decimals.

#### Using QGIS Analysis Steps:

##### 1. DONATION TYPES

- Open charity boxes shapefile
- Right click> Properties> Style
- Then select categorized from drop down. In column add "Donation"
- Click classify
- Click OK

##### 2. Heat Map

- Open Charity boxes shapefile
- From Plugin> Manage and Install Plugin> Heat Maps
- Raster> Heatmap
- Add charity boxes in the dropdown and press okay with default settings
- Now you will see the heatmap displayed. For statistics right click on heatmap> properties>style> choose a color gradient and classify and apply.

##### 3. Buffer Analysis

- Add charity boxes shapefile
- Right click>properties>general>coordinate reference system
- Change CRS:
- In Filter write EPSG:20440 and select the Ain el Abd/ UTM zone 40N and click OK (We did this step so that CRS is in meters. In WGS84 unit is decimals. Hence we have to change the CRS to make buffer)
- Now go to Vector> Geoprocessing Tools> Fixed Distance Buffer
- Add charity boxes as input layer. Distance as 200 because it is in meter i.e 0.2 km. You can change distance if you wish. Keep segments as 5 or above to make circular buffers.

Example: Convert Data from current format Degree, Minutes, Seconds (DMS) to decimals.

	B	C	D	E	F	G	H	I
1	24	42	59.924	=B1+C1/60+D1/3600	46	46	34.526	46.77626
2	24	41	1.696	24.68330444	46	46	68.84	46.78579
3	24	41	77.914	24.70497611	46	46	12.728	46.7702
4	24	42	22.238	24.70617722	46	46	3.83	46.70773

Table 1. Preprocessing Data

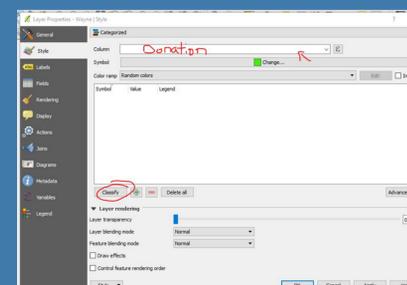


Table 2. DONATION TYPES



Figure 1. Association of productive families– Sliding Door

### Maps Produced

#### 1 Vector Analysis: Charity Box Heat Map and Hot Spot Raster Maps.

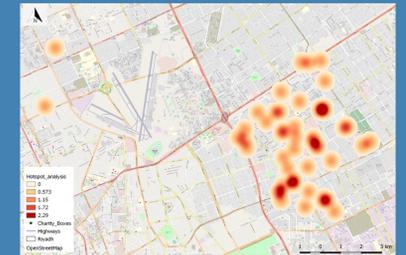


Figure 2. Heat Map and Hot Spot

#### 2 Buffer Analysis:

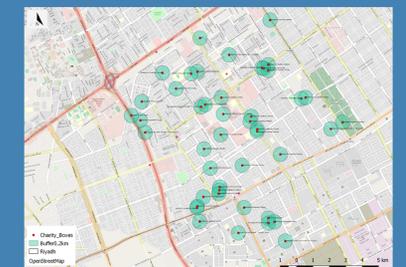


Figure 3. Buffer Analysis

#### 3 Spatial statistics Analysis: Donation Types Classified in a Map

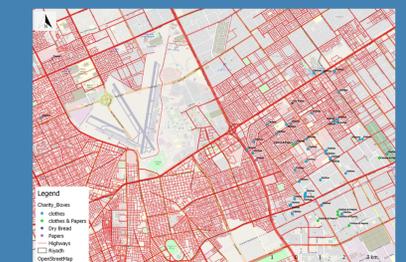


Figure 4. Donation Types Classified

### CONCLUSIONS

Main conclusion of my project: was focusing on allocating boxes locations and link it with attributes while performing few Analysis.

For Spatial statistics Analysis by Classification of charity boxes types: is very useful to allow citizens to see which charity box they should go to donate .

For HeatMaps: it gave an overall perspective of density of charity boxes in an area giving the charities a good idea of where to place the new charity boxes instead of cramming in the area that already have a lot of them, while spot hot shows the numbers of boxes.

For Buffer analysis: it shows that within a radius of 0.2 km , it shows the overlapping buffers while other boxes are far away from each other's.