INTRODUCTION TO REMOTE SENSING

Lab 5: Unsupervised Classification

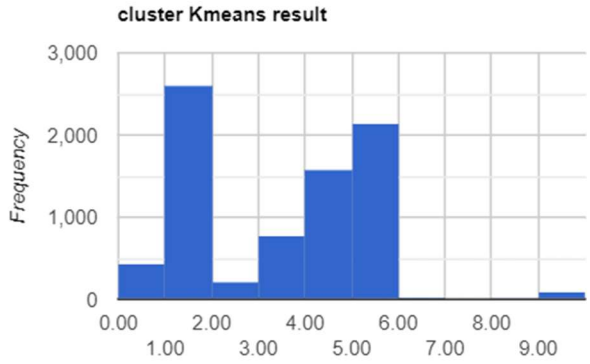
NAME: MST SANJIDA ALAM

Lab 5: Unsupervised Classification

Part 1

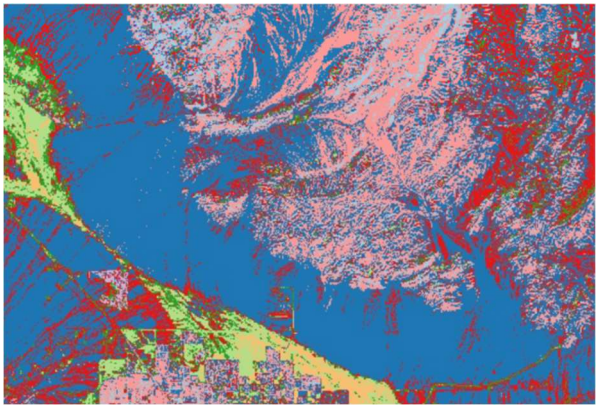
a) Which cluster number is the most predominant in the study area? Paste the histogram to justify your answer.

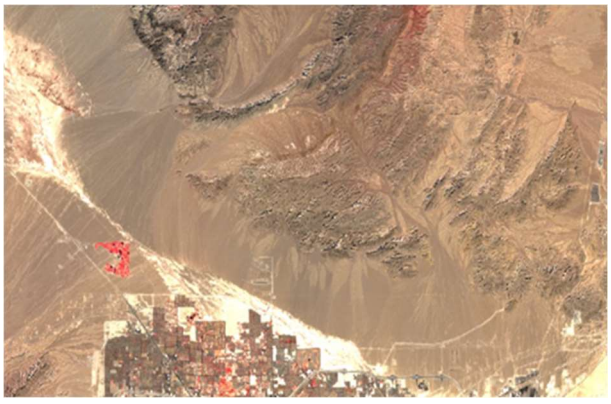
Ans: Cluster Number- 01



b) What information class is this cluster representing? Paste a zoom image that shows the most prevalent class and the color composite for the same region.

Ans: The cluster representing the blue area of the map. This cluster represents desert soil of arid zones without much vegetation in sight, Las Vegas is a city located in a dessert. So, cluster 1 represents the ground around the city of desert soil and it's distributed in some tiny areas within the populated area and also outside the populated area.





Zoom in picture and color composite picture of this cluster.

c) Identify for classes 1 to 10 the information class they represent.

Ans:

0= Road network (light blue)

1= Desert soil (Blue)

2= Sandy soil Area (Light green)

3= Bare land (Green)

4= Barren land with small shrub (Light Pink)

5= Build up area (red)

6= Open Space (light Yellow)

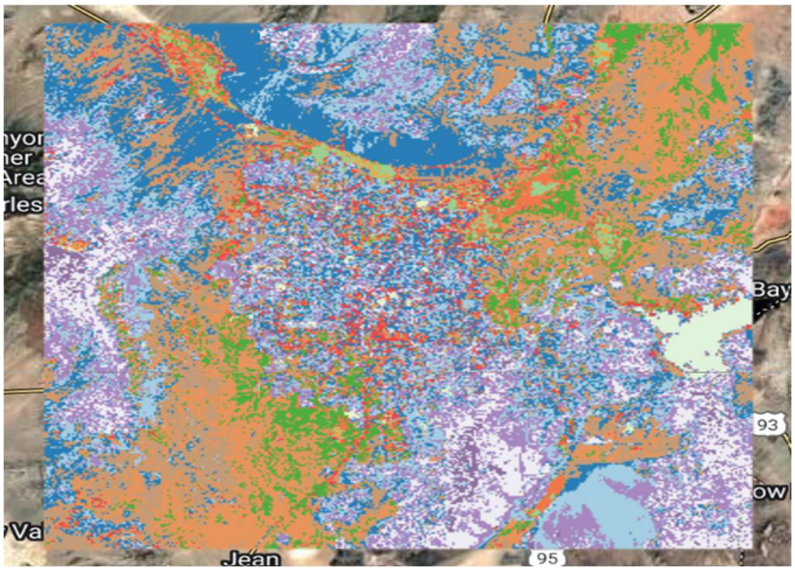
7= Commercial area/ buildings (Light Orange)

8= Small scale vegetation/Crops land area (light purple)

9= Water bodied (Purple)

d) Repeat steps 5, 6, and 7. Change the number of clusters to 15. Paste the resulting cluster map. What can you say about the definition of classes? Is it a better or worse classification? Why?

Ans:



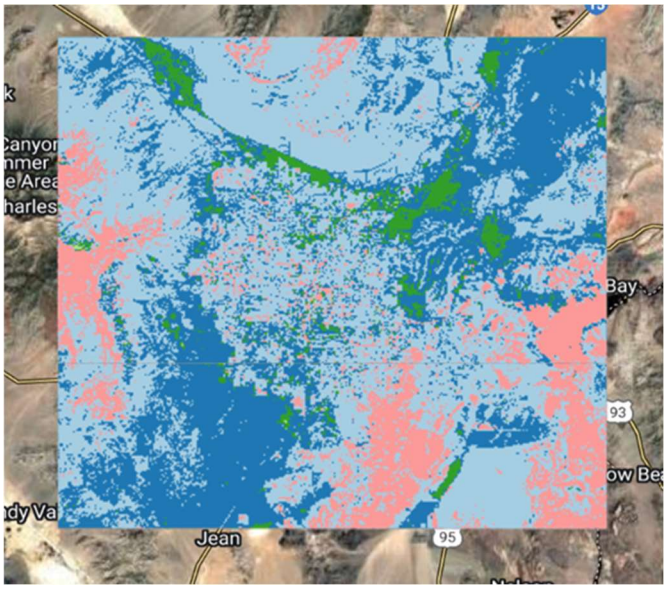
Picture of 15 clusters

Class 0 to 14 have defined the following features: Class 0 (light blue) sandy soil, class 1 (blue) desert soil, class 2 (light green) bright color bare soil, class 3 (green) bare soil, class 4 (brown) building area, class 5 (red) roads network, class 6 (light red) build up area, class 7 (light orange) barren land, class 8 (orange) reddish color bare soil, class 9 (light purple) small roads, class 10 (purple) Parking zone, class 11 (yellow) open ground, class 12 (white) commercial area, class 13 (off white) vegetation, and class 14 (light yellow) water bodies.

Too many classifications produce to more patches which is difficult to find out and the same features divide into other classes that lead to overclassification and inaccuracy. So, for this type of homogenous area, it is worse classification.

e) Repeat steps 5, 6, and 7. Change the number of clusters to 5. Paste the resulting cluster map. What can you say about the definition of classes? Is it a better or worse classification? Why?

Ans:



Picture of 5 clusters

The 5 clusters define the classes in the following way: Class 0 (light blue) define dark color sandy soil, class 1 (blue) represents brown color bare soil area, class 2 (light green) presents commercial area, class 3 (Green) defines build up area, and class 4 (pink) represents water bodies.

Reducing clusters to 5 reduced complexity classification and simplify the analysis process which can provide generalize overview of this homogenous area. That's why I believe this classification is better for this area for avoiding overclassification and maintain the simplicity.

f) What happens with the cluster's spectral homogeneity as you decrease or increase their number?

Ans:

The more clusters lead to less homogeneity because more clusters can define or separate more classes. Decrease number of cluster increase homogeneity of the final image.

g) How would you go about determining the number of clusters?

Ans:

I will determine the clusters number basing on the study area and the purpose of the study.

Part -2

h) Identify for each cluster the information class it belongs to. Provide zoom-in examples pasting FCC and classification.

Ans:

0= Rivers/ Waterbodies (light blue)

1= Cultivatable land (Blue)

2= Grass land (Light green)

3= Small scale industry (Green)

4= Baren area (Brownish Pink)

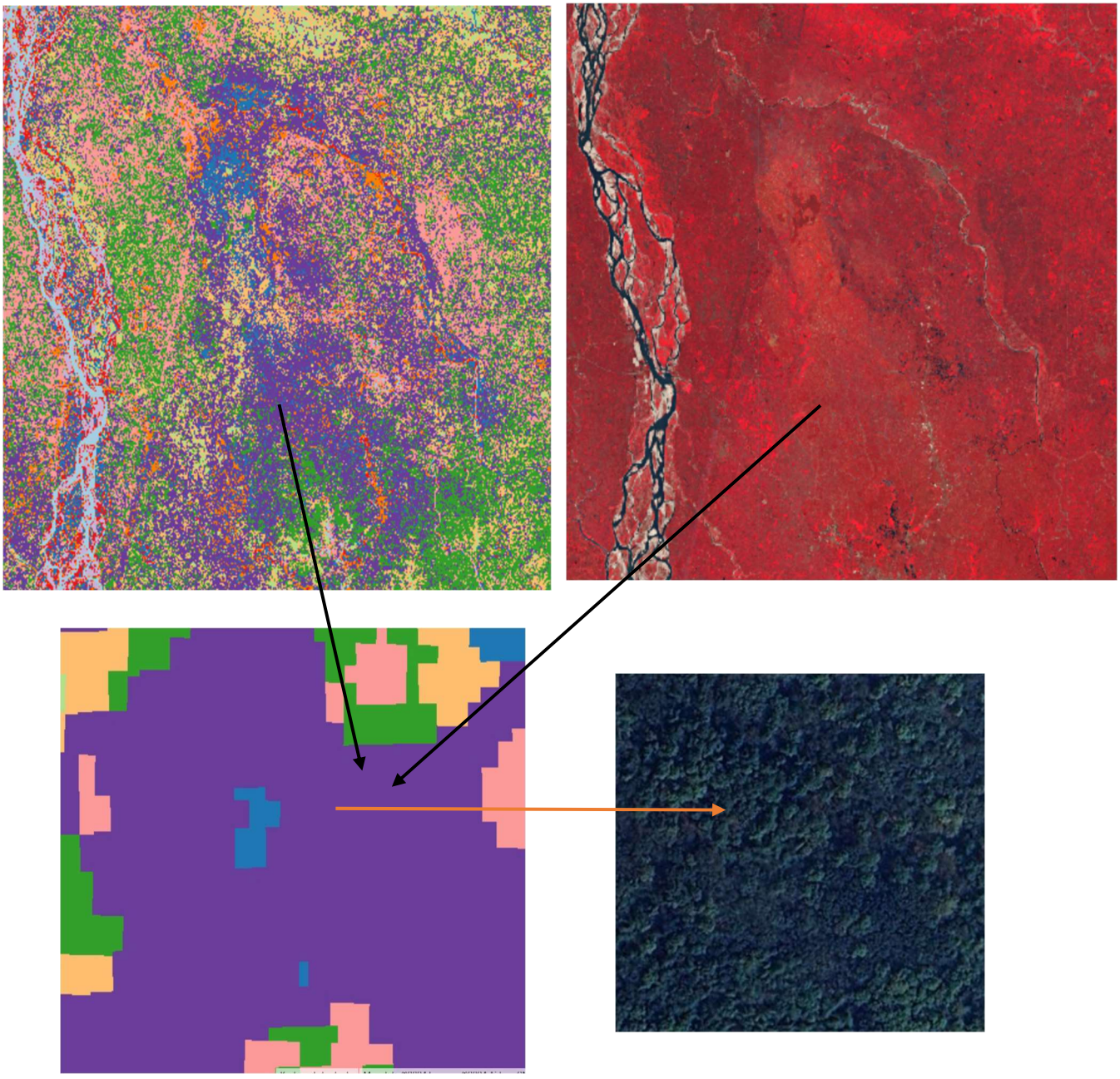
5= Build up area (red)

6= Bare land (light Yellow)

7= unused land (Light Orange)

8= Flood plain area adjacent with river (Pink)

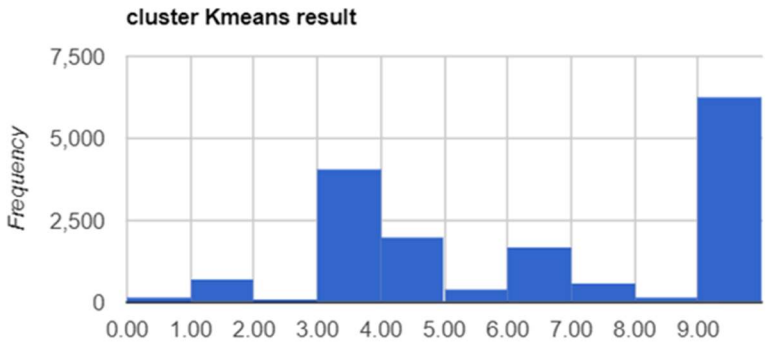
9= Vegetation (Purple)



Examples with classification, FCC and pasting zoom in example of predominant class and its satellite image.

i) Paste the histogram and identify the most prevalent class.

Ans:



The most prevalent class Number: 09

Bangladesh has subtropical monsoon climate. Thie prevalent class 9 is also under this climatic zone. This area is presented by purple color and this area is cover by vegetation. Some areas are densely vegetated and some are low vegetated.

Map outputs

Part-1

Link: https://code.earthengine.google.com/5bcc1e9545d9653199f5b4cb56aad6f9

Image 1: Image of False color composite bands B8, B4, B3 and vis Las Vegas BRG: G-R-NIR. Number of clusters 10.

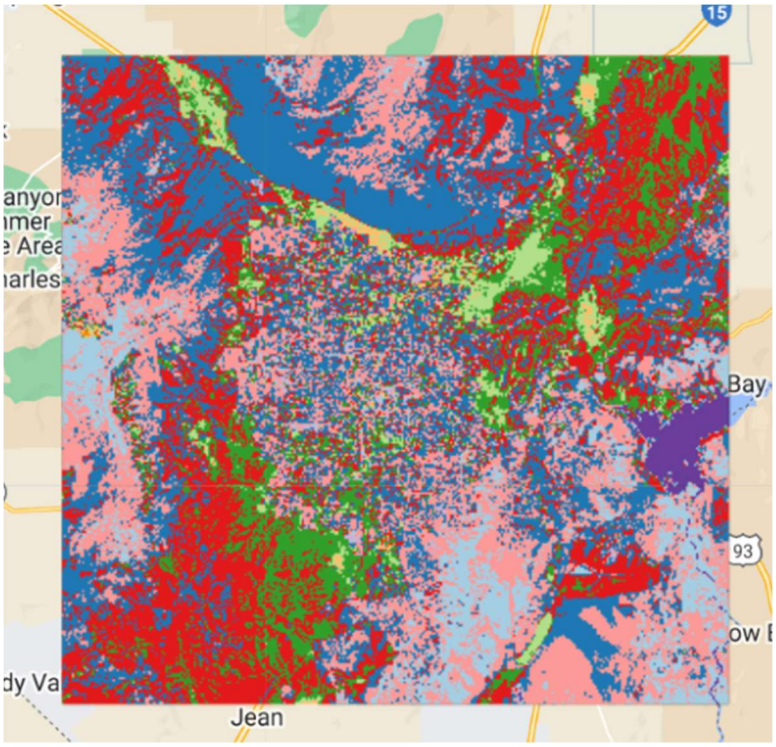


Image 2: Image of False color composite bands B8, B4, B3 and vis Las Vegas BRG: G-R-NIR. Number of clusters 15.

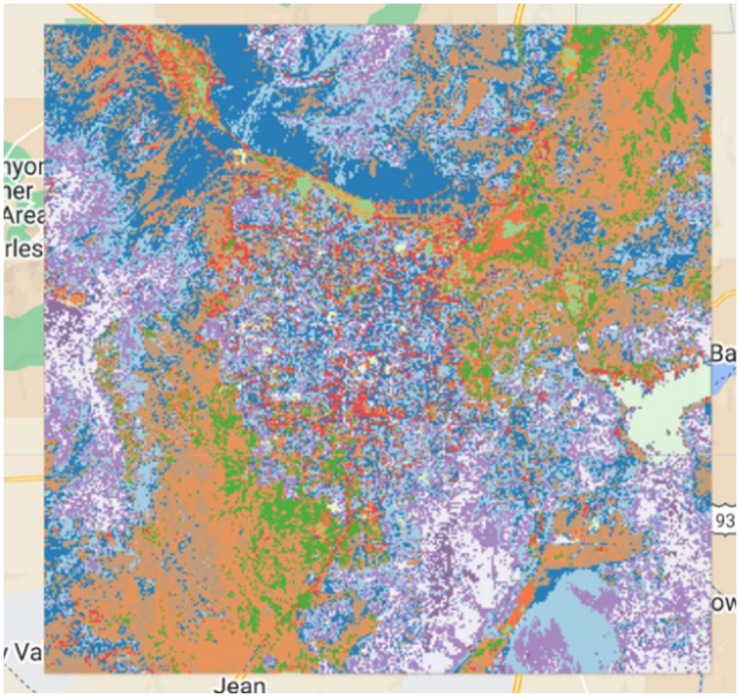
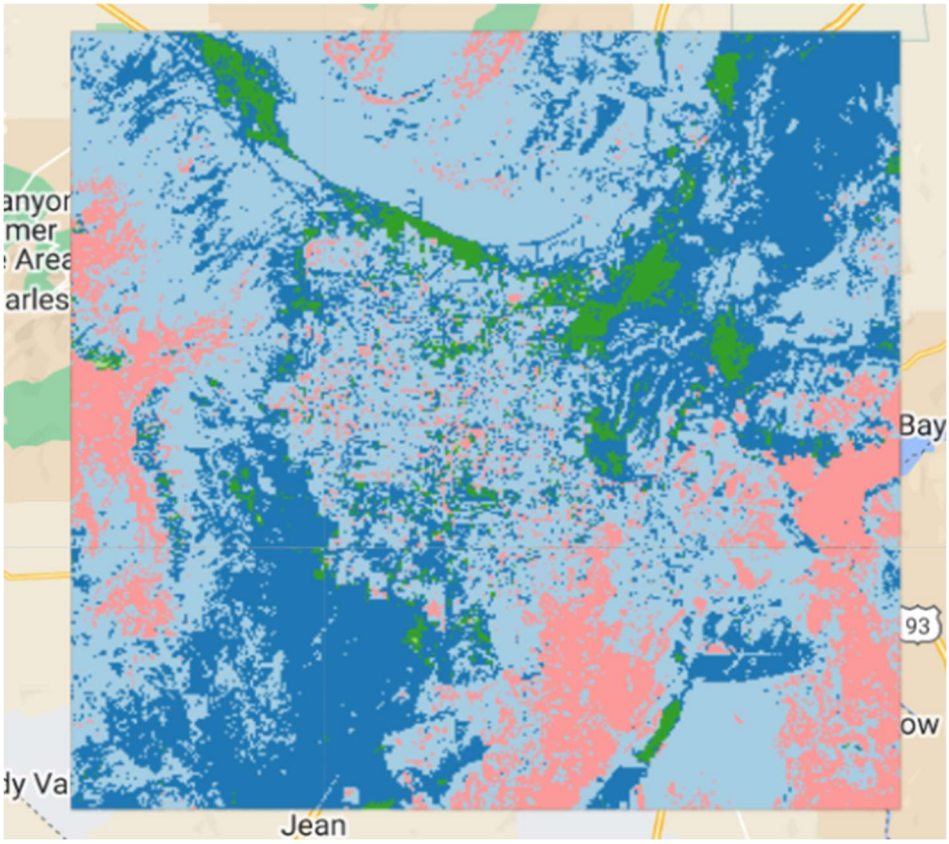


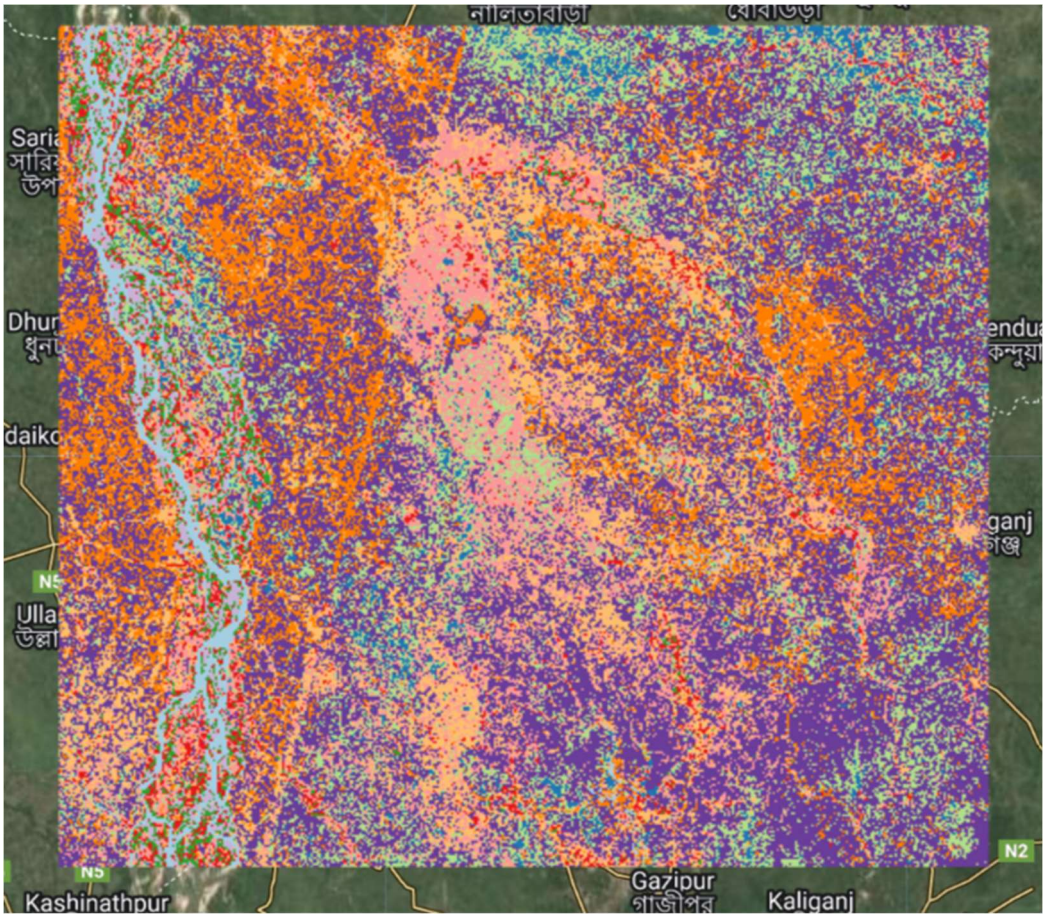
Image 3: Image of False color composite bands B8, B4, B3 and vis Las Vegas BRG: G-R-NIR. Number of clusters 5.



Part-2

Link: https://code.earthengine.google.com/44b91051f03432fee63092e6d4517498

Image of False color composite bands B8, B4, B3 and vis Las Vegas BRG: G-R-NIR



FINISH