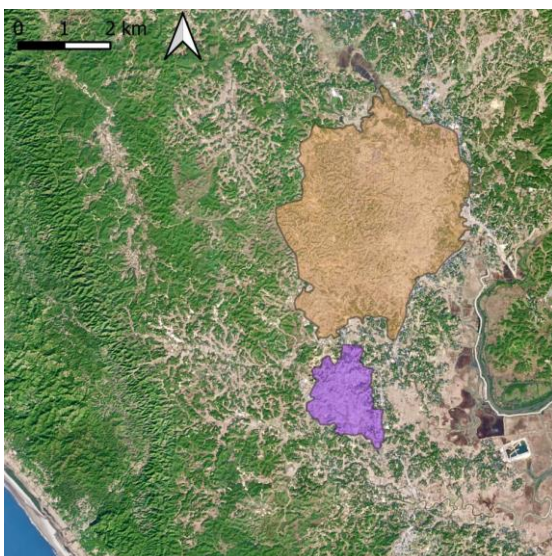ESA SCHOOL ATLAS
the view from space



*2017-01-09, Sentinel-2*



*2023-01-03, Sentinel-2*



*Extent of the refugee camps*

The Kutupalong Refugee Camp, located about 30km south of Cox's Bazar, a town in Bangladesh, is one of the largest refugee camps in the world. Established in 1991, it was originally designed to house refugees fleeing conflict in neighbouring Myanmar. Over the years, it has grown into a sprawling settlement providing shelter and essential services to Rohingya refugees and other displaced communities.

Satellite images of Kutupalong show the change in the land cover, as the original vegetation is removed from the area of the camp. In this way it is possible to monitor the growth and current size of the camp.

Covering an area of approximately 13 square kilometres, in 2023 the camp has been home to over a million people. Rows of makeshift shelters, schools, medical clinics, and markets can be seen, depicting the camp's evolution into a self-sustaining community. Kutupalong hosts around 130 formal and informal learning centres, providing education to over 100,000 Rohingya children. Humanitarian organizations have built over 45,000 shelters, but the need for more durable housing remains critical - the challenges are immense.

**Exercises**

- Satellite Map:
  - Describe the satellite maps from 2017 and 2023.
  - Which landscape structures and land cover classes can you identify?
  - Which differences can you identify between the two satellite maps? What do they tell you about the development of the refugee camp?
  - Look at the map showing the extent of the refugee camp. How well does this extent agree with the changes you have identified? Can you see differences beyond the borders of the camp? What about forest areas in the wider environment?
  - Using the information given in the text, try to estimate the population density of the camp. Compare with the values of densely populated European cities such as Paris or Athens with roughly 20.000 inhabitants per km².

**Additional Material**



*2019 – Life in the refugee camp (photograph Capt. Raju)*

**Links and Sources**

- https://www.esa.int/ESA_Multimedia/Images/2019/09/Kuputalong_refugee_camp - example of Sentinel-1 radar satellite data used to highlight the development of the refugee camp
- https://www.esa.int/Enabling_Support/Preparing_for_the_Future/Space_for_Earth/Space_technology_improves_conditions_for_refugees - a project applying satellite information for supporting the management of refugee camps