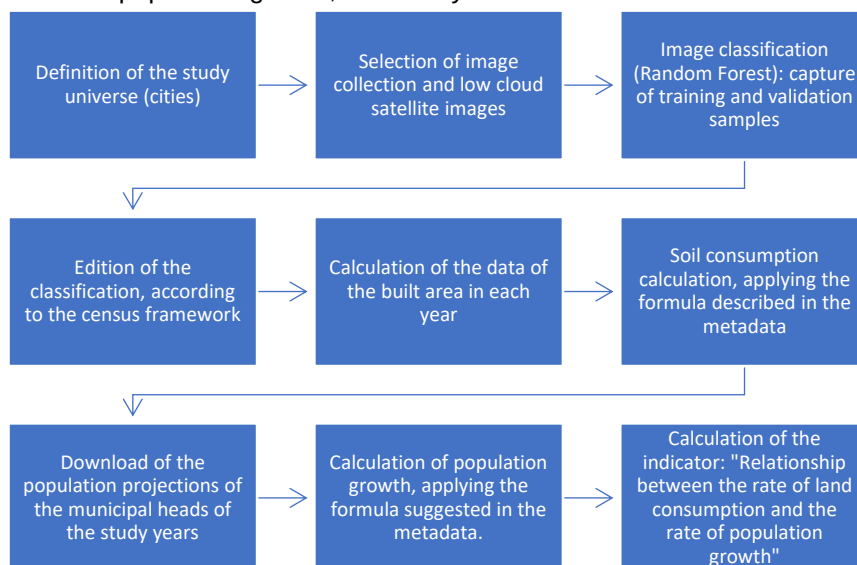




Country Use Case of EO for SDG Indicator	
SDG Indicator/Sub-indicator	SDG Indicator 11.3. 1: "Ratio of land consumption rate to population growth rate"
Country or region	Colombia
Status (please check)	☒ being used in official SDG Indicator reporting ☐ being verified or tested by country ☐ studying feasibility
Earth Observation Data Used and its links	Landsat satellite imagery https://developers.google.com/earth-engine/datasets/catalog/LANDSAT_LC08_C01_T1_SR Sentinel satellite imagery https://developers.google.com/earth-engine/datasets/catalog/COPERNICUS_S2_SR
Additional/ Other Data Used and its links	DANE National Geostatistical Framework https://geoportal.dane.gov.co/descargas/mgn_2018/MGN2018_URB_AREA_CENSAL.rar Population projections https://www.dane.gov.co/index.php/estadisticas-por-tema/demografia-y-poblacion/proyecciones-de-poblacion
Description of data access, processing, and analysis, including methodology that was developed, associated tools or applications, and how these are applied to compute SDG Indicator	<i>Population projections for 2003 and 2015, published by DANE, were used to calculate population growth. In this process, the census level "municipal head" was taken into account.</i> <i>The selection and digital processing of Landsat and Sentinel satellite images for the classification of impervious surfaces (built-up areas) was carried out in Google Earth Engine. The classified images were downloaded and ArcGIS was used to calculate the built area in each year. The census framework, designed by DANE, was used to select the built-up areas that intersect with the "municipal head". Then a comparison was made between the area built in 2003 and the area built in 2015, to then calculate the consumption of the soil.</i> <i>Finally, the indicator was calculated: relationship between the rate of land consumption and the rate of population growth</i>

Work flow

The workflow is summarized in three stages: determination of soil consumption, calculation of population growth, and finally the calculation of the indicator.



Lessons learned, any gaps, key issues and recommendations

Lessons learned:

- Earth observation data is a very valuable source of information for determining the area of cities and their urban expansion.
- Google Earth Engine is a platform that has an updated catalog of satellite images and processing algorithms, in the cloud, freely accessible, through which users generate their routines. The use of this platform has allowed DANE to optimize the time in the digital processing of satellite images.

Any gaps

Determine the urban area and land consumption in cities with constant cloud coverage, this from the implementation of new processing methods or the use of radar images.

Recommendations:

- It is essential that there is a synchronization of the versions (updates) between the metadata published on the web portal of the United Nations Statistics Division <https://unstats.un.org/sdgs/metadata/> and those published by the custodian agencies.
- It would be convenient to include in the metadata the links to the tools and learning material that has been developed and that facilitates the calculation of the indicators.
- It would be convenient to develop a tool through which the DEGURBA (Degree of Urbanization) methodology is implemented and that allows countries to define their universe of cities.
- It would be important to highlight that the different data sources must be from the same year of capture, for example, if the satellite images were taken in 2015, the population should also be that of 2015.



Supporting material about this use case. Include links, publications, etc.	
Collaboration with other agencies - agency names and activities	
Name(s) and email address of individual(s) involved in this effort. Please note the principal point(s) of contact (POCs).	National Administrative Department of Statistics – DANE Sandra Moreno slmorenom@dane.gov.co , DANE Technical Director of Geostatistics Carlos Durán cadurang@dane.gov.co , Coordinator of the Research and Development Group of the Geostatistics Department.