

Leaves in the city

LAI measurement

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Intro

The amount of greenery in a city is measured with the leaf area index (LAI). Increasing greenery does not only improve air quality, but also affects other climatic factors related to our health, such as the urban heat area effect. The first step towards increasing greenery is understanding the LAI.

Objectives

- To quantify plant coverage and the density or biomass of leaf coverage (measured by the LAI) in the city's parks and gardens, using mathematic algorithms.
- See what the most convenient strategies are for increasing leaf coverage across the city.

Materials

- Any Android smartphone with an Internet connection or Wi-Fi
- Fish-eye lens for a phone (we recommend the MPOW MFE1N model, which costs around 20 euros)
- 1.5m of string and a weight on one end
- Physical or digital compass
- A ruler to mark the distance between measurement points

Steps to follow

1. CONNECT to the Internet and go to Google Play.
2. SEARCH 'ODK' and select 'ODK Collect' by 'Open Data Kit'.
3. INSTALL the ODK Collect mobile app.
4. OPEN the ODK Collect application on your mobile.
5. CONNECT to the Doctor X LAI Aggregate server of the UB.
6. To change the settings on ODK Collect, click the menu button on your device when you are in the ODK Collect home screen.
7. On Android 3.x and 4.x devices without a dedicated button for Menu button features, you can access your settings by going to the thin vertical line of three small squares, in the top right part of the menu bar.

8. In 'General Settings', select 'Server' and change the 'ODK Aggregate Settings' to the following URL: <https://universitybarcelonadoctorxlai.appspot.com>.
9. DOWNLOAD the Doctor X LAI form.
10. SELECT 'Get Blank Form' to download the Doctor X LAI blank sheets from the server, which you can fill in.
11. VISIT parks and gardens to take down measures, without forgetting your fish-eye lens, compass, string and a weight, if you want to collect data this way (see the associated recipe).
12. MEASURE the LAI of several areas of the park or garden. You should select an area of around 50 x 30m² in the park.
13. MAKE lines of measurement points, with 10m between each point and 10m between each transect (for a total of 15 points).
14. FOLLOW the instructions on the mobile form to add the first data from the group, and then the data from the LAI at a height of less than 1.5m (see the leaf area recipe).
15. CONNECT to the Internet (it is best to use wifi).
16. GO BACK TO 'Send Finalized Form (15)' to select the images, and click the 'Send Selected' button.

Form

The data sent back to the server/researcher uploaded by the participant

GPS / DD/MM/YYYY / LAI