



Reduction of Environmental Impacts: Absorption of Rainwater Through Green Roofs in Flood-Prone Areas

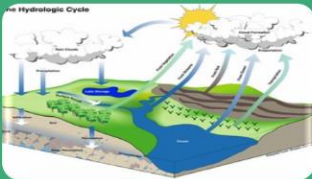
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INTRODUCTION



Environmental pollution caused by humans throughout history.



Climatic changes produced that affect the hydrological cycle.



Alteration in the frequency and intensity of rainfall around the world.



SDG 11 “Sustainable cities and communities“.



GREEN
ROOFS

Map of the Presentation

I. GREEN ROOFS

II. CLASSIFICATION OF GREEN ROOFS

INTENSIVE

EXTENSIVE

III. WATER ABSORPTION CAPACITY OF GREEN ROOFS

INTENSIVE

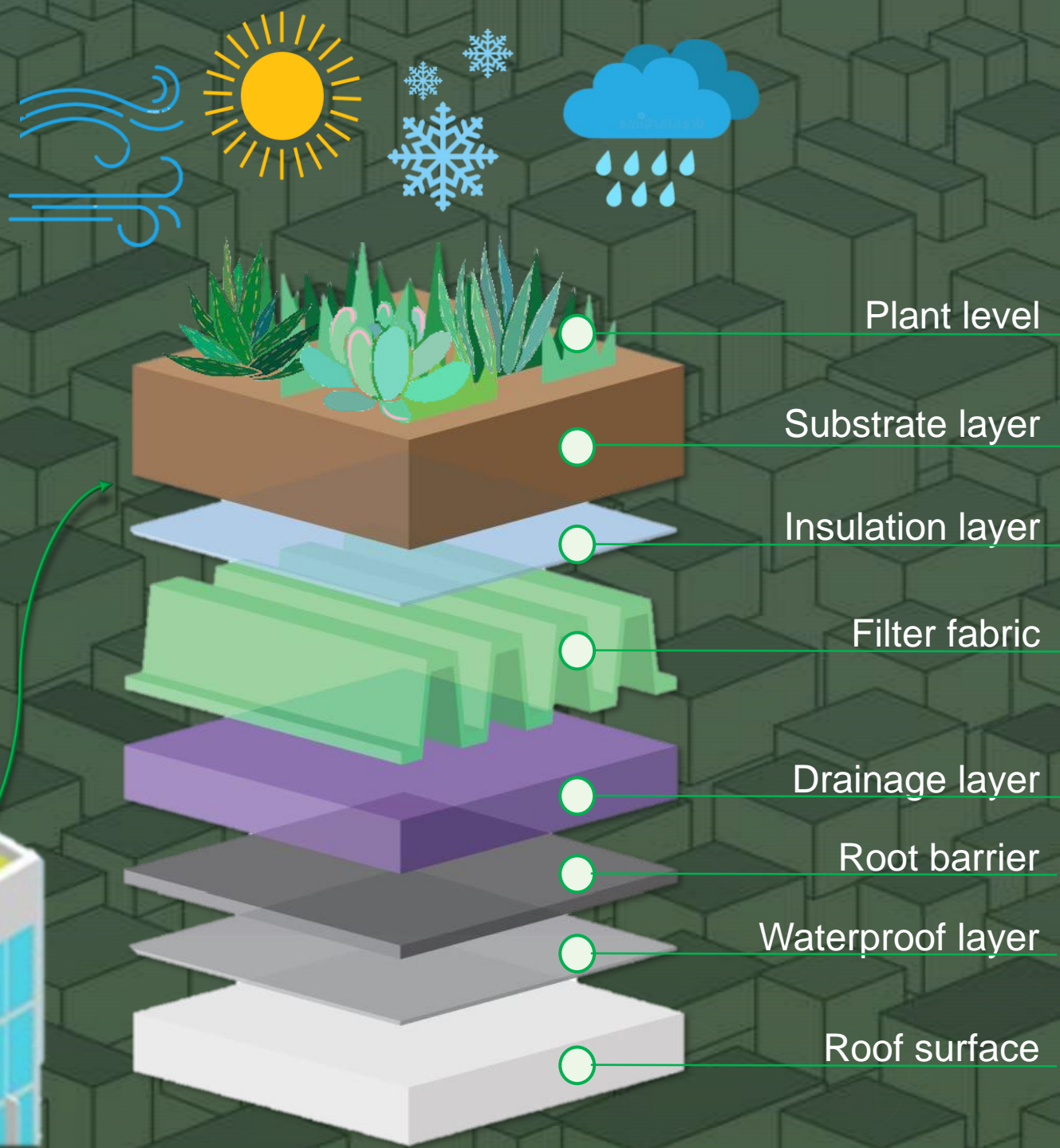
EXTENSIVE

IV. CONCLUSION



I. GREEN ROOFS

A green roof is an artificial system that offers a green space on the slab of a structure, complemented by several layers of filters.



HOW DO GREEN ROOFS WORK?

Rainwater retention and filtration



Improvement of biodiversity

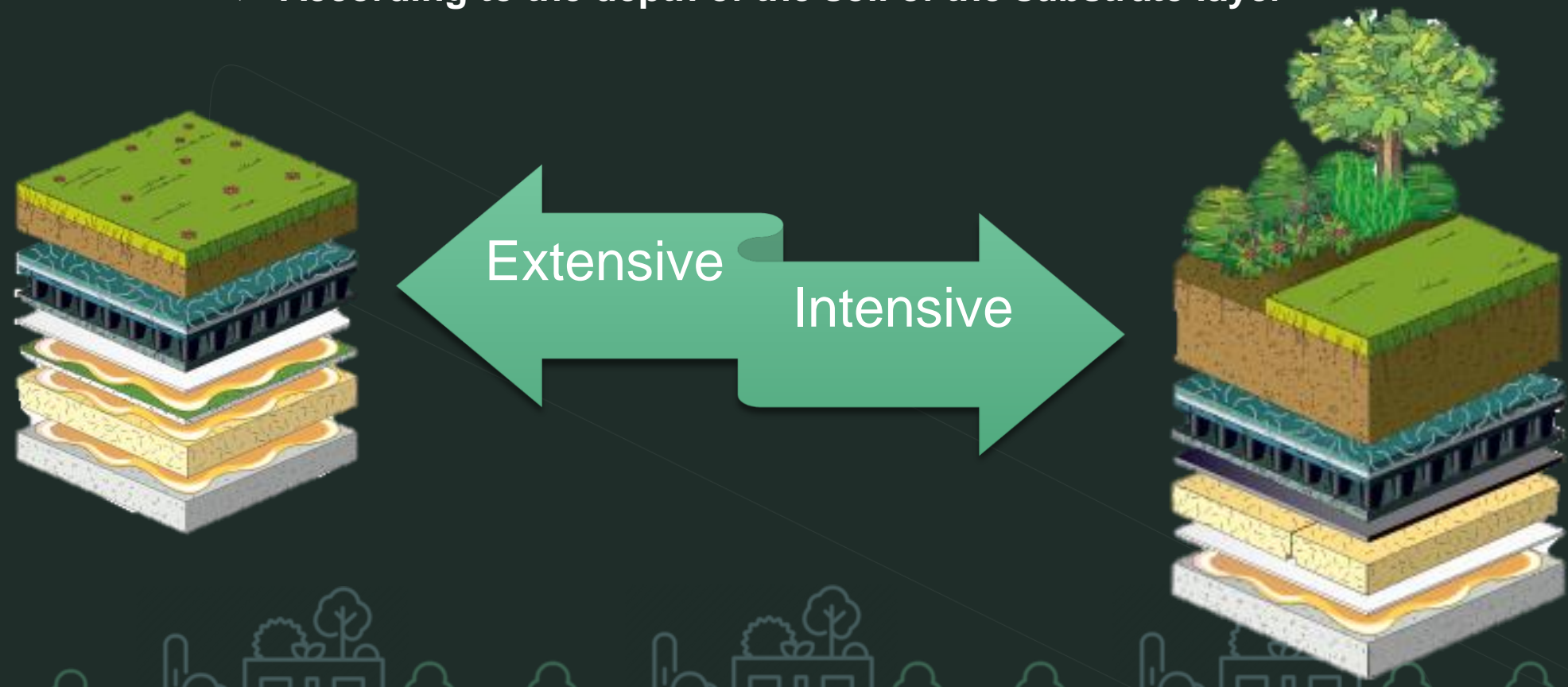


Improvement of local microclimate



II. CLASSIFICATION OF GREEN ROOFS

❖ According to the depth of the soil of the substrate layer



INTENSIVE GREEN ROOF



Depth of more than 15 cm

Different types of vegetation



High maintenance

Expensive installation





EXTENSIVE GREEN ROOF



Approximate
depth of less than
15 cm

Drought resistant
plants



Low
maintenance

Economical and
simple installation



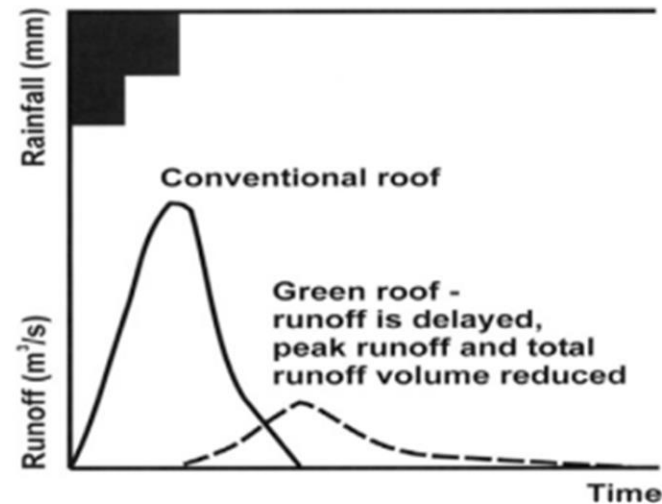
III. WATER ABSORPTION CAPACITY OF GREEN ROOFS

- ❖ To address the issue of flooding prevention, it is important to focus on the performance of the water absorption capacity of green roofs.

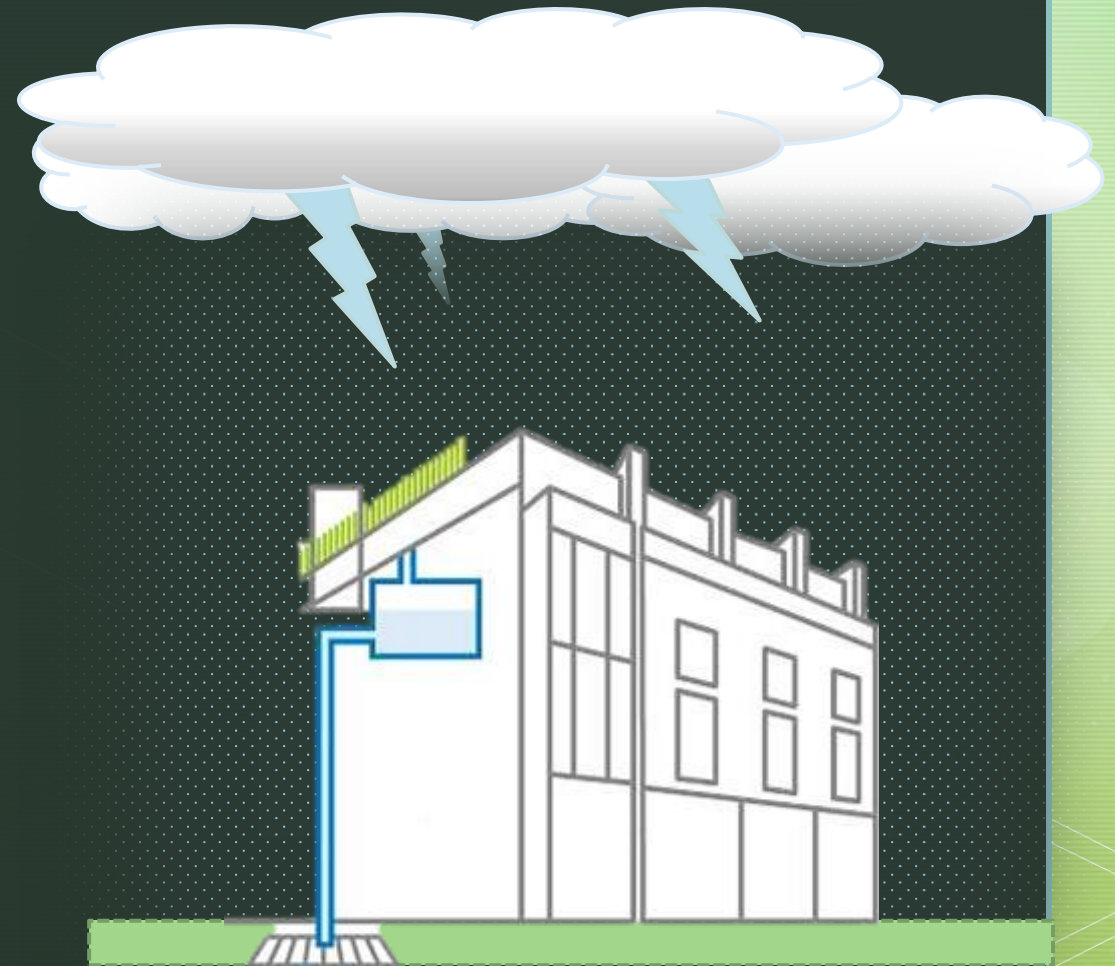
Water absorption capacity or retention

$$\text{Retention (\%)} = \frac{\text{Rainfall (mm)} - \text{Runoff (mm)}}{\text{Rainfall (mm)}} \times 100$$

Difference between the retention capacity of a green roof and a conventional one.



Rainfall runoff response of the green roof and conventional roof.



III. WATER ABSORPTION CAPACITY OF GREEN ROOFS



Runoff retention results of green roofs depend on:

- Age of the green roof.
- Pore spaces.
- Depth, substrate, vegetation and type of drainage.
- Intensity and duration of rain events.



The performance of a green roof depends on:

- Climate conditions.
- Different compositions of substrate, depths and slope.

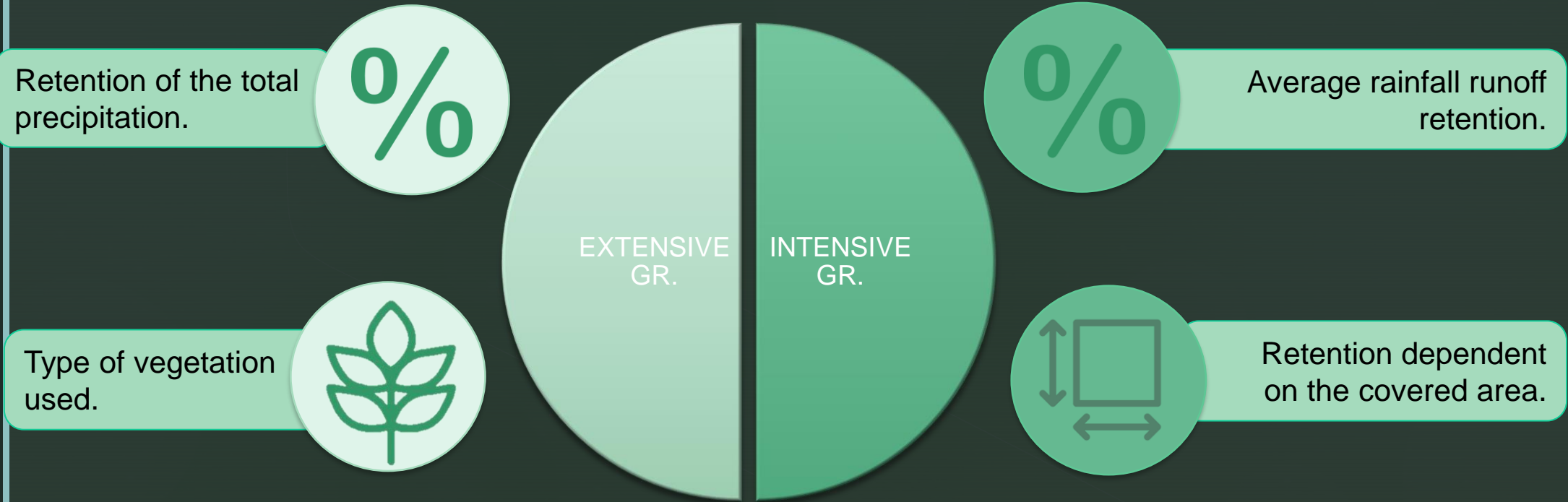



Intensive

Extensive

WATER ABSORPTION CAPACITY, INTENSIVE AND EXTENSIVE

❖ The performance of the water absorption capacity of green roofs varies in extensive and intensive systems.



 Studies on rainwater retention.



Over several consecutive days, the reduction in the outflow of rainwater decreases in both systems.



IV. CONCLUSION



It is a viable and sustainable solution.



A deeper study is necessary.



The use of native plants suitable for green roofs is important.



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