

Restoration of urban soils for environmental health, climate adaptation, and community well-being



**GLOBAL SYMPOSIUM
ON SOIL SEALING AND
URBAN SOILS**

*Healthy soils for
healthy cities*



Food and Agriculture
Organization of the
United Nations



Consiglio Nazionale
delle Ricerche



Restoration of urban soils for environmental health, climate adaptation, and community well-being

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I

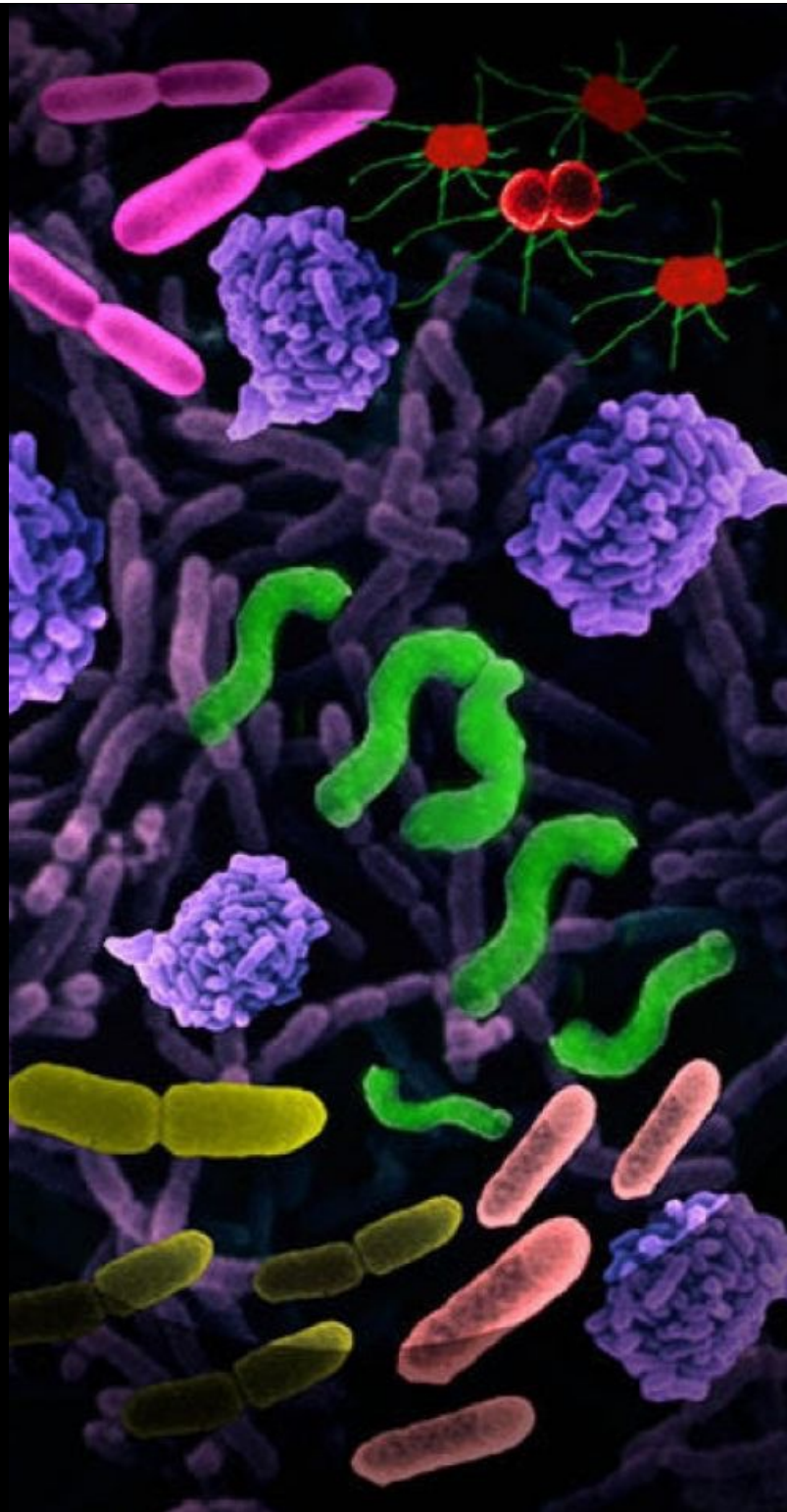
Life is in soil

Fungi



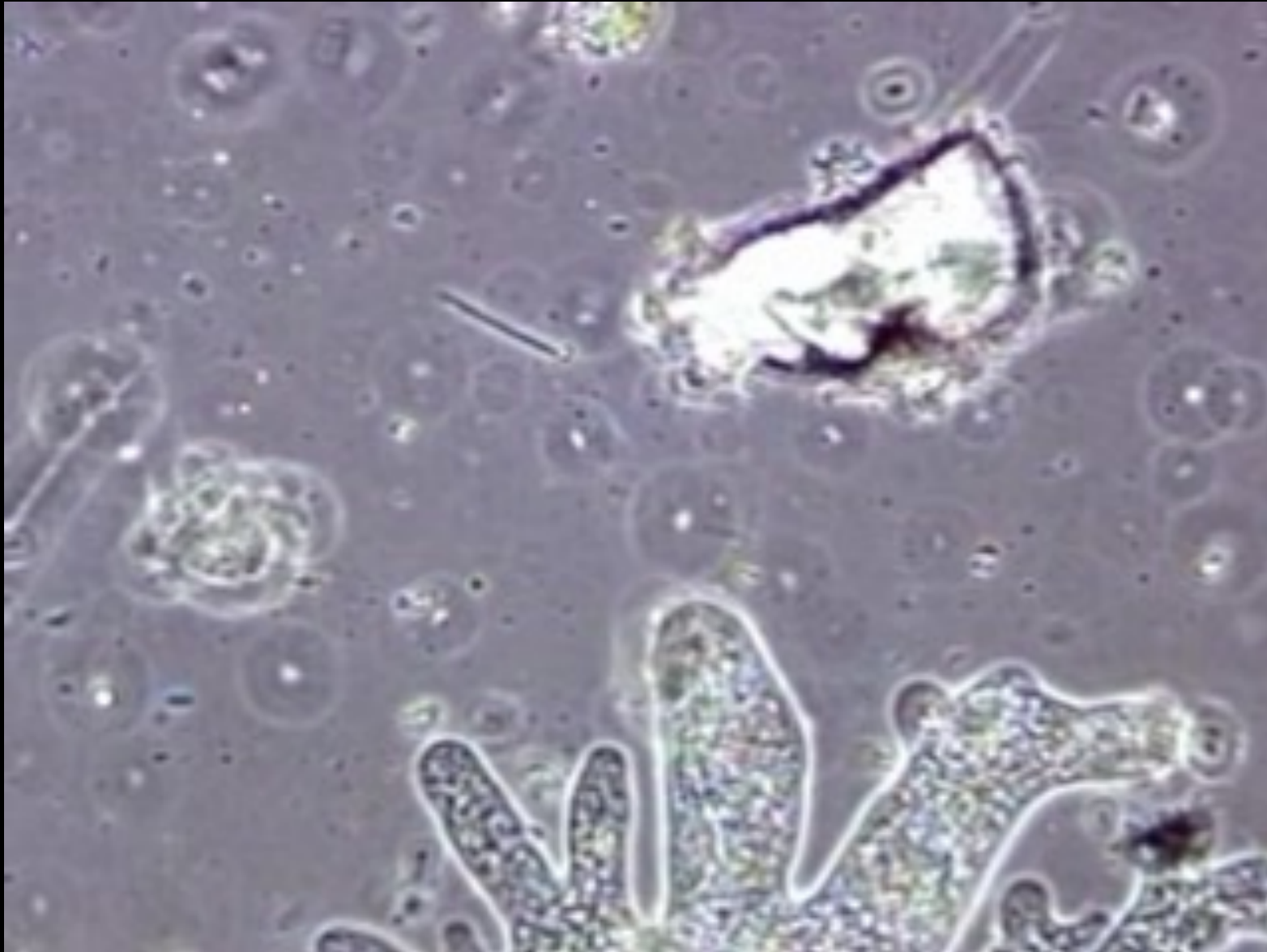
ARTE

Bacteria



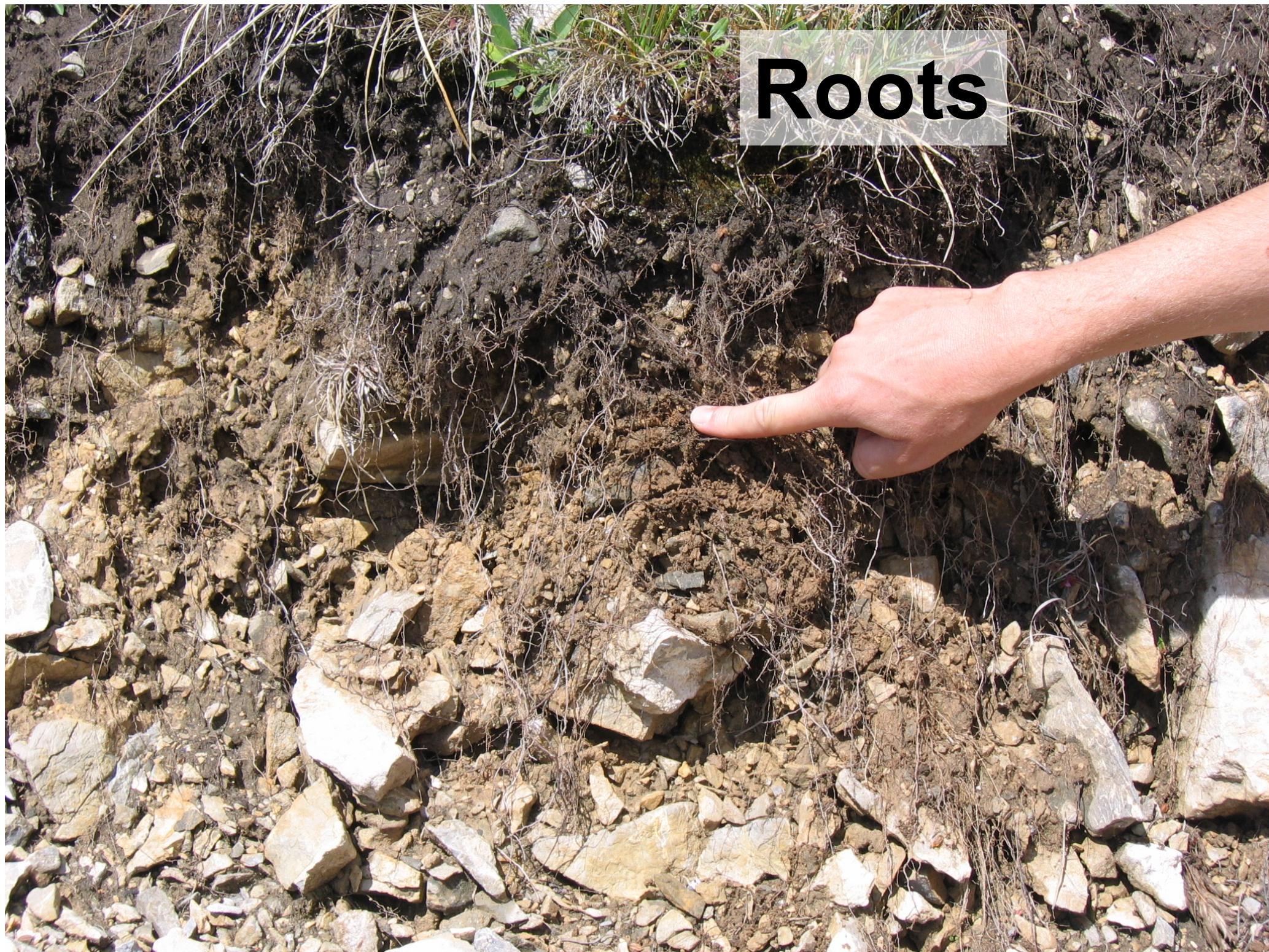
Streptomyces

Amoebas



IWF

Roots



Animals



arte

ARTE

One gram of fertile soil...

one million of bacteria, thousands of species

one thousand fungal species

hundreds of amoeba species

25 to 60% of living species in soils!

50 à 75% of living biomass

60 à 90% of total organic matter (L+D)

One gram of fertile soil contains...

Decomposers recycling N, P, S and C



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Nitrogen-fixing bacteria



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Nitrogen-fixing bacteria

Rock-dissolving biofilms (K, Mg, Ca, Fe... oligo-elements)



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Organic matter storing C (climate mitigation)



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Decomposers recycling N, P, S and C

Nitrogen–fixing bacteria

Rock-dissolving biofilms (K, Mg, Ca, Fe... oligo-elements)

Organic matter storing C (climate mitigation)

Pore formation : water retention and aeration



One gram of fertile soil contains...

Decomposers recycling N, P, S and C

Nitrogen–fixing bacteria

Rock-dissolving biofilms (K, Mg, Ca, Fe... oligo-elements)

Organic matter storing C (climate mitigation)

Pore formation : water retention and aeration

> what we eat, finally

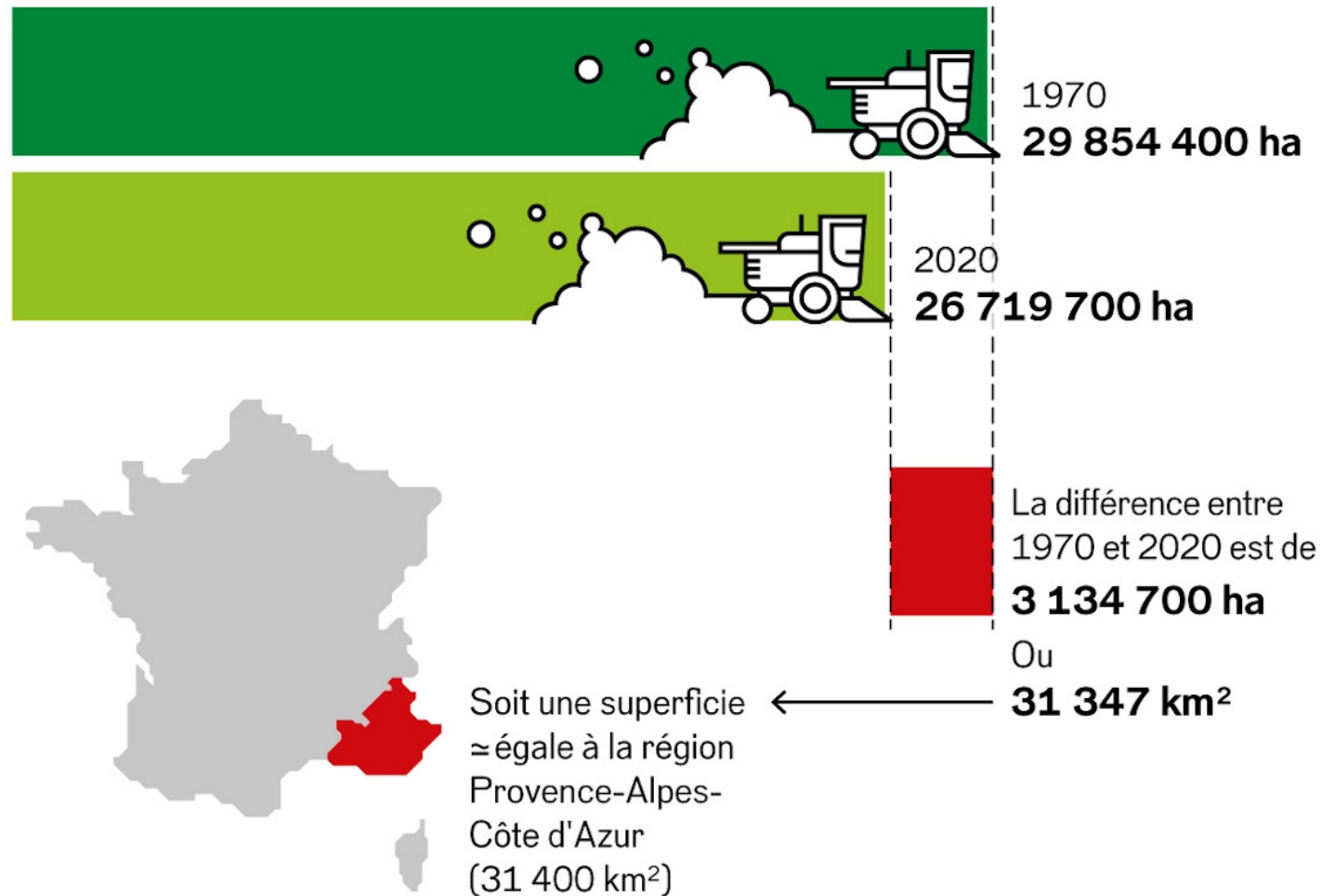


II

Artificialisation



Artificialisation between 1970 and 2020



Source : Safer

Artificialisation

between 1970 and 2020



In France:

**5 football stadiums per hour
3,7x the demographic growth**



STABILISATION DES SOLS

L'oxyde de calcium et l'hydroxyde de calcium jouent un rôle fondamental dans la récupération des sols et des matériaux du tracé dans la construction de routes et de chemins de fer, et constituent une option toujours efficace et rapide.





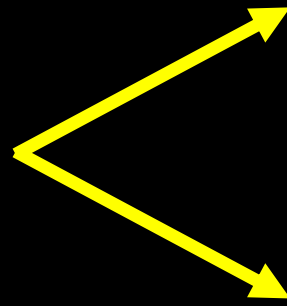
Sealed technosoil



Soil covered



Soil covered



No organic matter

**Few water
& air**

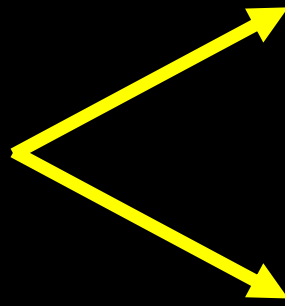


Soil covered

No organic matter

**Few water
& air**

Very few life, no C storage





De-artificialization





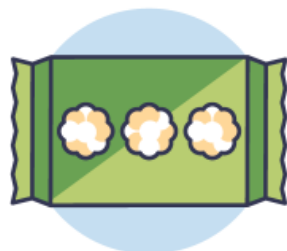
Heavy metals



Polyaromatic compounds



**FIREFIGHTING
FOAMS**



**MICROWAVE
POPCORN BAGS**



**WATER RESISTANT
CLOTHING**



PAINT



**STAIN RESISTANT
PRODUCT**



**PERSONAL CARE
PRODUCTS**

PRODUCTS THAT CONTAIN PFAS



COSMETICS



**NON-STICK
COOKWARE**



**FAST FOOD
PACKAGING**



**STAIN RESISTANT
FURNITURE**



PHOTOGRAPHY



PESTICIDES

PFAs, etc.

Restoration costs:

**95-390 millions
euros /km²**

**Better avoid
artificialization**

III

Soils in the city





Phonic isolation

Thermal isolation

Cooling down in summer

Against floodings

Food production

Aesthetic, leisure

**Health (mental,
depollution)**



« Sponge cities »



A Placebo-controlled double-blinded test of the biodiversity hypothesis of immune-mediated diseases: Environmental microbial diversity elicits changes in cytokines and increase in T regulatory cells in young children

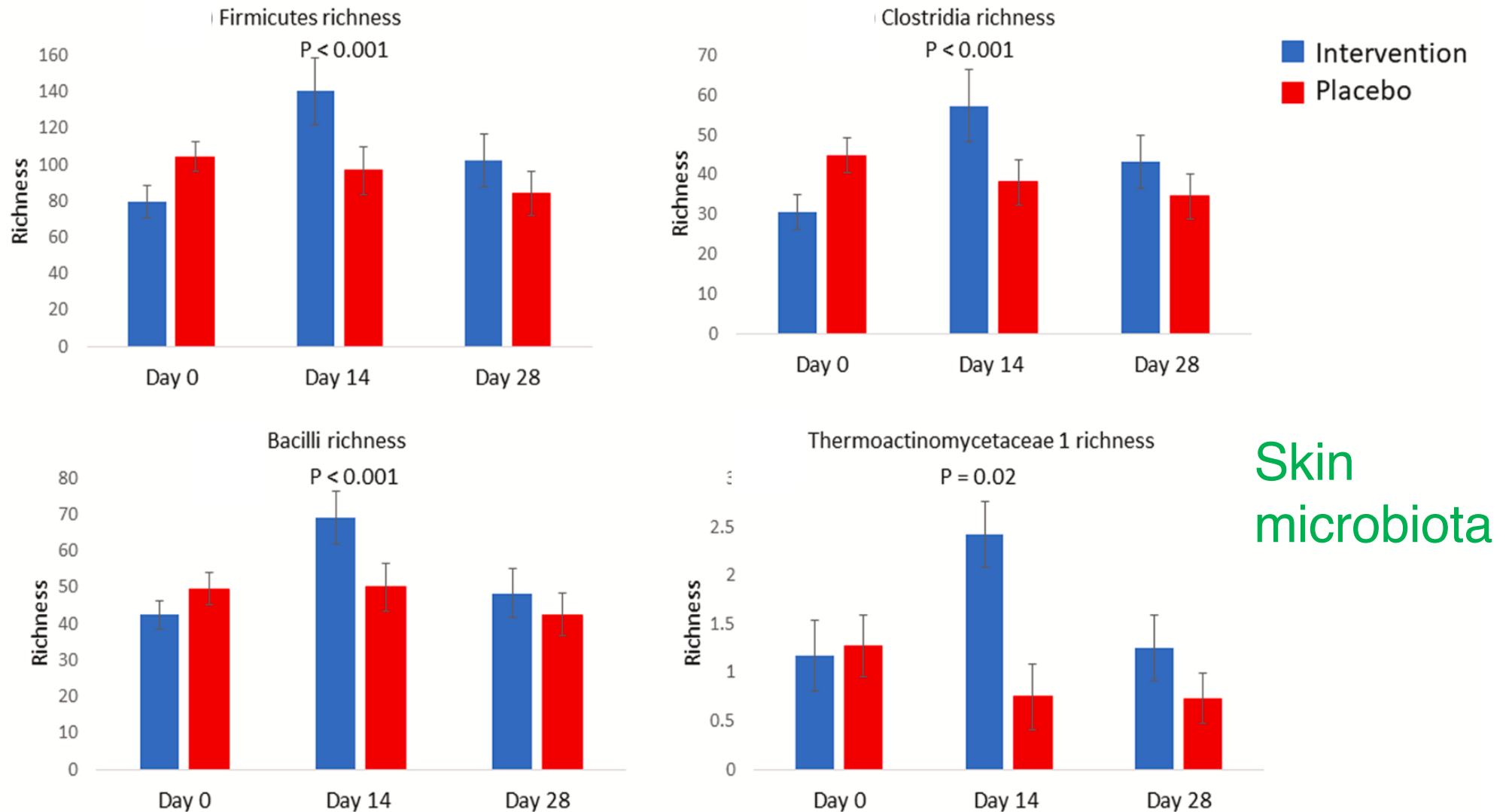
Children aged 3–5 years playing twice a day for 20 min in a sandbox for 14 days.

In the intervention group, sand is enriched with microbially diverse soil (n = 13).

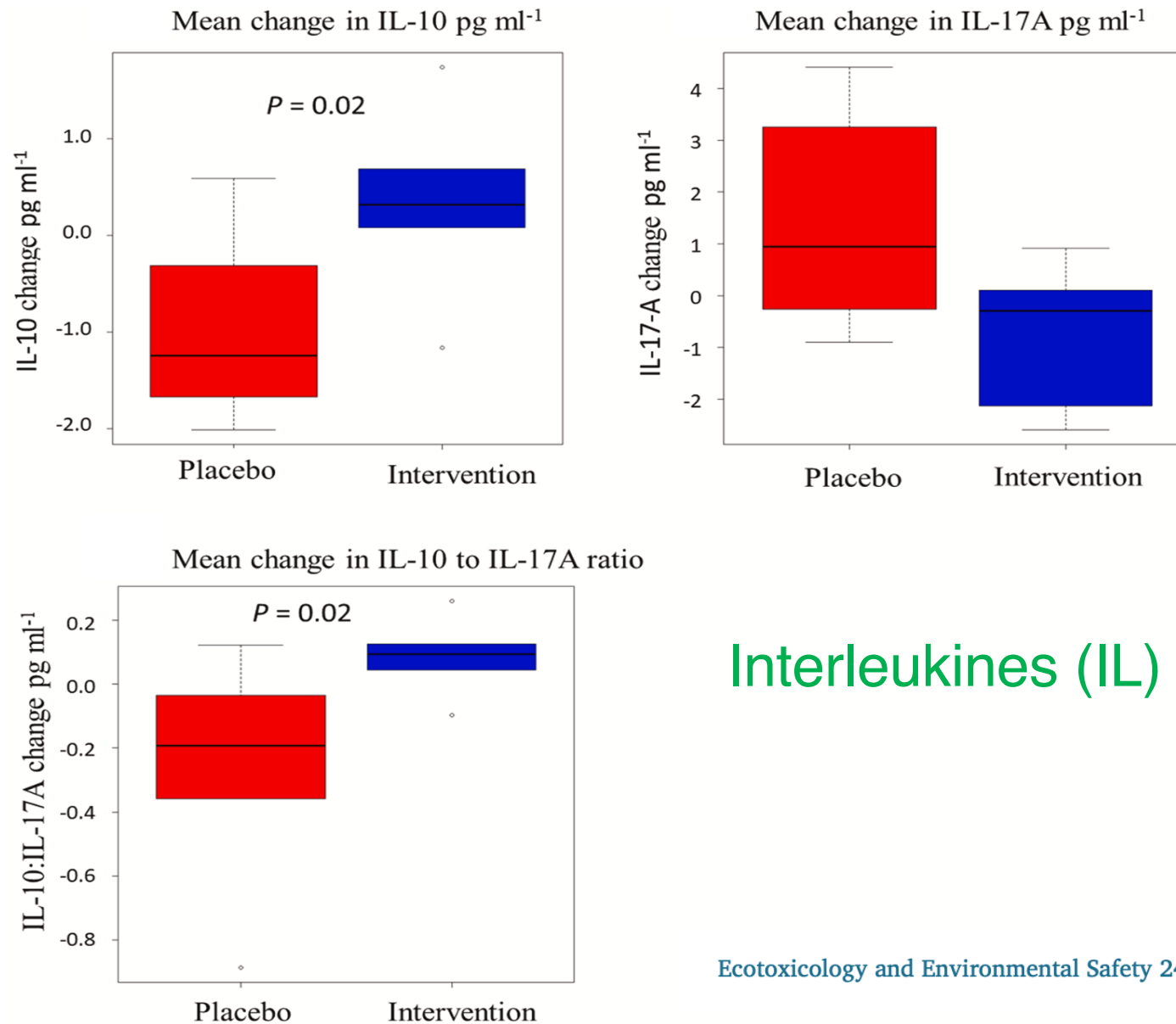
In the placebo group, visually similar, but microbially poor sand colored with peat (n = 13).

Analyses at days 14 and 28 (microbes / immunity).

A Placebo-controlled double-blinded test of the biodiversity hypothesis of immune-mediated diseases: Environmental microbial diversity elicits changes in cytokines and increase in T regulatory cells in young children



A Placebo-controlled double-blinded test of the biodiversity hypothesis of immune-mediated diseases: Environmental microbial diversity elicits changes in cytokines and increase in T regulatory cells in young children



Interleukines (IL)

LE GROUPE CIAM-FRANCE

URBANISME DES C.I.A.M.

LA CHARTE D'ATHÈNES

avec

UN DISCOURS LIMINAIRE

de

JEAN GIRAUDOUX

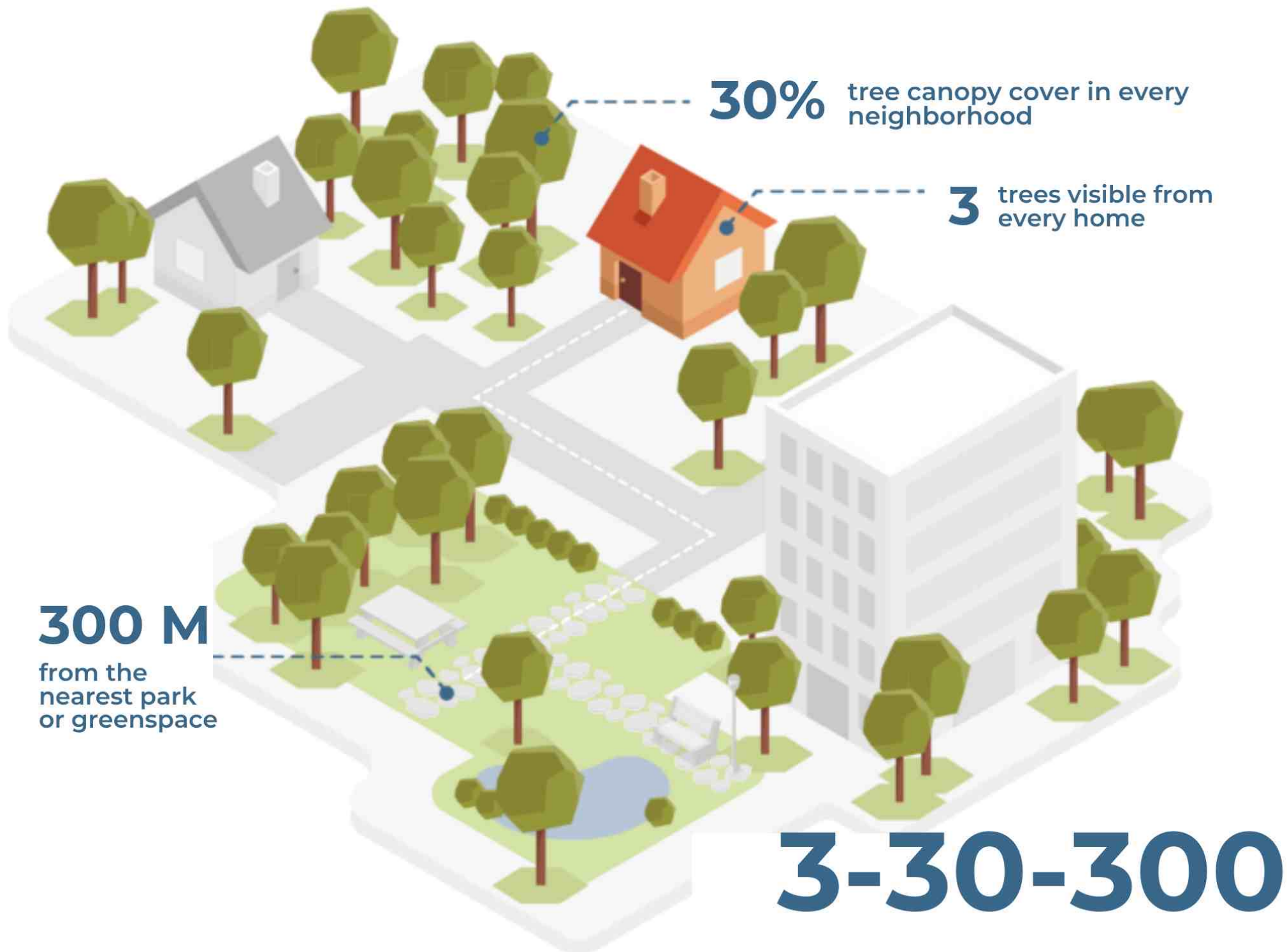
PLON



HABITER

TRAVAILLER

CIRCULER



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