Bioeconomy Science Institute™

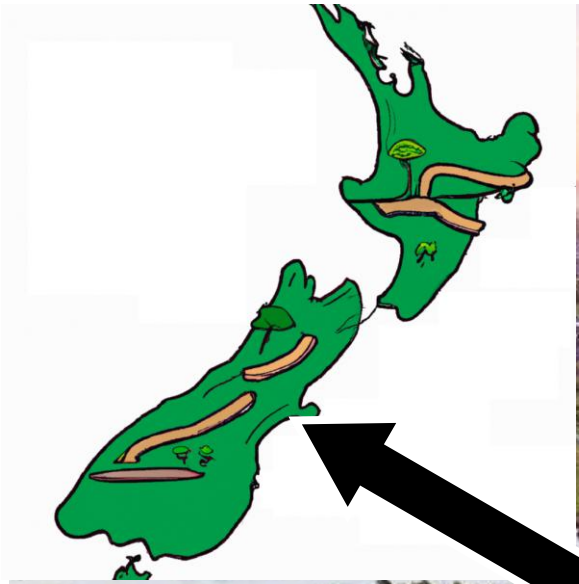
Ecological principles for design

Dan Richards

National Park Iguazú Design Studio

6th of October 2025

Kia ora!



Ecology

Relationships of organisms to each other, their physical surroundings, and people.

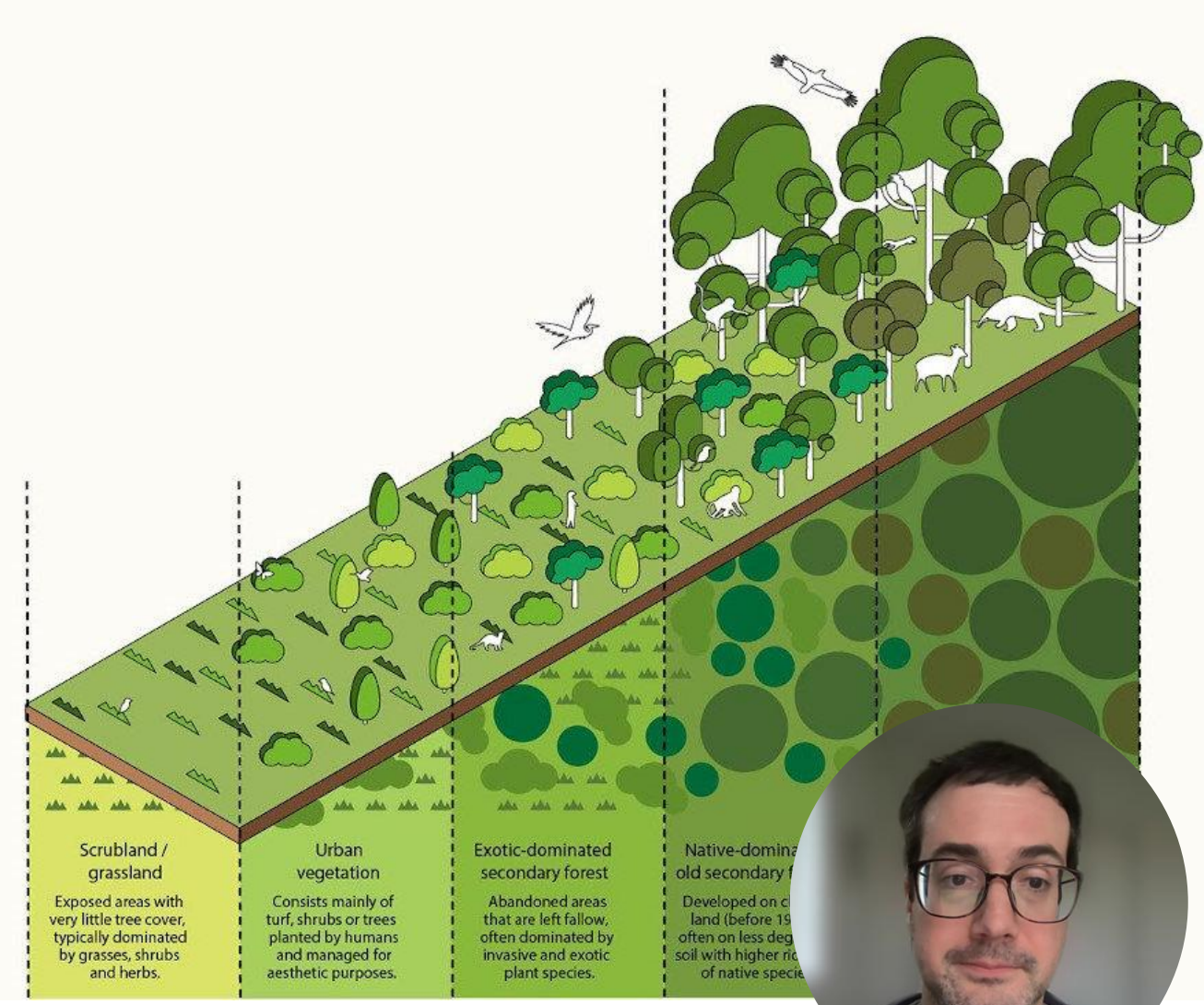
Kererū (Hemiphaga novaeseelandiae)

Ecological principles for design

- Biodiversity/ Biodiversidad
- Connectivity/ Conectividad ecológica
- Systems thinking/ Pensamiento sistémico
- Disorder/ Desorden

Biodiversity/ Biodiversidad

- Different types of plants give different benefits to people
- Different types of plants are home to different animals
- Mixing vegetation types can support better outcomes



https://www.ura.gov.sg/Corporate/Planning/Long-Term-Plan-Review/Space-for-Our-Dreams-Exhibition/Natural-Capital

Biodiversity/ Biodiversidad

- Different types of plants give different benefits to people
- Different types of plants are home to different animals
- Mixing vegetation types can support better outcomes

Turf

Tree over turf

Shrub

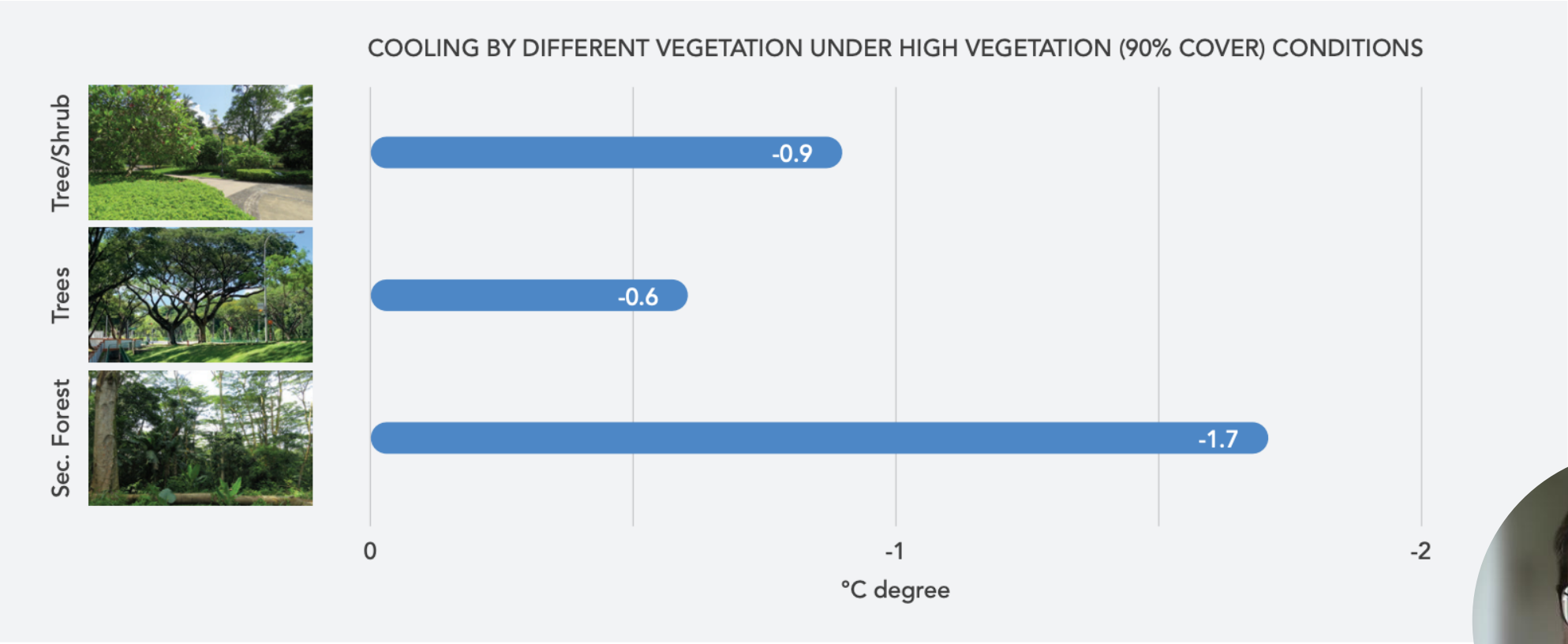
Tree with shrub understorey

Unmanaged veg

Increasing biodiversity

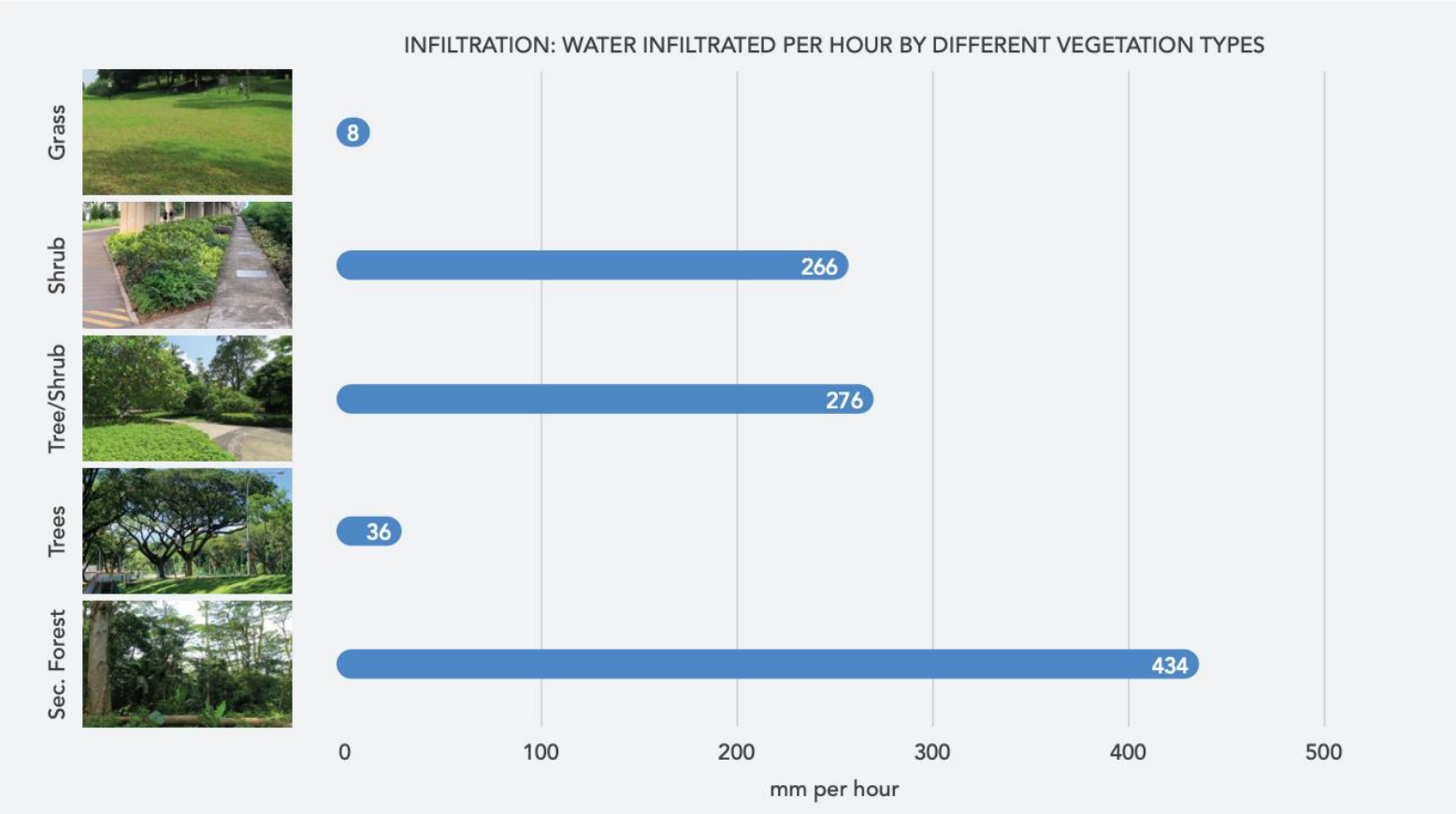
Biodiversity/ Biodiversidad

- Different types of vegetation provide different cooling benefit



Biodiversity/ Biodiversidad

- Different types of vegetation provide different flood prevention benefit



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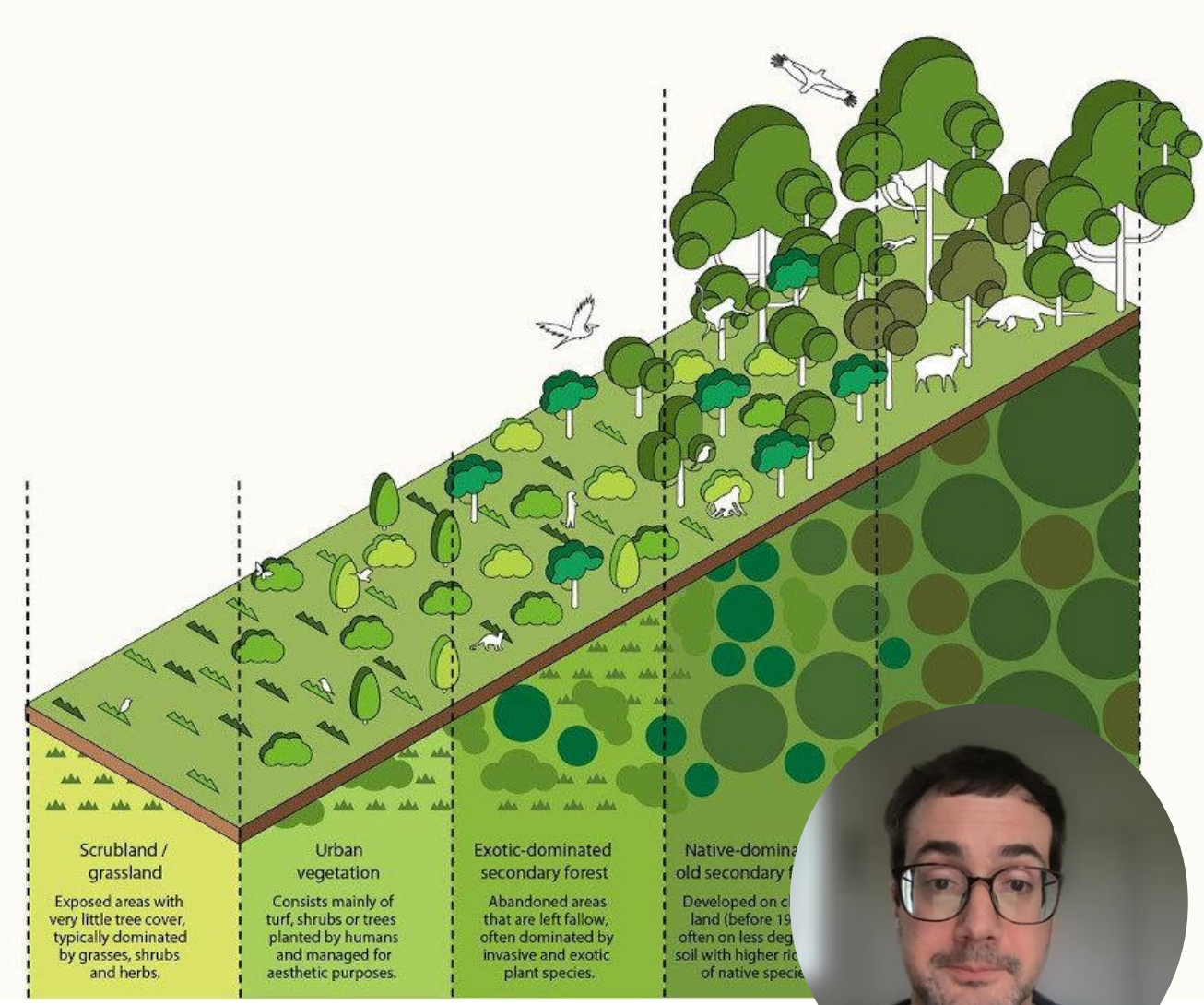

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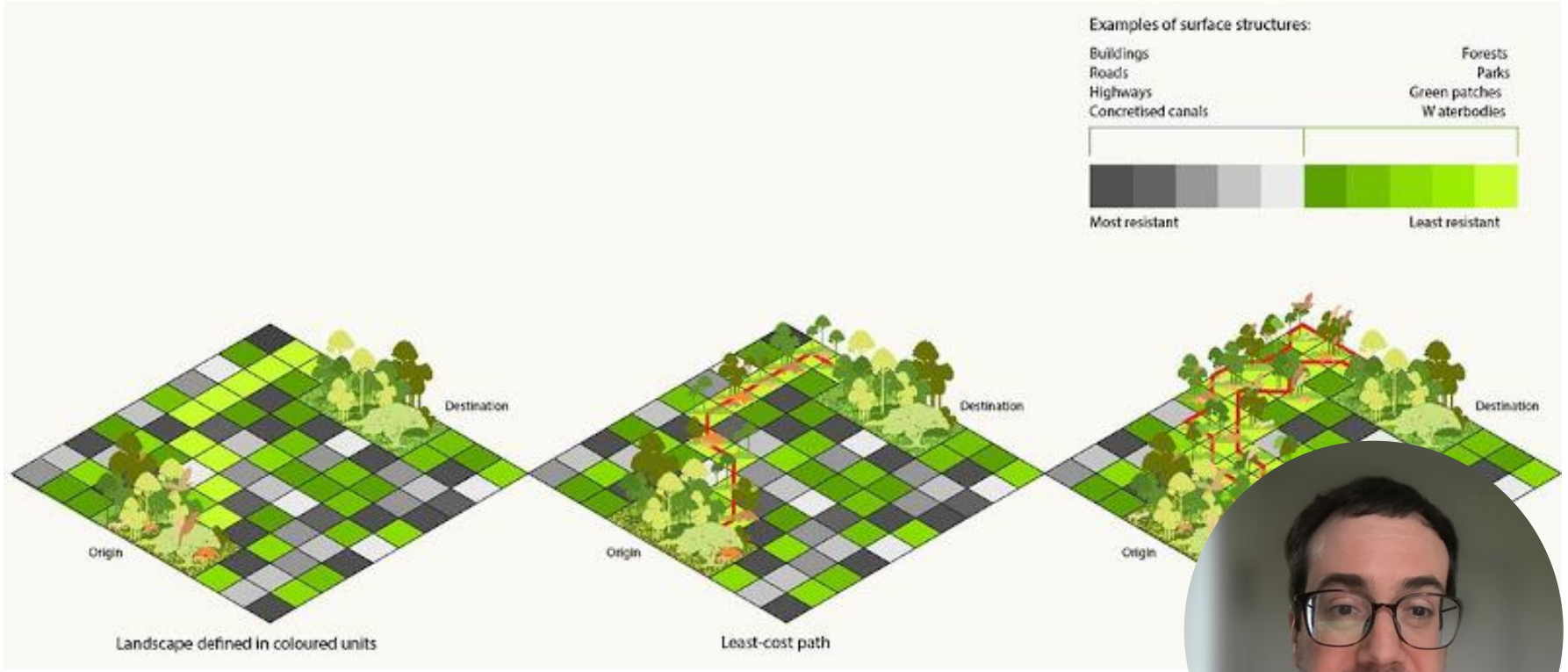
Connectivity/ Conectividad ecológica

- Animals and plants need to be connected across space
- So do people!
- Corridors can help link green spaces
- Careful design can reduce barriers



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Connectivity/ Conectividad ecológica

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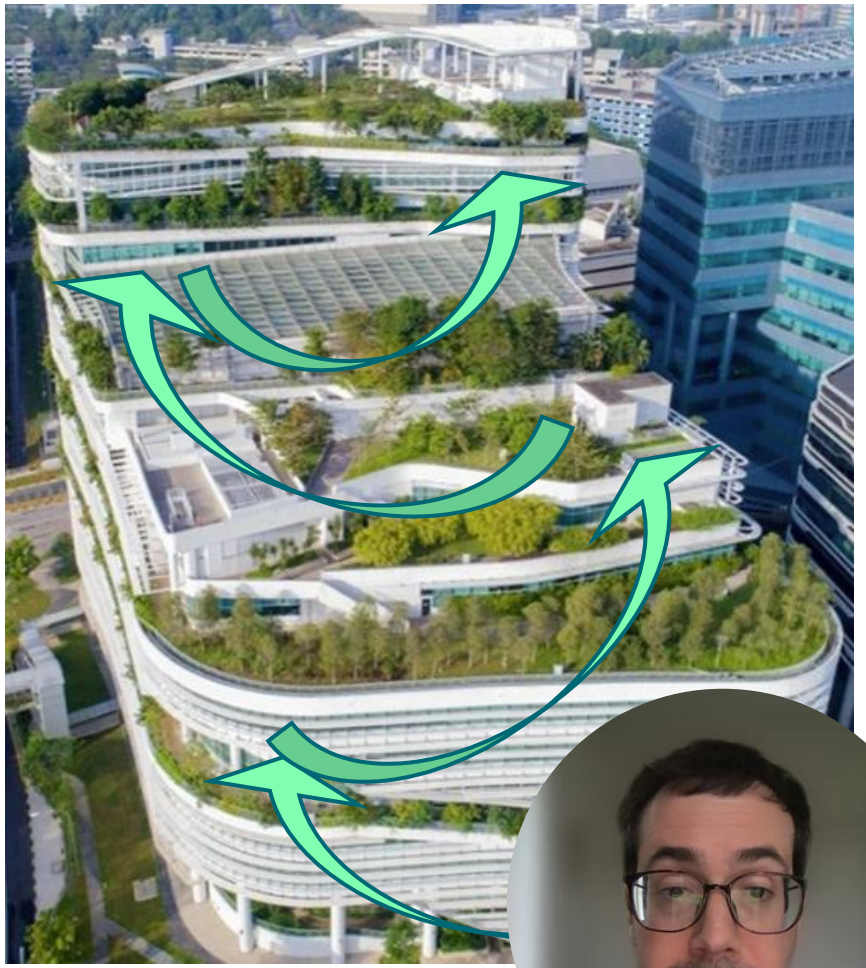
Connectivity/ Conectividad ecológica

- Vertical connectivity also matters

https://hericoll.com/the-pinnacle-duxton/ https://www.instagram.com/p/CyUrww_hsVc/

Connectivity/ Conectividad ecológica

- Vertical corridors can help



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Connectivity/ Conectividad ecológica

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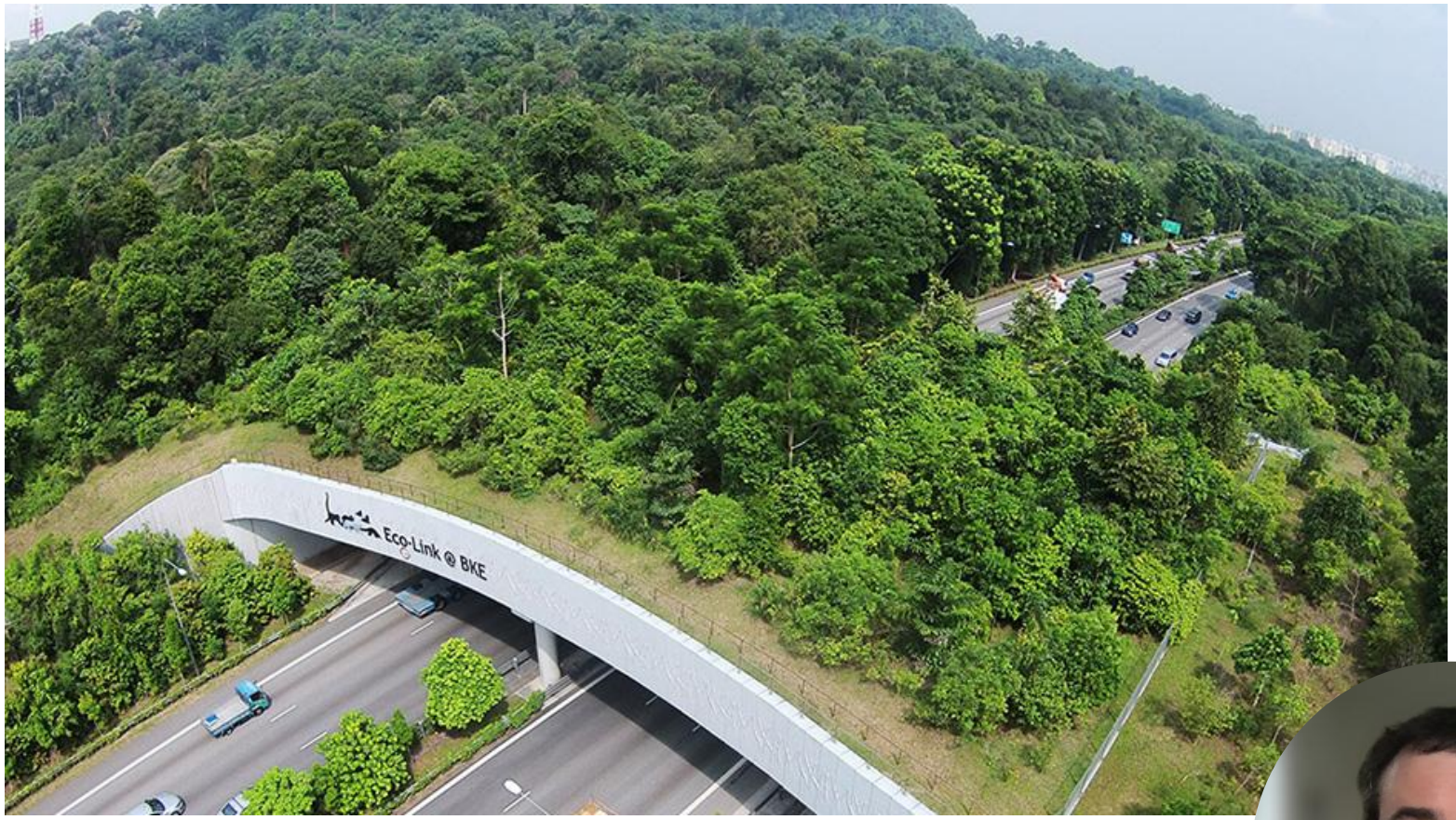
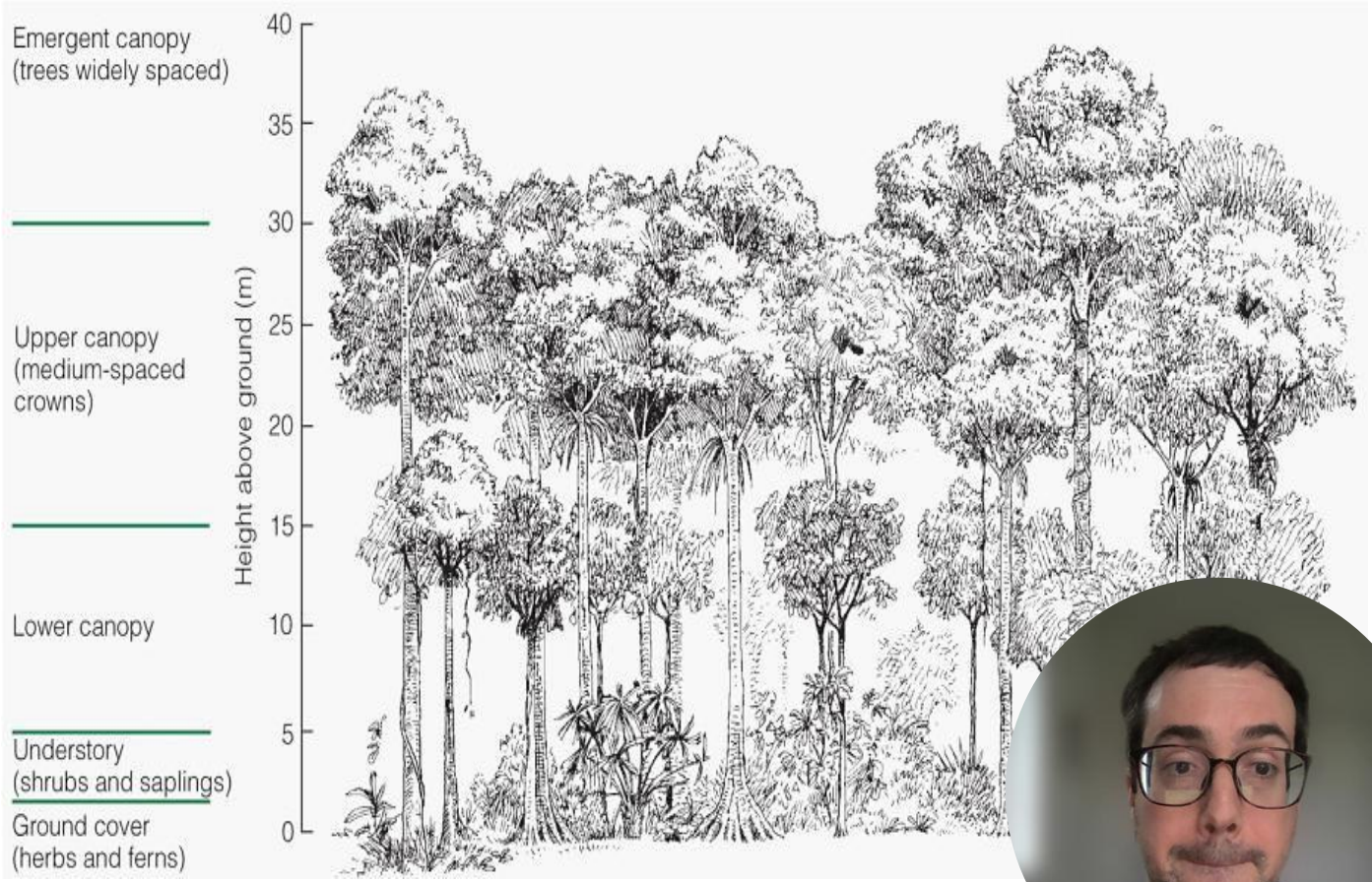


https://www.nparks.gov.sg/visit/parks/bukit-timah-nature-reserve/special-features/eco-link-bke

Systems thinking/ Pensamiento sistémico

- Ecosystems are complex
- We need to think about them in a connected way
- It is hard to think of everything, but important to try



Systems thinking/ Pensamiento sistémico

- Example: don’t forget about soil
- Healthy soil supports healthy plants, animals, and people
- We need to care for the soil in design and construction

Disorder/ Desorden

- Nature is disorder, it is messy
- Disorder is not something to be afraid of
- Disorder can be beautiful

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Tree over turf

Shrub

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Disorder/ Desorden

- Nature is disorder, it is messy
- Disorder is not something to be afraid of
- Disorder can be beautiful
- Sometimes we need to explain to people why there is disorder

https://ethz.ch/content/dam/ethz/special-interest/dual/fcl-dam/doc/LR_FCL_Benefits_of_Tropical_Urban_Ve

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Thank you