

# ***Living City***

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One Planet Architecture institute

***Ten principles:***

**resilience**

**stability through diversity**

**development incubator: evolution**

**circular**

**sun**

***Ten principles:***

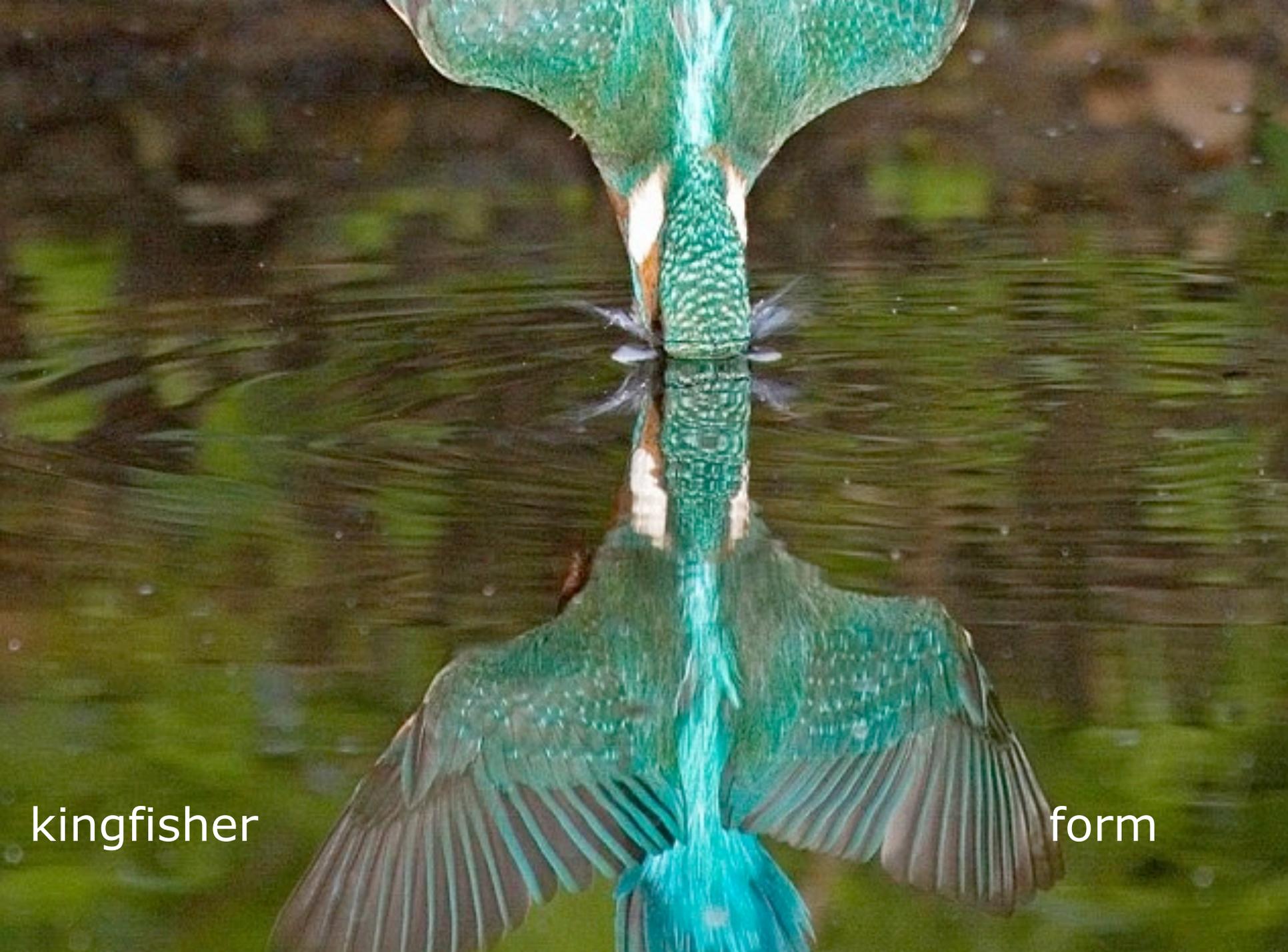
**connectivity (symbiosis)**

**action - reaction**

**entropy**

**adaptive**

**interdependence**



kingfisher

form



Shinkansen



**Tardigrade (Water Bear)**

**proces**  
*Anhydrobiosis*



CATALOG # 52091-026

Best to use before 03/12

Lot No. S1

Store at 4°- 20°C

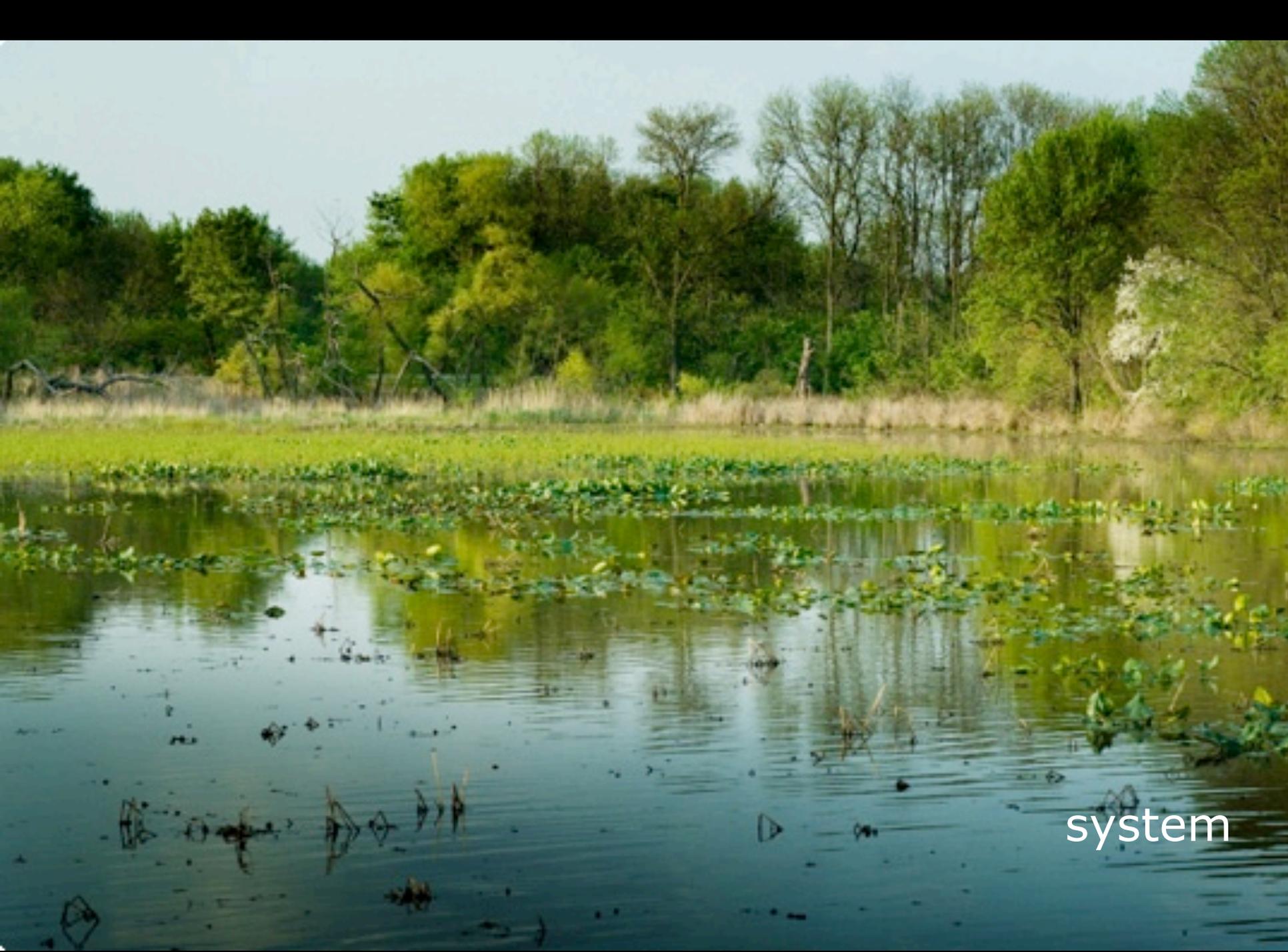
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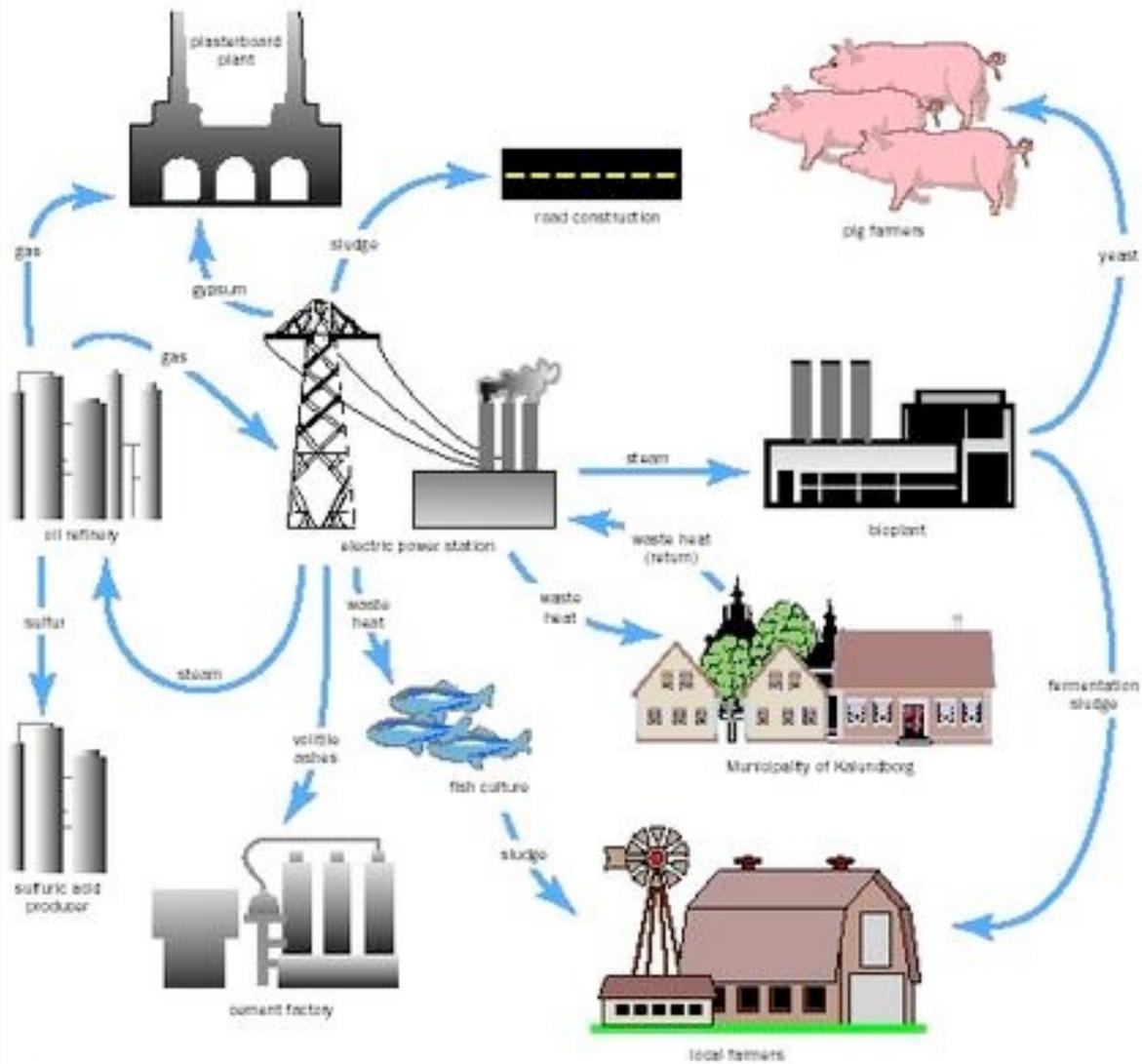
biomatica

Anhydrobiosis



system

# INDUSTRIAL ECOSYSTEM AT KALUNDBORG, DENMARK



Kalundborg  
*industrial symbiosis*



Kalundborg  
*industrial symbiosis*

***ten (10)***

***1,2,3 Form***

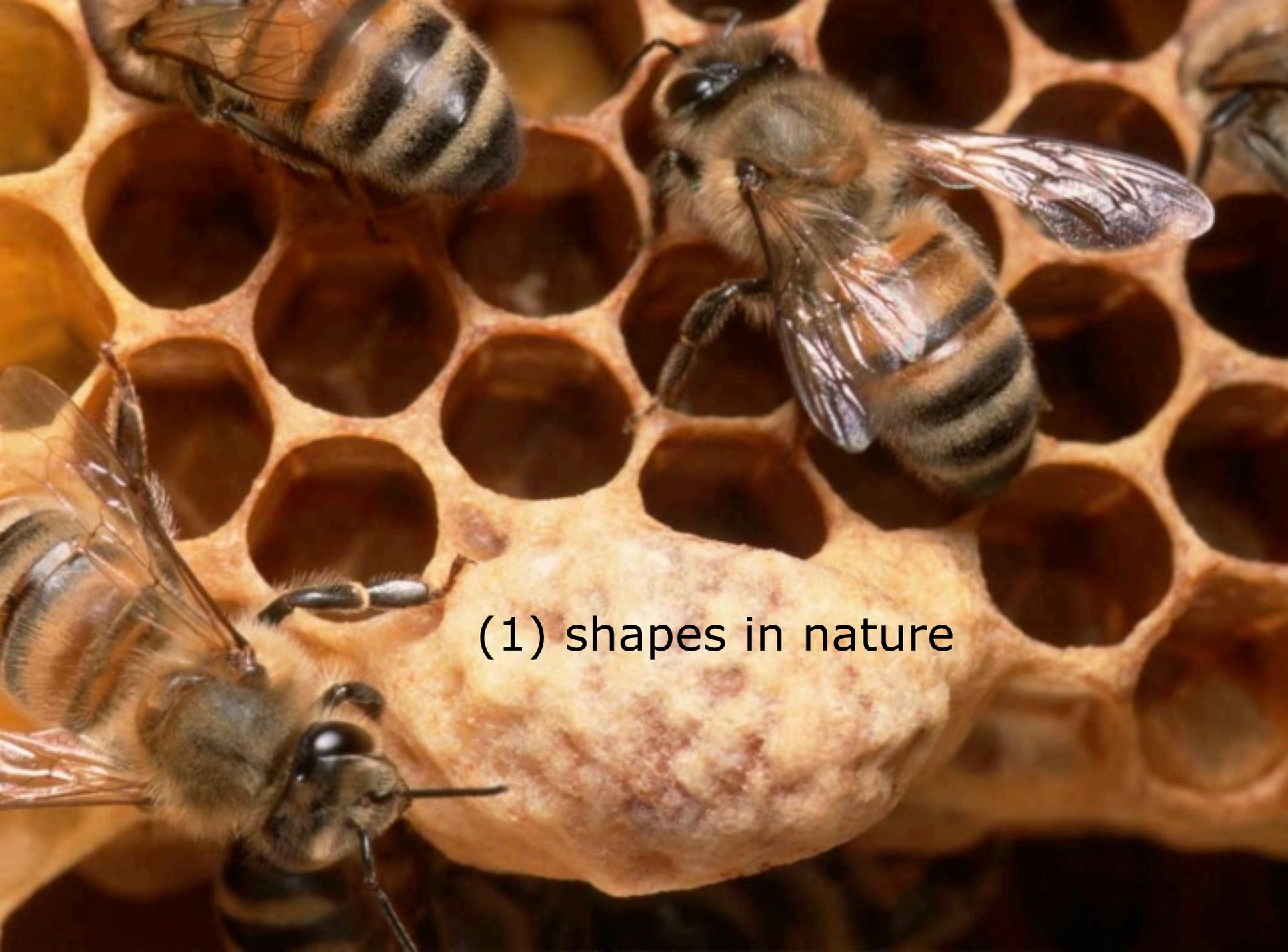


(1)  
shapes in nature

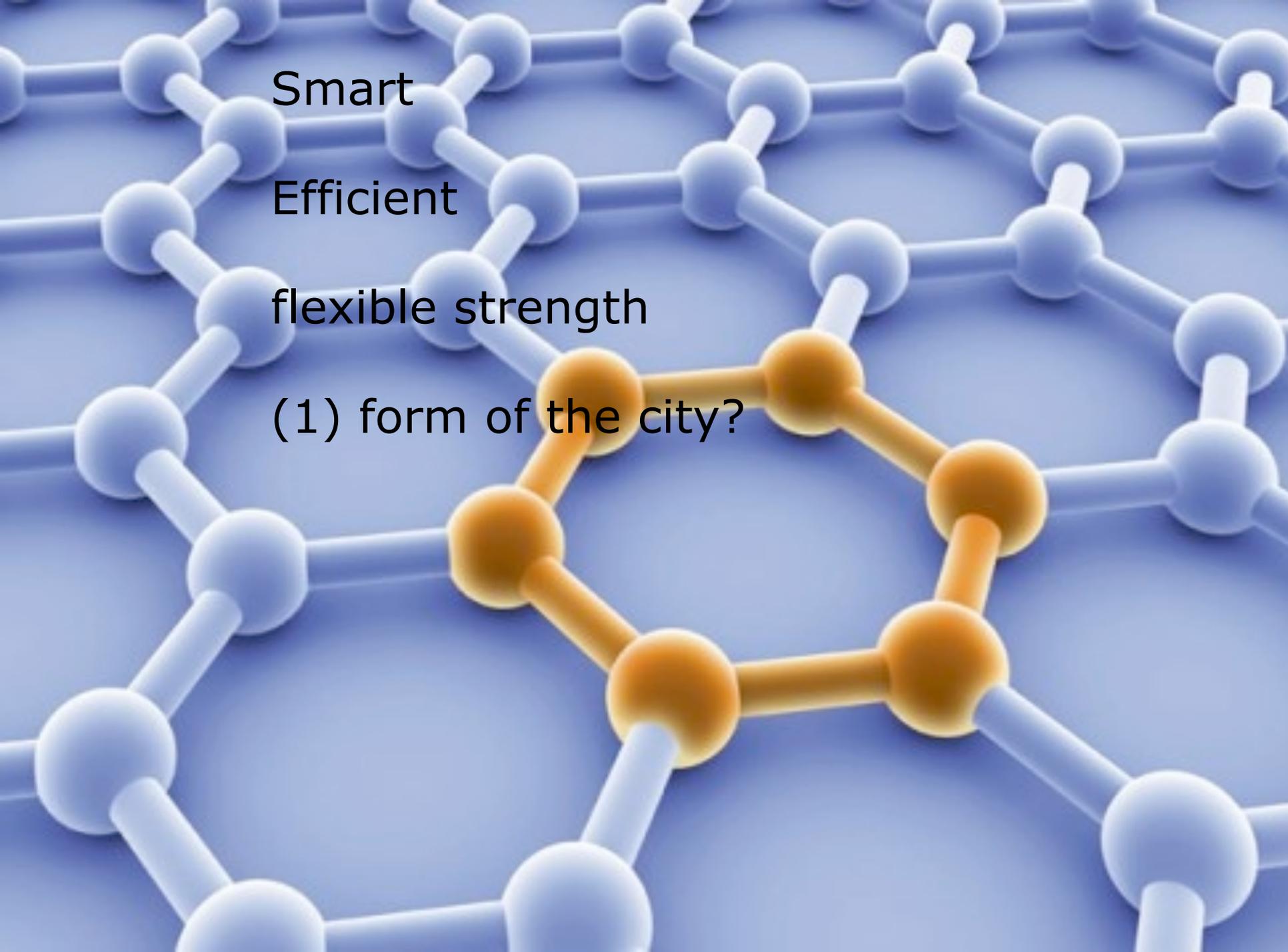
football

breaking power





(1) shapes in nature

A 3D molecular model of a crystal lattice, likely diamond or silicon, showing a network of atoms (spheres) connected by bonds (cylinders). The atoms are light blue, and the bonds are light blue. A single pentagonal ring of atoms and bonds is highlighted in a bright orange color, standing out from the rest of the lattice. The perspective is from an angle, showing the depth of the structure.

Smart

Efficient

flexible strength

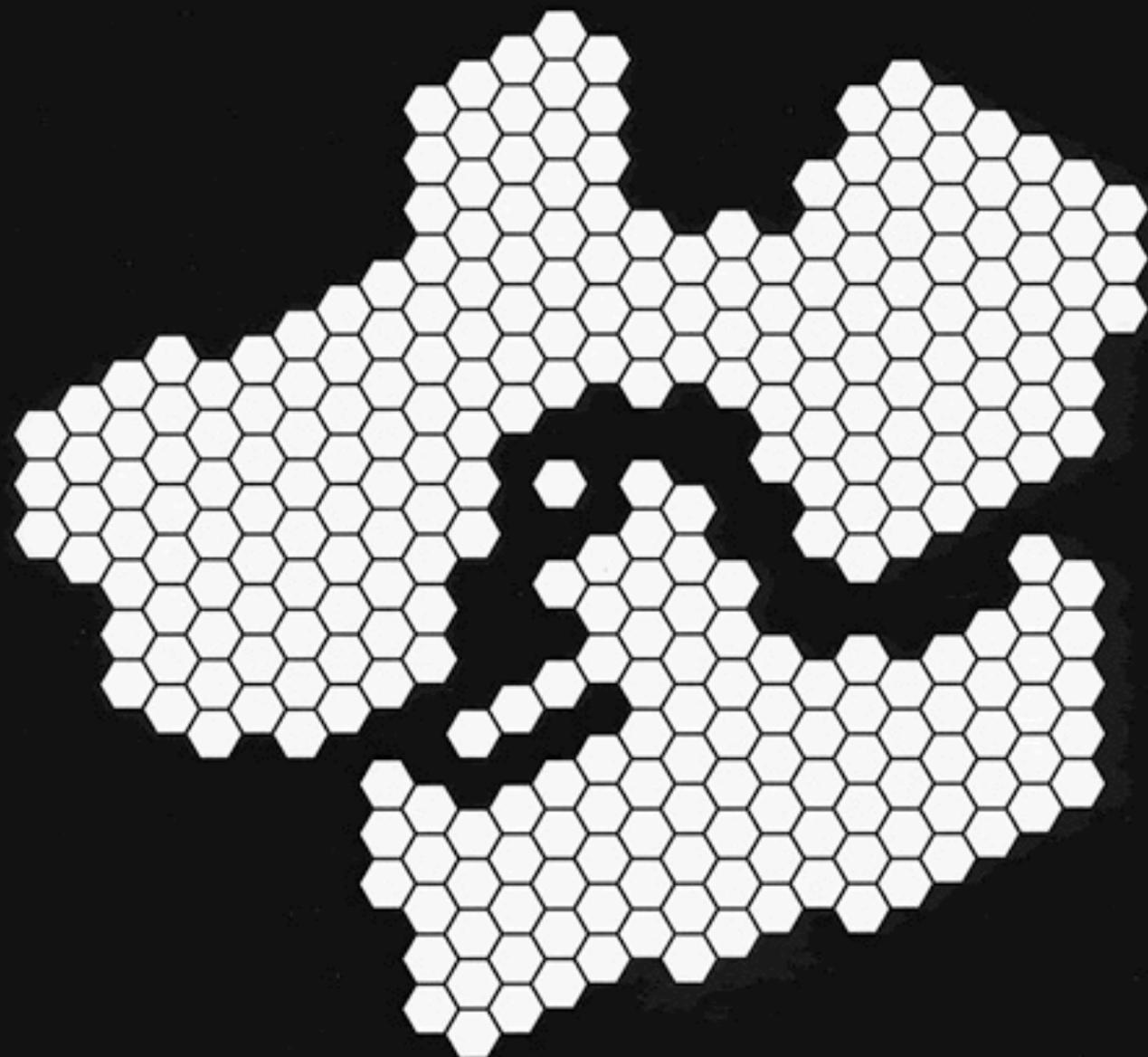
(1) form of the city?

# EFFICIENT STRUCTURES - The Eden Project



**Factor 100 savings**

**MATERIAL  
SHAPE**



## (2) Form

strong

efficient

flexible

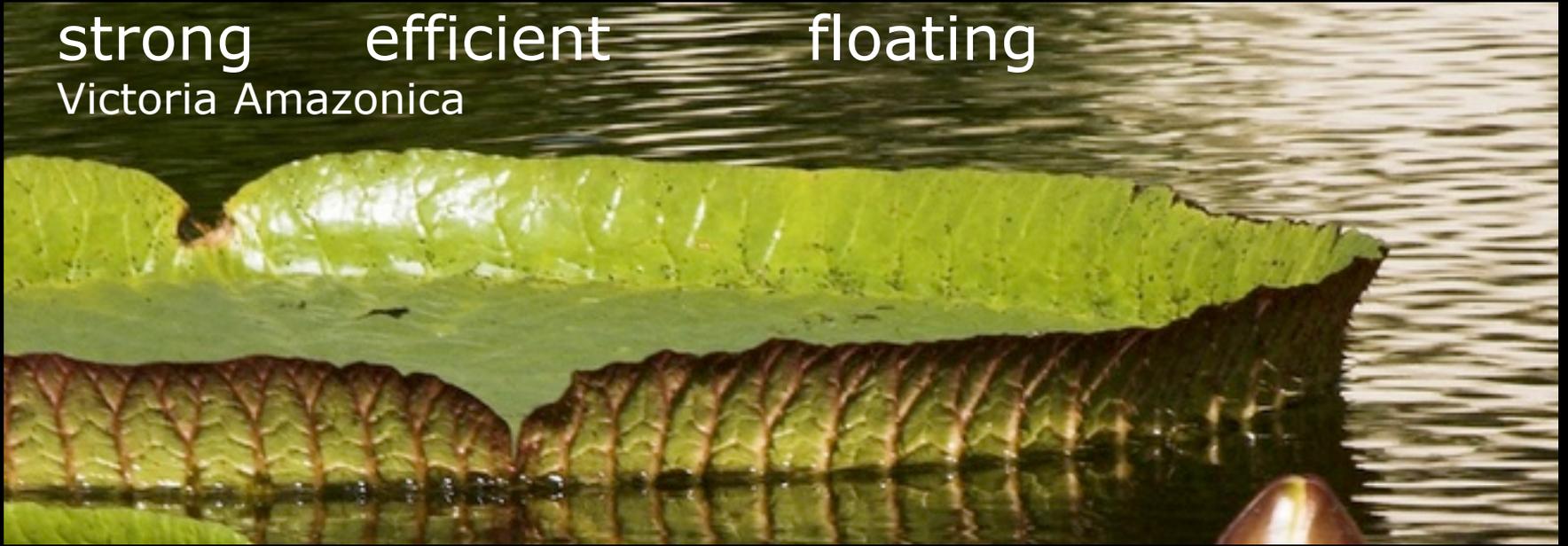


strong

efficient

floating

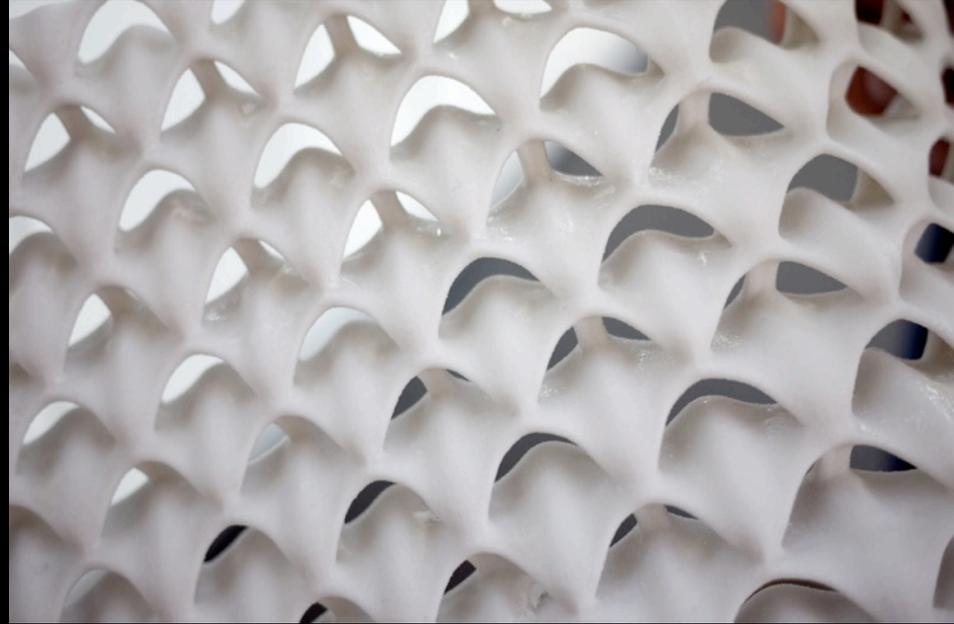
Victoria Amazonica







?



(3) does it control air flow  
better than our structures?

***ten (10)***

***4,5,6,7 proces***

# Biomass and the sun

## (4) Process

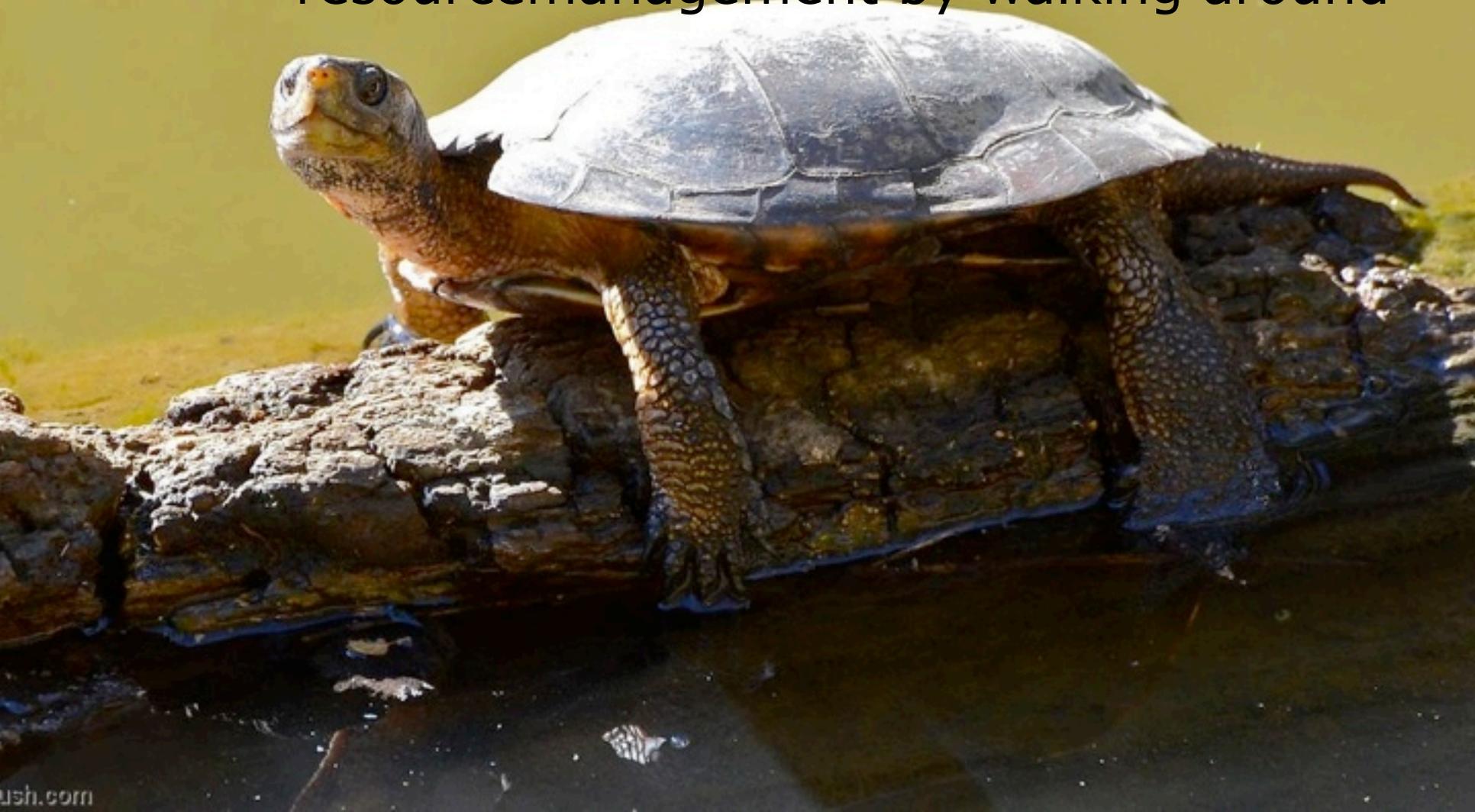
Biomass production is:

- no diversity
- high input
- high output
- **high risks**

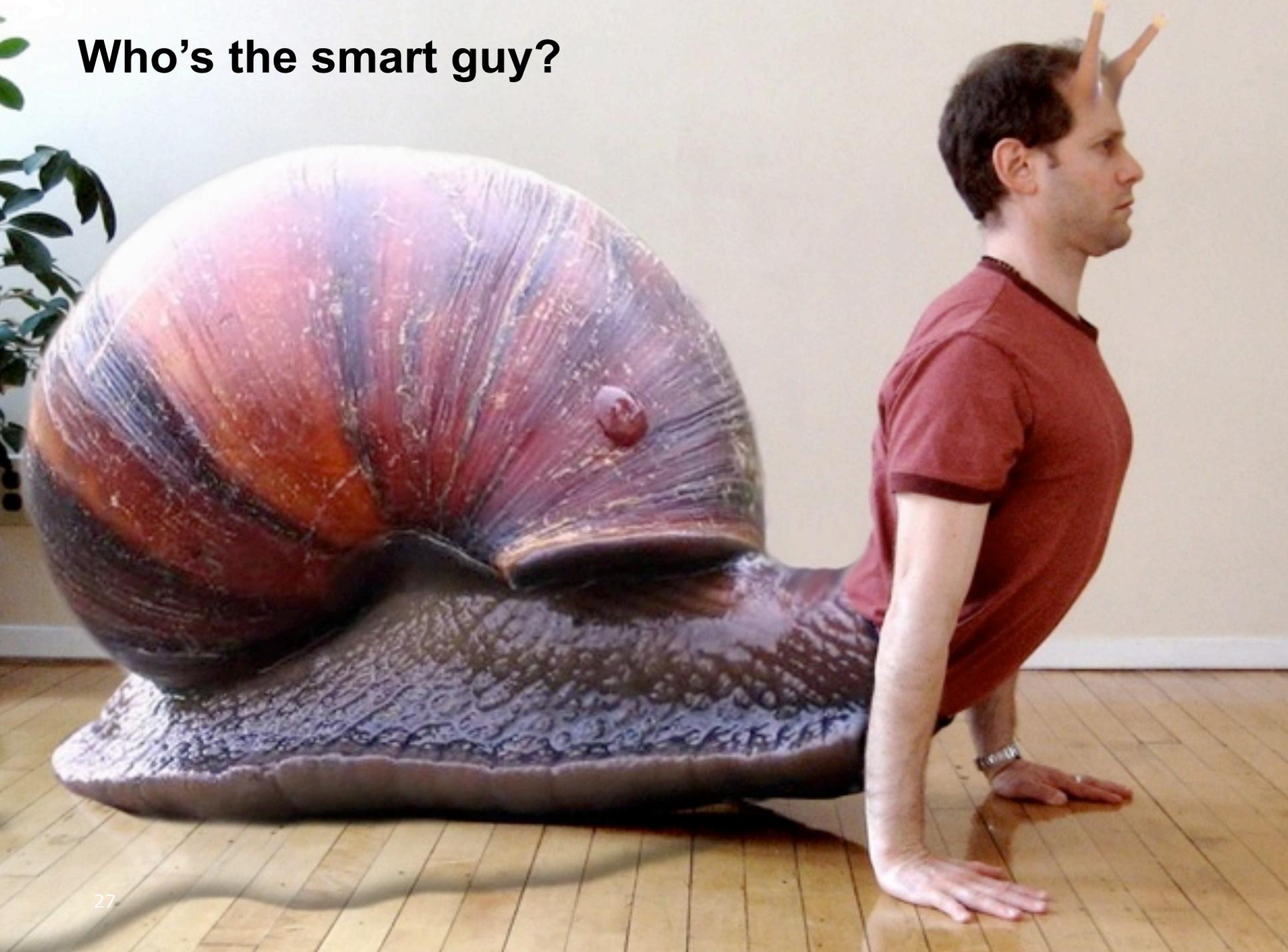


## (5) Process

- mobile home
- good architecture
- resourcemanagement by walking around



**Who's the smart guy?**



## **(5) ENERGY**



**Leaves of plants maximize exposure to sun to maximize photosynthesis by moving throughout the day.**

**Leaves remove pollution**

## **(5) ENERGY EFFICIENCY**

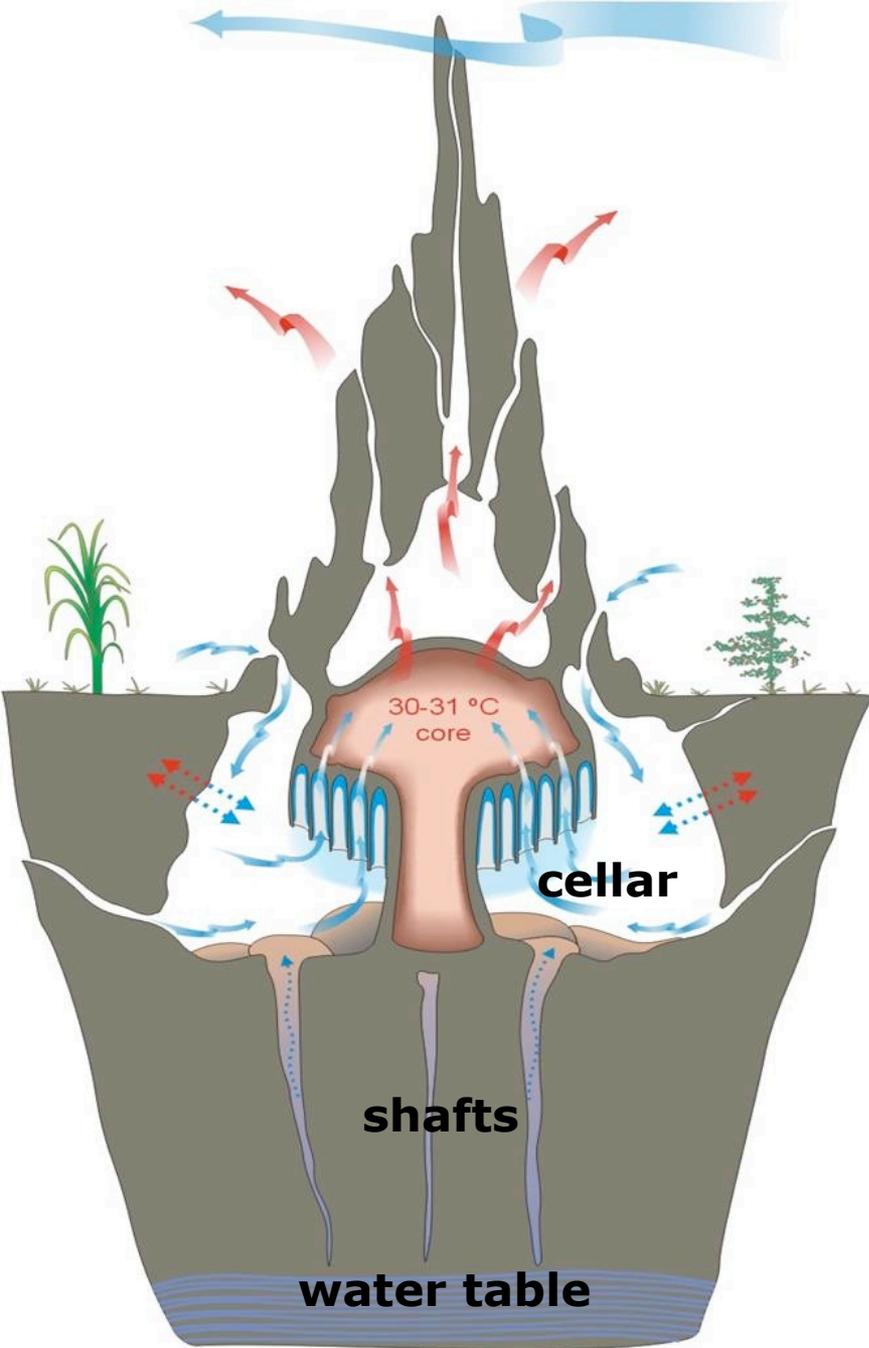


**Photosynthesis in plants creates energy from sunlight  
they absorb almost 100% of the sunlight reaching them**

## **(6) HEATING AND COOLING**



**Mounds of compass termites provide heating and cooling at appropriate times of day thanks to orientation with respect to the sun.**



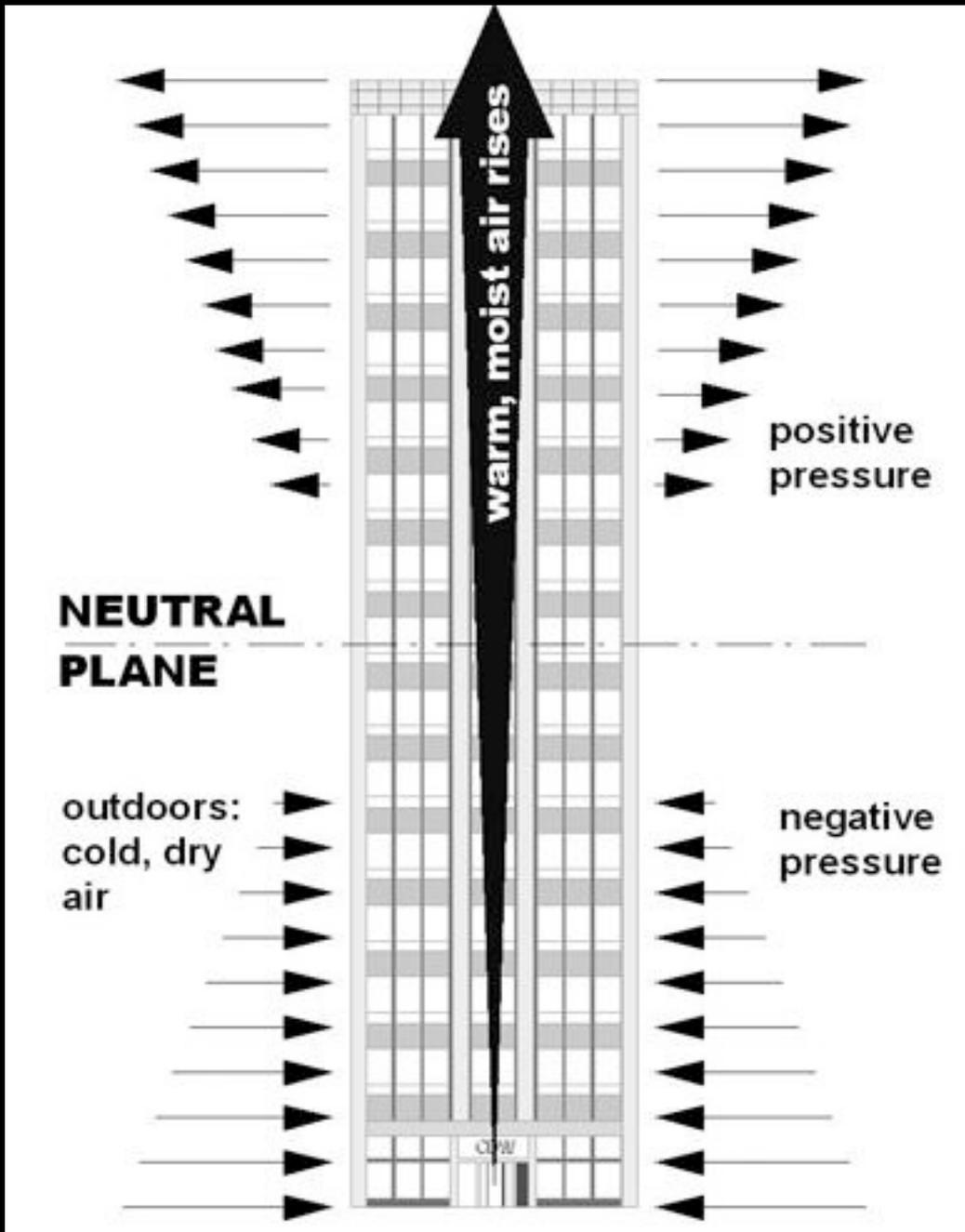
**wind**

**lose heat**

**if closed, use heat again**

**coldest part due to  
evaporation of wet mud**

**use mud to built**



**Eastgate building, Harare**

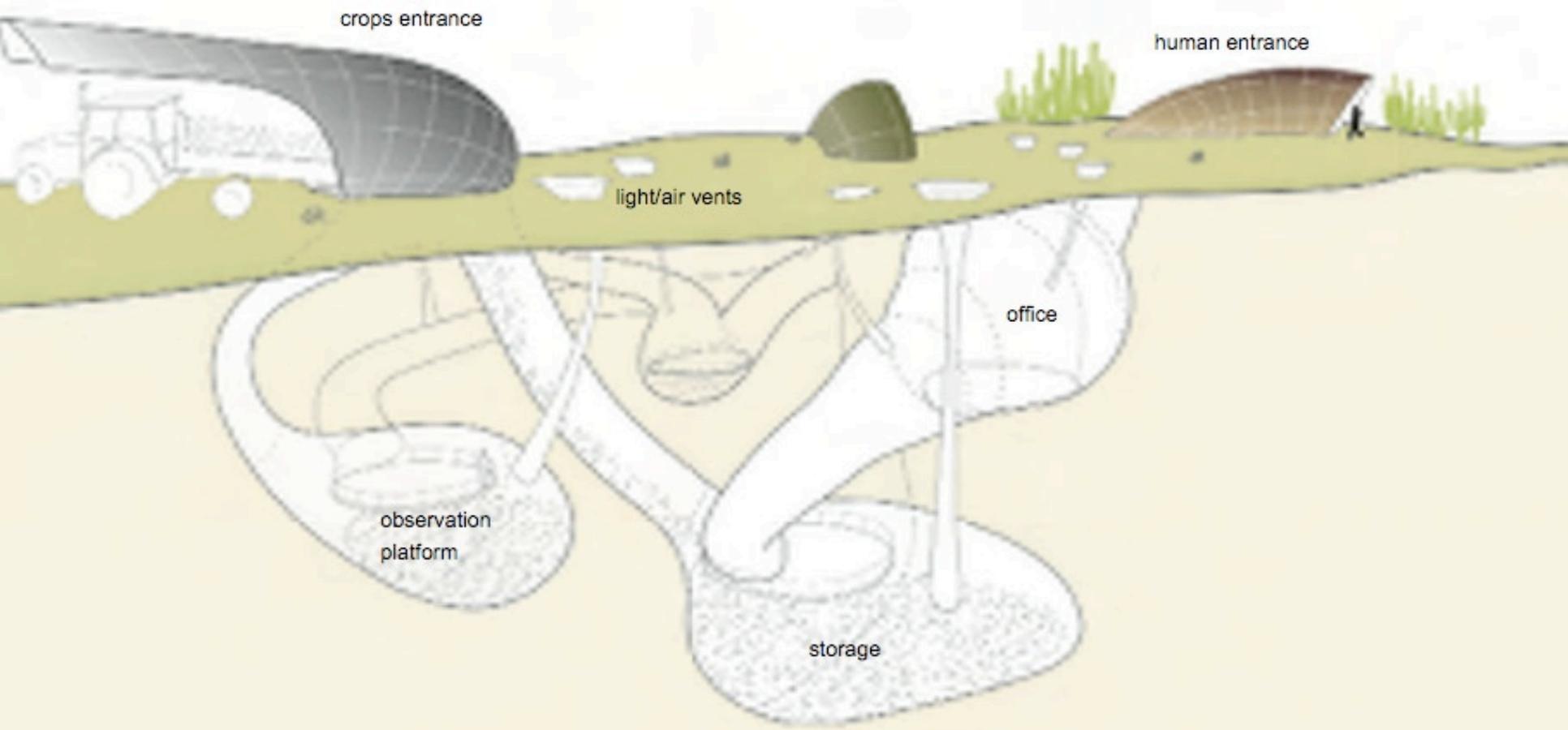


(6) Kangaroo rat  
scarce water

predators

high temperature fluctuation



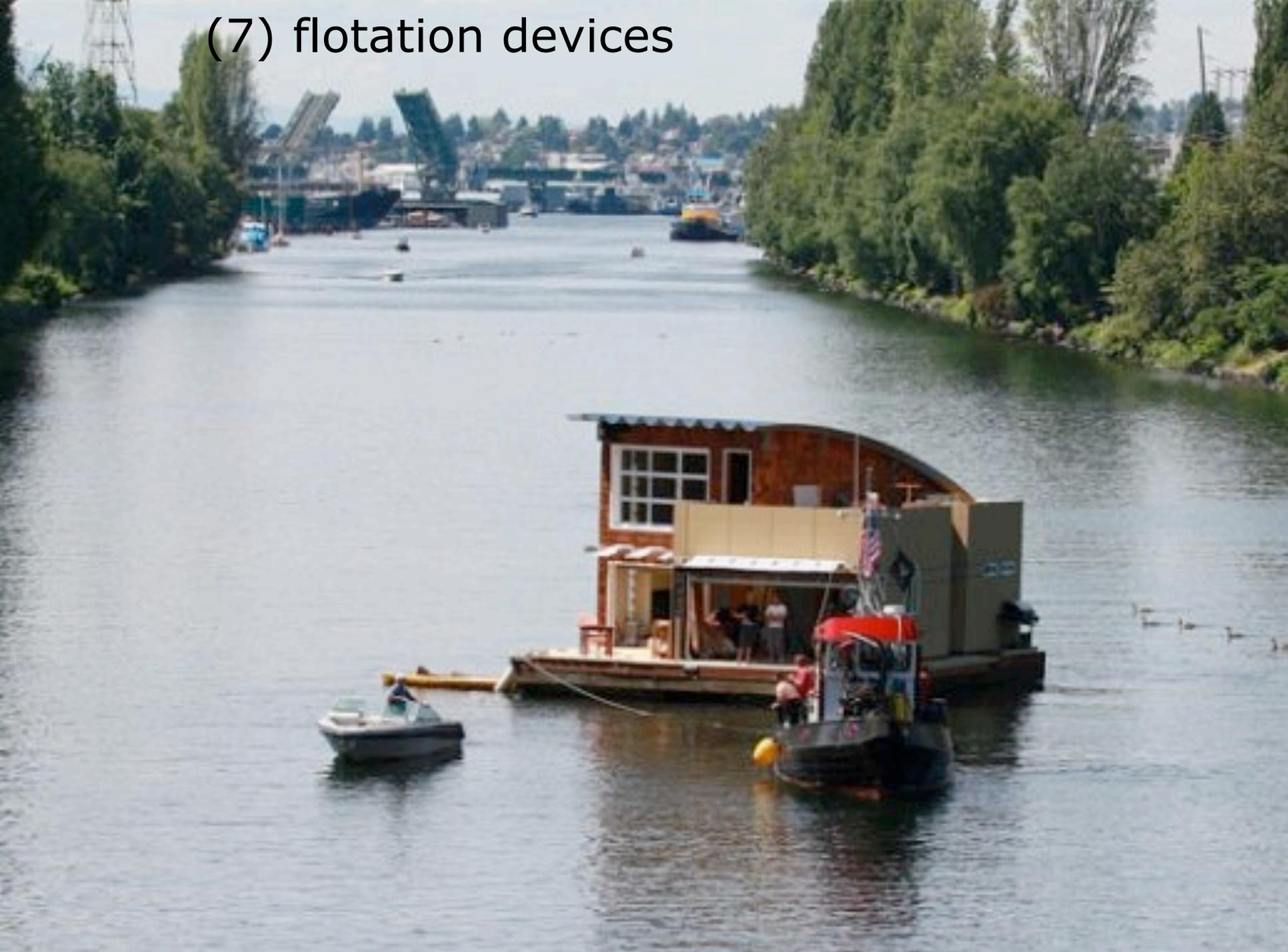


(7) flotation devices

turbulent water resistant



# (7) flotation devices





## **FLEXIBILITY**

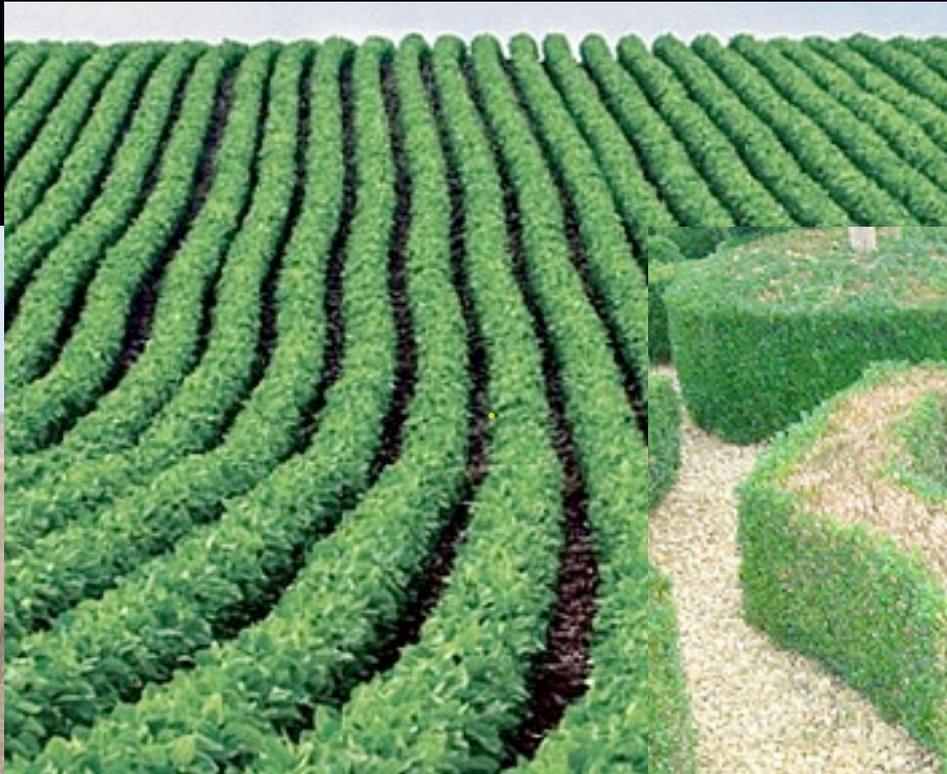
**Walking palm tree:  
Cashapona**

**Can walk about 1 meter  
each year**

*ten (10)*

*8,9 & 10 ecosysteem*

## (8) diversity and stability



Farming one specie on all of the landscape

## (8) diversity and stability

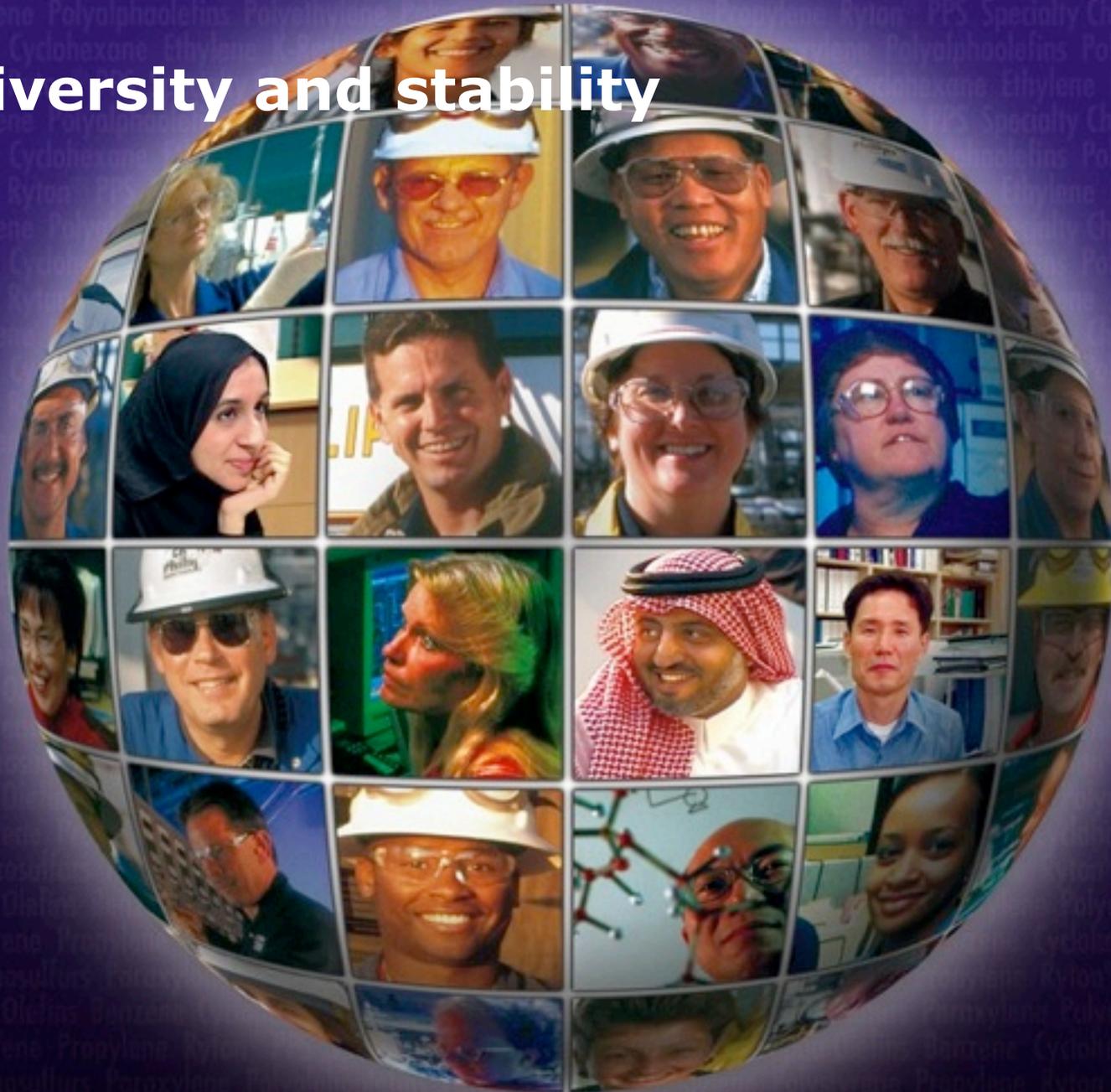


diversity in crops



diversity in environment

# (8) diversity and stability



(9) connections / borders



(9) hard border



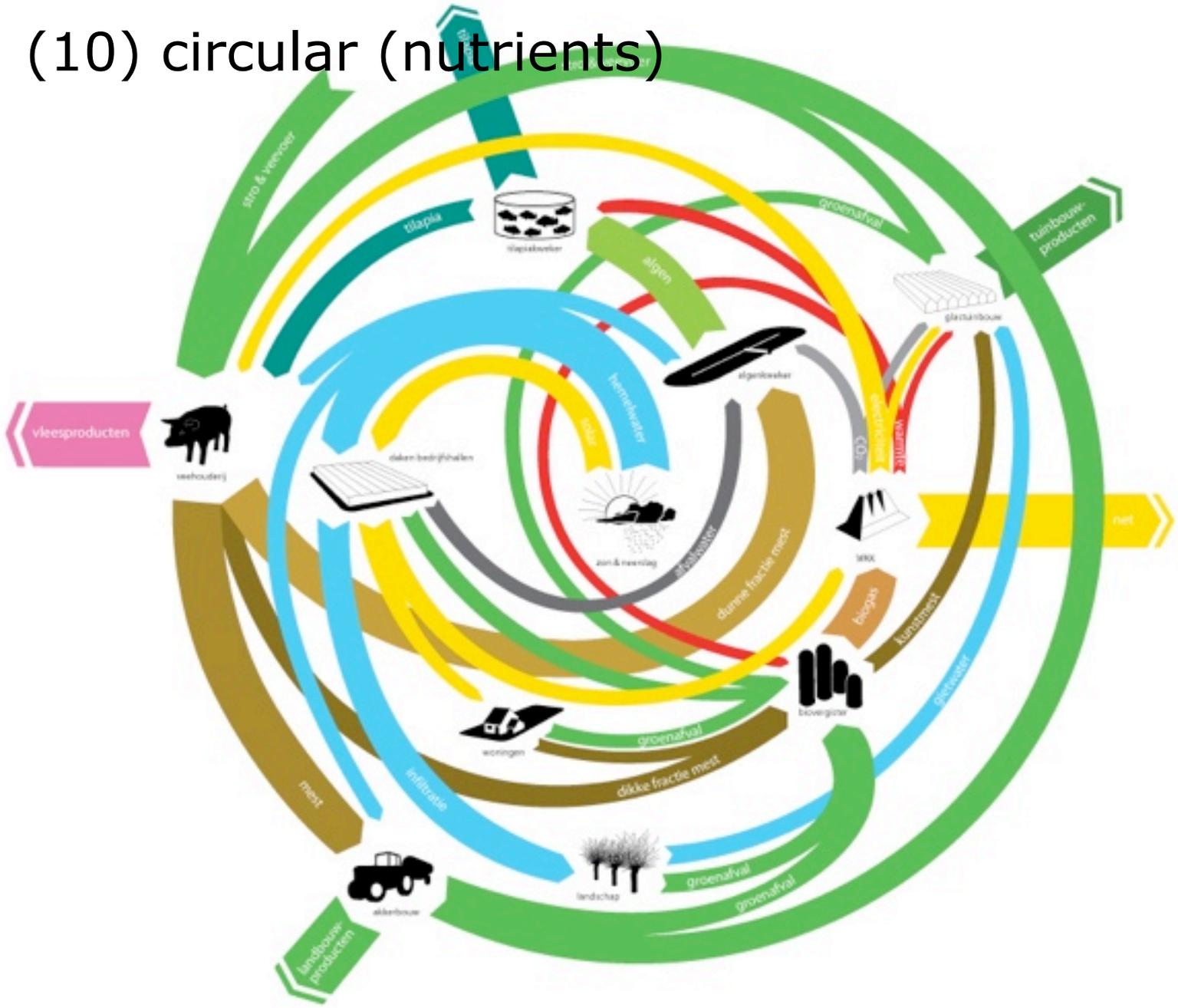
# (9) slow borders



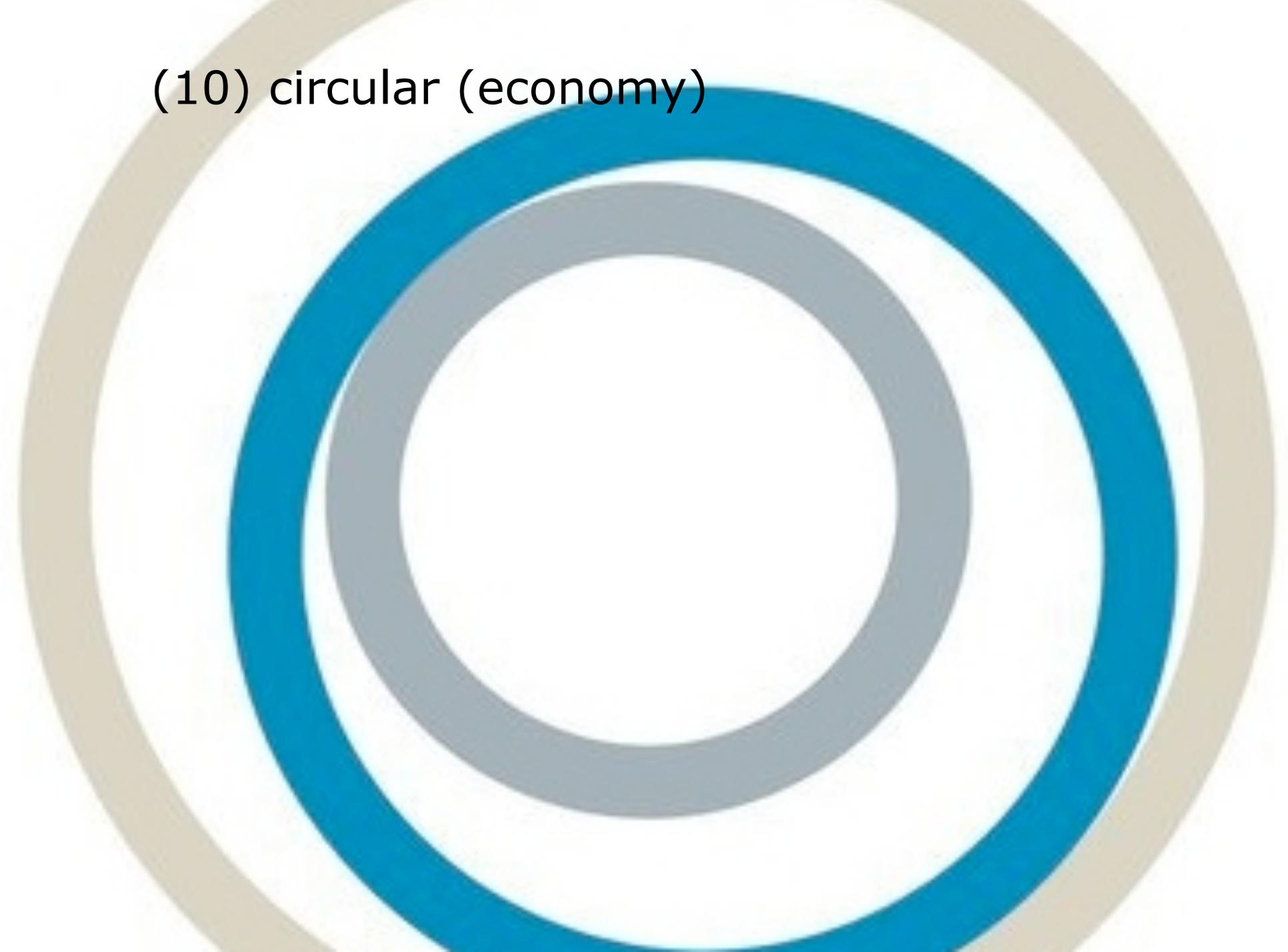
(10)circular, circular, circular



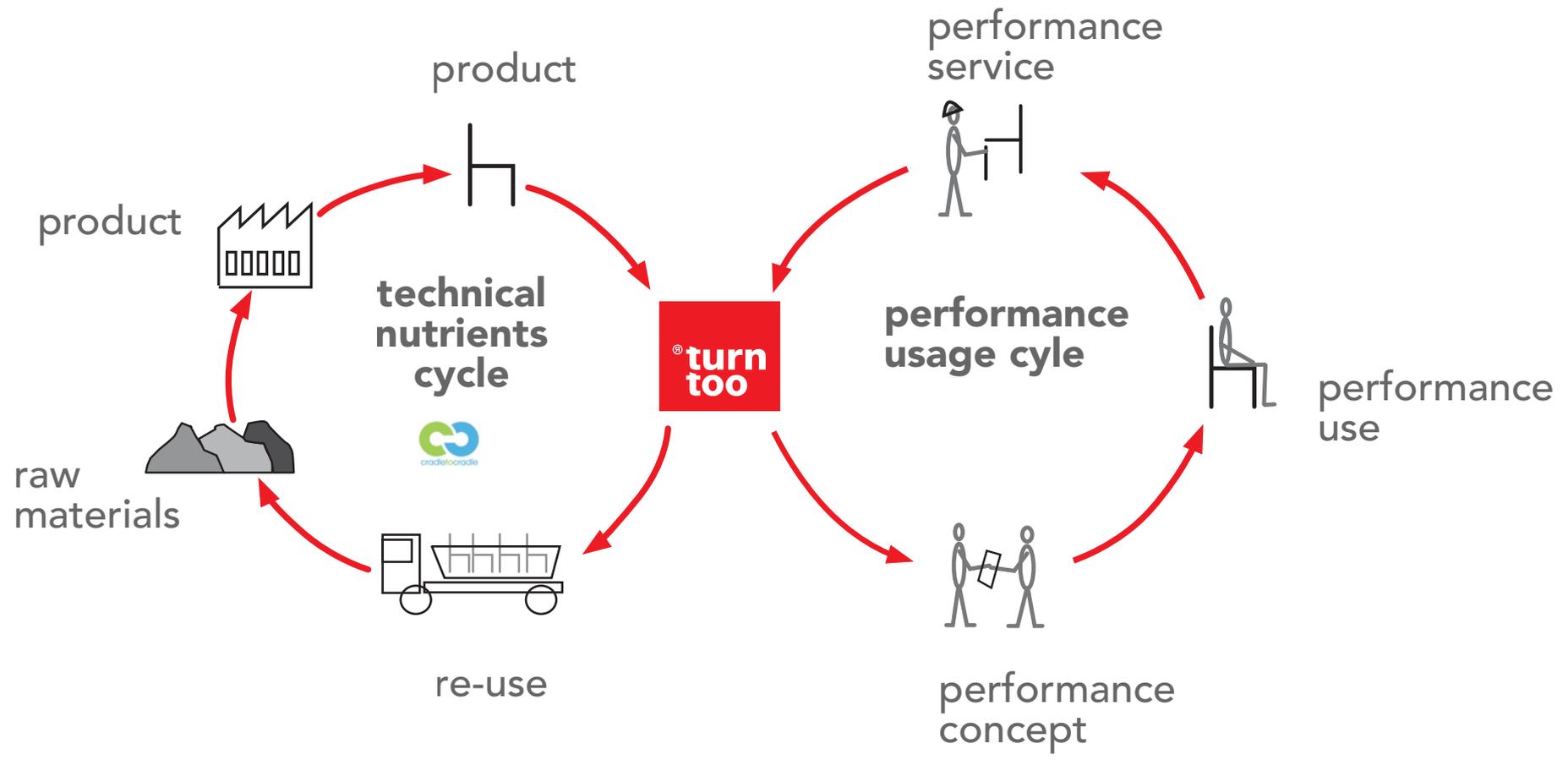
# (10) circular (nutrients)



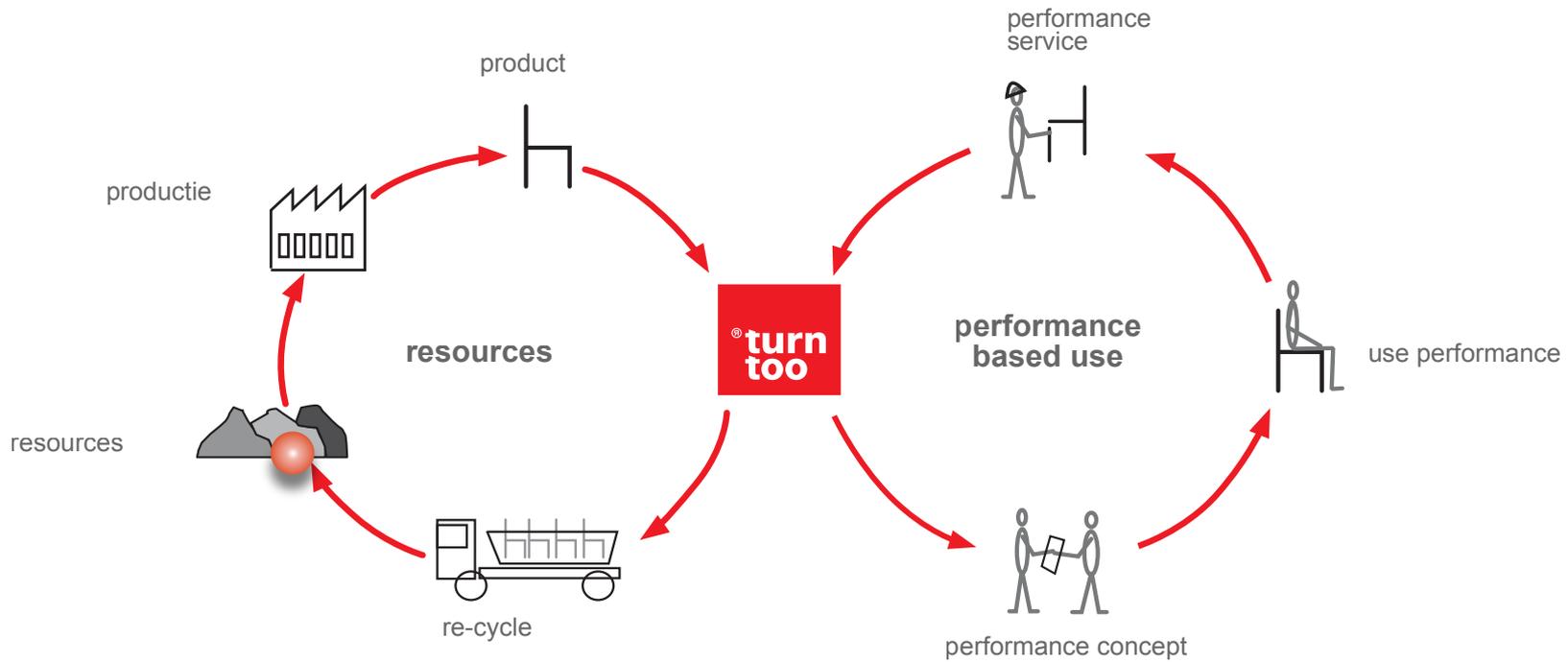
(10) circular (economy)



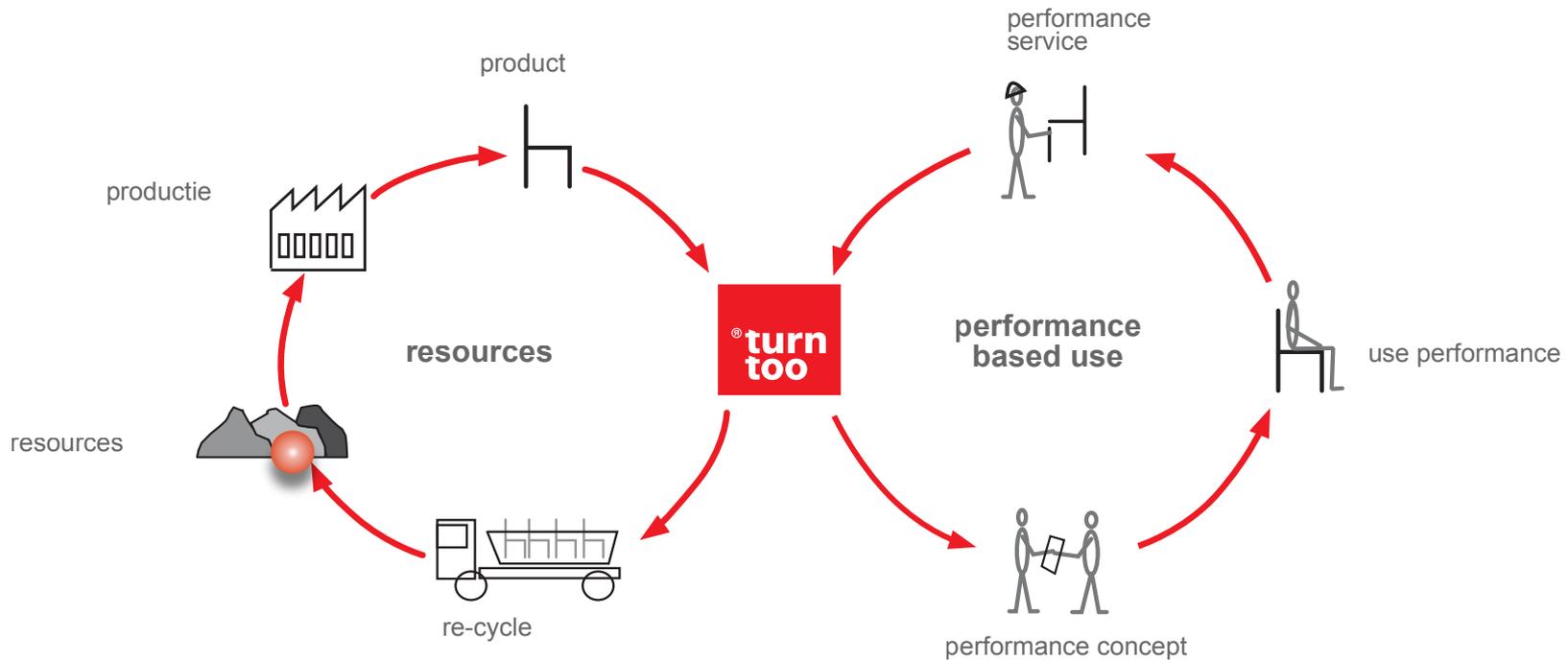
# Learning by nature: circular economy



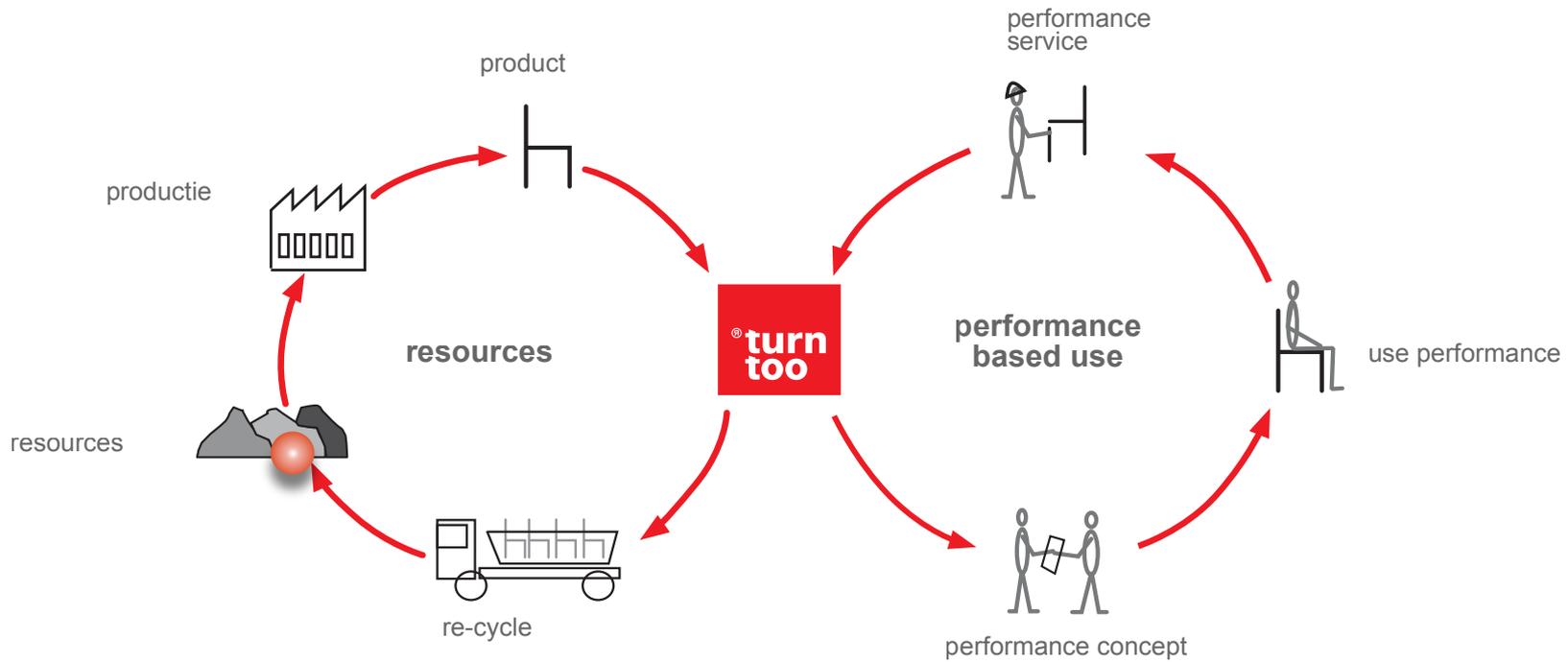
# Learning by nature: circular economy



# Learning by nature: circular economy



# Learning by nature: circular economy





just because

# lookout mountain

tipping points

survival of the fittest

on the monkey-rock

non-linear relations

circularity

nutrients

time is on the side of the city

patterns

patterns

# patterns

**energy from the sun**

# patterns

**energy from the sun**

patterns

**energy from the sun**

**nutrients forever**

# patterns

**energy from the sun**

**nutrients forever**

# patterns

**energy from the sun**

**nutrients forever**

**diversity gives stability**

# patterns

**energy from the sun**

**nutrients forever**

**diversity gives stability**

# patterns

**energy from the sun**

**nutrients forever**

**diversity gives stability**

**connective borders**

# patterns

**energy from the sun**

**nutrients forever**

**diversity gives stability**

**connective borders**

# patterns

**energy from the sun**

**nutrients forever**

**diversity gives stability**

**connective borders**

**intuitive planning**

Janine Benyus

Janine Benyus

Janine Benyus

Janine Benyus

***"We need cities to perform like ecosystems,  
not just look like them."***

Janine Benyus

***"We need cities to perform like ecosystems,  
not just look like them."***

Janine Benyus

***"We need cities to perform like ecosystems,  
not just look like them."***

asking

asking

asking

asking

**ask the right question**

asking

**ask the right question**

asking

ask the right question

and

asking

ask the right question

and

asking

ask the right question

and

*"You can't tell me that it can't be done."*

asking

ask the right question

and

***"You can't tell me that it can't be done."***

(Ray Anderson, InterfaceFlor)

the challenge

the challenge

the challenge

# the challenge

**Biomimicry is not**

# the challenge

**Biomimicry is not  
a product category or a durable solution.**

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**Biomimicry is not  
a product category or a durable solution.**

***It's a durable way of finding solutions.***