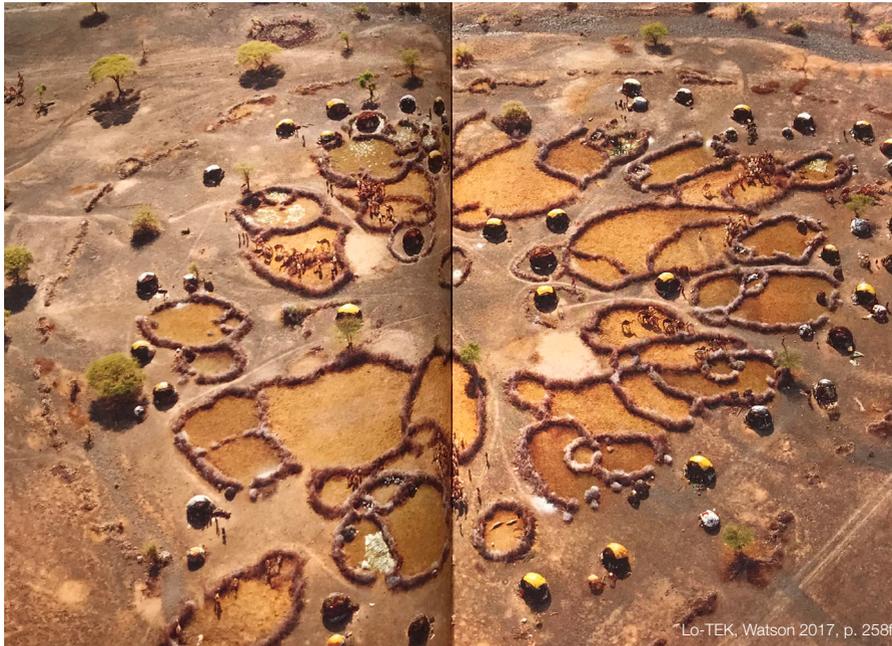


a future with trees



Urban development:

analysis



analysis

Urban a.

Major cities like Nairobi are pan-African and global centers of commerce. They have good infrastructure and promise a modern life.



Urban b.

The dark side of the great attraction of urban centers are slums, poverty and segregation.



Rural a.

The rural seclusion and tranquility do not have to be coupled with deprivation, especially for tourists.



Rural b.

73% of the Kenyan population lives in rural conditions. Access to water, education, health, infrastructure is sparse in remote areas.





<https://www.unhcr.org/ke/kalobeyei-settlement>

Water is a crucial element for the people and the environment



<https://www.unhcr.org/ke/kalobeyei-settlement>

Entrepreneurship and market activity are very much alive despite food aid is also a reality

starting points



environmental

- Drought
- Soil degradation
- Erosion
- Flooding
- Loss of biomass
- Loss of biodiversity

The dynamics of nature no longer guarantee the processes to ensure the necessary ecosystem services. We have to search for an understanding, mimic nature and actively take part in it in a positive way.

starting points



economical

- Space for trade
- Produce trade goods
- Market oriented education
- Securing subsistence
- Open up perspectives

The project seeks to address multi-layered social and economic points through a central resource. A tree nursery primarily produces trees, but trees can be fruit, fodder, building material, geoengeers, and in all uses labor and production depend on it.

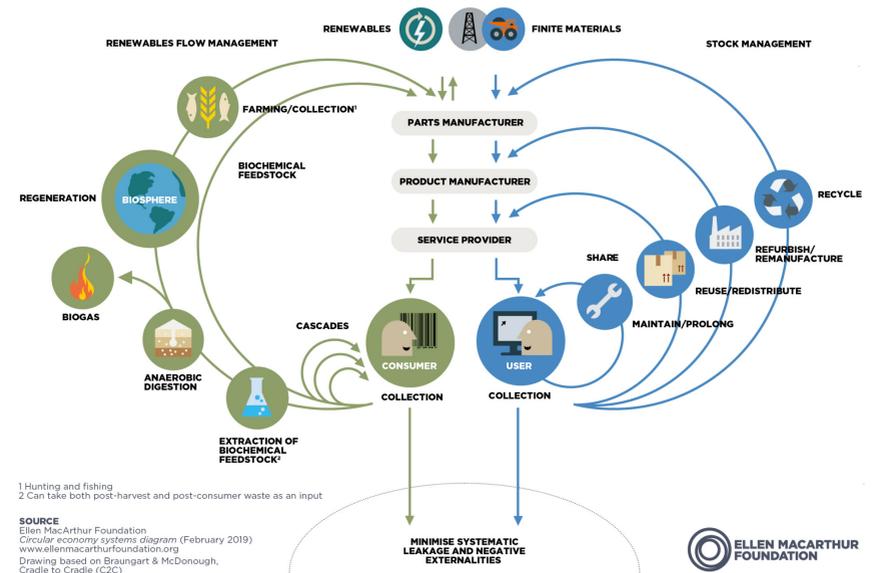


social

- Opening common space
- Healing from trauma
- Learning common culture
- Cross learning

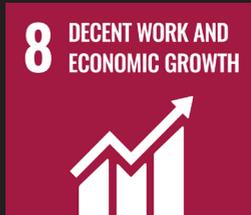
Community bond can grow. This requires space, time, generosity and care. A botanical garden for the common future with anchor points in one's own memories builds a bridge.

Circular Systems



goals

How could we target multiple sdgs with a simple measure?



goals

Trees for a green infrastructure

The goal is to establish a green infrastructure in Kalobeyei Integrated Settlement based on trees. Trees have a very wide range of benefits.

trees function as soil stabilizer, habitat, fodder ,source of food (fruit, leaves) ,source of medicine, source of construction material, shadeing, root system, source of myths and wisdom

One tree has a beneficial impact on the life of a family.



- food
- fodder
- energy
- medicine
- shade
- habitat

What can thousands of trees do?



1Kg Acacia tortilis seed = 30 tsd. seeds = 800 Ksh / 7.42 USD

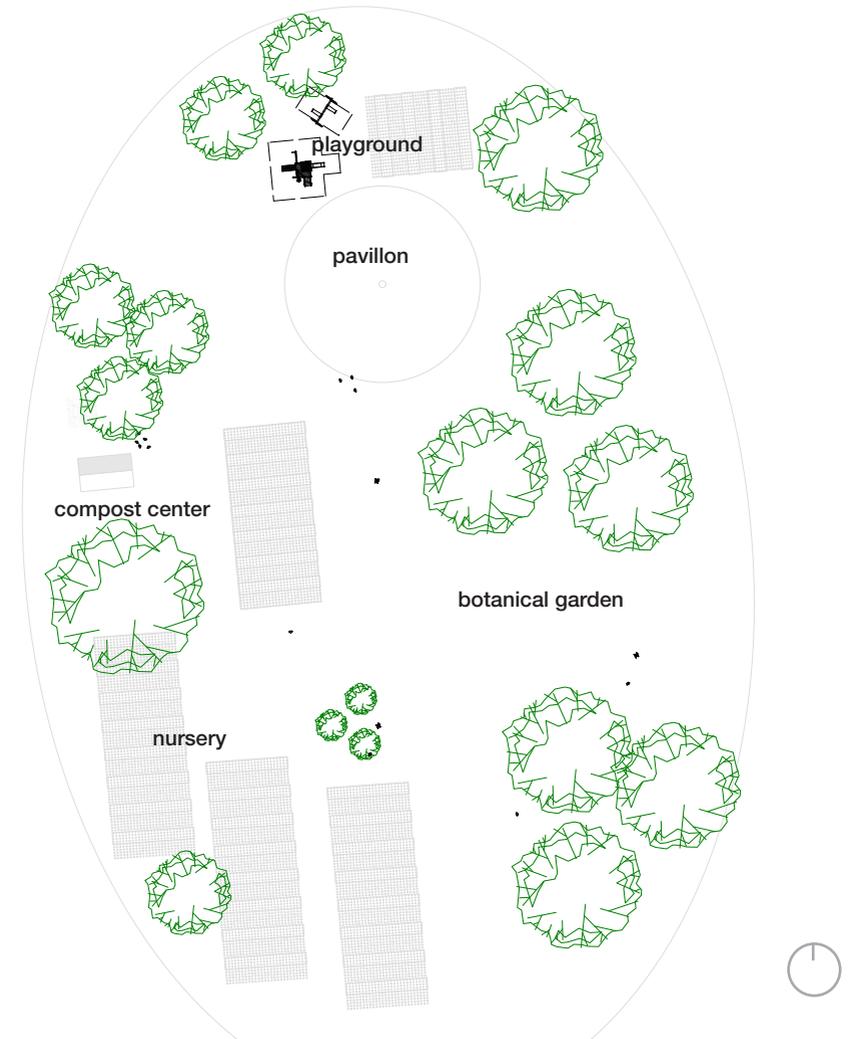
7.42 USD + soil + water + time + care = approx. 15.000 Acacia trees

location



Each core forms a starting point. A center. The botanical garden and nursery are located at a central point in the village two. Next to main traffic axes and at intersections of public uses and recreational facilities. It is intended to add density to the commercial and social node.

location



The conceptual idea follows the steady development of a seed into a tree. One goes from the small, fragile to the big, to the present. In the process it is necessary to be attentive and to take care. Formally, the round and oval shapes are also inspired by seeds. The botanical garden with the architecturally striking pavilion forms the cultural center of the square. A place of rest, exchange and knowledge is created. A simple or architecturally striking construction carries a wide roof for a proper area

for rainwaterharvesting. Knowledge can be learned in the nursery and the compost center and is then carried out into the settlement where it inspires further ideas and literally bears fruit. If the the nursery or compost center will move, the structur remains as a treegarden and a community center. The playground allows also the youngest generation to take part.

mood board

mood board



nursery

seedlings can be produced in numbers



pavillon

multifunctional infrastructure



compost center

functioning, healthy soils are key



playground

a place for the young generations



food

Parinari curatellifolia



medicine

Ziziphus mauritania



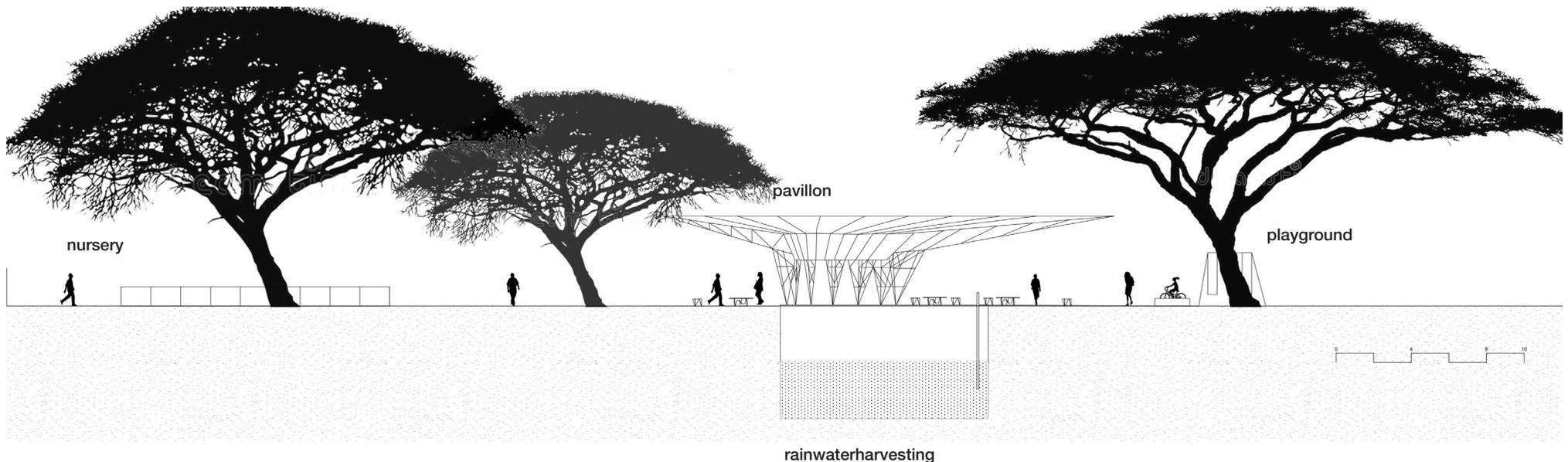
spirituality

Salvadora persica



construction material

Acacia tortillis



how

how



direct seed plantation in the shadow of elder trees

In order for the project to have a low-threshold result, two very short leaflets were designed. In them, the topics of composting are discussed very simply and step by step, and it is explained how to prepare seeds, plant them and how to take care of the seedlings. These leaflets can be used for school purposes or for distribution.

how to



1. Dig a pit 1.2 m (4 feet) wide and 0.6 m (2 feet) deep, and as long as you need for the amount of materials you have.
2. Build a pile in the pit, using the layer system.
3. Begin building a compost pile by putting a bottom layer of rough materials such as maize stalks and hedge cuttings in the pit. This layer should be about 30 cm thick. Chop up any materials which are too long to improve the air circulation in the pile. Sprinkle some water on this layer.
4. Add a second layer of dry vegetation, hedge cuttings or grass. This layer should be about 15 cm thick (6 inches). Sprinkle water on this layer too. You should sprinkle water on each layer as you add it. The pile should be moist throughout.
5. Put on a third layer of animal manure. The manure contains micro-organisms which are vital for decomposition.
6. Sprinkle some ash or dust on this layer. The ashes contain valuable mineral including potassium, phosphorus, calcium and magnesium. The ashes also neutralise the acids produced during decomposition, especially by the animal manure.
7. The next layer should be green leaves from high-protein leguminous trees if possible.
8. Sprinkle on a little topsoil or old compost. The topsoil contains bacteria which are useful in the decomposition process.
9. Continue adding layers until the material is 30 cm above ground level. Apply water. The heap will shrink as it decomposes.
10. To complete the pile, cover it all over with a layer of topsoil about 10 cm (4 inches) thick. This layer prevents plant nutrients from escaping from the compost pile. Lastly, cover the whole with dry vegetation such as banana leaves or a plane to reduce moisture loss through evaporation.

layers of the compost pile

repeat or pile cover	repeat or pile cover
top soil	top soil
greens	greens
ash	ash
manure	manure
dry grass	dry grass
rough material	rough material

how to

11. Take a long, sharp, pointed stick and drive it in at an angle so that it passes through the pile from top to bottom. This stick will act as your "thermometer". After 3 days, decomposition will have started in the pile, and the stick will be warm when you pull it out.
 12. Pull the "thermometer-stick" out from time to time to check the progress of the pile. You can also tell from the thermometer how dry or wet the pile is: it should be moist but not wet.
 13. After 2-3 weeks, turn the pile over. Do not add any fresh materials except water. You must turn the pile if the "thermometer-stick" is cold when you pull it out, or if it has a white substance on it (fungus), as this shows that decomposition has stopped. Turning the pile is important because it mixes the different layers, making the decomposition faster and more complete.
 14. Turn over the heap three times. Moistened with water each time. Decomposition needs proper mixing as well as circulation of water and air. You can ensure this by turning over the material three times.
- First turning: 10-15 days after filling
- Second turning: 15 days later
- Third turning: after 15 day - 1 month.
- Finished compost should have a fresh, earthy smell and should contain no grass, leaves, or animal manure. Well-decomposed compost should be applied at the rate of 20 t/ha (8 t/acre), about two large hoefuls per square metre, or enough to barely cover the ground with a layer 1 cm (0.4 inch) thick.

how to



Generally, trees require minimum inputs after planting compared to agricultural crops. However, weeding and protection against grazing, trampling and browsing by animals and trespass or destruction by humans is important. The following example is for acacia species and not exactly the same for all other tree species.

Trees are multipurpose and multifunctional organisms.

- Soil stabilization
- Water holding of soils
- Fruit
- Fodder
- Medicine
- Shade
- Construction material
- Source of energy

Seeds

Certified tree seeds are recommended for best germination results. Seed certification is a legally sanctioned and internationally recognized system for quality control of seed multiplication and production. Certification ensures that tree growers have access to high quality seeds and

propagating materials of known genetic identity and purity, with high germination rates and freedom from weed seeds. KEFRI, through its Tree Seed Programme is mandated to produce tree seeds that are collected from selected and approved tree sources. Certified tree seeds can be obtained from KEFRI Regional Center and Sub-Centers distributed in Kenya, for the project the Sub-Center in Lodwar would be nearest. Seed can also be locally collected and stored with the right knowledge and management as a further development of the project.

Seed collection and storage.

Flowering of most Acacias is dependent on the rains. The seeding period occurs approximately six months after flowering. On average Acacia xanthophloea produces 24,000 to 30,000 seeds per kilogramme while Acacia polyacantha produces 15,000 seeds per kilogramme.

Tips on seed collection and storage.

- Collect mature brownish pods from the crowns of standing trees by shaking the branches to release the pods.

how to

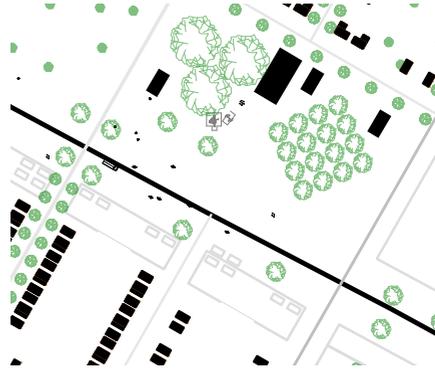
- Split the pods by hands to obtain small quantities of seeds.
 - Store mature and properly dried seeds in (airtight) containers at room temperature (germination rate will sink maybe after one year storage).
- Seed treatment and sowing.**
- Acacia seeds can be sown in seedling trays or directly in the field. To achieve high germination and seedling survival rates, establish the tree nursery or sow the seeds directly during the rainy season.
- Pre-sowing treatment.**
- Nick the seed coat at the cotyledon end using a knife or any other sharp tool and sow immediately; or
 - Soak the seed in hot water, cool overnight and sow the next morning.
- Seedling planting and management**
- Start tree planting at the beginning of the long rains i.e. after approximately 100 millimetres of steady rainfall.
 - Transplant seedlings after they have grown to the 2-leaf stage from seedling trays or nursery beds into nursery bags filled with a mixture of five parts river sand and one part compost (ratio of 5:1).
 - To achieve high survival rates tree seed-

- When sowing cover the seeds with a thin layer of sand and keep moist (water the seedling trays / beds during dry spells). Under ideal conditions germination occurs within 5 to 15 days for Acacia xanthophloea and 10 to 21 days for Acacia polyacantha. The expected germination rate for mature, healthy and properly treated seed is 40% to 90% for Acacia xanthophloea and 60% to 90% for Acacia polyacantha.

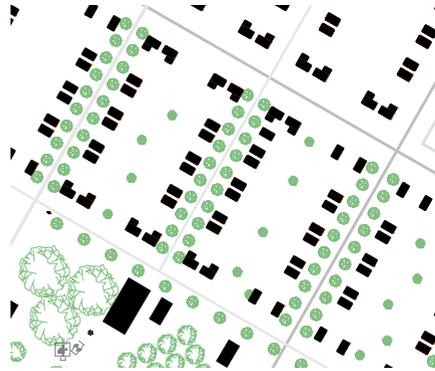


green infrastructure

Large trees and small groves of trees create space in public places and invite people to linger in the shade.



Neighborhood streets are planted more densely than main streets, the immediate residential environment becomes more pleasant.



Main thoroughfares are loosely planted with large trees. Intersections as meeting places have trees and public uses can be distinguished by openness or densification of tree planting.

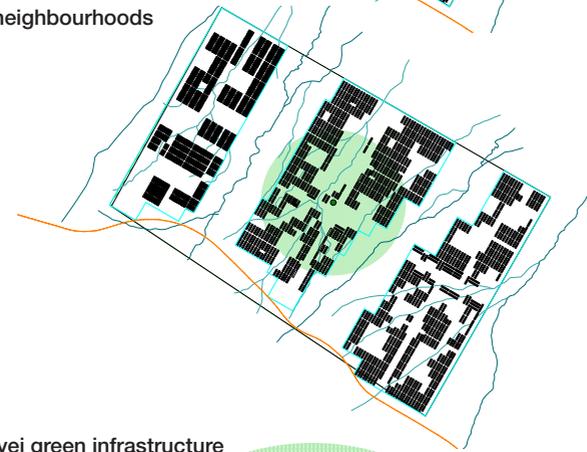


green infrastructure

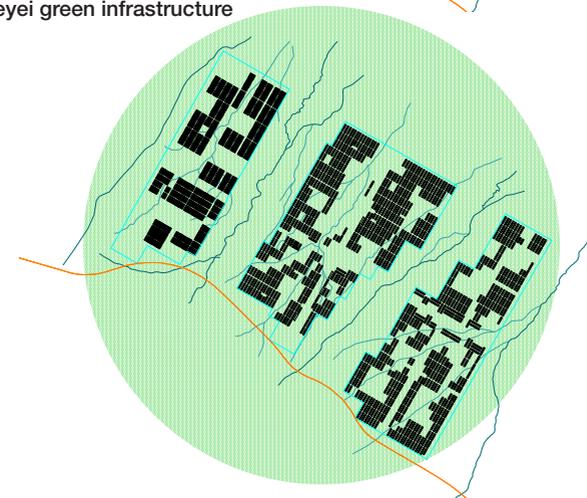
nursery



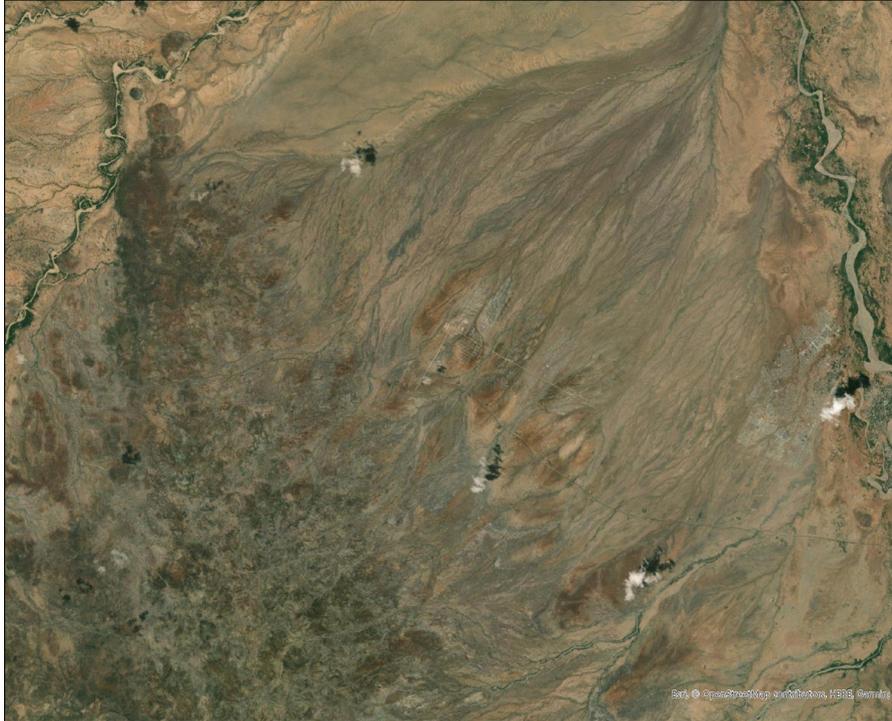
green neighbourhoods



kalobeyei green infrastructure



What can thousands of trees do?



erial view of the current situation

They can restructure a whole ecosystem.



erial view of the settlement embedded in green infrastructure