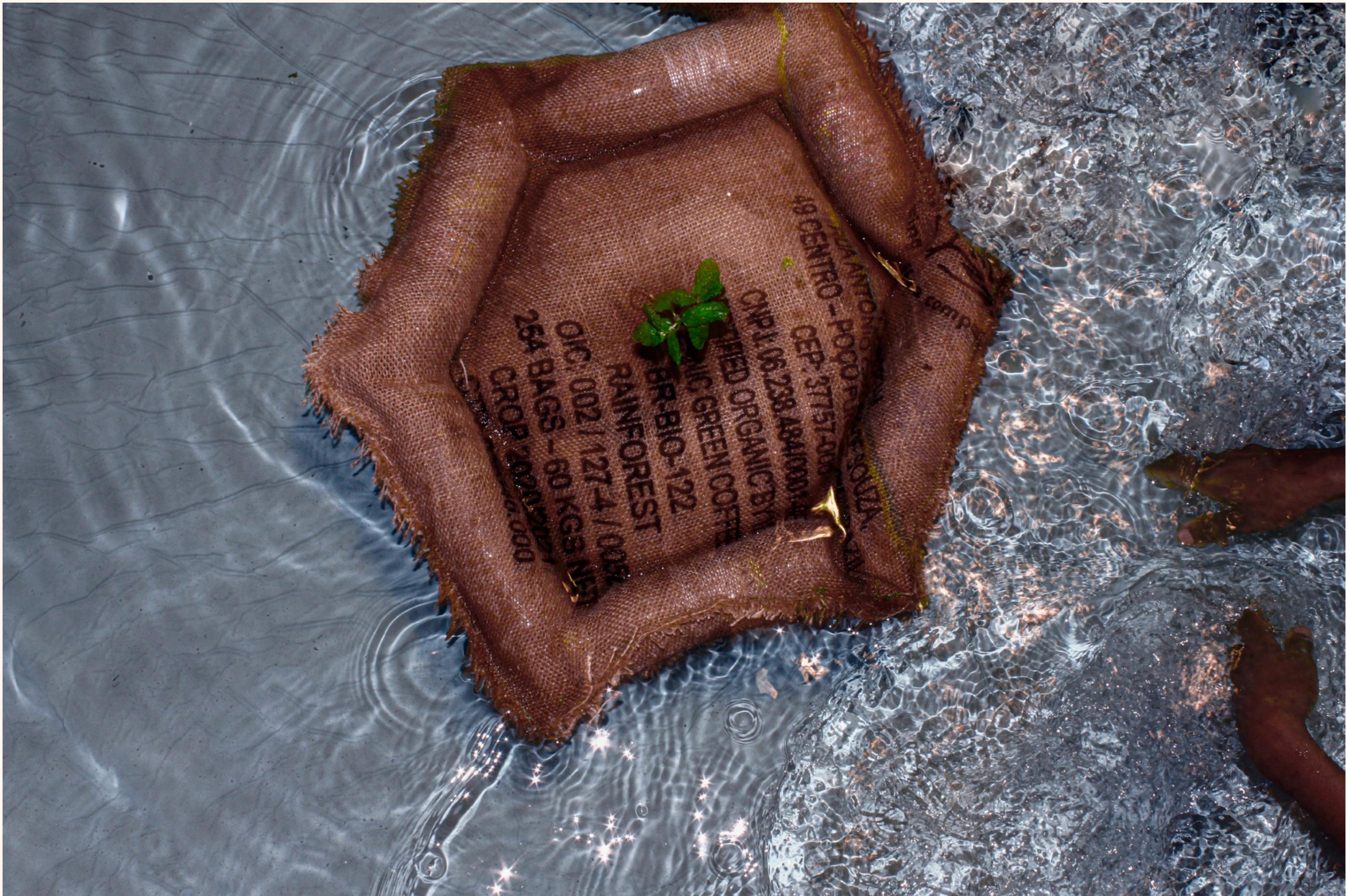


PHYTO

D R I F T

GUIDE

Phytodrift –
Floating Treatment
Garden



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CEP: 37751-000
CNPJ: 06.238.484/0001-44
CERTIFIED ORGANIC BY
NIC GREEN COFFEE
BR-BIO-122
RAINFORREST
CIC: 002/127-4/002
264 BAGS - 60 KGS NET
CROP 2020/2021

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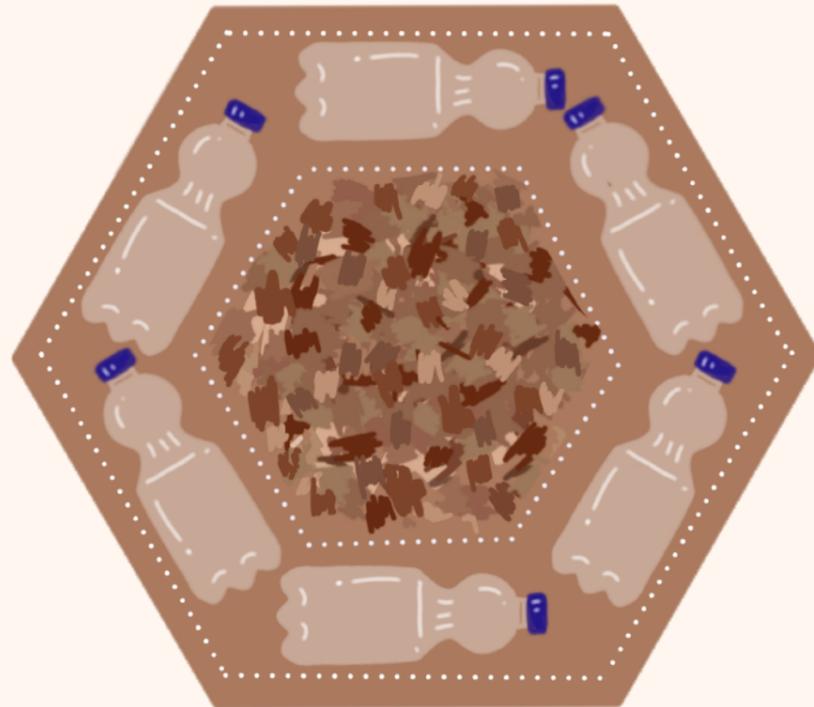


WHAT

What is a Phytodrift – Floating Treatment Garden?

Essentially, a Phytodrift is a platform used to grow vegetables while filtering the water of excess nutrients.

In this case, the platform is created with woodchips as a substrate, which are held together by a jute sack and surrounded by plastic bottles for flotation. The garden is placed on a waterbody. On this platform, plants are grown. Their roots hold onto the substrate and reach through the bottom of the platform into the water below. Gaining their essential nutrients from the lake water vegetables grow and can be consumed after harvesting.



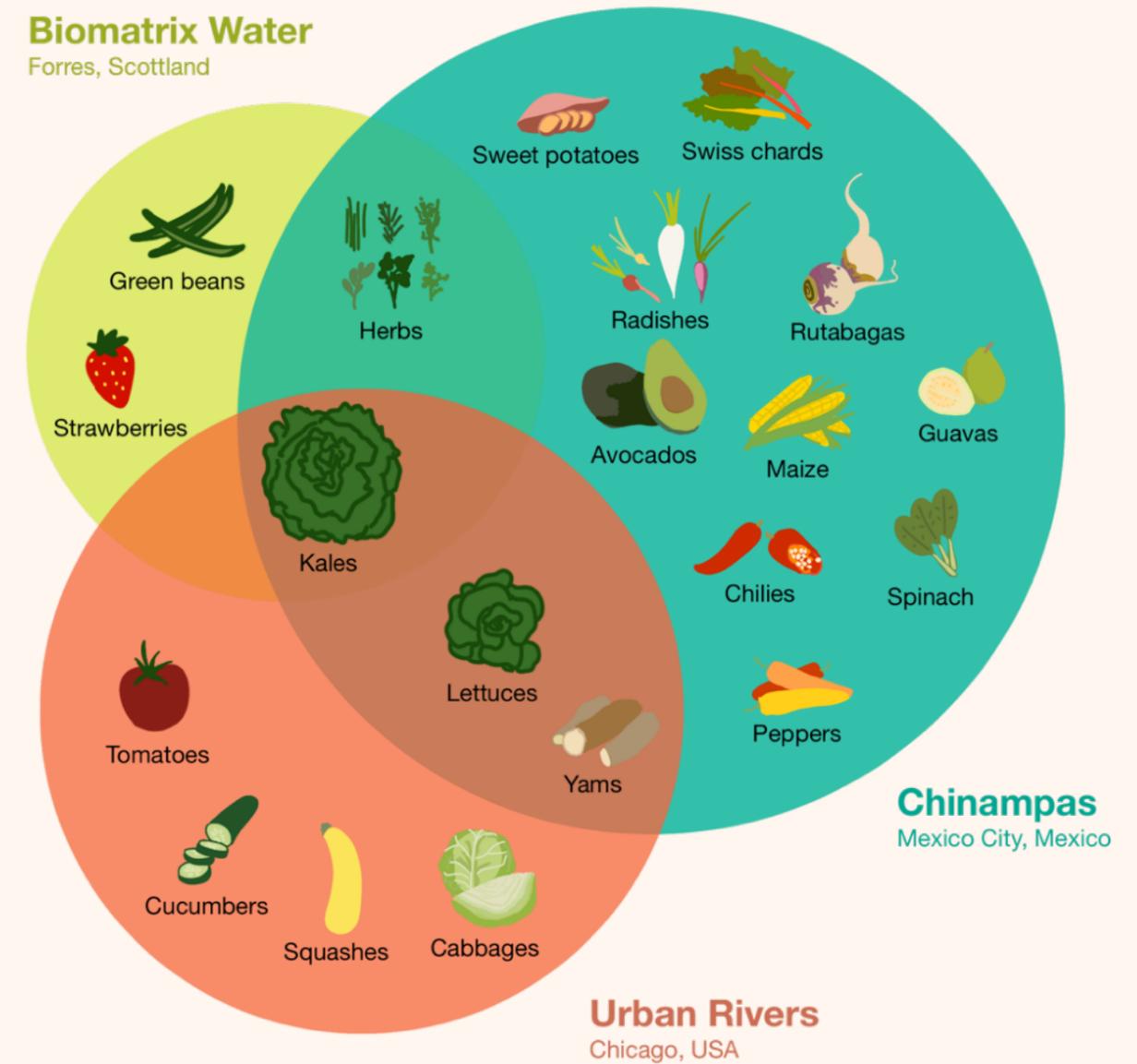
What vegetables can you grow on them?

There is a big variety of plants that can flourish on floating gardens. Usually, plants that can be grown hydroponically can also be planted on Phytodriffs.

Below is a diagram that shows the different plants that have been successfully grown on artificial islands in three similar projects. Based on the tests conducted for this project, I recommend tomatoes, lettuce, cabbage, and mint.

Biomatrix Water

Forres, Scotland





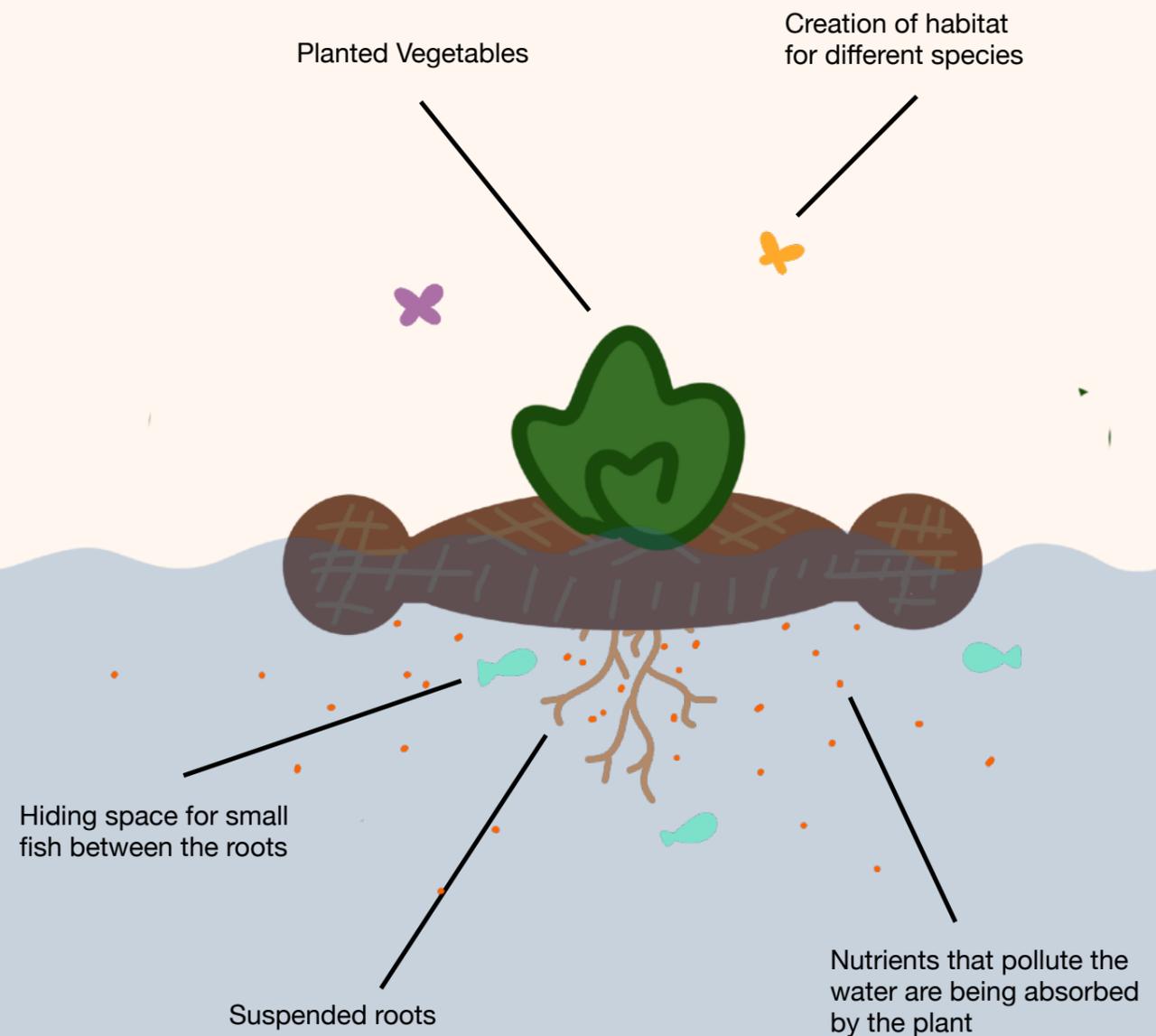
WHY

Clean water is one of humanity's most vital needs, yet algal blooms caused by eutrophication plague lakes and seas globally. Nitrogen and phosphorus are the main culprits behind this phenomenon. One of the main reasons they end up in waterbodies is due to runoff from agricultural productions where they are used as fertilizers (Johansson and Schmieder 2024). Interestingly, because these nutrients are essential for plant growth, cultivating plants on waterbodies can filter nitrogen from the water.

This practice of planting macrophytes in waterbodies is often referred to as Floating Treatment Wetlands (FTW), where floating beds are created for the vegetation to grow on. Usually, native plants are used to achieve this filtration effect (Choudhury et al. 2024). However, what if we could additionally have the benefit of being able to grow vegetables on them; satisfying two needs in one? That is the idea of Phytodrift.

This project challenges the conventional capitalistic way of profit by expanding the definition of value beyond money. By aligning human and ecological needs, it demonstrates how we can profit from nature in non-exploitative ways, gaining cleaner water, healthier food, and stronger communities rather than just financial returns.

The materials used here are surplus, like jute bags from coffee roasteries and woodchips from the forest industry, as well as plastic bottles that form the border of the floating islands.





HOW

What you need to make one Phytodrift:

- Jute sack e.g. jute coffee sack from a coffee roastery
- Substrate e.g. woodchips ca. 4,2L
- 6x Empty 500ml plastic bottle with lid
- Seed from a vegetable of your choice e.g. lettuce
- Seed starting soil
- Empty kitchen roll

-  Needle and Thread / Sewing Machine
-  Scissors
-  Pen / Chalk / Bar of soap to mark the fabric
-  Stick / Similar tool to poke a hole
-  6x Pins

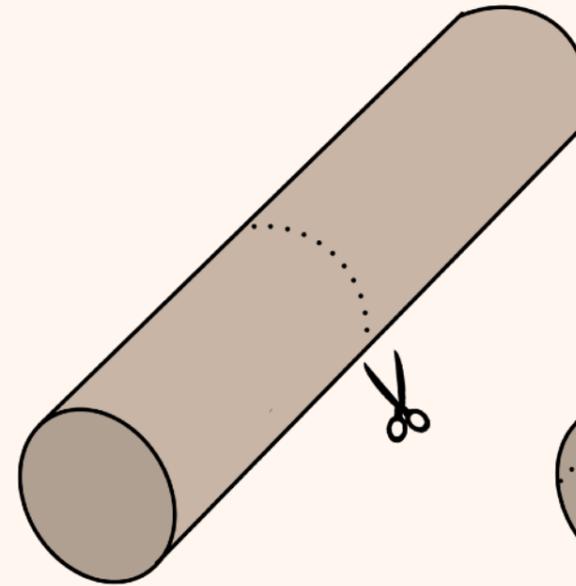
- The following pattern printed on 4x A3 sheets of paper

You can download the pattern here:

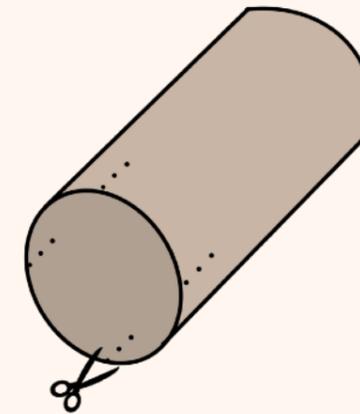


Scan the QR-code or use the link to it in the sources

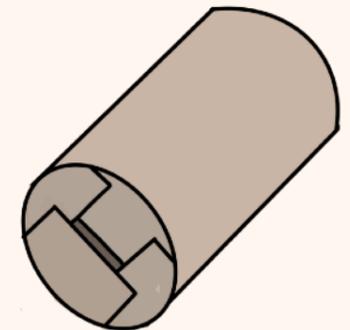
Start by planting your seed as follows:
It needs about one month worth of growth before being planted in the Phytodrift



Cut an empty kitchen roll in half



Cut 4x ca. 2cm long slits in it



Fold the sides inwards



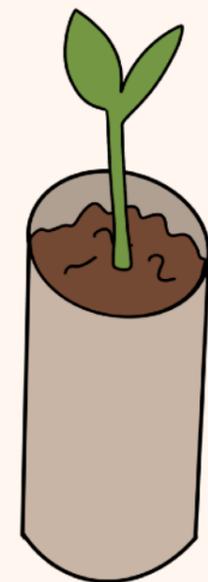
Fill it with your seed starting soil

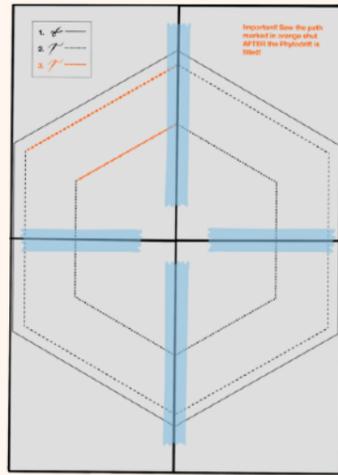


Plant the seed as instructed on the seed packaging

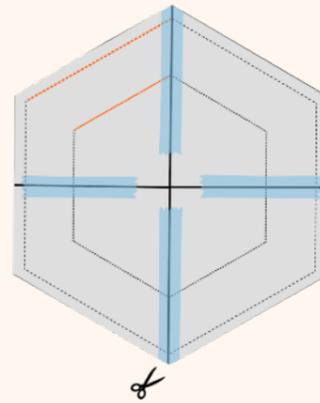


Let the seed grow until the plant is around 8 cm tall

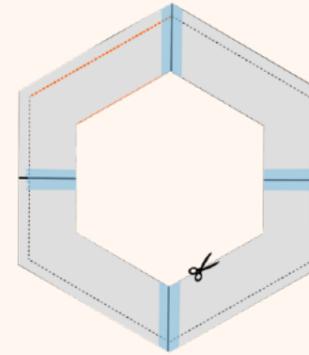




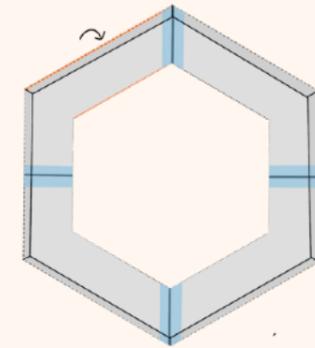
Print out the pattern on 4x A3 papers, assemble it and tape it together



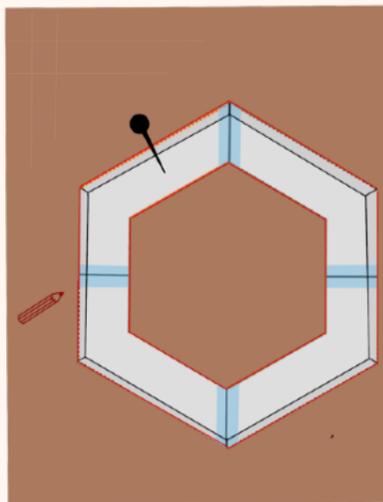
Cut around the solid line on the outside of the pattern



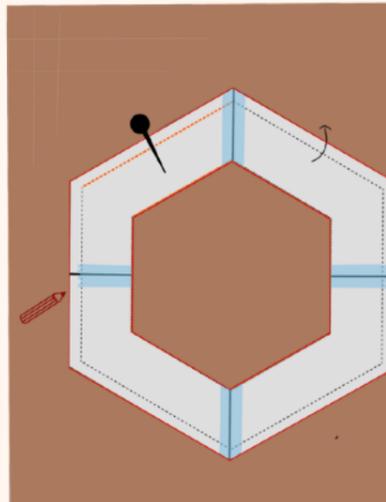
Cut around the dashed line on the inside of the pattern



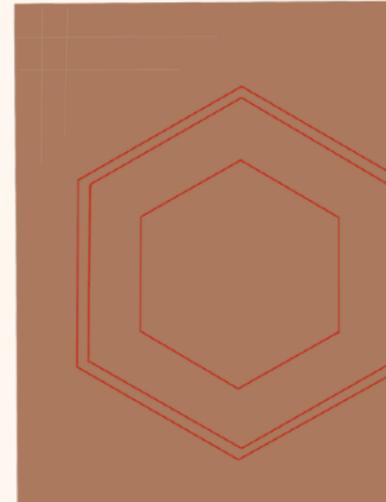
Fold the edges of the outer side of the pattern inwards along the dashed line



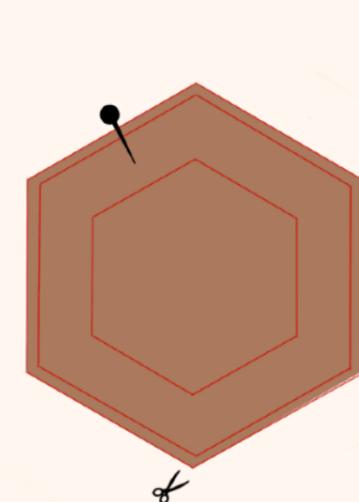
Pin the pattern to a flattened jute sack, trace the outlines of the pattern onto the sack with a pen, a piece of chalk or a bar of soap



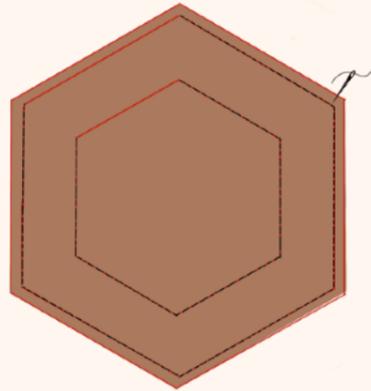
Unfold the edges of the pattern outwards again
Trace the outline of the pattern once again



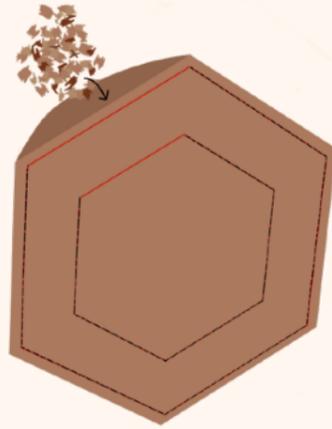
Remove the pattern and pin the two sides of the jute sack together to keep them in place



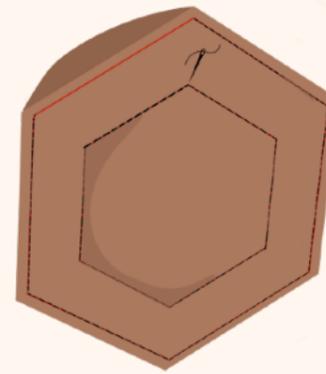
Cut around the outermost outline on the jute sack



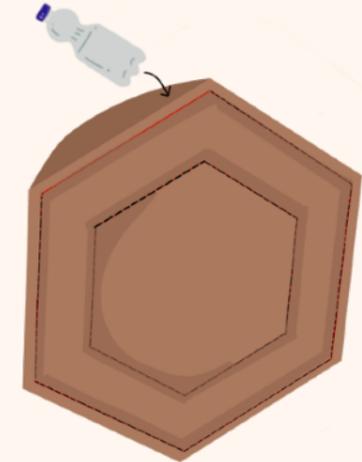
Sew along the dashed lines leaving one side open like instructed in the pattern, so that two "pockets" are created



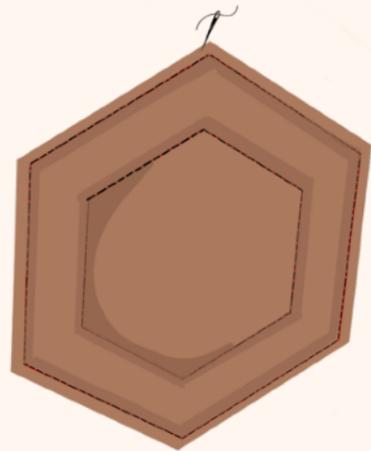
Fill the inner pocket with woodchips



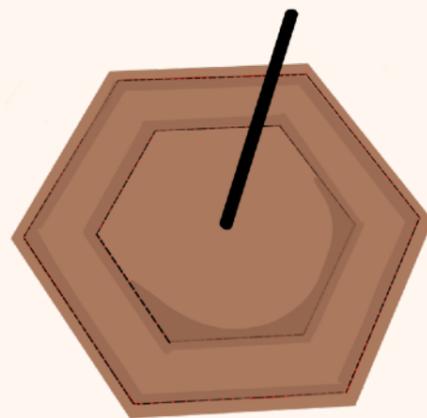
Sew along the inner dashed line to enclose the woodchips



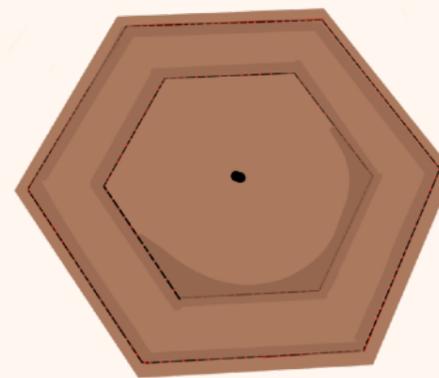
Fill the outer pocket with empty plastic bottles, one per side



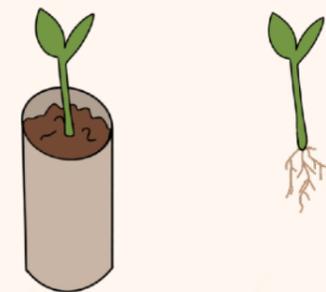
Sew the last dashed line by hand to enclose the bottles



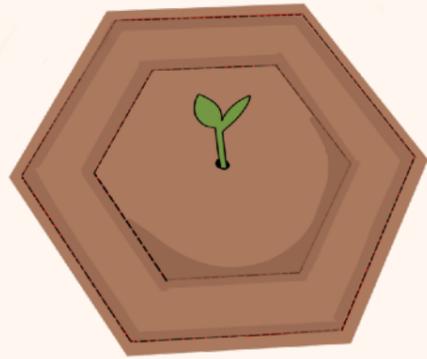
Use a stick or similar tool to poke a hole in the middle



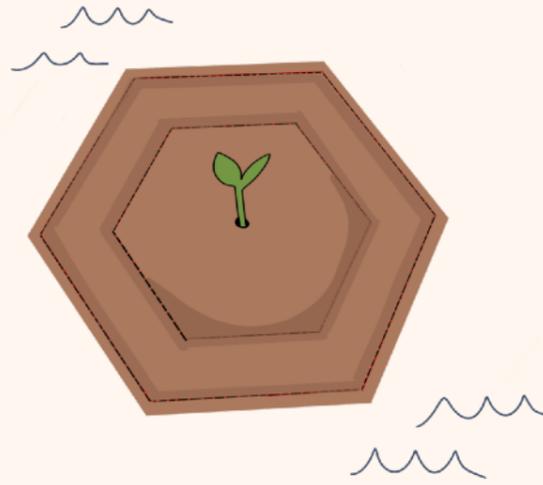
If the opening isn't wide enough you can cut a tiny piece out



Take your previously planted seedling out of its pot



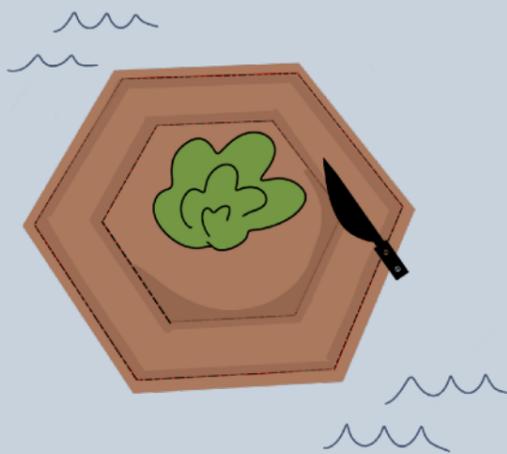
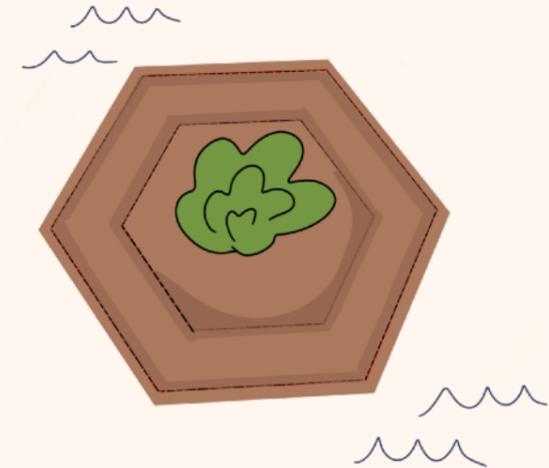
Carefully plant the seedling with its roots first into the hole



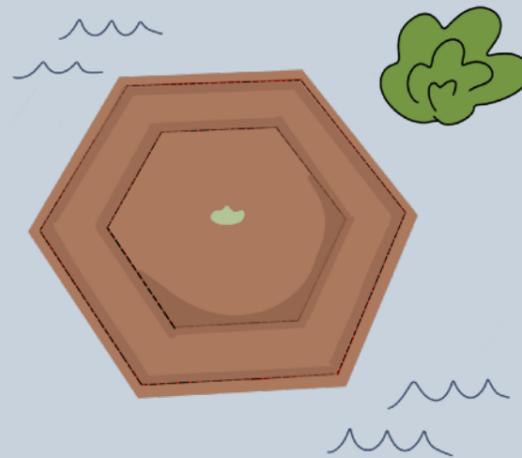
Put your Phytodrift into a waterbody of your choice



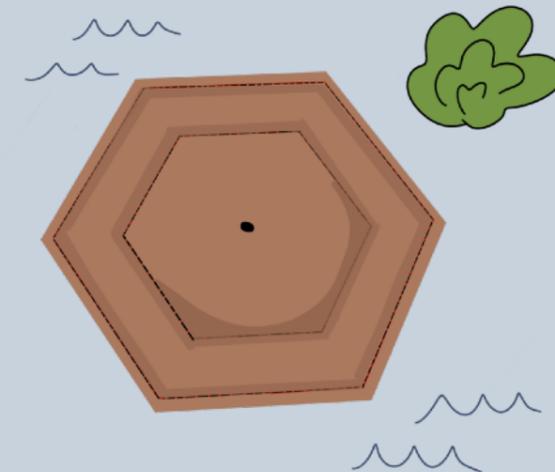
Let the seedling grow into a plant e. g. lettuce



To harvest your lettuce cut it off at its stump with a knife



Remove the stump from the hole in the Phytodrift



You can now reuse your Phytodrift and enjoy your lettuce!

HISTORY

During ancient times, as the Aztecs and Mayans flourished in Mesoamerica, agriculture held a profoundly different meaning. Their souls embraced nature in a way that farming enhanced ecosystems rather than destroying them. Contrary to the stereotypes, the Aztecs were hardworking and highly skilled farmers (Kimball, 2021). Their ingenuity and perseverance allowed them to cultivate crops in the challenging, swampy environments surrounding them.

The Aztecs developed Chinampas, a raised field farming technique, to plant crops on swamps, wetlands, and other waterbodies. They created artificial islands by dredging nutrient-rich soil from the bottoms of waterbodies and shaping it into raised beds. On these islands, they cultivated maize, squashes, lettuce, and other crops. Ingeniously crafted, the Chinampas allowed for sub-irrigation and required minimal manual care. Their nutrient-rich soil made them incredibly productive and efficient (Ebel, 2020).

Chinampas are still used today, serving both as a cultural heritage site and a tourist attraction, particularly around Lake Xochimilco in southern Mexico City (Arca Tierra). Similar farming techniques are also found in small-scale projects across the world. In pre-Hispanic times, Chinampas were much more widespread (Figure 1). One wonders how they might have evolved if colonization had not disrupted these practices.

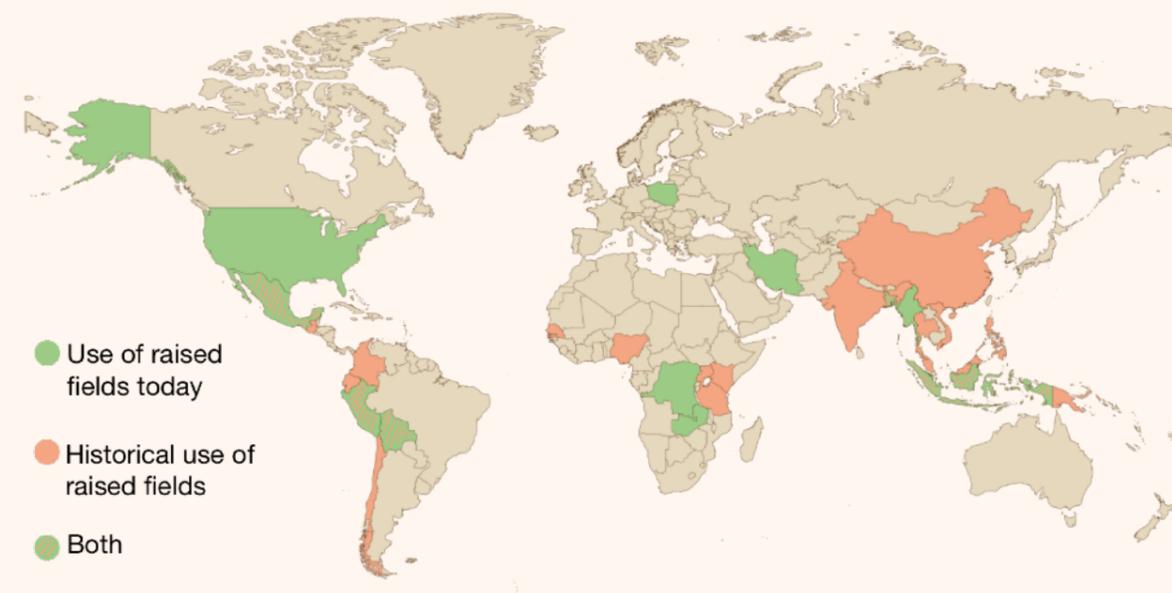


Figure 1 Map of historic and modern use of Chinampa-like farming (Ebel 2020)

Inspired by this farming technique, I was led down a path of discovering deep anthropogenic issues I was not aware of; one of them being fertilizer pollution.

Floating Treatment Wetlands have had an effect on limiting the pollution of lakes with nitrogen (Choudhury et al. 2024).

Phytdrift is the embodiment of Floating Treatment Wetlands and Chinampas combined. Farming sustainably on waterbodies while filtering nutrients from the water.

The goal is to learn from our past, redefining farming and encouraging a balance between the needs of nature and those of humans.

The name Phytdrift is inspired by Phytoplankton - Phyto (old Greek: Plant), plankton (old Greek: Drifter / Wanderer) (Lindsey and Scott 2010). Phytoplankton is a microscopic organism that lives in waterbodies. It consumes nutrients like nitrate and phosphor. When these nutrients are too excessive, phytoplankton will grow exponentially, which means algal blooms occur (CeNCOOS 2025). This project is named after this plant since Phytdrifts provide a place for plants to absorb these excess nutrients instead of phytoplanktons consuming them.



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Additional Information on Phytodrift

 @phytodrift

Here you can find a folder with the online version of this guide, the pattern ready for downloading and a link to step-by-step picture instructions on how to make a Phytodrift:

<https://drive.google.com/drive/folders/1U-PpxT8dVtJyaaAtlhxEfvinD8XgR-we?usp=sharing>





**To plant a
garden is to
believe in
tomorrow.**

— Audrey Hepburn