

# growcer by YASAI

GROW **MORE** WITH LESS

Underground Farming  
17.09.2019

YASAI  
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# Your view out of the airplane?

agriculture requires

40%

of ice-free land

64%

of fresh water

25%

of greenhouse emissions

to feed and nourish  
**8'000 million** people

Sources: <https://science.sciencemag.org/content/360/6392/987>; <https://www.nationalgeographic.com/foodfeatures/feeding-9-billion/>



# Problem (Daily News)



Causes 70 %  
of **deforestation**



**Overdrafting of groundwater**<sup>2</sup>



**Groundwater pollution and soil  
degradation through pesticides**<sup>3</sup>



# Opportunity

By 2050 we will be

**9.8 billion**



Production will need to

**double**



How can we produce  
enough nutrient rich  
food,

without destroying  
our ecosystems





# Vertical Farming



LOCAL

VERTICAL

GROW **MORE** WITH LESS

# Underground Vertical Farming



# Vertical Farming in a subway in London



GEWINNE  
EINES VON FÜNF

JAHRESABOS

IM WERT VON 499,-<sup>CHF</sup>\*



basefit.ch  
WIR SIND FITNESS

## Look inside the underground farm just 100ft beneath your feet in Clapham

And it's inside an air raid shelter, woah

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 COMMENTS

By [Tilly Gambarotto](#)  
12:48, 5 FEB 2019

NEWS

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Which do you prefer?



Gum

OR



Mints

INSTICATOR

Quiz: 1 point

True or false: Samples of moon dust were once taken to Bristol for analysis.

☐ False

Walmart.com

Savings  
Center



# The Swiss dwarfs and their bunkers

**The largest tunnel worldwide!**

**&**

**360'000 Bunkers!  
(Most bunkers/capita)**



Why did we dig so many bunkers ?





Cold War  
1945-1991



Climate Crisis  
NOW - 2050



We design, build & market  
your Underground Vertical Farm



# Holistic Design Thinking



**Ecosystems**  
for Vertical Farming



# UN Sustainable Development Goals



# Existing examples

## NATURAL LIGHT



Company: **ALTUS FARMS**  
Country: **USA**  
Space: **GREENHOUSE**  
Area: **650 m²**



Company: **URBANFARMERSAG**  
Country: **NETHERLANDS**  
Space: **ROOFTOP**  
Area: **1200 m²**



Company: **SKY GREENS**  
Country: **SINGAPORE**  
Space: **GREENHOUSE**  
Area: **> 10 000 m²**

## ARTIFICIAL LIGHT



Company: **INFARM**  
Country: **GERMANY**  
Space: **GROCERY STORES**  
Area: **2 m²**



Company: **AGRICOOOL**  
Country: **FRANCE**  
Space: **CONTAINER**  
Area: **30 m²**



Company: **AEROFARMS**  
Country: **USA**  
Space: **INDUSTRIAL HALL**  
Area: **2790 m²**



# Venture Capital

 SoftBank

invests

**\$ 200 million**

in



July 2017

Sheik of Dubai  
&



invest

**\$ 115 million**

in



August 2017

Balderton.  
capital

invests

**\$ 25 million**

in

**inform**

February 2018

Google  
ventures 

invests

**\$ 90 million**

in



December 2018

# What can you grow ?



Leafy greens



Soft fruits



Eatable flowers



Herbs



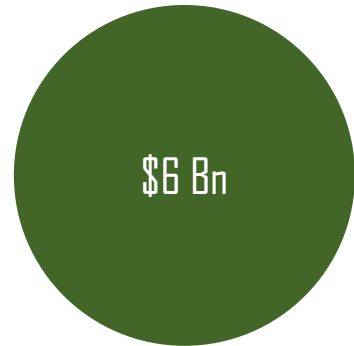
Microgreens



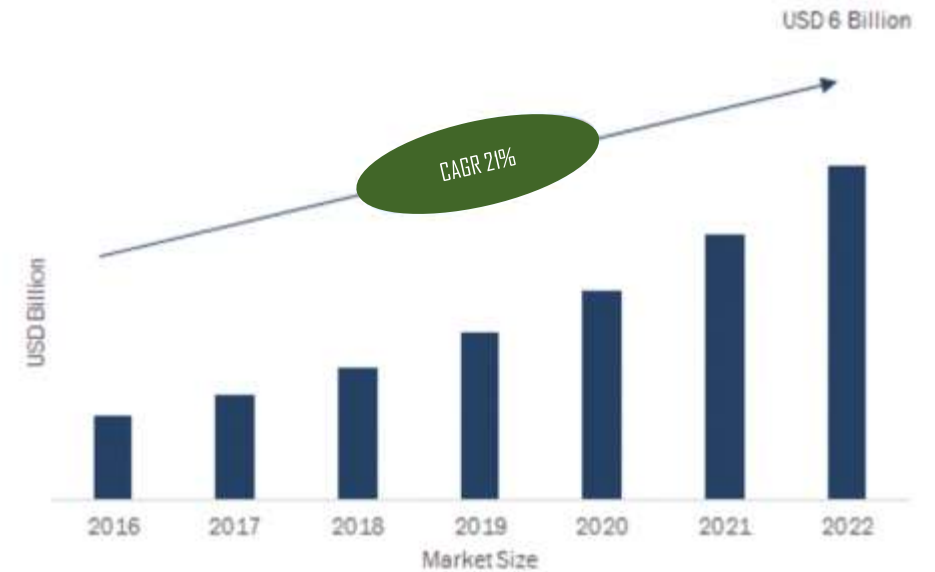
# Market



Global  
Fresh Produce Imports



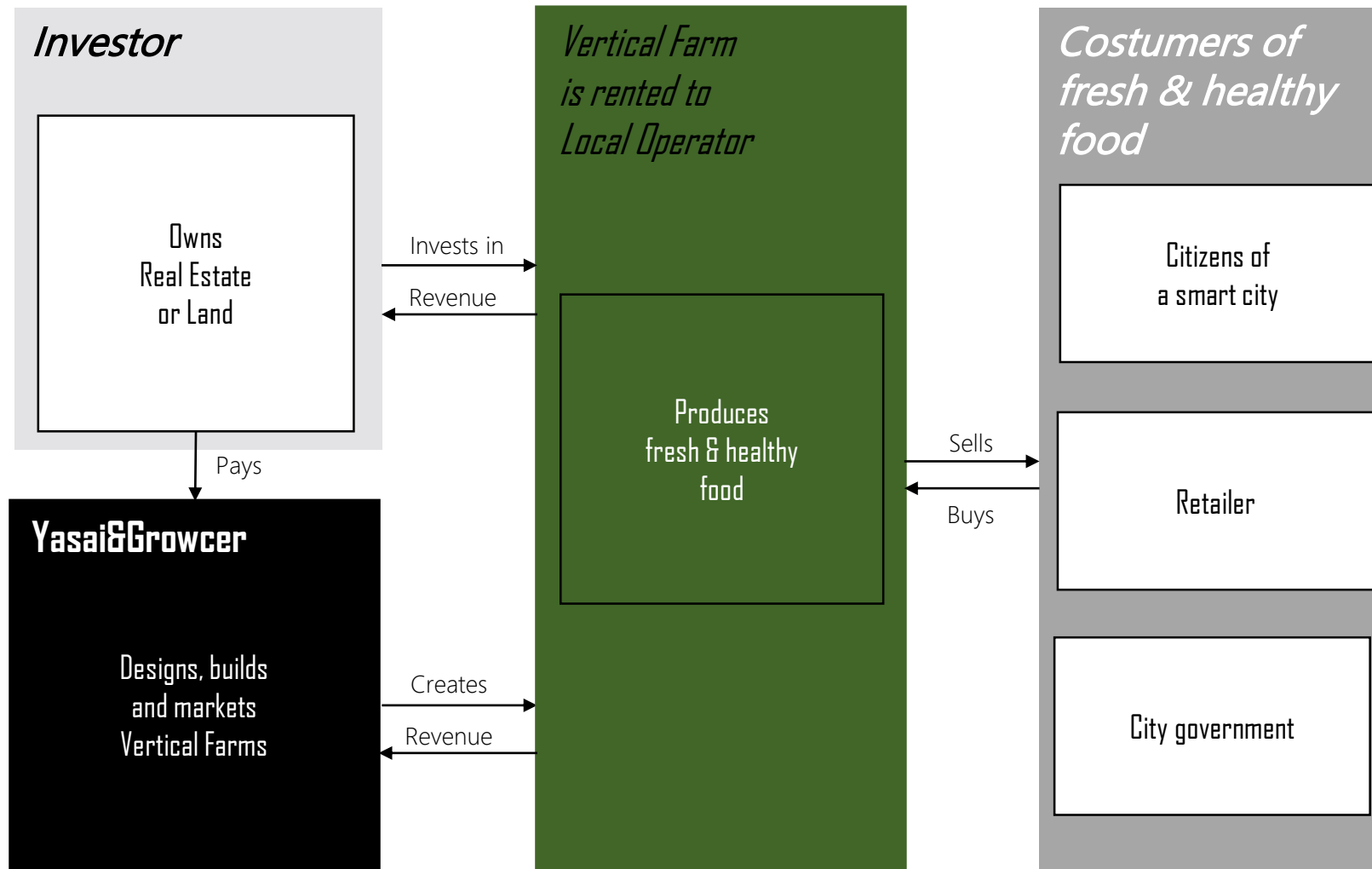
Global  
Vertical Farming Market



Growcer & Yasai have the potential to dominate a new market which is growing at 21% CAGR by 2022



# Business model



## CORE PRODUCT

Vertical Farm

- Design & Arch
- Marketing & Sales
- Technology & Ressources
- Plants & Seeds

## SIDE PRODUCT

Fresh & healthy food

- Branding & Marketing
- Sales chanel
- Customer relations



# Current projects



SBB Smart City Lab  
Urban Farm

**PROOF OF CONCEPT**  
TESTING FIRST  
AUTONOMOUS URBAN  
VERTICAL FARM

**M**



Lafarge Holcim  
Limestone Quarry

**SCALING**  
DESIGNING A PIONEER PROJECT  
VERTICAL FARM

**L**



# First Autonomous Urban Vertical Farm in Switzerland, Smart City Lab Basel Wolf

*SBB Smart City Lab*





# Proof of concept



**CAPEX: 1'000'000 CHF**

**Plants (Herbs; basil, mint and thyme): 35'000 kg → Revenue: 700'000.- CHF/a**  
**-OPEX: 262'500/a**

**Profit: 437'500 CHF/a (Amortisation within 2.5 years)**

# Stakeholders

## **Company**

Growcer

Yasai

NoTime

Retailer

SBB

## **Role**

Technology provider

Vertical Farming planer

LastMileDistributor

Costumer

Space provider

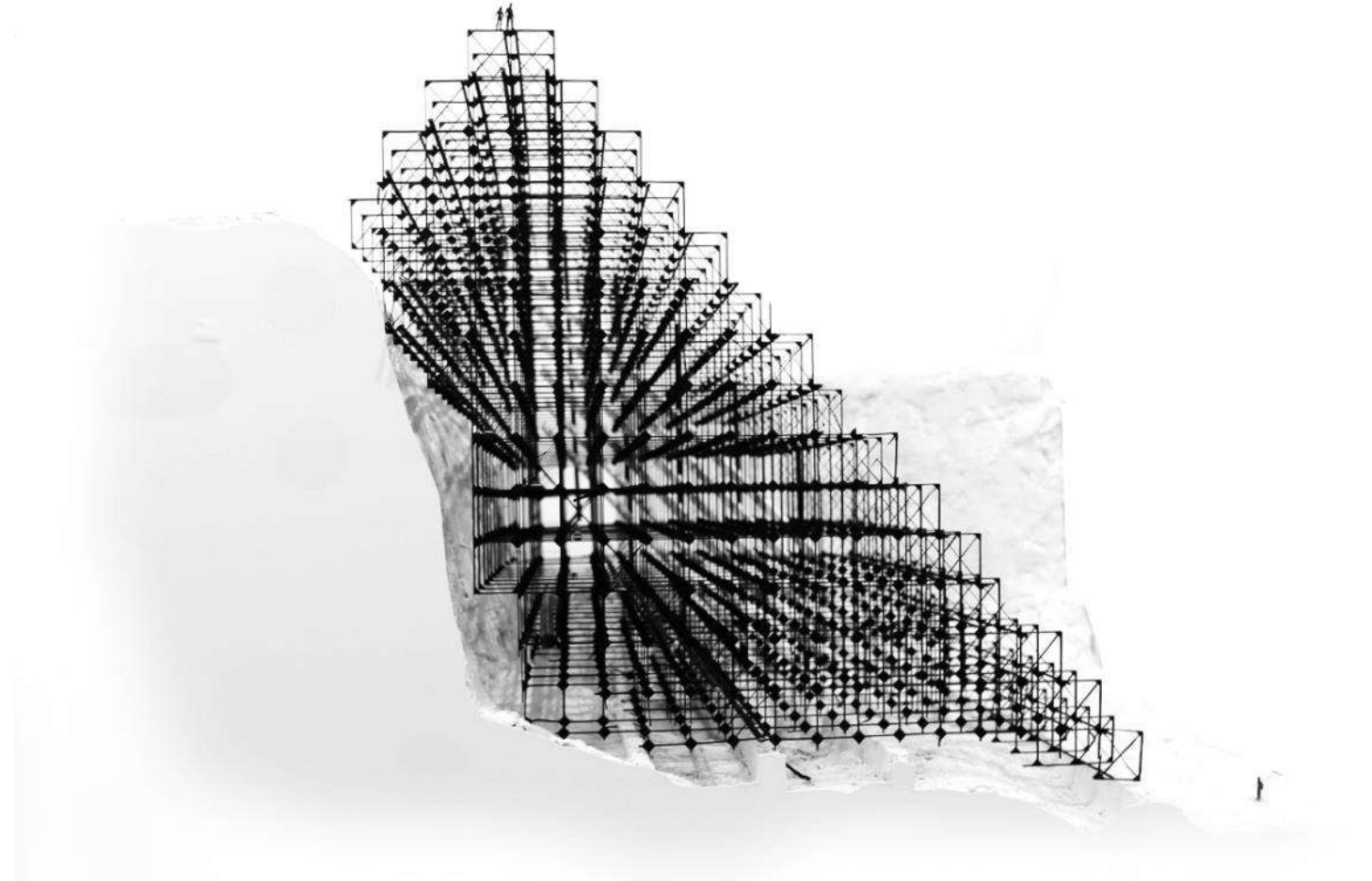
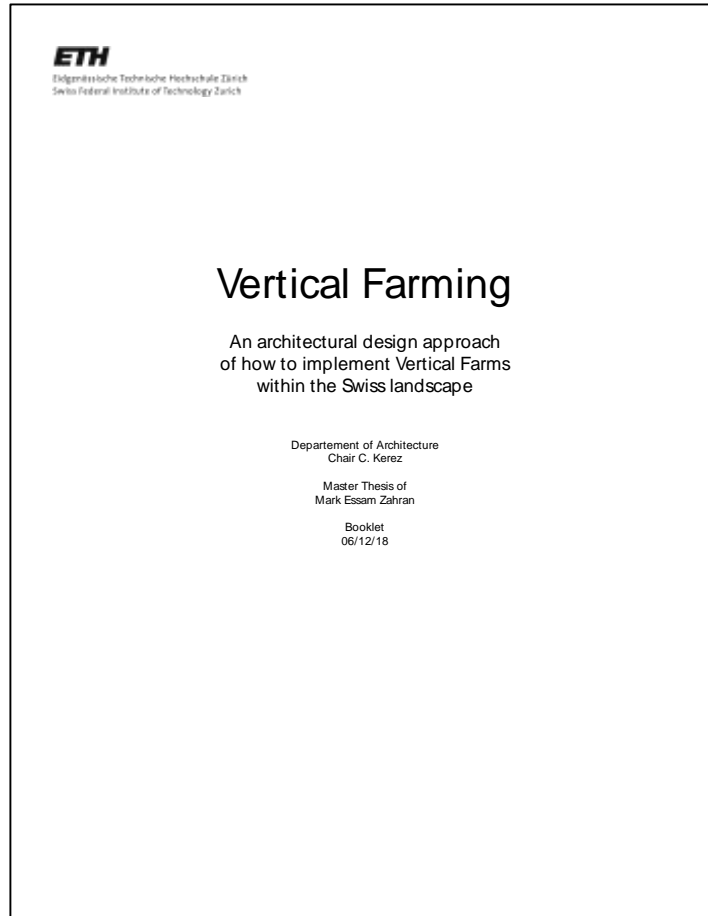


# Transforming a quarry into a Vertical Farm



# Connection to ETH technology

Master Thesis at D-Arch with theoretical paper and architectural design





# The largest Vertical Farm of the world!

200 m  
Diameter

40 m  
Height

1'256'637 m<sup>3</sup>  
Volume

31'415 m<sup>2</sup>  
Area



# Stakeholders

## Company

Growcer

Yasai

Fenaco

Migros/Coop

Lafarge Holcim

## Role

Technology provider

Vertical Farming Planer

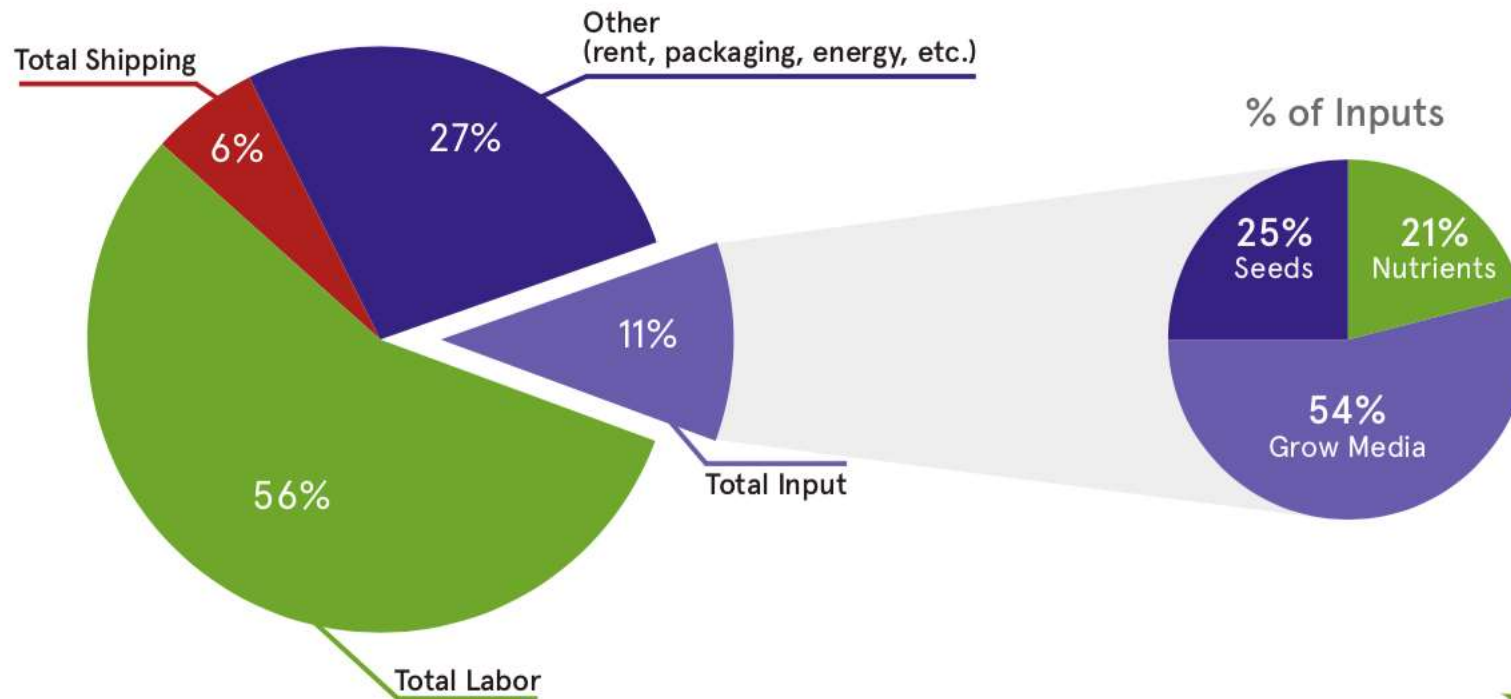
Operator

Costumer

Space provider



# Main cost factors of a Vertical Farm Today





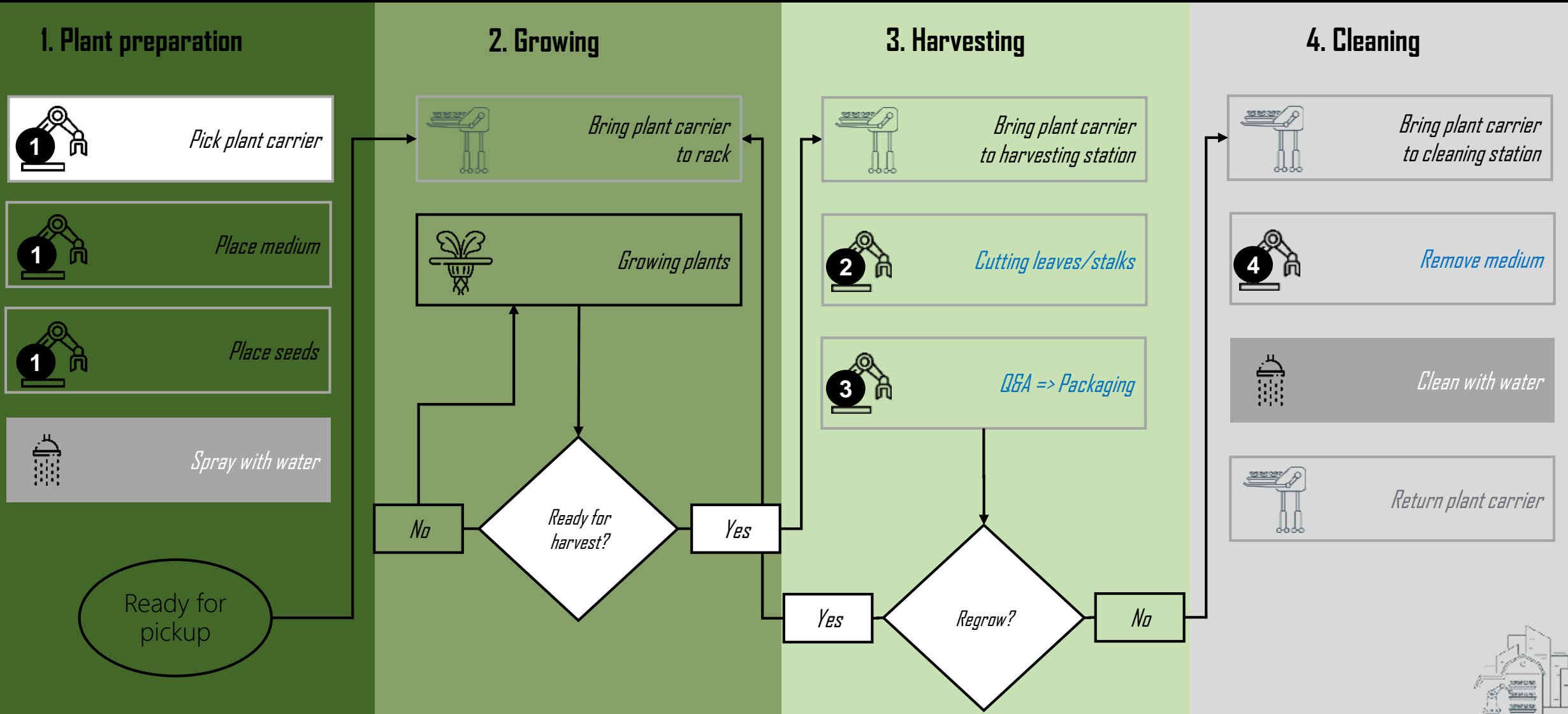


Let robots do the work

Moving plant carrier: [check video](#)



# AI & Automation

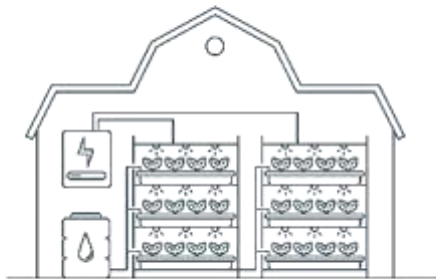


# Technology Trends



## AI & AUTOMATION

Less physical human labour, cheap prices  
and premium quality



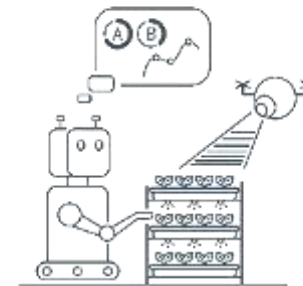
## CONTROLLED CIRCUAL SYSTEMS

Zero pesticides, 80 % less fresh water required  
and an all-year round supply



## DECENTRALISATION

Less food miles, less CO2 emissions  
and less food waste



## DIGITALISATION

Energy optimization, transparency  
and 24/7 services



# Controlled circular systems



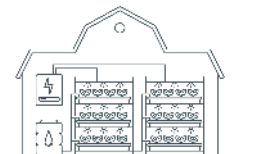
Zero pesticides



80 % less fresh water  
with hydroponic systems  
compared to traditional farming



All-year round supply

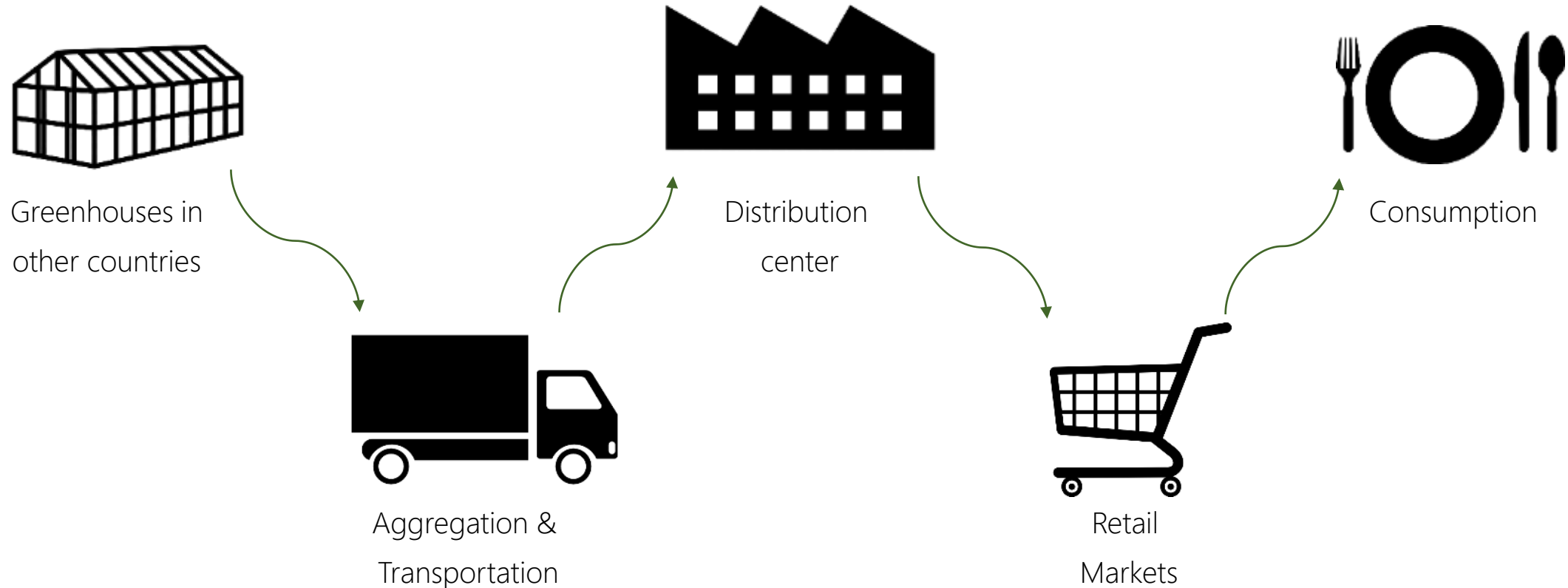


# Decentralisation

From food supply chain to . . .

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1500 food miles – 30 % of food wasted during transport<sup>1</sup>



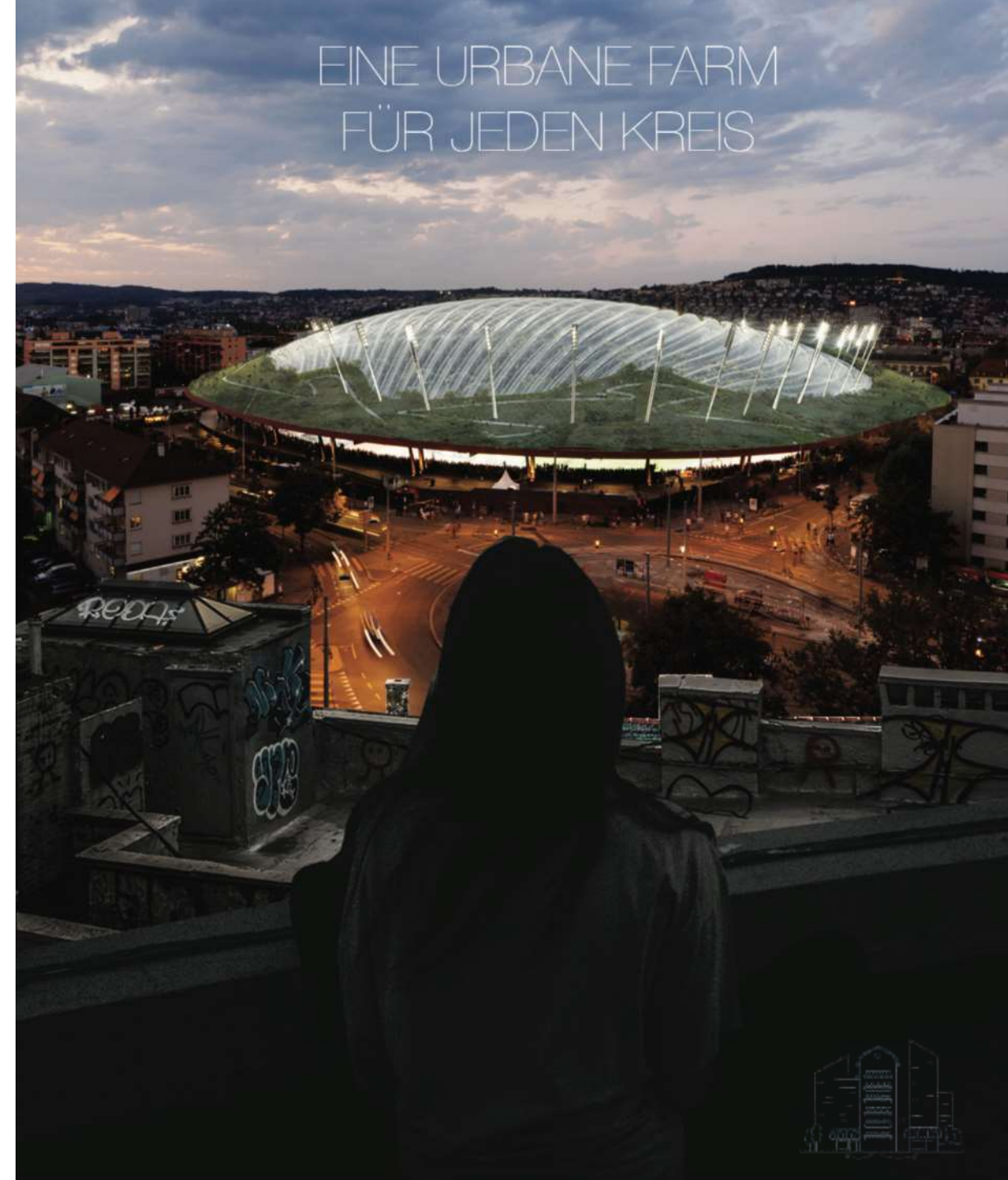
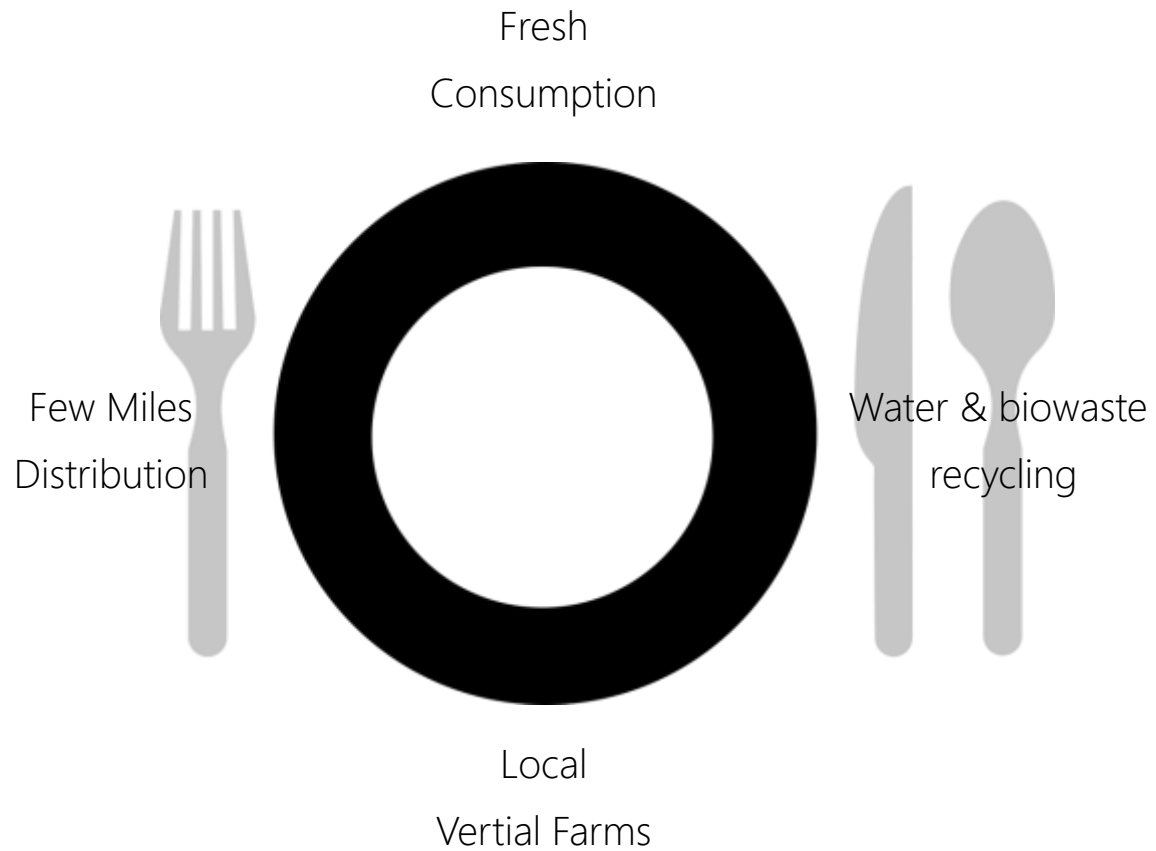
*Sources:*





# Decentralisation

... to food supply cycle



EINE URBANE FARM  
FÜR JEDEN KREIS



# Digitalisation

Smart farming in smart cities



100 % Transparency  
about the product

Data collection

Healthy food  
education

24/7 Service  
E-Commerce





# Unique Selling Proposition

## **AUTOMATED**

50% less OPEX and CAPEX  
than current Vertical Farms

## **HOLISTIC DESIGN**

We offer a holistic design and  
cover all aspects from  
architecture to plant

## **MODULAR**

Our Vertical Farms adapt to  
various spaces and are  
rapidly scalable

## **INTEGRATED**

By using synergies we can  
save energy costs

## **ECOLOGICAL**

Efficient use of resources  
based on closed loop systems

# Our supporter & business partner

## Business partner:



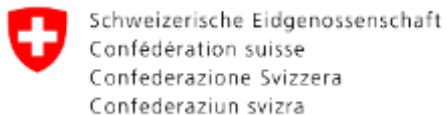
- Invests 30' 000 CHF in IT Infrastructure
- Co-Selling



- Announced official partnership
- Acts as a bridge for farmers



- Feasibility study and design of the largest Vertical Farm of the world



- Agroscope does 100% financed R&D on crops & varieties grown in our CEA

## Space providers:



Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich

- RocketHub, Zurich City
- StudentProjectHouse. ETH Campus



- StartUp Space by IFJ, Schlieren



- Smart City Lab, Basel Wolf

## Investors:

Here could be your name



# YASAI



Mark E. Zahran  
**MSc Architecture**  
ETH Zurich  
Founder & CEO Yasai



Elizabeth Ramirez  
**Business & Innovation**, EAFIT  
University, Medellin



Anouk Schaedler  
**Design in Trends & Identity**,  
Zurich University of Arts



Philipp Bosshard  
**Environmental Engineering**,  
Zurich University of Applied Science

# growcer



Marcel Florian  
**E-Commerce**  
FH Würzburg  
Founder & CEO Growcer



Rudolfo Rivera  
**Systems Engineer**  
TU Berlin



Dmitry Bondarenki  
**Software Engineer**  
Tu St. Petersburg



Dimitar Hristakiev  
**Robotics Engineer**  
TU München

# growcer & YASAI

GROW **MORE** WITH LESS

GROWCER & YASAI

[www.yasai.ch](http://www.yasai.ch)  
[www.growcer.com](http://www.growcer.com)



# How This Vegetable-Growing Startup Became 400 Times More Productive Than Traditional Farms

AeroFarms' 120 employees are reinventing how your kale and arugula are grown--in cities, and indoors.

in f t



By Kevin J. Ryan *Staff writer, Inc.* [@wheresKR](#)





# Dubai is getting the world's largest vertical farm — and it will grow produce for the world's largest international airport

Leanna Garfield Jul. 5, 2018, 12:20 PM



Crop One Holdings' vertical farm in Massachusetts. Crop One Holdings

- **Crop One Holdings, a Silicon Valley food startup, and Emirates Flight Catering (EKFC), one of the world's largest airline catering operators, plan build a 130,000-square-foot vertical farm in Dubai.**

## THE ROBO OF WALL STREET

No need to be a wolf to  
invest. Trade with the Swiss  
No. 1 Robo Advisor.

Discover

 Swissquote

December 2019



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## World's largest urban farm to open - on a Paris rooftop

The 14,000m<sup>2</sup> farm is set to open in the south-west of Paris early next year

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**Caroline Harrap**

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Early next year