UNIVERSITY OF LIMERICK
OLLSCOIL LUIMNIGH

DESIGNING FUTURES 2050
International design competition

THE FUTURE OF FOOD

Creating more organic household spaces

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INTRODUCTION

Current State

Food waste is a critical global issue, with approximately **931 million tonnes of food wasted annually worldwide**, contributing to **8-10%** of global greenhouse gas emissions. At the household level, food waste accounts for a significant portion of this total, with **61% of global food waste originating from homes**. In Ireland alone, an estimated 250,000 tonnes of food are wasted by households each year, costing Irish consumers an average of €700 annually. This waste not only represents lost resources and financial inefficiencies but also has severe environmental impacts, as wasted food decomposes in landfills, releasing **methane—a greenhouse gas far more potent than carbon dioxide**. This is a multifaceted problem driven by factors like over-purchasing, lack of knowledge about storage and expiration dates, and improper meal planning.

As climate change intensifies and resources become scarcer, reducing food waste is becoming increasingly essential. Tackling household food waste offers a high-impact opportunity to reduce emissions, save resources, and promote sustainable practices.

Currently, 29% of all food waste in Ireland is generated at a household level.

There is a need for a development in innovative solutions for the future that can effectively manage food preservation and/or food waste prevention amongst limited resources.

SDG GOALS

Overview

APPROACH TO ISSUES↘

What changes, adjustments and introductions can be done to help achieve the wellbeing for all mankind formulated by the sustainable development goals by 2050?

DO WE TRULY UNDERSTAND HOW PEOPLE INTERACT WITH FOOD?

Globally, food waste remains a critical issue, with households contributing significantly due to improper storage, over-purchasing, and a lack of understanding. People often value convenience over sustainability, prioritizing aesthetic appeal and effectiveness, leading to unnecessary waste. This raises questions about whether the kitchen environment is built to support the needs of modern households or if it merely accommodates storage dictated by industry standards rather than user behavior.

DO PEOPLE TRULY VALUE FOOD AND UNDERSTAND ITS ENVIRONMENTAL IMPACT?

There is a need to understand these present-day interactions between people and food, especially looking at the lack of accountability of consumers. How can we address the power imbalance caused by large corporations that dictate shopping behaviors through bulk packaging and inefficiencies? Do we truly know the consumer's needs, and not necessarily what they want but what they need to have for a better life. To create meaningful change, nature as the non-human stakeholder must be put into the design equation for creating a better vision of the future.

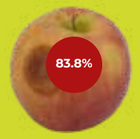
APPROACH TO ISSUE

Through this project, the goal is to design a system **where nature and engineering** merge seamlessly to create kitchens that foster sustainability. By leveraging **biomimicry and speculative design principles**, the project proposes solutions that transform kitchens into organic, living environments, enabling better food preservation, reduced waste, and **a deeper connection between people and their food**. This future-forward vision calls for a holistic redesign of household spaces to prioritize sustainability and align with modern behaviors while addressing environmental challenges.

Primary Research

UNDERSTANDING WHY PEOPLE WASTE FOOD...

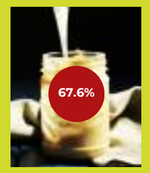
The Anonymous Behavior Survey was designed to uncover attitudes, knowledge, and behaviors around food storage, freshness, and waste. Conducted anonymously, the survey allows participants to respond openly and honestly, providing authentic insights into their food management habits.
- There was 37 participants.



83.8% of people chose to bin the bruised apple (which is still safe to eat), reflecting a preference for discarding produce over cooked foods, perhaps due to a sense of "fullness" in a prepared meal versus a raw item or preference in aesthetics. The 16.2% who chose to bin the leftovers suggest that the person feels like it's less "worth saving" than whole foods like fruits.

With a close match, 51.4% of people chose to bin the yoghurt, It reveals a strict adherence to expiration dates, particularly for dairy. It suggests a potential lack of awareness that "best by" dates are quality indicators rather than safety limits. The 48.6% of people might not have the education or time to see that stale bread can actually be revived.

73% of people chose to bin the wilted lettuce, even if It can be revived. This indicates the rice again has more value over being cooked/more nutritious. Three day old rice is fine to eat as long as it is not reheated. 27% of people chose to bin the rice that shows this heightened caution and education.



67.6% of people chose to bin the peanut butter, this could indicate a mindset that small amounts aren't "worth" preserving. The 32.4% who chose to bin the banana might indicate a preference for discarding foods with visual imperfections, particularly fruits since they are cheap

This was another close match. The bins are different that one of them is bigger and with fresher produce while the other is smaller with molded produce. This indicates that when looking at a bin people don't take into account the difference between the two.

▶▶ WHAT TYPES OF FOOD DO YOU THROW OUT THE MOST IF ANY AND WHAT IS A COMMON REASON WHY?

Common food types that were discarded included:

- Dairy (milk, yogurts), Meat (chicken, sausages), Vegetables (lettuce, spinach, salad mix, grapes, cherry tomatoes)
- Bread, Vegetables (lettuce, bottom of fridge items), Dairy
- Salad mix, lettuce, spinach, large packs of vegetables, cream cheese
- Bread, Cheese, Fruit (goes “furry”)
- Leftovers, Meat, Dairy
- Vegetables in large plastic packaging

Reasons for discarding included:

- Going bad quickly, expire before they’re used up
- Forgotten in fridge or cupboard
- Packages too large for single or small households
- Visible mold, spoilage
- Concern about food safety due to appearance or smell
- Excess quantity due to packaging leads to spoilage

Many people prioritize aesthetics, safety concerns, and perceptions of value when deciding what food to discard, often throwing away items like bruised fruits, dairy, and leftovers due to appearance, expiration dates, or uncertainty about freshness. This highlights a need for better food awareness, education, and practices to reduce waste caused by caution and convenience.

Qualitative Data

FOOD ATTITUDES - INTERVIEWS

A short survey was sent out through Google Forms to gen x participants to investigate their attitudes towards food prep at home and convenience. There was 8 participants, random responses were selected for this section.

▶▶ CAN YOU DESCRIBE RECENT MEAL WHERE THE TEMPERATURE (HOT OR COLD) MADE A DIFFERENCE IN YOUR ENJOYMENT? WHY DID IT MATTER TO YOU?

- Cold Chicken goujons. This mattered to me as i feel in my opinion hot goujons are far more tastier and enjoyable than cold.
- I ate chicken pesto pasta yesterday and it was hot. I prefer eating chicken hot as it tastes better.
- A warm coffee in the morning is lovely, its better than a cold one as it wakes you up more.
- I had cold pasta because I was out and didn't have access to a microwave . And it was harder to swallow and just not as enjoyable.

▶▶ WHEN YOU THINK ABOUT PREPARING A MEAL, HOW DO CONVENIENCE AND HEALTH PLAY INTO YOUR CHOICE? CAN YOU GIVE AN EXAMPLE?

- Convenience and health both play into my choice as i usually choose high protein microwavable dinners from shops.
- I typically use what I already have in the fridge so convenience is a big part of what I prepare. Health: I try to make add as many different-parts of the food pyramid into my meal to when I'm cooking but it depends on how I feel that day and how hungry I am.
- I get frozen chicken as I can keep it in the freezer for longer because I live far from a shop. Convenience is an important factor
- I have tried to make sure I have a source of protein in the food I eat to keep up energy. (Eg: I made korma yesterday and didn't have chicken so I got tofu and lentils to put in) it added a lot to the meal because it felt healthier.

▶▶ HOW IMPORTANT IS IT FOR YOU TO HAVE CONTROL OVER THE INGREDIENTS IN YOUR MEALS, AND HOW DOES THIS AFFECT YOUR FOOD CHOICES?

- I am not allergic to any food therefore i don't mind the control over the ingredients in my food, as long as there isn't too much salt or fats.
- It isn't too important to me, as long as it tastes good and isn't bad for me.
- Quite important as there are certain foods a don't like but it's not a be all and end all situation.
- It's important to me but not the biggest worry. It can affect me food choice if there are ingredients I don't like the taste and texture of, I may avoid buying those meals or making them

Meal satisfaction is driven by temperature and convenience, with health considerations and familiarity influencing choices, often shaped by past experiences or uncertainties. The findings highlight the need for balanced, accessible food options that address health, taste, and trust, while fostering confidence in exploring new foods.

Interaction Study

COOKING CHALLENGE

Individuals where asked to cook meals to study the daily interaction they have with food at home - three users from low-high skill levels were observed, and their differences, education and experience were documented - what skillset and knowledge can help play a part in ‘smarter’ cooking and using less waste?

Meal chosen for Low Skill Level

Meal chosen for Medium Skill Level

Meal chosen for High Skill Level

▶▶ SHOPPING & MEAL PLANNING

Both high skilled and medium skilled buys weekly produce that they need for the house. They cook quite often. The low skilled user does not plan his meals, or only plans one at a time. There is a huge **gap in knowledge** between the low skilled and medium skilled user.

- Higher cooking skills correlate with better planning and less waste. They also demonstrate flexibility in meal planning.

▶▶ STORAGE PRACTICES

The medium skilled user is limited in fridge space and has no composting options due to location. However both high skilled and medium skill utilizes containers efficiently unlike the lower category.

- Proper storage practices are adjacent to cooking skills.
- The low skill user is singled out again.

▶▶ FOOD DISPOSAL

The high skill cook has access to a bin, the medium does but the facilities don’t allow it and the low skilled user does not have a brown bin and uses general.

- Regardless of skill level, lack of composting/proper disposal options result in unnecessary and dangerous waste (methane).

Secondary Research

WHY IS FOOD WASTED?

2019 REPORT IN IRELAND ON WHAT GETS THROWN OUT THE MOST (EPA):

- **VEGETABLES: 11%**
- **BREAD: 9%**
- **MEAT: 8%**
- **POTATOES: 7%**

GLOBAL FOOD WASTE

In **high-income households**, average food waste per capita is 81 kg, highlighting potential waste from over-purchasing or consumer preferences favoring convenience foods that may expire more quickly. (UNEP, 2024)

81KG OF FOOD WASTE PER CAPITA.

People do not **appreciate the value** of food in modern times due to the convenience and lack of accountability they have over actually taking care, delivering and preserving food.

LACK OF VALUE

Irish consumers are **increasingly busy** (time-poor). Often parents work two full-time jobs and no one is home to prepare meals from scratch. (Bord Bia, 2020)

NO TIME

There is almost too much choices in today's grocery markets for people, with constant life-style changes, bulk quantities and lack of responsibility food gets forgotten.

CHOICE

Impacts

CONSUMER TRENDS

ACCORDING TO THE GSS (US), IT TAKES 41 MINUTES AVERAGE TO DO YOUR WEEKLY GROCERY SHOP.

THE WAIT TIME FOR RESTAURANT FOOD IS 23 MINUTES (US).

ACCORDING TO THE LATEST CIVICSCIENCE DATA (US), PEOPLE RECEIVE THEIR FAST FOOD ORDER WITHIN 2-3 MINUTES,

THE AVERAGE TIME TO MICROWAVE YOUR FOOD IS 2-4 MINUTES PER MEAL.

Classic 'meat and two veg' is the number one evening meal type eaten by adults in 2019, accounting for 11% of all adult evening meals across the 7 days. Chicken dishes and pasta with sauce meals, such as Spaghetti Bolognese, were in 2nd and 3rd spot at 10%. (Bord Bia, 2020)

Smaller meals and snacks are changing evening meal dynamics, with 17% of all evening meals no longer the main meal of the day. There has been a 12% decline in regular from scratch cooking among Irish adults, from just over 4 in 10 adults in 2011 to 3 in 10 in 2019.

Today's consumers want convenience, but don't want to skimp on nutrition or quality. Whether the choice is expensive, or not nutritious they will choose the fastest way to get food when they are hungry.

Consumers prioritize speed and convenience when it comes to food, opting for fast food in 2-3 minutes, microwaving meals in 2-4 minutes, or waiting an average of 23 minutes at restaurants. This shift, combined with a rise in smaller meals and snacks and a decline in home cooking, highlights the need for efficient, nutritious, and sustainable food options that balance convenience with environmental impact.

Possible Opportunities

DISPOSAL

What currently happens to food waste?

The majority of food waste ends up in **landfills**, where it decomposes anaerobically (without oxygen), releasing methane—a potent greenhouse gas that contributes significantly to climate change.

Some food waste is **incinerated**, where it is burned along with other waste. While this process reduces landfill volume, it generates carbon dioxide and other pollutants.

In some regions, food waste improperly **disposed of in drains** can end up in waterways, where it pollutes rivers, lakes, and oceans

Organic waste sent to landfills decomposes and produces 15.1% of U.S. methane gas emissions, according to a report from the Environmental Protection Agency (EPA). Municipal solid waste (MSW) landfills are the third-largest source of human related methane emissions in the United States, behind enteric fermentation (28%) and natural gas and petroleum systems (28%).

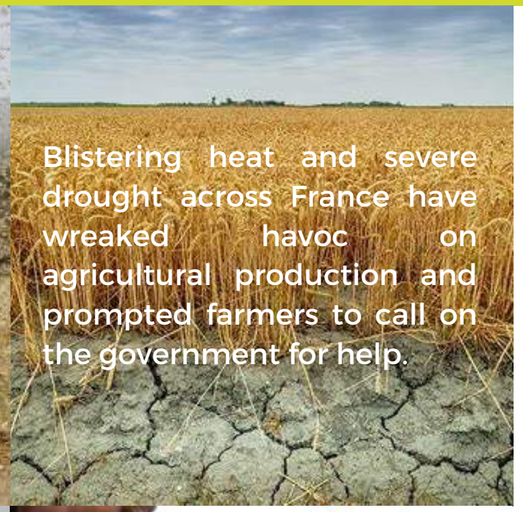
What should happen to food waste?

While some of it should be thrown away, many food scraps actually still have some utility, if we give them a chance. Many items that we prepare – whether fruits, vegetables, or other kinds of leftovers or food scraps – end up in the trash long before they have been utilized to their fullest extent.

- **Biochar** is a form of charcoal created by slowly burning organic waste materials. At home, a simplified, no-energy biochar-making device could convert food scraps into biochar.
- By **air-drying** peels, vegetable scraps, or herbs in a low-energy drying rack, these dried scraps can later be used as plant fertilizers or animal feed.
- **Bokashi composting** uses a natural fermentation process that can occur indoors. This process ferments food scraps (even meat and dairy), transforming them into nutrient-rich soil additives.
- **Drying and pressing food** waste into small pellets creates a multipurpose product that can be used as bedding for animals (e.g., for rabbits or chickens) or even as low-grade fuel for compost heating systems.

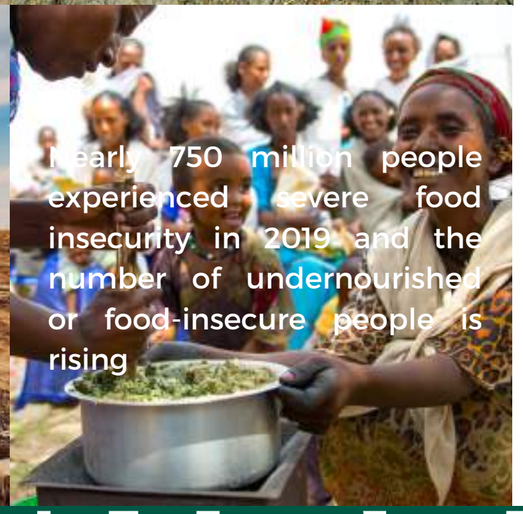
Reducing food loss and waste, which account for 8% of greenhouse gas emissions globally, is low-hanging fruit to reduce heat-trapping emissions. Adopting more sustainable diets, in particular shifting away from meat consumption, while difficult for social and cultural reasons, could lead to an 80% reduction in greenhouse gas emissions from the agriculture sector. (UNEP, 2021)

Swarms of locusts — provoked by unusually heavy rains — are destroying crops across large swaths of East Africa and Southwest Asia, disrupting food supplies.



Blistering heat and severe drought across France have wreaked havoc on agricultural production and prompted farmers to call on the government for help.

Yield growth for wheat, maize, and other crops has been declining in many countries due to extreme heat, severe weather, and droughts.



Nearly 750 million people experienced severe food insecurity in 2019 and the number of undernourished or food-insecure people is rising

Current Initiatives

Geneva - Free-Go

A Geneva-based not-for-profit initiative is providing free-access public refrigerators and food shelves on city streets, so cooks of all descriptions can stock them with food that's about to go bad. People passing by can then help themselves to fruit, vegetables, bakery products and other perishable food items at no cost.

Saudi Arabia - Hydroponic Agriculture

Mishkat specializes in hydroponic agriculture in Saudi Arabia and aims to ensure food security by reducing the country's reliance on imported foods. By cutting supply chain waste, it can deliver its produce from harvest to the end consumers within 45 minutes, thereby reducing waste from 40% to close to zero.

Australia - Farmer's Pick

Awkward potatoes, conjoined carrots, bulging strawberries and hail-blemished oranges have long had an image problem. Unloved by food retailers, they are among the millions of tons of food wasted in Australia each year. But in Australia, these irregular perishable items now make up cut-price 'imperfect' fruit and vegetable subscription boxes that are delivered to consumers.

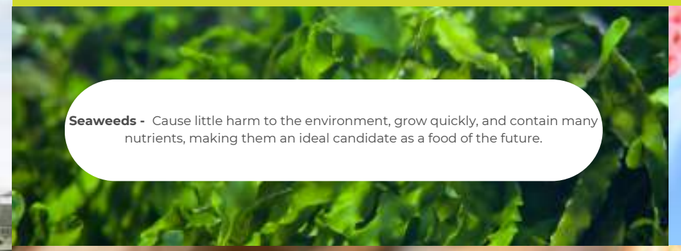
South Korea - FW Initative

Special bins around the city are set up to weigh and record food waste. Citizens simply dump in their waste and receive their bill. The waste is then converted to animal feed or energy. Citizens can also throw food waste in the trash, if they purchase special garbage bags, or take food waste to one of many compost bins, which also charge a small fee.

FUTURE RESILIENCE

What does the Vision of The Future Need?

Alexander, R. (2024). city of the future 2050.



Seaweeds - Cause little harm to the environment, grow quickly, and contain many nutrients, making them an ideal candidate as a food of the future.

Lab-Grown Meat - The first burger made of lab-grown meat cost a whopping $325,000 to make back in 2013. However, dozens of startups and companies are currently involved in developing lab-grown meat.

Insects - Close to 2 billion people on earth already practice entomophagy. Edible insects have been consumed by various cultures for centuries and may be integral to the future of food security.

Plant-Based Meat: A lot of research is going into the area of crafting plant-based meats. A molecule called heme that can carry the taste and texture of meat is being adapted for uses in new food products.

80% OF FOOD WILL BE CONSUMED IN CITIES BY 2050.

There is a big shortfall between the amount of food we produce today and the amount needed to feed everyone in 2050. There will be nearly 10 billion people on Earth by 2050—about 3 billion more mouths to feed than there were in 2010. As incomes rise, people will increasingly consume more resource-intensive, animal-based foods. (Hobert, R, 2020)

Eating Differently?

OLDER CITIES

BUILT WITH HUMAN CONNECTION IN MIND

- Narrow Streets
- Buildings Close Together
- Home & Work Environments mixed.
- Central Public Spaces

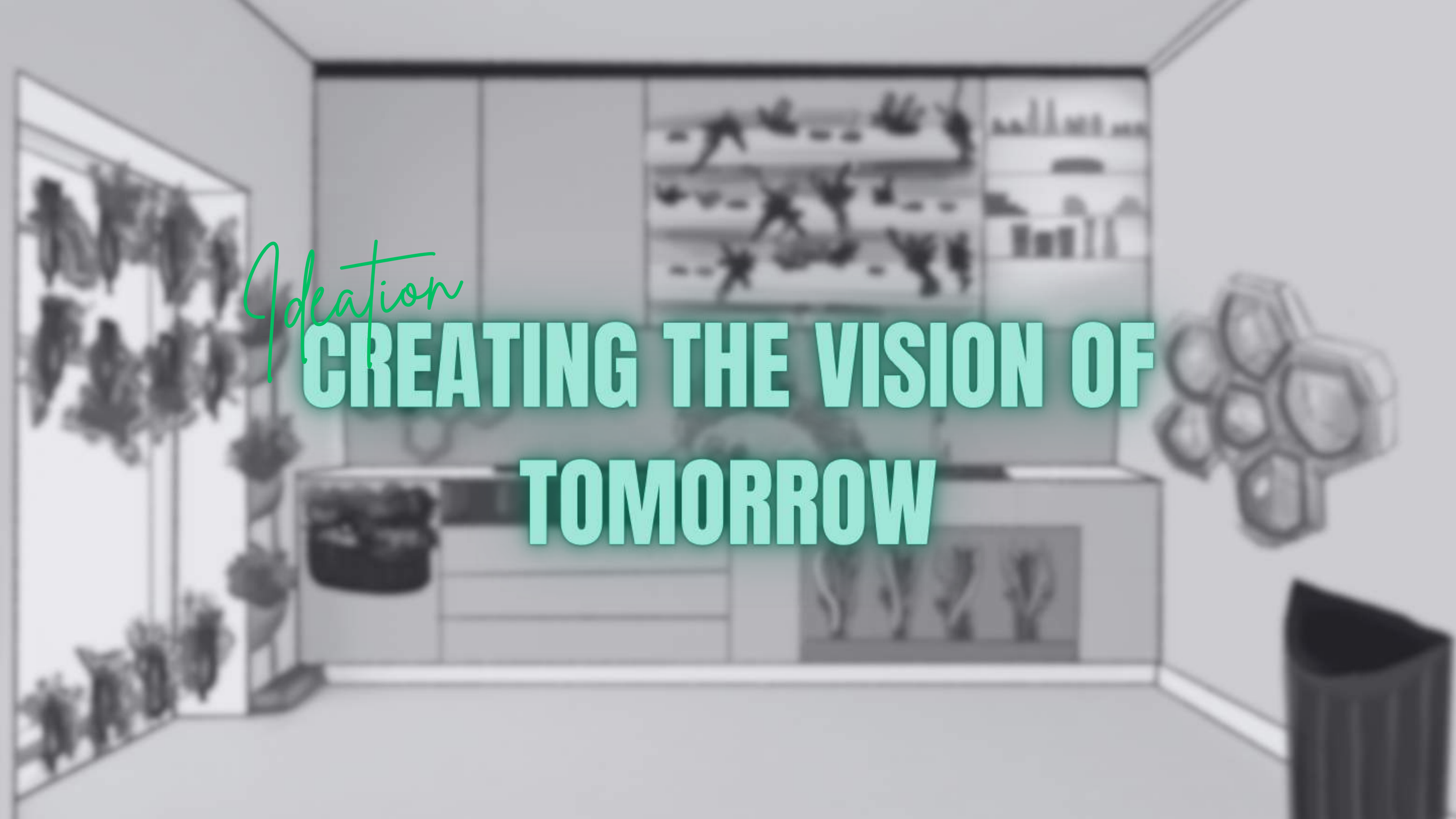
OUR CITIES

BUILT FOR CARS

- Wide Roads
- Houses built far away from centers
- Parking lots

FUTURE RESILIENCE

What could 2050 look like?


Ideation
CREATING THE VISION OF TOMORROW

Can you be Self Sustainable?

HYDROPONIC FARM

I decided to try build a small hydroponic farm to see if this idea is feasible for people to incorporate as a part of their lives. The materials and tool parts I needed had a cost of over 100 euro, however this was for things that simply weren't available in the shops, like buying a hose for 27 euro, even though I only needed about 3-4 meters of it.

MANUFACTURE

Air ducts had to be used instead of a PVC plumbing pipe as it was not available locally. This added an extra step to the process as air ducts don't come with end caps therefore I had to 3D model and print some. I also had to glue it in the middle as the ducts weren't long enough, which meant I had to use silicone and it could be the potential for more leaks. I also had to get a special drill bit to drill the holes for the plant pots to sit in. Which was another 29 euro. The majority of the plants part had to be ordered online, growing pots, growing sponge, clay pebbles to fill the pot and a water pump.

The process of making it in general wasn't hard - but it did take time. It was raining and windy which also slowed down the process.

END RESULT?

The farm had to be put outside for the time being (because there were a number of tiny leaks), which was not ideal at all because the temperature that week was -3 degrees. Ideally it should be kept inside near a window, however it was not possible even with how bulky the setup was. I wasn't expecting anything to grow in the middle of the winter either. The water level was tricky to figure out as it was to low at the start and too high when we switched the hose ends. However overall once it was sorted it worked pretty well. I left it alone for a couple minutes and the hose ended up slipping out and spilling all over the floor however.

This is one of my first experiences with DIY work, and I didn't expect it to be perfect. With some design changes and better craftsmanship this would be a great idea. It is much less bulky (besides the bucket), than having a soil garden, and I could imagine with the right fittings it could fit right into a home, the water pump is not too loud and is actually quite satisfying.

This will further aid in the research of creating a feasible future for food.

Trip to the Eco Village

CLOUGHJORDAN

Cloughjordan Ecovillage is the village with the lowest carbon footprint in Ireland. They thrive through democratic organizing, healthy organic food and enriched social lives while minimizing ecological impact. I wanted to visit them in early January but due to the heavy snow I couldn't, therefore they provided me with their articles.

▶▶ APPLE PICKING FESTIVAL

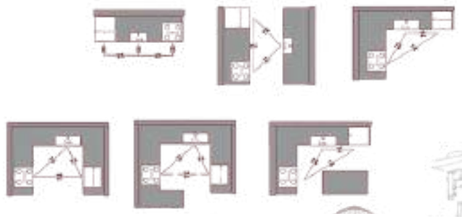
Cloughjordan provides numerous activities to educate the public. Residents grow their own food using permaculture principles, which emphasize working with natural systems rather than against them. The community also operates a shared farm where food is cultivated collectively, ensuring fresh, seasonal produce while reducing the reliance on imported goods. This focus on local food cycles mirrors the concept of vertical and hydroponic farming within urban spaces, reducing the carbon footprint associated with food transportation.

BUTTERFLY MONITORING SCHEME

Cloughjordan also focuses a lot on waste reduction and water recycling, which fits with my goal of creating a closed-loop kitchen system. They use composting toilets, rainwater collection, and greywater recycling to make sure resources are reused instead of wasted. This mirrors my ideas of capturing steam from cooking, reusing sink water for hydroponic plants, and composting food scraps for nutrient-rich soil—showing how everyday habits can become part of a circular, sustainable system.

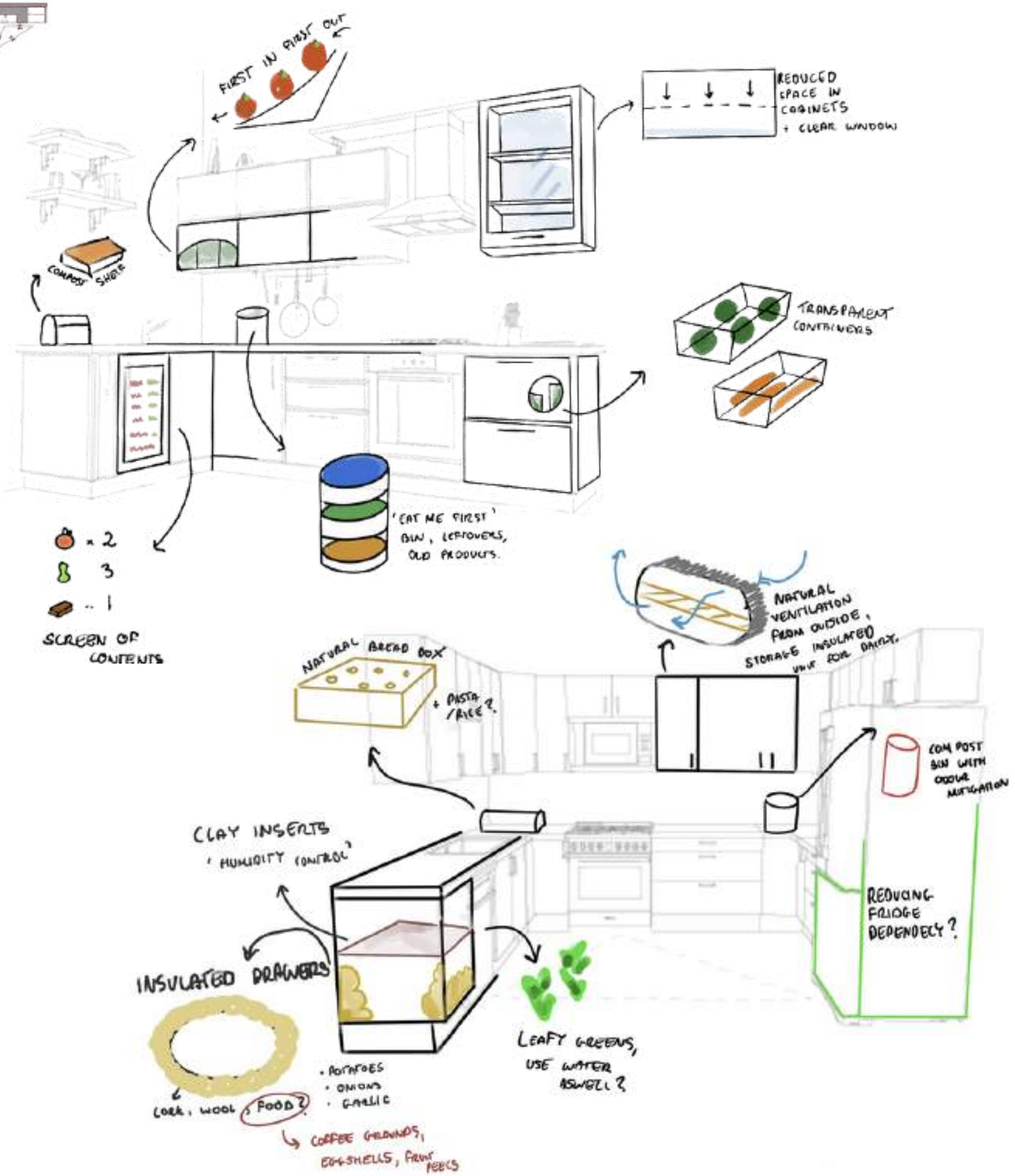
Cloughjordan also stands out because it builds a stronger connection between people and the food they eat. By involving the whole community in food growing and composting, it helps people see the value of their food and how much work goes into producing it. This mindset shift is a big part of my project too—when food is grown closer to where we live, like in hydroponic pods or community farms, it becomes part of daily life rather than something disconnected. It encourages people to waste less, appreciate their food more, and think about how their choices impact the environment.

KITCHEN SPACE



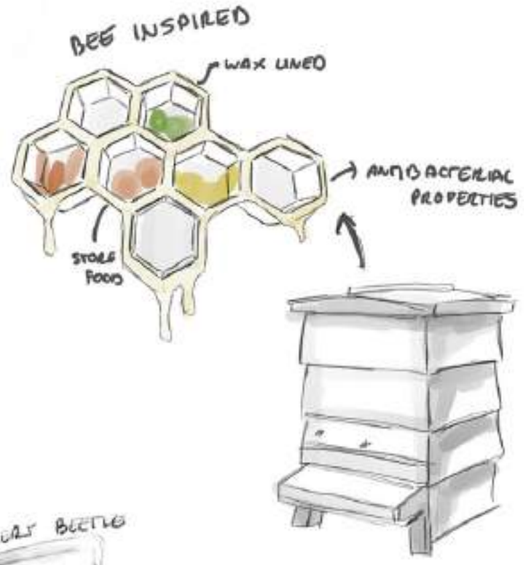
Modern kitchens focus a lot on aesthetics rather than practicality.
There are some common inefficiencies with layout that don't follow the work triangle.
There is frequent waste of space as tall upper cabinets are rarely utilized.
Kitchens can become cluttered and overwhelming really easily, especially after shopping.
Even with the amount of cupboards in the kitchen, some spaces can become overcrowded really easily, along with this most cupboards are designed in a block shape that might not suit items that are round etc.

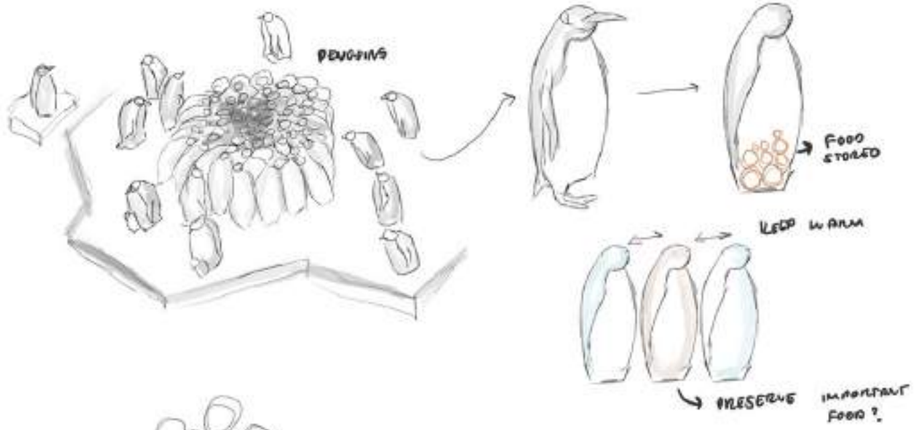
Here we explore the redesign of kitchens by looking at the problem findings.

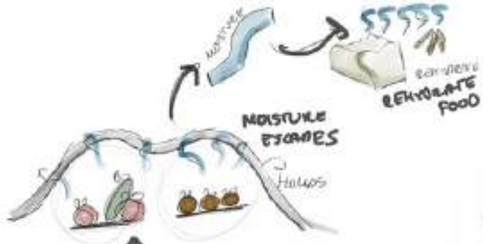


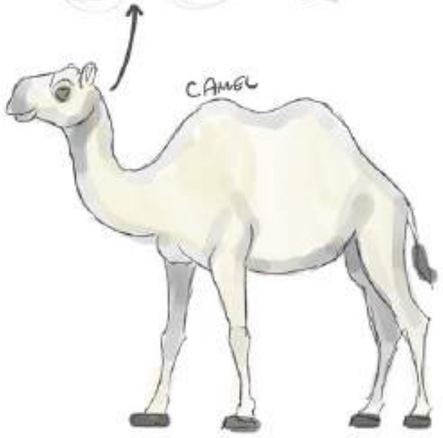
INSPIRATION FROM NATURE

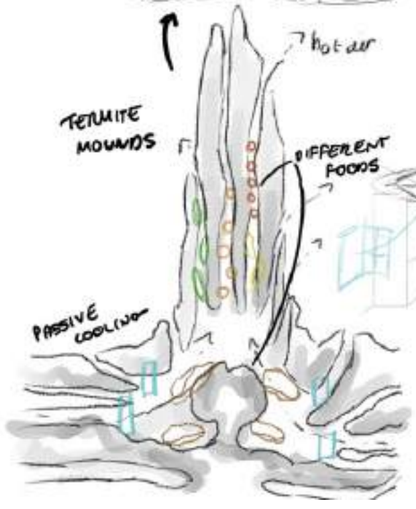
From termite moulds to camels, nature offers a lot of naturally engineered solution (through biomimicry) that could help looking at an innovative solution for a better quality of ‘life’ for food in the home environment. This page explores these concepts.

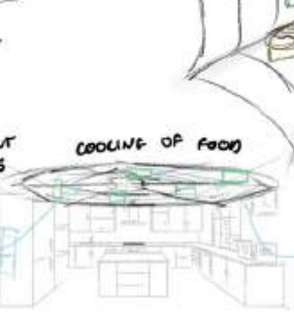


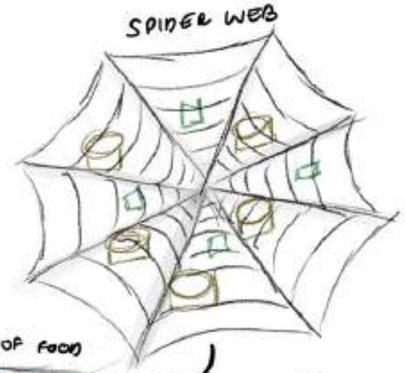






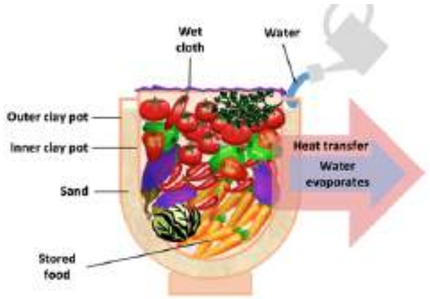






NATURAL PRESERVATION

Insights from the secondary research showed that unreliable refrigeration and rising energy costs were challenges for both urban and rural users. The ideation theme of "Future Resilience" directly helped this direction, emphasizing a need of low-tech, natural preservation methods for the vision of the future.



Peace Lily (Spathiphyllum)

Areca Palm (Dypsis lutescens)

Natural Dehumidifiers...

Plants to absorb moisture from the air, maybe combined with rock salt or activated charcoal due to it's hygroscopic properties.

"Clay Pot Cooler Training in Mali: Outcomes & Impacts"

By Laura Mogannam et.all

"Functioning through the principle of evaporative cooling, clay pot coolers provide a cool and humid environment to store fruits and vegetables, increasing their shelf life. "

In addition to the 73% of respondents who used a clay pot cooler, an additional 8% of respondents (22 people) did not use clay pot coolers, but reported other c**hanges in the way they store fruits and vegetables**. The changes these non-users reported include separating their produce based on **ethylene compatibility** guidelines provided in the training and covering a basket with a damp cloth. One-hundred percent (100%) of clay pot cooler users said the performance of the clay pot cooler is better than their previous method of fruit and vegetable storage at home.

These results indicate that the increased shelf life of fruits and vegetables enabled by using a clay pot cooler can lead to better nutrition for populations vulnerable to deficiencies.

Therefore the idea works and is good however can't be implemented all over the world because;

- Only works best in dry climates because water can easily evaporate.
- Ambient temperature are already low in colder countries, so it cannot evaporate as efficiently.
- Seasonal variations make a huge difference.

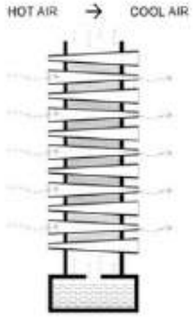
Possible solution would be to use a natural dehumidifier...

"Honeycomb-Like Structure can cool down any building..."

By Aeyesha Arif

"The DEKI air conditioner is inspired by the ancient cooling methods, but the size and structure of the components have been modified with Computational fluid dynamics (CFD) analysis.

The room temperature water recycled from the factory is poured back into the structure in a fountain flow, so it **runs down the cylinders and cools the hot air passing through it.** The system works all day, requiring to wet the cones only twice a day. The system has been found to cool the hot air at 50 degree Celsius (122 degrees Fahrenheit) down to 36 degree Celsius (96 degrees Fahrenheit) at an air flow of 4 m/s.



Possibility of integrating passive cooling panels with Phase Change Materials (PCMs)?

incorporating specific proteins into water, transforming it into a phase change material (PCM) that alternates between solid and liquid states. This modified water has a higher freezing point than regular water, resulting in solid ice that is more resilient to temperature fluctuations**. PCMS can potentially absorb the heat from stored food and maintain a stable and cooler temperature.**

NATURAL PRESERVATION

Continued exploration with research...

“Impregnated Sheep Wool Fibers with an Antimicrobial Effect...”

By Simiona-Biance Ghimis et. all

Explores enhancing coarse wool from the Romanian Țurcana sheep breed to create sustainable and efficient thermal insulation materials with antimicrobial properties.

“Land-Cultivated Seaweed Gets a Big Boost from Wastewater...”

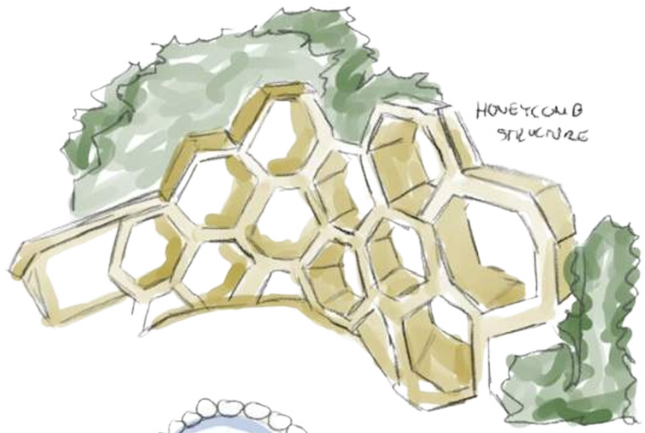
By Shea Swenson

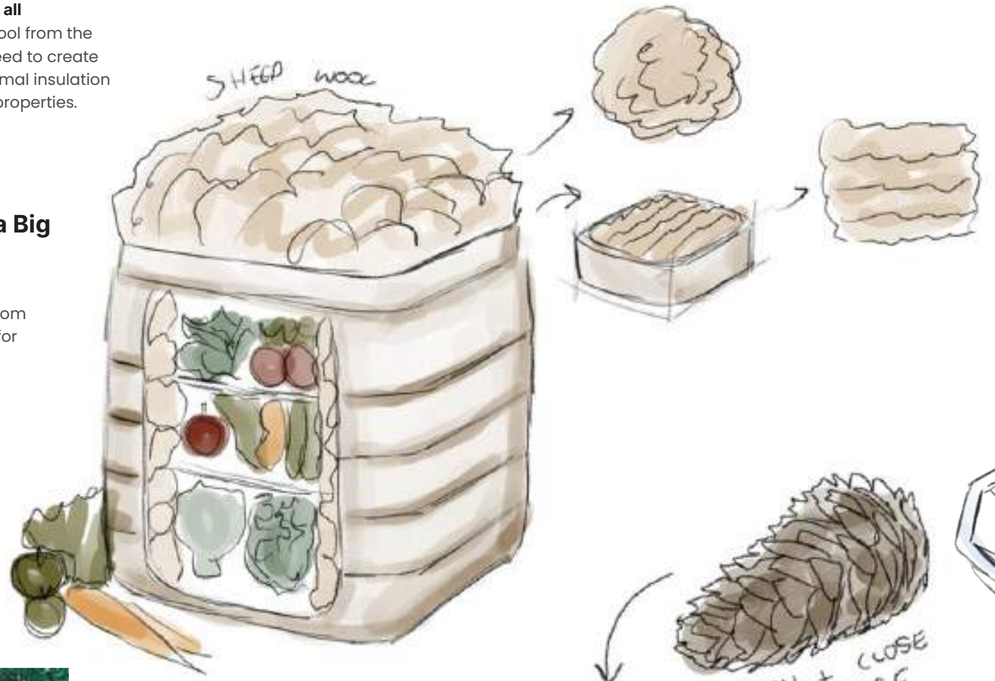
Researchers explore the potential of using water from salmon, shellfish, herring and oat milk production for growing sugar kelp and sea lettuce in tanks.

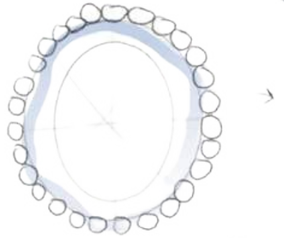
“Humidity-Sensitive Hydraulic Actuator Inspired by Pine Cones”

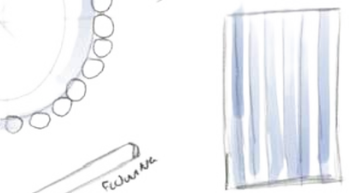
Technical University of Munich

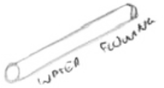
It is composed of two layers that absorb varying amounts of liquid to control the mechanical properties of the system. The actuator can be used in smart buildings to allow heat exchange with the environment, reducing energy usage and costs.

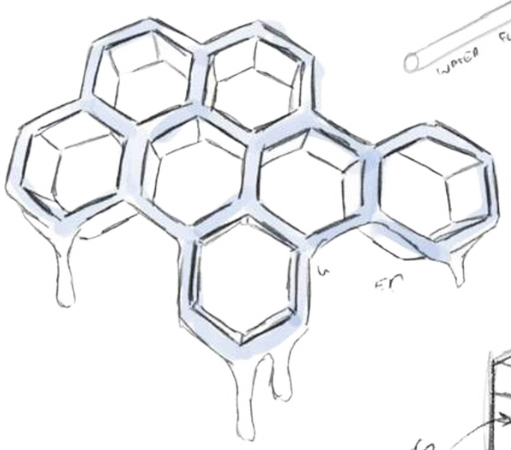


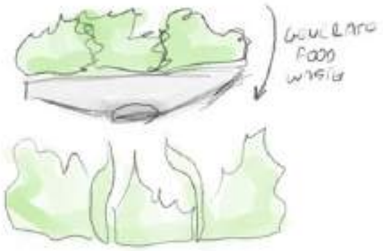


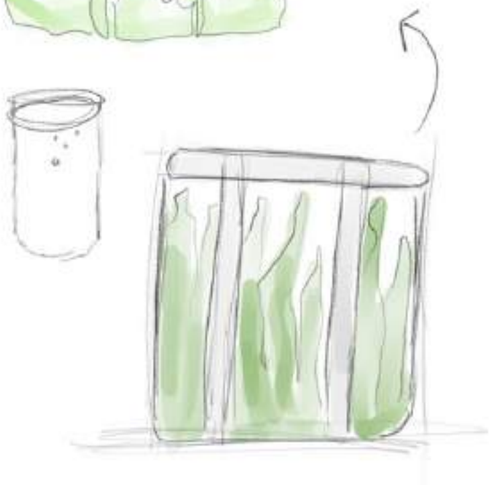


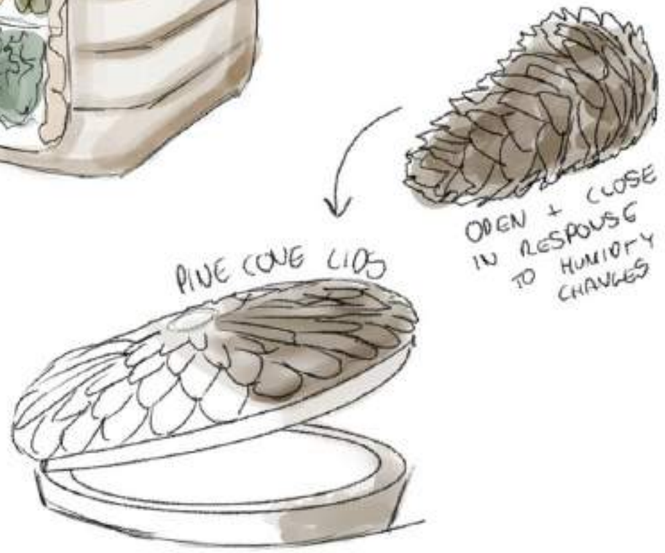






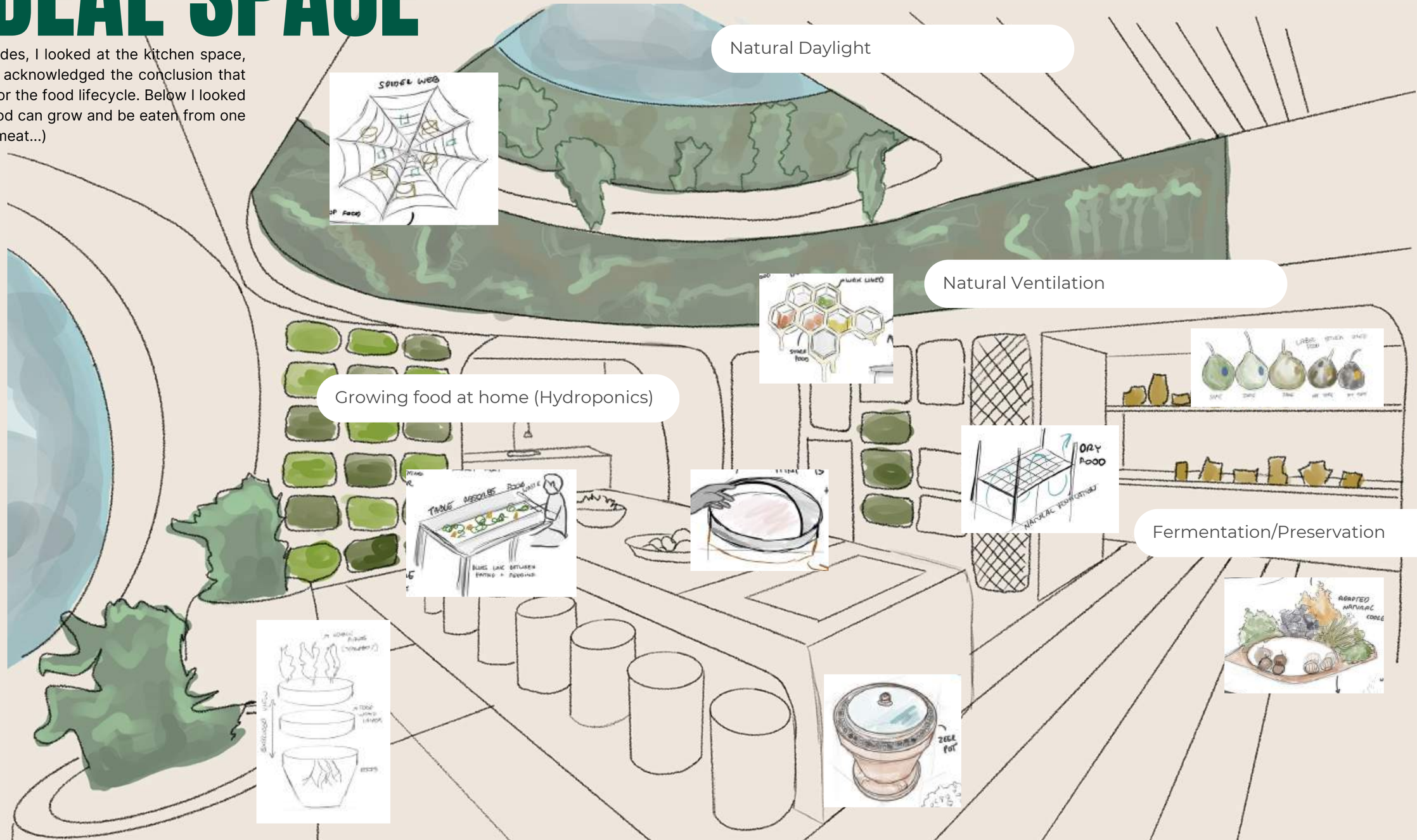






THE IDEAL SPACE

From my research on attitudes, I looked at the kitchen space, and identified observations acknowledged the conclusion that these spaces are not built for the food lifecycle. Below I looked at a future space of how food can grow and be eaten from one environment (not counting meat...)

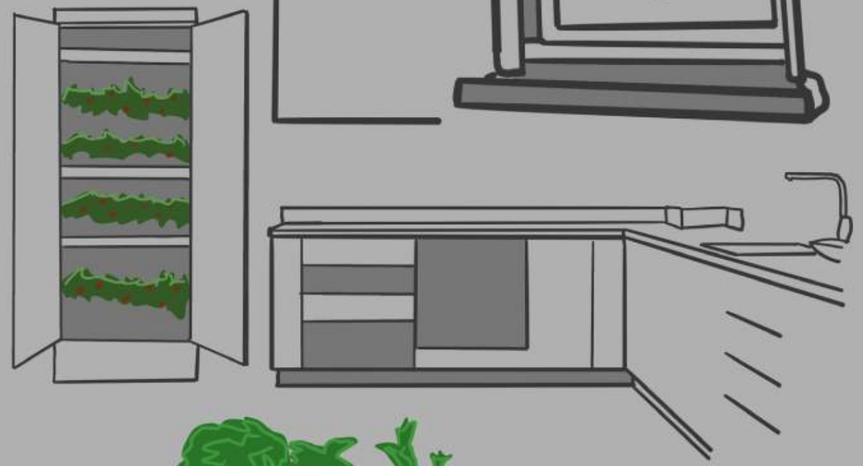



2050.
CORE MOTIVATIONS FOR A SUSTAINABLE FUTURE FOR FOOD
KEEPING FOOD CLOSER TO HOME REDUCES WASTE, STRENGTHENS FOOD SECURITY, AND RECONNECTS US WITH WHAT WE EAT.
SELF-SUFFICIENT SYSTEMS CREATE HEALTHIER COMMUNITIES BY MINIMIZING RESOURCE WASTE AND RELIANCE ON FRAGILE SUPPLY CHAINS.
GROWING FOOD LOCALLY EMPOWERS PEOPLE, CONSERVES RESOURCES, AND ENSURES LONG-TERM SUSTAINABILITY.

01. HYDROPONIC FARMING PODS

Hydroponic systems on windows for people to grow their own greens like vegetables and herbs, also provides coverage from intense heat and insulation during winter.

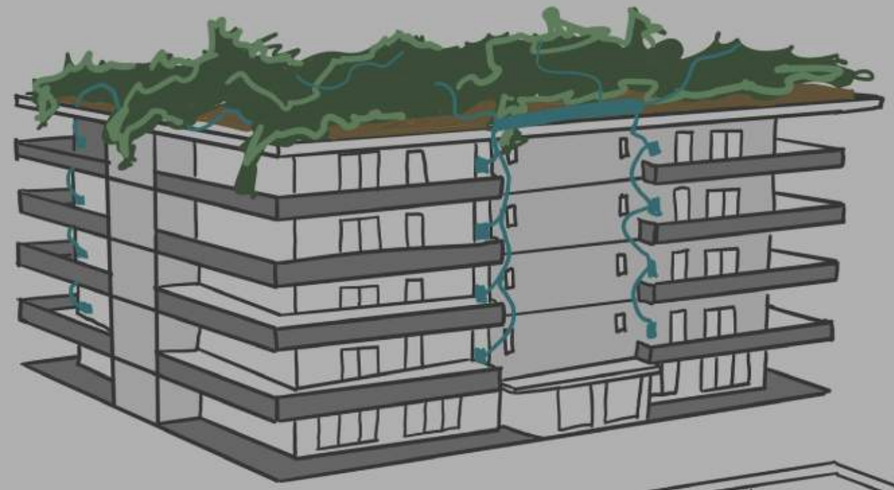
Special fridges that are ‘alive’ growing fresh produce instead of the conventional fridge.



For smaller spaces, jars and pots that can be placed around the home space.

This helps minimize the travel time an resource of fresh produce going from farms to cities.

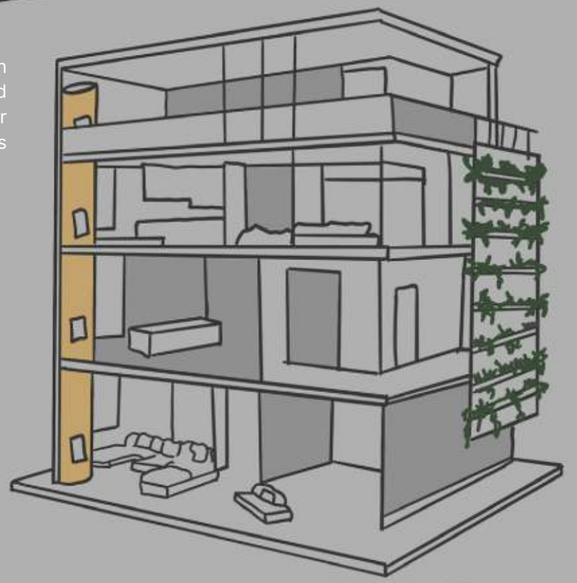
By 2050, 80% of the global population will reside in urban environments. Cities will transform into hubs of self-sustaining ecosystems where food preservation, water recycling, and energy efficiency are fully integrated into daily life.



Community resilience and participation is key as seen in Cloughjordan, a waste system can be incorporated into apartment buildings to supply fertilizer for a bigger community farm. The waste could therefore stay at it’s source and reduce impact.

Smaller housing can have vertical farms that can be accessed by it’s members, with a similar composting system to maintain nutrients from the farm.

Some locations can even have underground cellars for storing dry produce or have a similar clay fridge concept to store chilled foods.



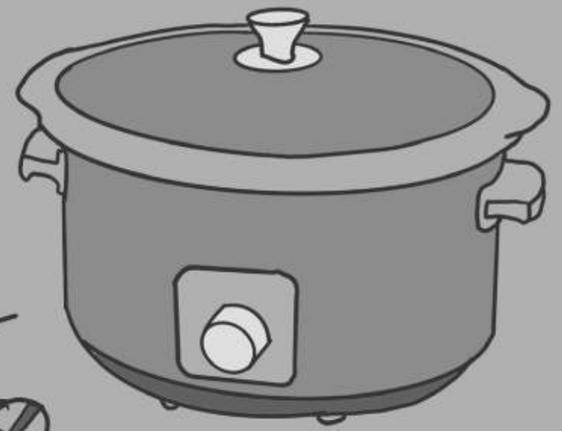
02. COMMUNITY WASTE MANAGEMENT

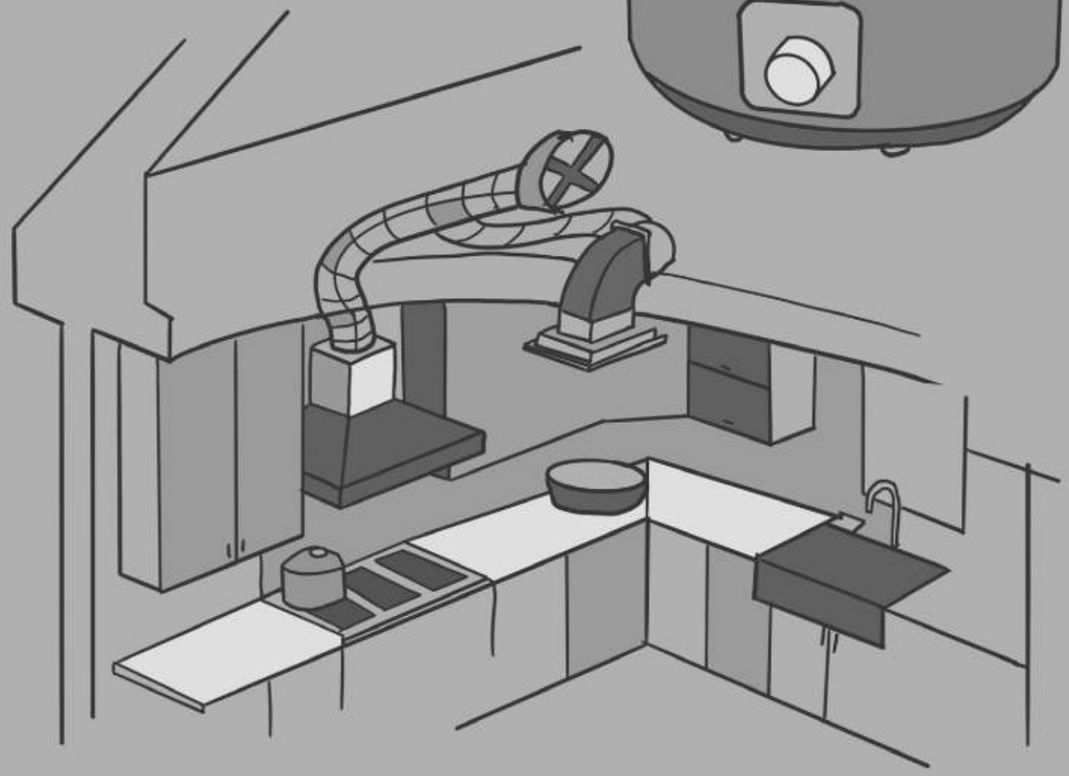
03. CLOSED-LOOP WATER SYSTEMS

Seaweed farms will be located in homes to support food needs (becoming a new source of food in the future). It will be grown from the waste water of the taps. A dial is presented to avoid any cleaning chemicals going into the water.

An example of an in-home system, to also support any additional waste water people can grown plants like lettuce etc. out of the water and support their hydroponic or small farms.

The slow cooker would be designed to capture excess steam and heat generated during regular cooking, redirecting it into a sealed, insulated chamber where food can cook slowly over time. As steam rises from boiling water or cooking food, it would be funneled into the slow cooker, maintaining a consistent low temperature ideal for stews, soups, and batch cooking.





04. WASTE ENERGY FOR COOKING FOOD

This setup would reduce energy consumption by reusing heat that would otherwise escape, making cooking more efficient while encouraging meal preparation that minimizes waste. It could also be developed to have other uses like generation of energy to be used by something else in the house.

05. INDIVIDUAL SPACES

THE VISION OF THE FUTURE.

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thank you

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