

CONCEPT COOK BOOK SIL VAN DOMMELEN

CONCEPT GUIDE

De schijf van



GEZOND - DUURZAAM - VEGETARISCH -
GEMAKKELIJK - LEKKER

Introduction

Hello and welcome to the concept guide about De schijf van 50tig. In this concept guide, you can find all the ins and outs about the concept and I will take you through the whole concepting journey.

This concept is the outcome of a school assignment from the minor Graphic Design: Design for Good. Within this assignment, I got the opportunity to create a concept about a global issue that concerns me. The outcome was totally up to me which gave me the freedom to think and act as creative as possible.

I want to thank my coaches, my co-students and my family who supported me throughout this whole journey. Have fun, I hope you like it!

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Concept

Why?

Did you know that since 1900, 75% of the genetic plant diversity in agriculture has been lost? (Fao, What is happening to agrobiodiversity). The extinction of food is something that is a little-discussed subject. Probably because we have plenty of food and besides that with artificial and chemical processes, we can make all kind of flavours and products. However, it is something to be conscious of. The loss of food species will lead to a loss of very important vitamins and minerals which is dangerous for our health. Even though we have food enough; we may do not have enough different nutrients if we continue like this.

The fact that we rely on a small range of food is not only a risk for our health but also the health of the ecosystem. The monoculture farming exhaust nutrients and leave the soil vulnerable for pests and pathogens. This requires applications of fertilisers and pesticides that can if used inappropriately, damage wildlife and leach into water system (WWf, 2019). We also rely a lot on the animal-based protein. Total agriculture accounts for around a quarter of all greenhouse gas emissions, of which approximately 60 per cent is due to animal agriculture (Baker, 2015). As you can see, change is needed.

Besides the nutrients that we lose and the ecosystem that we exhaust, our current food system also affects other elements. Food is our main source of energy, but it is also a very important part of our culture and economy. Losing food varieties entails much more than just losing food, it is related to the loss of tradition, a piece of culture, family experience and memories. We need to understand the importance of our food better.

Easier said than done. We currently live a fast-paced society which means that people seek for fast, easy and multi-functional solutions. On the other hand, it is a trend nowadays to live sustainably and eat healthily. We want to do good for people and nature. It can be hard for people to find the right balance between those two. Eat healthily, live sustainably but still participate in our fast-paced society which demands more from us than possible.

I like to approach problems positively and actively. Do not show what is going wrong but show how we can improve the situation. That is why we need a positive solution. Something that helps the fast-paced society to eat healthy, sustainable, easy and quick!

What?

How can we help society to eat healthy, sustainable, easy and quick?

Via an easy healthy sustainable cookbook!

People need to understand that cooking doesn't have to be as complicated as MasterChef dishes. It doesn't have to take as long as the 24 kitchen episodes. Via this cookbook, people can easily and quickly cook healthy and sustainable at the same time.

How?

To make sure that every recipe is quick, easy and healthy, I came up with 5 elements that every recipe has to contain.

The 5 elements of the recipes:

- **Healthy:** Here in the Netherlands we use the Schijf van vijf to determine whether a product is healthy or not. All the used ingredients fit in the Schijf van vijf.
- **Sustainable:** Knorr, WWF and Dr. Adam Drewnowski created a list of 50 ingredients which are nutritious and lower the impact on our planet and support the agrobiodiversity. Every recipe contains at least 2 ingredients of the future 50 foods list.
- **Vegetarian:** The recipes are all vegetarian to lower the environmental impact and to show people that you don't need meat to create a complete and satisfying meal.
- **Easy:** All the recipe have a maximum of 5 ingredients (except some basic elements that everyone has, or can easily have, at home). The recipes are easy to make with easy to follow and show how much time you need (maximum of 50 minutes including oven time). I also give alternative options for some ingredients when the accessibility is low.
- **Delicious:** The recipes contain a lot of flavor and can be adjust to tast. I often give tips how to expand the recipes with for example toppings or extra ingredients.

Who?

This cookbook is created for everyone who wants help with cooking easy healthy and sustainable. To scope my research and create a bit of a direction I mainly focused on Cosmopolitans: Critical citizens of the world who integrate post-modern values such as growth and experience with modern values such as success, materialism and enjoyment (Motivaction). They are seen as conscious eaters, prefer the world cuisine, and it should be nutritious (Motivaction, Food atlas of the Netherlands).



Journey

Three global issues

Within this assignment, I got the opportunity to choose my own Design for Good subject. I had to choose a global issue that concerns me. I started with a mindmap in order to come up with several topics. During meetings with my coach, I discussed personal problems and topics, for example, child marriage in Guatemala (I did a charity mountain bike tour for this topic). Besides that I conducted desk research. In the end I chose 3 out of all the topics which are the following:

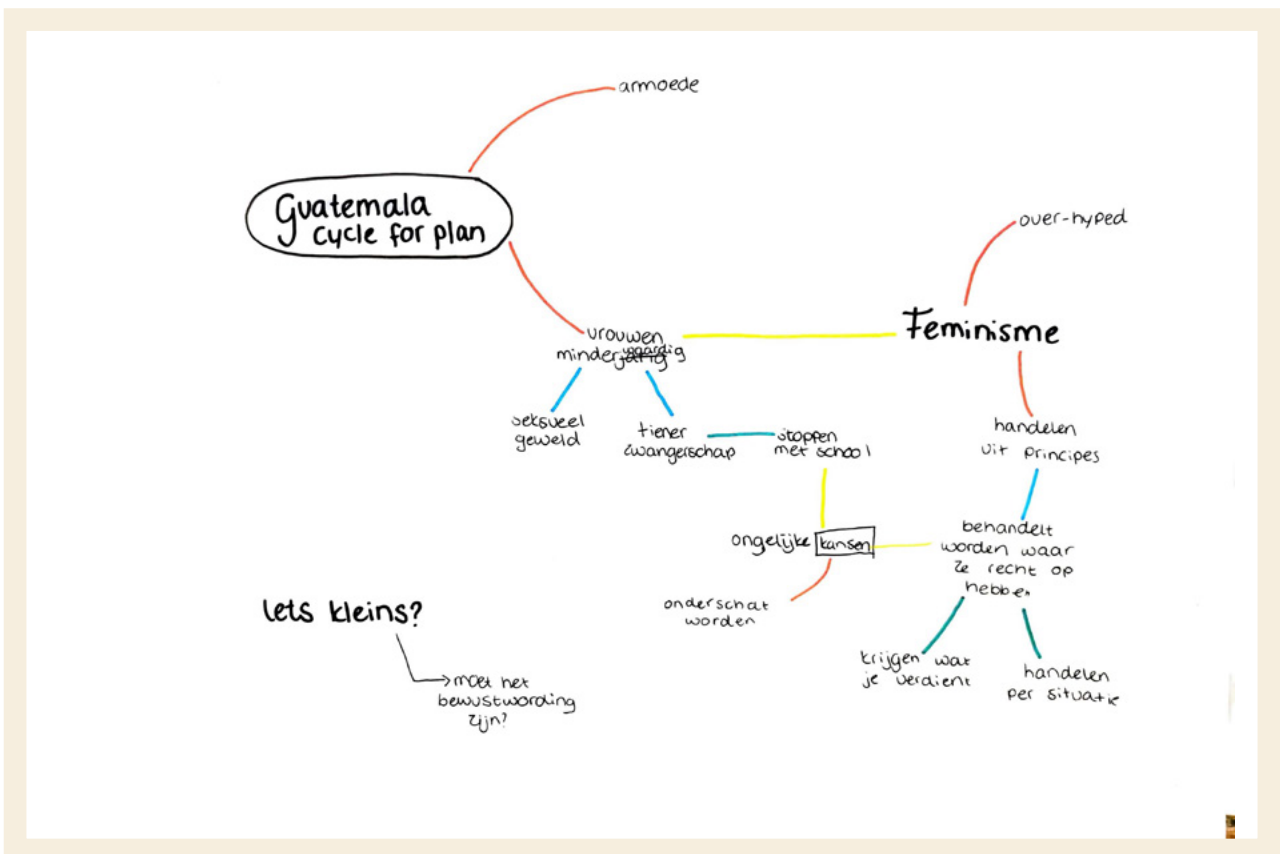
Three global issues:

1. **Gender equality**
2. **Food waste**
3. **Extinction of species**

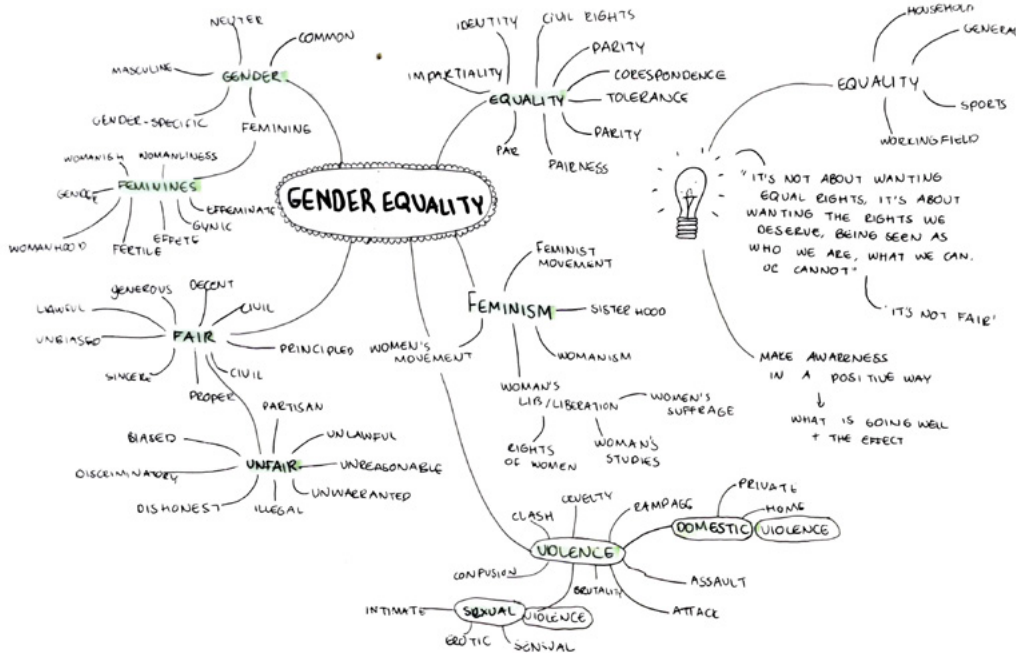
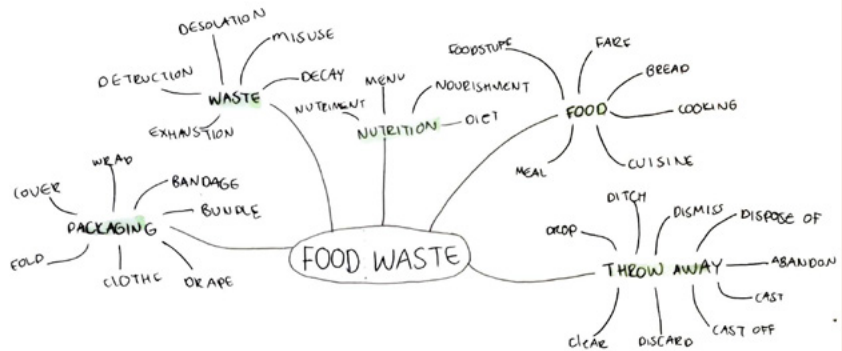
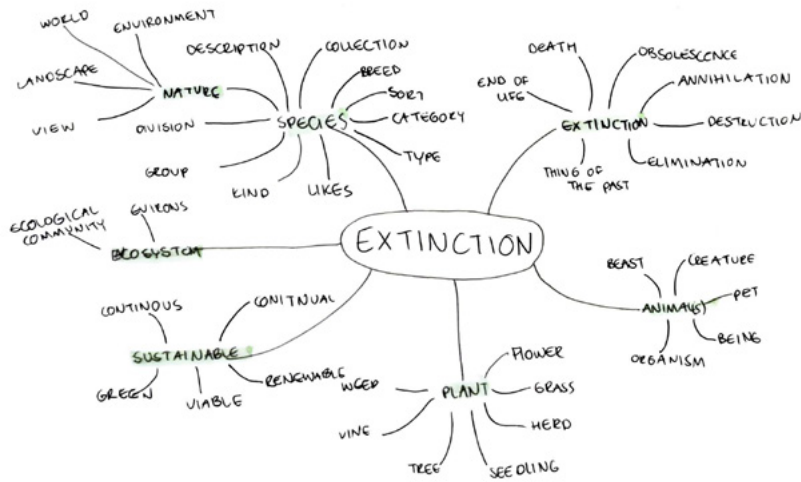
I researched all of these 3 topics to immerse myself in various social themes. During the research class I made a mind map with important keywords that I could use during my research and I learned how to search efficiently on Google. Because of these keywords and Google tricks I encountered very interesting information that I did not know before during my research; like the difference between gender and sexes, and the difference between food loss and food waste. I chose to continue with food loss instead of food waste as a topic.

If you want to know more about this, you can read my researches in the **Appendix (35)**.

Mindmap topics



Mindmap Keywords



Two global issues

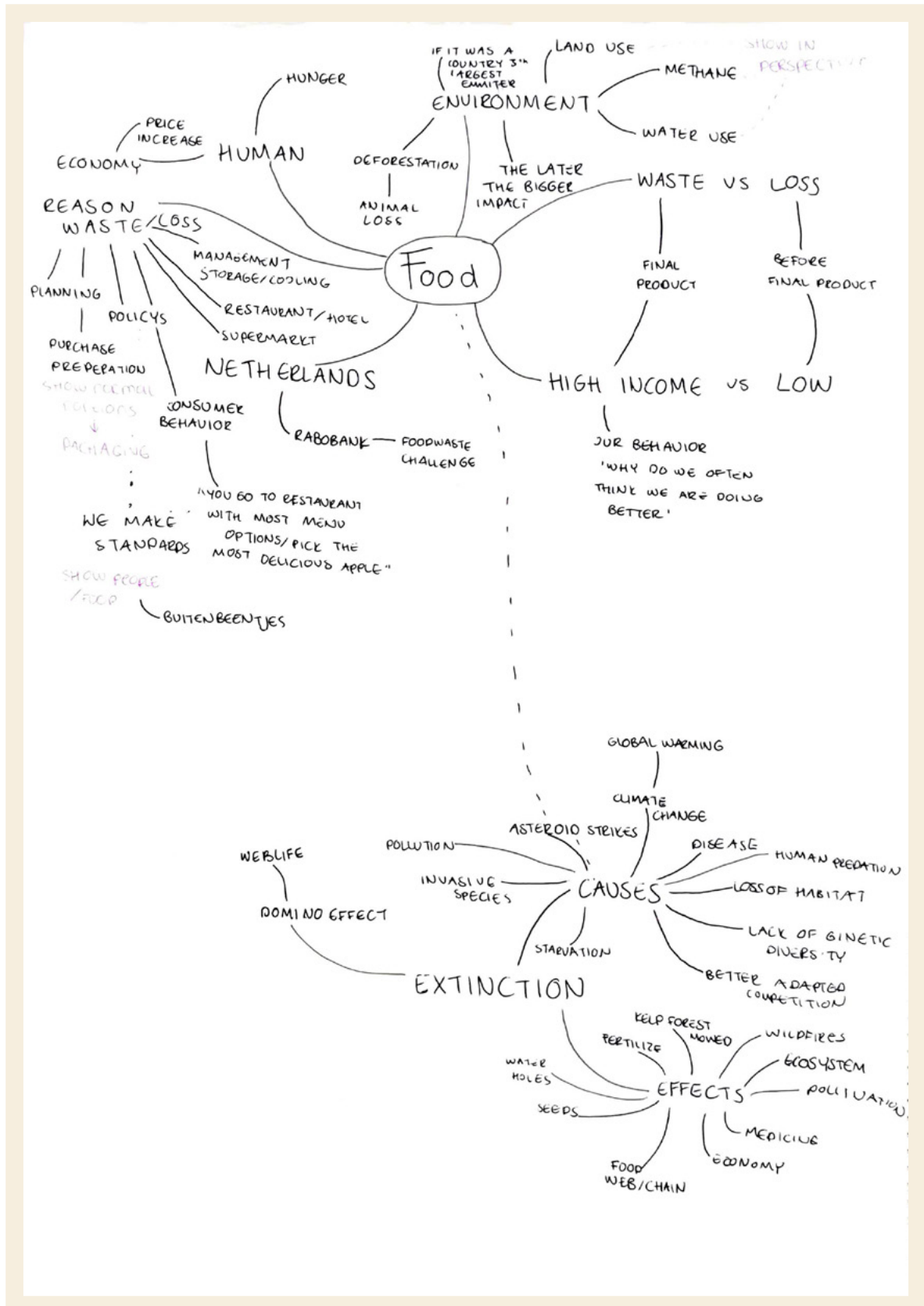
During coaching classes with my project group and coach I discussed the different topics. We concluded that Gender Equality keeps me busy the most. However, it frustrates me so much that it gives me a negative feeling. Working on a multiple week's project with a negative feeling won't spark my creativity. Besides that, it is a well-known topic that many people use for projects. I wanted to have something that makes me enthusiastic to work with and which is more original. So, the gender equality has been omitted.

Two global issues:

1. **Food loss**
2. **Extinction of species**

I continued the process with Food loss and Extinction of species. I had the feeling that I needed deeper additional information per topic. I immersed myself deeper in these social themes by a new mind map per topic. This helped me understand their cultural, political, economic and environmental connections and offered me surprising angles that I didn't see before.

Mindmap Two Global Issues



One global issue

During coaching class, I presented these two topics with a few slides and explained the further information that I found. I discussed together with them which one would be my final topic. I chose for the extinction, and especially animal extinction. It inspired me the most for a creative project, I already had many ideas. Animal loss interested me the most regarding research but not really for a creative project. My final topic was Animal Extinction.

One global issue

1. Animal Extinction

Animal extinction. For the last time I wanted to make a mind map. I still had the feeling that I could find a more special angle. I elaborated my research, talked with many people about animal extinction, and used my keywords again to find more in-depth information. I read an article about the domino effect that occurs when animals extinct. The whole web life and food chain from other animals is disturbed which leads to more and more animals who extinct. I started to reflect this information to humans and started to think about what our food chain and web life is. What would happen is our food goes extinct? That is where I came up with a topic that interested me, I instantly got very active and happy and wanted to know more and more about this topic.

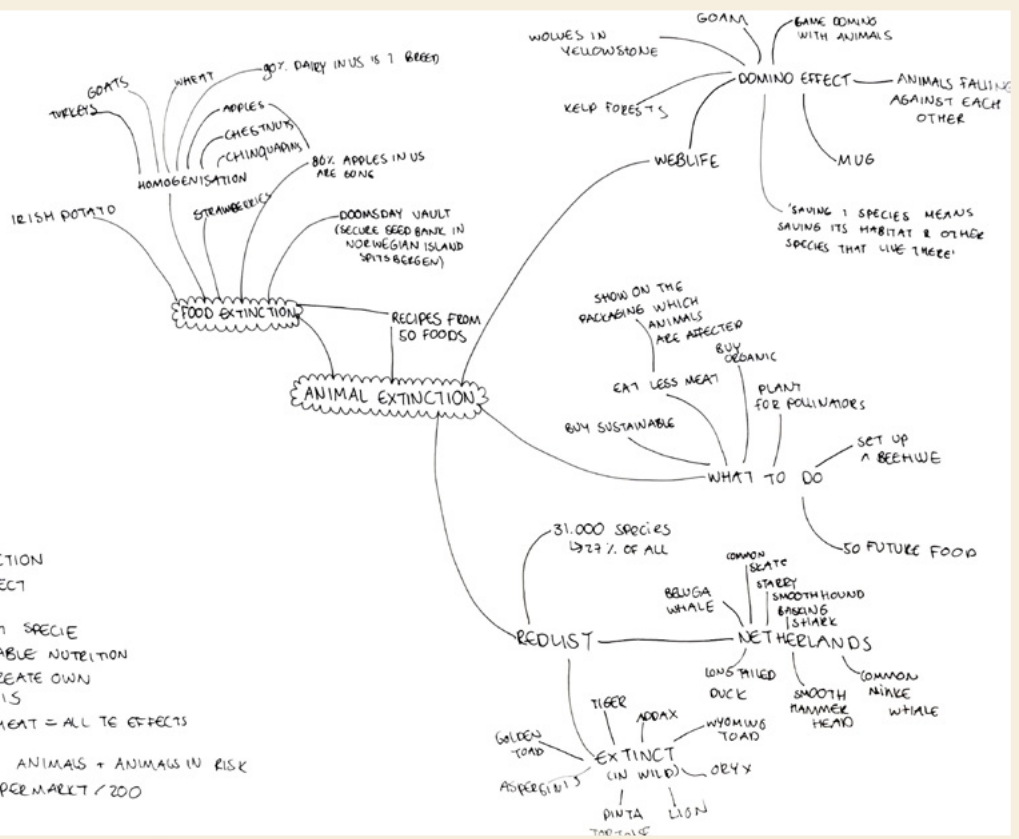
I changed my topic for the last time: Food Extinction with the focus on changing our food system towards a healthier and more sustainable one.

Final Global Issue:

1. Food Extinction

I did an indepth research about this topic which you can read in the **Appendix (41)**.

Mindmap One Global Issue



CONCEPT IDEAS

- RECIPES FOOD
- SHOW FOOD EXTINCTION
- SHOW DOMINO EFFECT
- DOMINO GAME
- POSTER MANY → 1 SPECIE
- SHOW FOOD + VALUABLE NUTRITION
- SHOW HOW TO CREATE OWN BEEHIVE/VOGELHUIS
- PACKAGING FROM MEAT = ALL TO EFFECTS LIKE ROZEN
- SHOW EXTINCTION ANIMALS + ANIMALS IN RISK
- SHOW FUTURE SUPERMARKET / ZOO

Contextual Research

I also researched the target group, organisations, the sector and trends in order to understand the context of the issue:

Target group:

Since we all participate in the food system, the concept is created for everyone. However, I focus my project on the western world since they can make a change, have the most impact on the food system and is the easiest to reach for me.

As a mentality group I chose to focus on Cosmopolitans. This a mentality model from motivaction. They are critical citizens of the world who integrate post-modern values such as growth and experience with modern values such as success, materialism and enjoyment (Motivaction). They are seen as conscious eaters, prefer the world cuisine, and food should be nutritious (Motivaction, Food atlas of the Netherlands). They are open for change, and want to live more sustainable. They just don't want to turn in their busy lifestyle for a more sustainable one since it will take their valuable time.

Organisations:

There are a couple of organizations who are committed to food extinction. For example Slowfood who documents traditional, endangered foods and recipes (Nuwer, 2014). Or the doomsday vault is a secure seed bank in Norwegian island Spitsbergen where many seeds from all over the world are stored. There is also a cooperation between Knorr, WWF and Dr. Adam Drewnowski called Future 50 foods. They researched the food extinction and the nutritional value of our food. To help society, make a change towards a more sustainable food system they created a list with 50 ingredients which have a high nutritional value and a low environmental impact (WWf, 2019). Eating these ingredients support the agrobiodiversity.

Trends:

Fast-paced society:

First of all, we live in a fast-paced society nowadays. Which means that people seek for fast and quick food options. Fast food restaurants, drive throughs, options 'to go', food boxes, home delivery, meal boxes and over processed ready to eat meals are very trendy right now.

Healtify:

However, we see fitgirls and fitness guru's everywhere. Healthy nutritional meals are a must. Eat your spinach smoothie, avocado toast and acai bowl! Living a healthy these days is very important for many people (Lidner, 2019).

Vegetarian/vegan:

People get more conscious about their footprint. The animal industry is very harmful for the environment. More and more people are going to eat vegetarian/vegan or try to eat less animal products (Nieuws, 2020).

Individualism:

People are focusing more on themselves as a person. They want to make their own choices. Have products and services personalized towards their lifestyle. Customizations and personalization is very important for them (Burns, 2020).

Sustainability:

Sustainability is already a trend for many years. People start to value the environmental quality more and more. Living sustainable became even a status thing.

Sector:

Currently the food sector is hard hit by the corona virus. Many restaurant had to close. People earn less money and stop investing money in dinners at a restaurant, going out for lunch or ordering food at home. The Rabobank stated that the crisis will be felt by the horeca for at least till the end of 2021 (Rabobank). Rabobank also explained that the consumer spends less money at specialty shops. More people to start cooking at home again (Rabobank, Foodupdate november 2019, 2019). Convenience cooking became very popular during this corona virus as well. 'Many parents have become teachers—in addition to working their regular jobs—which leaves them even less time to get meals on the table. That's why recipes that are easy to make, require few ingredients or can be thrown in the oven or slow-cooker are so handy' (Loh, 2020).

Summary of insights

Target group Cosmopolitans

- Critical citizens
- Value growth and experience
- Value success, materialism, enjoyment
- Conscious eaters
- World cuisine
- Nutritious food
- Sustainability

Organization

- Future 50 food
- Slowfood
- Doomsday vault

Trends

- Fast-paced society
- Individualism
- Healtify
- Sustainability
- Vegetarian/ vegan

Sector

- Corona virus hit horeca till end of 2021
- People stop investing money in the horeca
- Consumers spent less money on specialty shops
- More people cook at home
- Convenience cooking is popular

Based on these insights I wrote a concept statement which gave me direction in the project:

Easy foody

Food is our main source of energy, but food has also cultural, environmental, economic and political impacts on our lives. Making the right food choices can be very difficult in our fast-paced society. However, if you start right the rest follows itself.

Brainstorm

It was time to brainstorm for concepts. I began with a brain dump where I just wrote all the ideas I already had down, while thinking about my concept statement and insights. To think outside the box, I created a how can we questions based on the insights of the research for example:

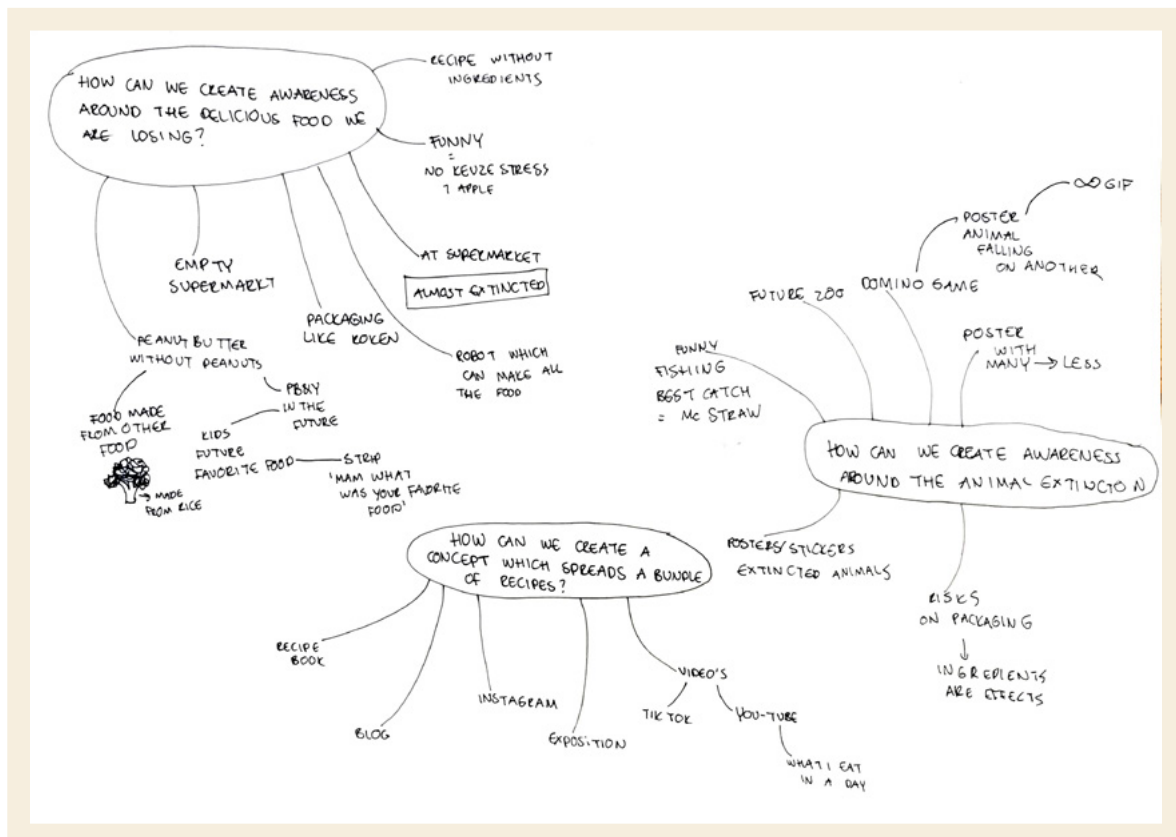
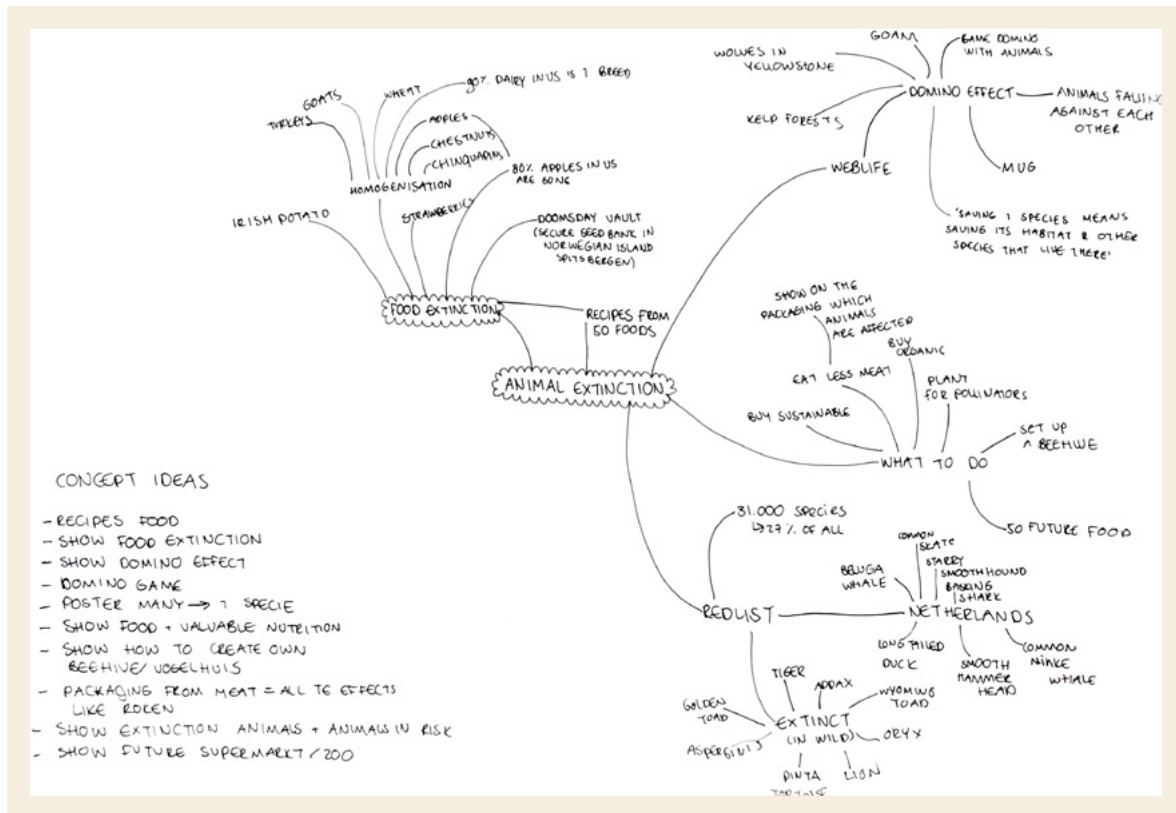
How can we create awareness around the delicious food we are losing?

Using a how can we question helped me to focus on new aspects.

In the end I had many ideas for example:

1. *Visualizing the domino effect*
2. *Visualize the ingredients from the future 50 food list*
3. *Photoshop food packaging like a sigaret box*
4. *Show the future supermarket with almost no food left*
5. *Show future recipes without ingredients*
6. *Video's where people can only choose between 3 meals*
7. *A recipe book with recipes containing ingredients from the future 50 list*
8. *A meal box with ingredients and recipes from the future 50 list*

Mindmap Brainstorm



Concept

During the coaching classes we discussed my different concept ideas. I also explained that I would like to focus on making a change instead of only making people aware of the problem. I think it is nice to focus on the positive side that we can still make a positive change and that we can easily come to action.

I doubt between the meal box and the cookbook. I talked with many people about the two options and in the end I chose for the cookbook idea in which I would add recipes which contain ingredients from the future 50 list. The meal plan box is possibly a too big step for the target group.

Final concept idea:

1. Cook book

Benchmark:

Before I started improving the concept idea, I did a bench mark test. Unfortunately I found a cookbook from Knorr with recipes containing the 50 ingredients (Knorr). First I thought, alright let's continue with another concept but than my coach inspired me to continue with my idea and just specialize it. I analyzed the cookbook and I found that the recipes looked complicated due to many ingredients per recipe.

Improving the concept:

My trend research showed that more and more people are cooking from home. This means there are new people in the kitchen who need easy recipes. Besides that it showed that people want healthy and sustainable recipe with less ingredients; convenience cooking. They also want vegetarian meals and customizable meals; personalization. Due to the fast-society they want it all together in a very easy way. I own a lot of cookbook and they all contain one of these element: easy, or healthy, or sustainable, or quick, but none of them contains them all: Healthy, sustainable, vegetarian, easy and quick. ***That is the unique element of this book: it's all in one!***

Name

Together with my coach I chose for the name De schijf van 5tig:

- **'De schijf'** refers to a plate.
- **'De schijf van 5'** refers to the food groups in the Netherlands. All the recipes in my book fit in the Schijf van 5 which means that they are healthy.
- The **'5tig'** refers to the future 50 food list from Knorr and WHO.
- The **'5'** refers to the fact that all the recipe contain a maximum of 5 ingredients & refers to the 5 key elements in this cookbook: Healthy, Sustainable, Vegetarian, Easy and Delicious.

The idea of this name is to make people curious. I want people to start thinking and wondering what this book could be about.

I chose to use 5tig instead of 50 because some people refer 50 to the age of 50. During a testing phase they explained that 50 would make them think of a cookbook for people of 50+, whereas 5tig would not.

Design

Now that my concept idea was ready, I could start with the design phase. To create a cookbook that appeals to the target group, I decided to make an online survey with questions about cookbook design and sent it to the target group. I searched for inspirational photos and cookbooks on the internet and used them in the survey.

Within this survey I asked questions like:

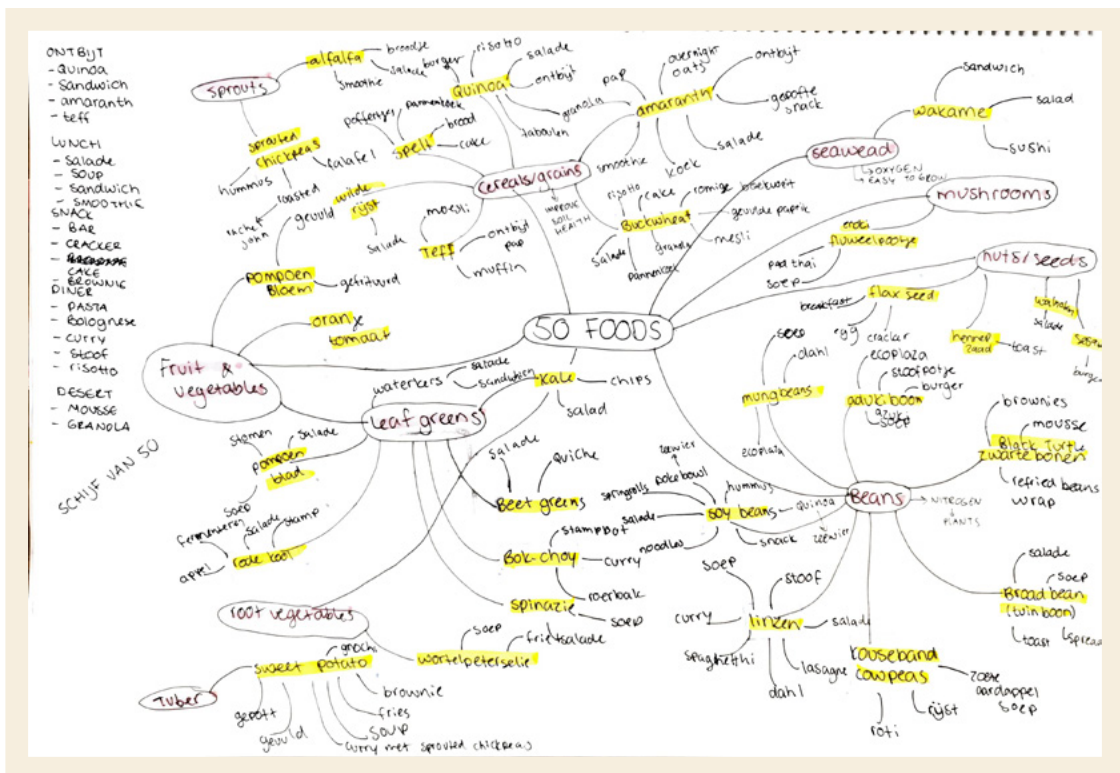
- Which way of presenting sandwiches do you think fits best for a healthy sustainable and easy cookbook?
- Which way of presenting granola would activate you to recreate the recipe? And which way do you think looks best?
- Which way of presenting meals would activate you to buy the cookbook?

In the end I gathered all the answers and created a moodboard with the visuals that were chosen the most to document the results in a visually appealing way. Based on these answers I decided to make a cookbook with a minimalistic look to express simplicity and easiness.

Moodboard Design



Mindmap Recipe Creation



Recipe creation

It was time to make the recipes! I made a mindmap with some of the 50 ingredients that are widely available in the Netherlands, and did a brain dump with recipes that came into my mind. At the end I made list with breakfast, lunch, snack, diner and desert ideas.

Since the target group prefers the world cuisine, I tried to implement multiple cuisines from all over the world. Doing so I also show my open mind towards the cultural and social difference in the audience that will visit the online exhibition. I know that some people are more focust on basic foods and do not like to try new things. That is why I also added food swaps, recipes that look like popular food but than more healthily and sustainably. In this way I try to attract an as broad audience as possible.

I discussed the meals together with a dietitian Hanneke van Dommelen. In the end we came up with a list of meals that would fit the target group and the goal of this project. I started writing the recipes, thinking about the ingredients (did research to make sure that they fit in the schijf van 5 and the other 4 elements of this cookbook), and wrote down how to make them. Besides that, I wrote the introduction, information about the book, the end word, information about the schijf van vijf, nutrients and the future 50 food list.

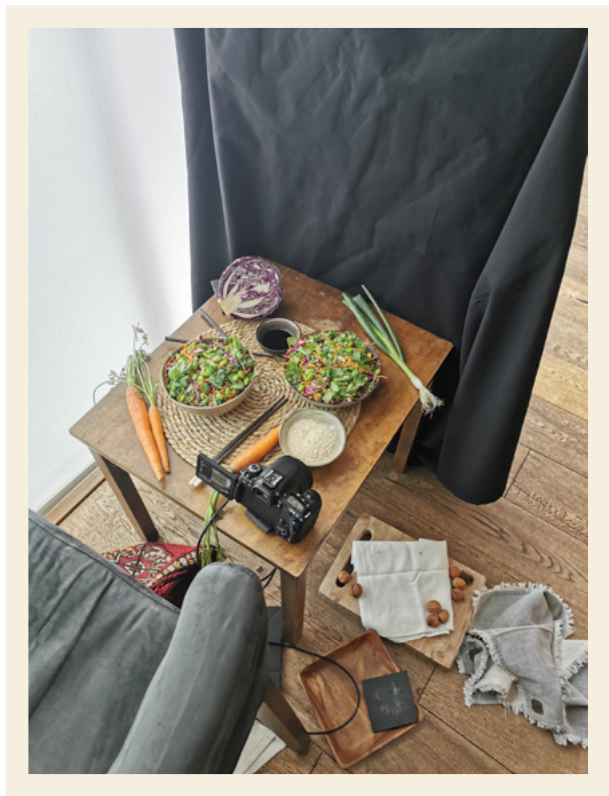
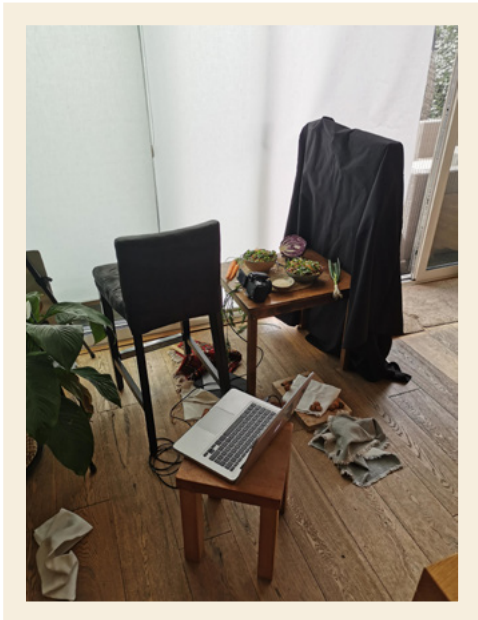
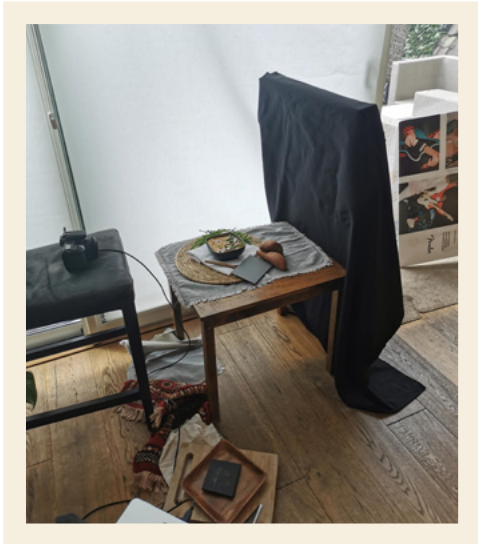
Cooking, Testing & photography

The fun part: cooking! I tested all the recipes together with my friends and family who gave their opinion and some feedback. Due to the corona crisis I wasn't able to go to the target group. Based on the feedback I received, I adjusted some recipes.

Now it was time to photograph the recipes! I video called a photographer and asked him for tips and tricks about food photography. He explained me how to work with different lighting, and the camera settings. He also taught me how to work with a diffuser, a black board, and a grey card. I also texted my photography teacher Marlinde for tips and tricks. Besides that I watched video's and read articles about food photography.

I made a photo setup in our living room and started cooking. It was fun to play with the meals. For example, I placed a little bowl in the bowl of soup to make sure that the ingredients would stay on top of the soup. I also sprinkled some water on the cherries to make them glow. I learned a lot from this process. Based on my moodboard I strated taking pictures.

It was hard to pick the best photo's out of 750 attempts but with the picking tool from Lightroom it was an easy job. Ater that I watched video's of food photographers, how they edit their photo's. Based on this information I edited my photo's with Lightroom.



Book design

When I photographed 5 recipes, it was time to create a draft version of the book in InDesign. I created one recipe page and duplicated a couple of times. At all the pages I changed the fonts and asked the target group which fonts they taught was the best. I only gave them serif font options for the base text since I wanted to give it a higher quality and traditional style.

I had another coaching session with some co-students in which I presented my recipe page. The first remark I received was that they did not like the serif font. They preferred a more modern sans serif font. Another remark I got was that the concept (healthy – easy – sustainable) wasn't really visible in the recipes and got the tip to use icons. It was a thoughtful coaching session.

Old fonts:

{ This was the title }

And this was the font for the base text. As you can see it is not very modern. And this was the font for the base text. As you can see it is not very modern. And this was the font for the base text. As you can see it is not very modern. And this was the font for the base text. As you can see it is not very modern.

After the session I started making changes and asked people for feedback. I also started taking the other 5 pictures. Together with my friends and family I did another brainstorm about the concept again. At the end we came to the idea to change the title of the recipe into some fun facts that make people think and want to read more about it. It has to confuse them. I changed all the titles. I also added a highlighted box with information about why it is healthy and sustainable together with icons which show what information can be found in the box.

How the concept is visible throughout the book:

- Healthy (the box in on the bottom and sometimes the title)
- Sustainable (the box in on the bottom and sometimes the title)
- Vegetarian (the ingredients, at the right corner there is an icon to show when a recipe is vegan)
- Easy (only 5 ingredients, every recipe tells how long it will take, tips how to take a short cut). The childish and playfull illustrations refer to easiness.
- Delicious: Extra tips and inspiration throughout the book so people can adjust it to their own taste.

I also added all the other pages like introduction, the information pages, chapters and the end pages. For these pages I also drew illustrations on my I-pad in order to give it a more playful and easy vibe.

In the end I had a couple of options for the cover page. I asked my friends, family and classmates who helped me designing the final page. In this page you can see the Schijf van vijf, by the 5 placemets and the 5. You can see the sustainability trough the world, and the eahl trough the lettuce. The easiness is shown by the sans serif fonts and the minimalistic placing.

Final product

Here you can see my final product: [Schijf van 5tig](#)





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Appendix

Gender equality

The first topic I going to research is gender equality, also known as sexual equality or equality of the sexes (Wikipedia, sd). The meaning of this term is very discussable. It consists of two words 'gender' and 'equality' which are both not very defined. According to the Cambridge Dictionary gender equality stands for the act of treating woman and men equally. They also added an side note that gender equality does not imply that woman and men are the same, but that they have equal value and should be accorded equal treatment (Dictionary, sd). I do agree with this definition so when I talk about gender equality, this is what I mean. We all probably know that woman and men are not always treated equally. And we all know that there are feminist movements in order to equalize resources and opportunities for the different sexes. But what does gender equality actually entail? What does it mean for different people? That is what I am going to research.

Gender or sexes

To me it all starts with the first word of the term; gender. The society divided our humanity, and even other species, into two groups; men and woman, or girls and boys. These two groups do have differences and similarities. We have two important terms that describe these groups; gender and sexes.

Let's start with the word gender. The WHO defines gender as the socially constructed characteristics of women and men, such as norms, roles, and relationships of and between groups of women and men. It varies from society to society and can be changed (WHO, sd). Gender refers more to the cultural and social role of each group within a certain society. The gender roles and stereotypes are becoming more and more fluid nowadays (Newman, 2018). Your gender identity is not a fixed characteristic, it is your individual view of yourself.

The other term is sex. The differences between male and female sexes are anatomical and physiological. "Sex" tends to relate to biological differences (Newman, Sex and gender: What is the difference?, 2018). However, even the boundaries of sexes are not fixed since some woman are born with an Y chromosome or men are born with more X chromosomes. Besides that, men and woman do have the same hormones, but in different levels, which will differ per individual.

What I try to make clear is that the boundary between men or women is difficult to determine. Each individual is different and not everyone can easily be placed into these two imaginary boxes.

Gender roles

Gender roles, also known as gender division of labor stands for the allocation of different jobs or types of work to woman and men according to the European Institute for Gender Equality (EIGE, sd). Over the years, society has developed some unwritten rules about which jobs and tasks has to be done by which gender and which behavior has to be shown. This applies in households, the business world, the nightlife, school and even public places. The rules are probably based on the average person within a particular gender. However, every individual is different, has different skills, characteristics and qualities. Personally, I think that every job has to be handed out to the person who's most appropriate for that job, despite the gender. Unfortunately, a lot of choices are made based on gender roles and prejudgments, since they make it easy to make a rough estimation of a person when you do not know them in person.

Problem

Alright, now we know a bit of the context around gender equality. You probably could already feel that there is an underlying problem due to my tone of voice. In one way or the other, it often occurs that women are treated unfairly. These problems occur in different subjects:

- Economics
- Sport
- Household
- Education
- Sexual harassment
- Child marriage
- Agriculture and rural development
- Culture
- Digital agenda
- Employment
- Energy
- Entrepreneurship
- Environment and climate change
- Health
- Justice
- Maritime affairs and fisheries
- Migration
- Poverty
- Regional policy
- Research
- Tourism
- Transport
- Youth
- Violence

As you can see there are a lot of topics to research and the problem is very big in multiple areas.

Food waste

The second topic I am going to talk about is food waste. Here I am, writing this research and in the meantime eating a disgusting tangerine (you know sometimes you have those tangerines which are dull and have a weird taste). I finished the whole tangerine since I couldn't throw my food away while writing a report about food waste. I think we all have heard the term food waste. Throwing away food, right? Well food waste contains way more than just throwing away food. I am going to research this for you.

Food waste or food loss

Food waste is a very popular term, but food loss is not often used. I did not even know there was a difference before this research. However, there is a big difference. Food loss and food waste both refer to the decrease in mass or nutritional value of food throughout the supply chain that was intended for human consumption (Save, sd).

Food waste refers to food that completes the food supply chain up to a final product, of good quality and fit for consumption, but still doesn't get consumed because it is discarded, whether or not after it is left to spoil or expire (Save, sd).

Food Loss refers to food that gets spilled, spoilt or otherwise lost, or incurs reduction of quality and value during its process in the food supply chain before it reaches its final product stage (Save, sd).

As you can see, there is a significant difference between those two terms. I will use these definitions in this research.

Problem

Food waste is a huge problem in the food industry and also for our climate. According to Voedingscentrum, Dutch households wasted an average of 34.3 kg of solid food per person per year in 2019 (Dooren, 2019). This is a lot. Even though we decreased already by 17% since 2016, there still is a lot of work to do. 9.5% of all the food we buy in the Netherlands is wasted, which is way too much (Dooren, 2019). The most wasted product in the Netherlands is bread and bread-based product followed by dairy products.

This is a shame. Think about all the time, energy, resources and money that are used to grow or create this food. We really need to work on this problem.

Low vs high income countries

Food waste occurs during upstream and downstream processes. Upstream processes are the production, yield handling and storage. The

downstream processes are distribution, processes and consumption. The FAO rapport showed that higher income countries showed greater food loss and waste during the downstream phase, the consumption level. And the lower income countries were more likely to lose of waste food at the upstream phase due to lack of proper harvest techniques and infrastructure (Moveforhunger, 2015).

Environmental impact

Food waste and loss leads to enormous environmental impact. They say the later food is waste in the food chain, the greater its environmental impact will be. This is because we have to keep in mind all the energy and resources that are expended in the chain so far. Besides that, food waste leads to a great emission of methane into the air. Often the food waste ends up in the landfills. The food produces methane, a more powerful greenhouse gas than CO₂ which will cause global warming and climate change (Moveforhunger, 2015). If food loss and waste was a country, it would be the third largest emitter of greenhouse gases. Failing to tackle our wastage makes it extremely difficult to keep climate change from causing catastrophic impacts (WWF, sd).

We also do not have to forget all the water that is used for the production of the food and is locked in the cells of the food, or is used to water the crops, wash the food or used in the machinery. For example, if you are throwing away one kg of beef, you essentially waste 50,000 liters of water that were used to produce that meat, and 1000 liters of water when you pour a glass of milk down the drain (Moveforhunger, 2015).

Not only the water but also the land which is used to grow food is wasted when you throw away food. And also, oil which is used for the production (Moveforhunger, 2015).

Human impact

Food waste also has a moral impact. The world is dealing with a great number of hungers. If one-fourth of the food lost or wasted globally was consumed it would be sufficient to feed 870 million people, 12 percent of the world's current population. Everyone currently suffering from hunger could be properly fed on less than a quarter of the food wasted in Europe and the US (WWF, sd). Food loss and waste drive up the price of food. Reducing food loss and waste is a key strategy towards ensuring food security for a projected 9 billion people in 2050 (Murali, 2018). It costs the global economy \$940 billion per year – an astonishing cost to all citizens and lost income for farmers (WWF, sd)..

Extinction of species

The last topic I want to talk about is the extinction of species. I am a nature lover. I flourish in nature, get energized and active. Besides that, I am impressed by all the different species and their powers. The beautiful animals we have around us, which can teach us so many skills. But also, the plants which are so powerful, that we can learn from them as well. Look at those beautiful biomimicry examples like the ventilation system in the shopping center in Zimbabwe inspired by termites, or the shock absorbers in a black box inspired by a woodpecker, antimicrobial film mimicking sharkskin and so on (Adams, 2017). We need our ecosystem with all the species, but we are losing a lot of them. In this research I will research all of it.

Extinction crisis

A recent intergovernmental report on the biodiversity crisis estimated that extinction threatens up to a million animal and plant species (Kolbert, 2018). One of the biggest problems are we, humans. We expand as we develop land for agriculture, commerce and housing which will lead to habitat loss or change. But also, the trade which will bring diseases and species from one place to another.

Threats:

There are multiple threats that lead to distinction.

- We probably all know that asteroid strikes lead to the disappearance of the dinosaurs and many other animals.
- Another threat are diseases. When a specie is already very scare, a virus or bacterium can lead to complete distinction. For example, the Black Death, a medieval pandemic, wiped out a third of Europe's population in the middle ages (Struass, 2019).
- A very big problem is the habitat loss due to human civilization and deforestation.
- Another threat is the lack of genetic diversity which is caused by inbreeding. When a specie is very scares the changes are high that they marry family instead of strangers. Because of extreme habitat loss, today's dwindling population of African cheetahs suffers from unusually low genetic diversity and, thus, may lack the resiliency to survive another major environmental disruption (Struass, 2019).
- Invasive species are often introduced by an unwitting human and can result in extermination of the native population.

- A very big threat is the lack of food which also leads to weaker populations.
- The pollution, for example see pollution, is very dangerous and can suffocate entire populations.
- Human predation and poaching are of course another threat.

Numbers

More than a quarter of approximately 100,000 species assessed by the IUCN are threatened with extinction; 40% of all amphibians, 25% of all mammals, 34% of all conifers, 14% of all birds, 33% of reef-building corals, 31% of sharks and rays. IPBES estimated that a million species of animal and plant are already threatened with extinction because of human action (ExtinctionRebellion, sd).

Food extinction

Did you know that since 1900, 75% of the genetic plant diversity in agriculture has been lost? (Fao, What is happening to agrobiodiversity). For example, in Thailand, where they used to have 16000 varieties of rice, now only have 37 varieties (Fao, Biodiversity and nutrition). And the US has lost 80 percent of its cabbage, pea and tomato varieties. Probably you didn't know. I didn't know either. The extinction of food is something that is a little discussed subject. Probably because we have plenty of food and besides that with artificial and chemical processes, we can make all kind of flavors and products. Even though we have food enough; we may do not have enough different nutrients if we continue like this. This will lead to a lack of very important vitamins and minerals which is dangerous for our health.

The carrots we eat now are far from the same as a carrot used to be. Strawberries we have nowadays can we get all year round, but do not taste like a strawberry has to taste.

Farmers have introduced new genetic iterations which caused a homogenization of certain foods. For example: In North America, for example, myriad cattle varieties used to be raised. Today, a single breed – Holstein Friesians – account for 90% of dairy cattle raised in the US, and another 4% are Jersey cattle. All other dairy breeds occupy the remaining 6% sliver (Nuwer, 2014). There are many endangered food sources; apples, chestnuts, chinquapins, dairy, wheat, goats, turkeys. Extinction of a food source can be very dangerous. Look at the Irish potato. In 1845 Ireland was reliant on one single potato, Irish Lumper. A potato disease; Potato blight, came and many people died or fled (History, 2019).

The fact that we rely on a small range of food is not only a risk for our own health, but also for the health of the ecosystem. The monoculture farming exhausts nutrients and leaves the soil vulnerable for pests and pathogens. This requires applications of fertilizers and pesticides that can, if used inappropriately, damage wildlife and leach into water systems (WWF, 2019). We also rely a lot on the animal-based protein. Total agriculture accounts for around a quarter of all greenhouse gas emissions, of which approximately 60 percent is due to animal agriculture (Baker, 2015). As you can see, change is needed.

Beside the nutrients that we lose and the ecosystem that we exhaust, our current food system also affects other elements. Food is our main source of energy, but it is also an very important part of our culture and economy. The taste of the old traditional recipes from grand grand grandmother is a centuries old recipe that has been adapted by gourmets for years to test the perfect combination of flavors together. These recipes are ultimately balanced and hold a long important history. It would be a great pity if these flavors and experience are lost because the ingredients lose their pure flavors. Losing food varieties entails much more than just losing food, it is related to the loss of tradition, a piece of culture, family experience and memories. We need to understand the importance of our food better.

Organisations:

There are a couple of organizations who are committed to food extinction. For example, Slow food who documents traditional, endangered foods and recipes (Nuwer, 2014). Or the doomsday vault is a secure seed bank in Norwegian island Spitsbergen where many seeds from all over the world are stored. There is also a cooperation between Knorr, WWF and Dr. Adam Drewnowski called Future 50 foods. They did research about the food extinction and the nutritional value of our food. In order to help society, make a change towards a more sustainable food system they created a list with 50 ingredients which have a high nutritional value and a low environmental impact (WWf, 2019). Eating these ingredients support the agrobiodiversity.

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