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Project report

HZ University greening strategy. Community diagnosis and design recommendations.

Becoming Fit for the Future
Circular economy minor

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Abstract

This report presents findings of the research carried out by the minor students of Becoming Fit for the Future, Circular Economy, in the second semester of the academic year 2021/2022. The research focuses on developing the guidelines for the greening strategy of the HZ University of Applied Sciences through user-centred methodology, and recommendations for communications and engagement activities to increase community uptake in sustainability and greening.

The research team deployed several methods to understand and analyse the characteristics, preferences and needs of different stakeholder groups to specify key functions greening interventions should serve and put forward recommendations for design and implementation. Action research is supported by the literature of circular economy and circular urban development, permaculture, sustainability and nature-based solutions. The aim of this report is to serve as a guidebook for designers and engineers, facility management, decision-makers, members of the Green Office and everyone interested in greening the facility.

Key conclusions are that greening should be tackled holistically, addressing multiple aspects of school operations, communications activities should be revised and intensified to attract the university community better. The involvement and cooperation of a variety of other stakeholders is required, including senior management. Recommendations on the functions and communication strategies are given.

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Introduction

Scope of this project is framed based on the work done by the Circular Economy minor students in this and previous semesters, including Marie Marcheguay and Paul Georges, conversations with the Becoming Fit for the Future programme leaders - Ingrid de Vries and Carlien Nijdam, food forest expert Viviane Smit, and HZ University facility manager Martine van Ommen.

Considerations about the project are focused around the two guiding ideas, which emerged from activities with and materials received from the stakeholders mentioned above:

1) 'Greening' the outdoor space of the facility (HZ University - campus in Vlissingen)
2) Applying the principles of permaculture, particularly the food forest concept in one of the areas designated to be re-designed to a greener environment.

According to the facility manager, Martine van Ommen, and the Head of Green Office, Ingrid de Vries, the project's goal is to make the outdoors space of HZ University more attractive through nature-based interventions. The rationale is that the facility is missing green, pleasant spaces where students could spend time between classes to relax and work on their projects. Most of the outdoor sitting infrastructure is placed on the concrete surface, which causes thermal discomfort during the spring and summer months. It is exposed, which does not secure users from wind that is often strong in Zeeland, and noise from traffic. It was also raised that teachers miss the opportunity to teach outdoors due to a lack of appropriate places and infrastructure. The increased natural ecosystem could reduce heat stress, insulate noises and provide pleasant surroundings. Carlien Nijdam is also looking into designing a place where Pabo students could learn and train educational methods using nature.

The concept of food forest came up as an interesting idea for implementation for a couple of reasons:

- social value - creating a stronger connection between people and nature - students and other stakeholders might be more attracted to spend time outdoors or even look after the 'forest', if the place provided an added value in the form of fruits, vegetables and herbs, or gardening possibilities. A greener environment helps for the mental health and concentration of the students.
- environmental benefits of applying permaculture principles - biodiversity increase, soil surface improvement, creation of relatively self-sufficient ecosystem, better air quality
- educational benefits - for the Pabo students, but also for students of other faculties as a means to raise awareness of the importance of natural ecosystems, native species, biodiversity.
- economic benefits - growing food for the school canteen, to make supply less expensive and dependant on external suppliers.

Students of the BFF Circular Economy minor have deployed the following actions that fall under the scope of the project:

- a green corridor in one of the university's yards with sitting infrastructure built of upcycled materials of natural origin, wooden chips footpath to create an easily accessible and pleasant space for students to hang out and learn
- Removing hortensias (monoculture), laying down the compost to improve soil quality, and seeding berries in the area designated for the food forest
- Taking soil samples for contamination analysis.
- Early sketches of the food forest design (see figure 1).

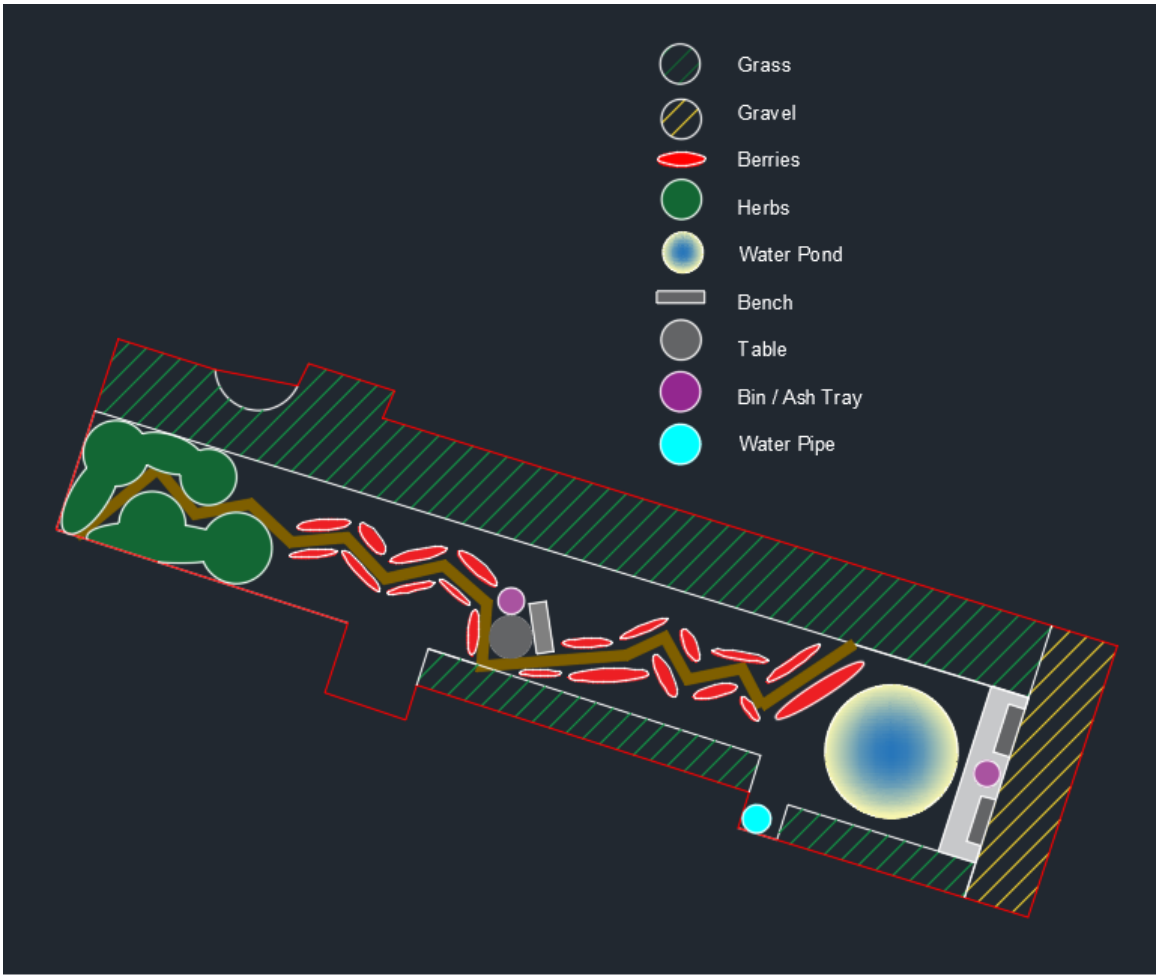


Figure 1. First sketch of the school garden developed by Circular Economy minor students Marie Marcheguy and Paul Georges.

Our initial research found that the school does not have an overarching strategy for greening the premises to guide the implementation of tailored solutions. We believe that it is crucial to develop at least guiding principles for such a strategy, as it would support streamlining and connecting all activities in this realm, such as systematisation of Green Office activities, input for re-design and reconstruction of the facility planned in the next four-five years. For the strategy to be a living and endorsed document, it has to be developed with the active participation of multiple stakeholders. We find this project an excellent opportunity to provide input for this strategy through field research, communications and engagement activities.

In this project, we aim to examine presented above assumptions in order to:

- define clear goals,
- identify the needs and wants of different stakeholders: students, teachers, staff, Green Office, and visitors
- develop guidelines for the HZ University greening strategy
- develop engagement and communication tools to increase stakeholders' awareness and uptake of nature-based interventions.

The largest and most impacted stakeholder group are students of HZ University, at whom this endeavour is targeted. At the same time, this is the least informed and possibly least interested group. As we primarily look into the social benefits that greening interventions can bring, the biggest challenge is to actively involve students to raise their awareness and build ownership of deployed solutions. For the ownership building, the greening interventions should be tailored to their needs and designed with their involvement. We applied the user-centred research approach and participatory methods to address the challenge, which is explained in the 'Methods' chapter of this report.

Our research focuses on how the solution can address multiple environmental and societal challenges and generate multiple benefits to different stakeholders of the facility - internal and external. We look into how the school garden can serve as a demonstration site to test out different ideas (environmental, educational, social). The underpinning idea of the demonstration site is that the journey towards sustainability and social change starts with small changes. It recognises the conditions we can influence, so we start from there, having the big picture in mind. Keeping an eye on the big picture while building small successes will help scale solutions over time.

We acknowledge that the design of the demonstration garden comprises the technical (engineering) and social solutions, which should inform each other. As the background of the project members is in commercial economics, urban economics and public participation, our research focus is on developing social design.
Marie Marcheguay and Paul Georges (another group of the Circular Economy minor, Water Management students) examined the technical (engineering) side of the design.

The social aspect of the solution should be made up of the following components:
- stakeholders' needs and wants research and analysis
- community vision of the HZ green re-developments
- communication and engagement activities
- recommendations for site functions, usage and maintenance
- recommendations for the HZ greening strategy

A visual representation of the technical and social solution can be found in figure 2.

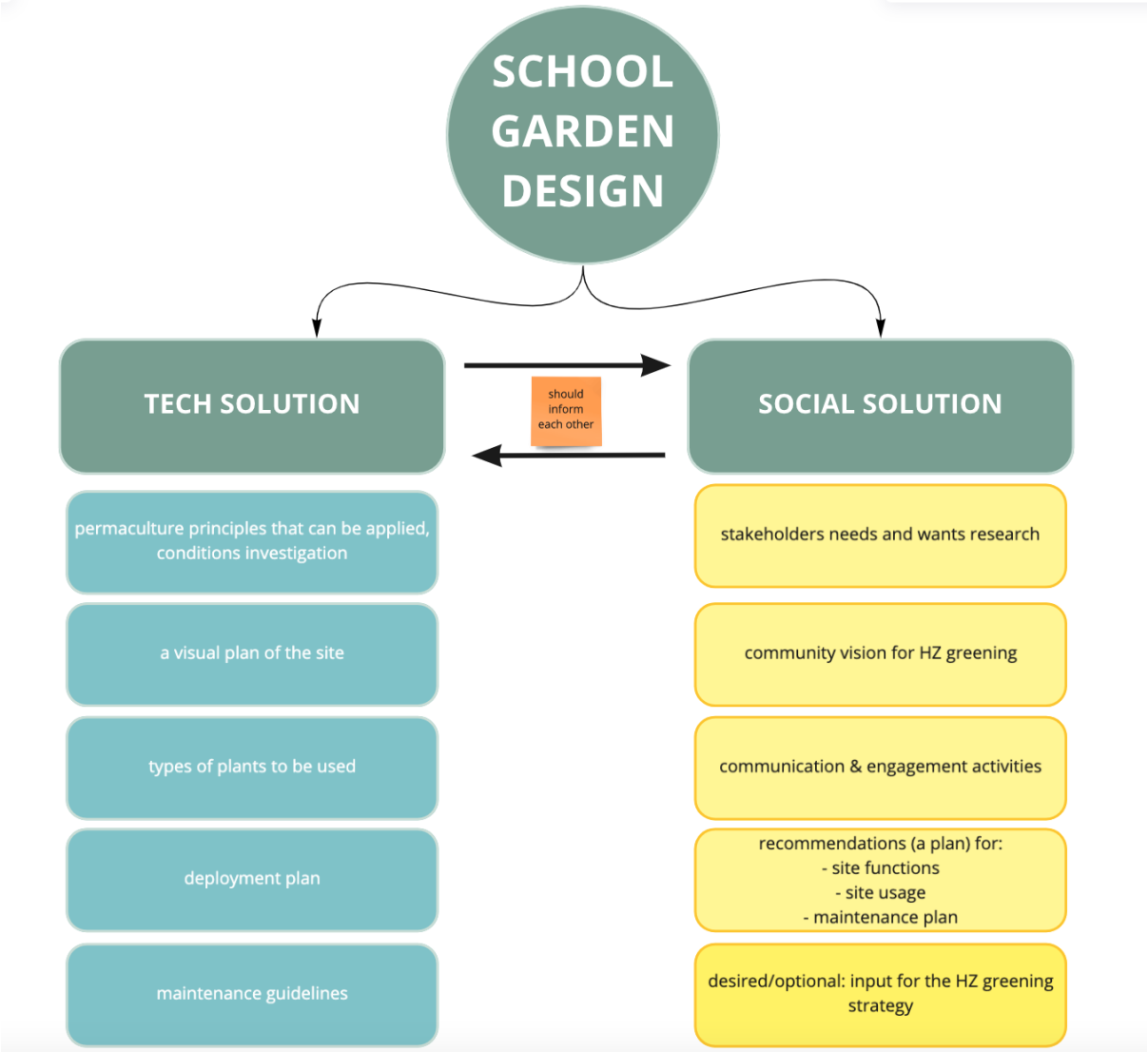


Figure 2. Technical and social components of the school garden design. Self-reported data.

Over the research, we strived to deliver the following outputs:

1. Set of recommendations for the school garden applying the food forest concept, with the focus on its functional design
2. Recommendations for HZ University greening strategy
3. Engagement and communications plan targeted at the students' community to raise awareness of the greening interventions taken up by the University and the Green Office.

A visual representation of our research work plan and desired outputs is presented in figure 3.

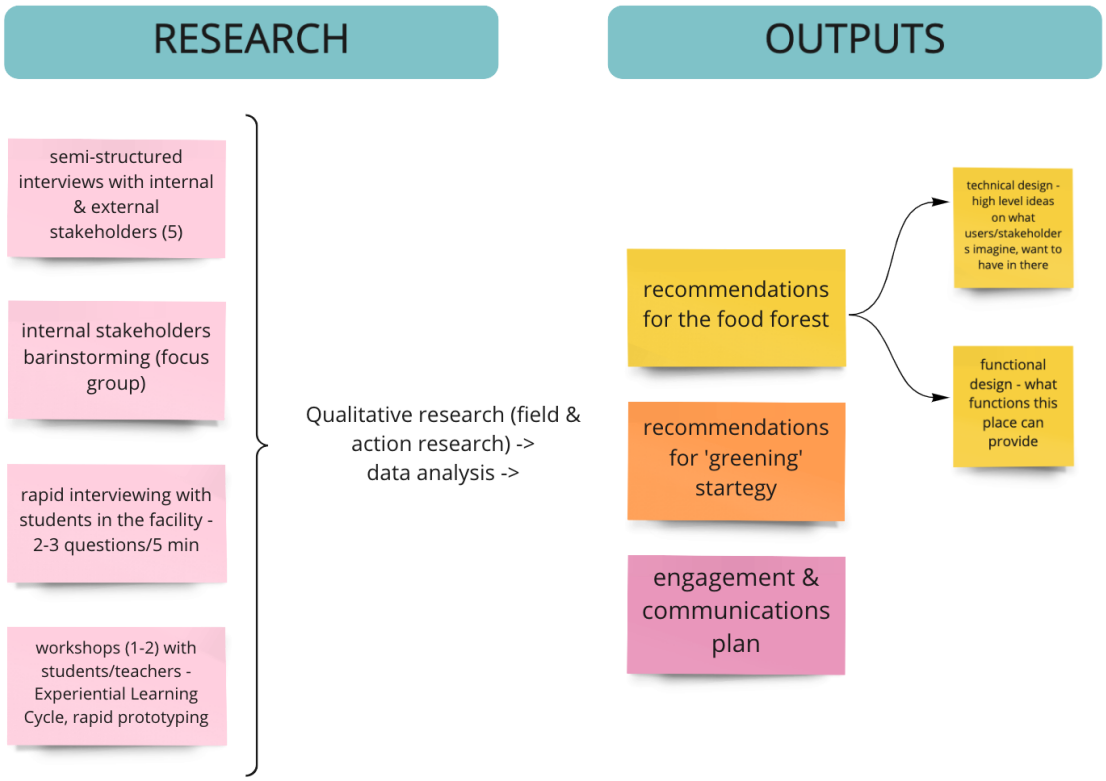


Figure 3. Research activities overview and desired outputs. Self-reported data.

Theoretical framework

We see this project as a multi-function intervention, addressing different challenges, broadly described as:

- Improving students' and other school stakeholders' health and well-being.
- Application of the urban greening and permaculture principles to increase urban ecosystem resilience.
- Community uptake of nature-based interventions, supporting social cohesion development

In this chapter, we elaborate on the theoretical background supporting this hypothesis.

Nature's impact on human health and well-being

A green environment is good for human health and well-being. It provides fresh air because the CO2 is reduced. But it also has a positive effect on the brain (Staatsbosbeheer, n.d.). People spend too much time indoors at work or school, which can leave little time to go out. In the winter months, the Dutch spend 21 hours a day indoors, while 51 percent like to go outside (Schaaprok, 2016). This behaviour can be changed by shifting priorities and making time to spend some time in nature.

A walk in a green environment creates positive thoughts and it reduces stress, but is this an effect of nature or physical activity? Research shows that this is only the effect of nature and that it is not related to the physical activity of walking, which is proven by a movie of a forest (Wesselius, 2013). A green environment does invite people to exercise, more than half of the Dutch like to walk in nature (Hoyng, 2020). Today, many young people struggle with anxious feelings and depressive thoughts. In 2021, suicide rates have increased by 15% of young people under the age of 30 (Nu.nl, 2022). An American study shows that people with clinically diagnosed depression have a great improvement in their mood after 50 minutes of walking in nature. Students are a vulnerable group of young people who can experience a lot of stress. The school can make the learning environment more pleasant for this target group by making it greener - not solely because it looks nicer, but also that the students become more positive and creative at school. The green environment also improves the students' ability to concentrate, which can lead to better results during the study period.

After all the positive effects have been identified, changes must be made in the school environment. The appearance of the Hogeschool Zeeland mainly consists of tiles and bricks,which has been chosen mainly to keep it maintenance-free. There are areas of land where some greenery has been planted,but the soil there is very unhealthy due to the monoculture and four metres of sand that has been placed while restoring the area after WW2. The appearance of the school will change into a pleasant environment for all stakeholders. The main stakeholders will be the management staff who decides what can go through, the students who make the most use of the facilities and the teachers who have a great influence on the students. The trees will provide shade when the weather warms, so that it is still attractive to seek out the green surroundings more. The various plants and trees

will create biodiversity according to the permaculture principles. This will make the soil a lot healthier, and nature will do its job better than any designed system.

Permaculture - baseline considerations

Permaculture is a concept which aims to create ecosystems that respect biodiversity (Learn the 12 Permaculture Principles - With Free Permaculture Workshop, 2022). The term stands for ‘permanent agriculture’, implying that agriculture should be done on an ongoing basis, with the long-term focus when it comes to cultivation and impacts. The goal of permaculture ecosystems is to be sustainable and self-sufficient. Sustainability is achieved through adaptation of long-term perspective: thinking about the consequences in a hundred years, planting more perennial (multi-year) plants, which in turn adds to the ecosystem resilience. Food forests are the example of practical implementation of permaculture, thus we take a closer look at its principles to inform the school forest design.

The ethic of permaculture lies in 3 ideas: care about humans, care about the land and share fairly. Therefore, application of this model in real life can deliver benefits in the form of an environment rich in biodiversity, self-sufficient, creating connections between people, for example, by sharing food and jointly taking care of a garden.
David Holmgren developed 12 principles of permaculture that should guide implementation. Those principles are especially relevant for greening the University as they refer to increasing biodiversity, propose low-maintenance solutions and support thriving ecosystem building. An overview of the principles is presented in Figure 4. is relevant, because the HZ wants to have a green environment full of biodiversity that does not need a lot of maintenance. While using these principles the biodiversity increases and nature can maintain itself.

12 principles of permaculture by David Holmgren

1. Observe and Interact: take time to engage with nature so that solutions are designed to fit the situation.
2. Catch and store energy: develop a plan for the abundant resources, so they can
3. Obtain a yield: get useful rewards.
4. Apply self regulation and accept feedback: the system needs to work well.
5. Use and value renewable resources and services.
6. Produce no waste: everything needs to be used.
7. Design from patterns to details: step back and observe how nature and society runs. These concerns the external factors, for example, wind, temperature, water, sunshine, people, animals - they all need to be taken into account for a design.

8. Integrate rather than segregate: put the right elements in the right place.
9. Use small and slow solutions: small systems are easier to maintain than bigger ones.
10. Use and value diversity: use biodiversity for a better system.
11. Use edges and value the marginal: the most interesting things happen between things.
12. Creatively use and respond to change: observe and intervene in the right time to have a positive impact on the change.

Figure 4. 12 Principles of permaculture. Source: David Holgrem.

The water is the most important part in the permaculture system and nature can spread it easily from the highest level if there are different levels of height. You can design zones in your system to put everything in the right place, in accordance with the natural set-up:

- Zone 0 is the place you stay the most, like home - you live in there and store your utensils.
- Zone 1 is directly surrounding zone 0, where you can put the delicate vegetables.
- Zone 2 is for the more difficult vegetables.
- Zone 3 is a zone for higher plants, so it should be more spacious.
- Zone 4 is for the trees.
- Zone 5 is a zone where you don't intervene at all to observe nature solving problems itself.

Zones division should be introduced in the design of the school food forest. If you divide the terrain in different zones, there is a vegetable garden and fruit trees that need little maintenance, taking into account the space a tree needs for maximum growth.

Urban greening as a critical means for sustainable and circular urban development

Cities across the globe are the frontrunners in the fight against climate change and environmental crises. However, they are key trouble makers too, with 57% of the global population living in cities, generating 70% of the global GDP, and being responsible for over 60% of energy consumption, 70% of greenhouse gases (GHG) emissions and 70% of the global waste. As the urban population is predicted to grow rapidly in the coming decades, cities are becoming increasingly responsible for environmental degradation and climate change. Therefore, cities worldwide are redesigning urban systems to mitigate the unfavourable effects of traditional urban development. They are adopting strategies towards reaching climate neutrality, reducing the use of resources and raw materials, developing urban resilience and ensuring healthy and safe living environments for their residents. One of the critical ways to achieve sustainability goals is adapting the circular economy (CE) approach, endorsed by the high-level European Union policies, like the New Green Deal, or the Urban Agenda for the EU (2016).

The origins of the CE date back to the sixties of the past century, gaining broader recognition in the eighties and nineties. The concept focuses on services' and products' design and production and is primarily applicable to business models - manufacturing and consumption. A circular economy derives from closed-loops of ecological systems, which are interconnected and interdependent. In natural ecosystems, waste practically doesn't exist because what is no longer needed for a process to carry on, and what would be seen as a residue, serves as 'food' for another cycle. This way, nature operates in a closed-loop, making it self-regenerative and self-sufficient.
On the opposite of the circular cycle, the traditional economy is based on the linear model, which can be briefly described as a four-stage process: take, make, use, dispose. As the product or service is not regenerative by design, waste coming out of the production and consumption cycle will likely pollute the environment.

Circular economy proposes a different approach, looking into mimicking the natural self-regenerative systems. Four key principles describe the essence of CE (Kholod D., 2019):

1. Waste equals food - thinking about and designing products so that the waste from production and consumption serves as a material for a new product or service.
2. Respect and nurture diversity - diverse systems prove to be more resilient to crisis and unexpected changes. Biodiversity ensures a healthy and thriving ecosystem.
3. Renewable energy sources - plants grow thanks to the energy coming from the sun. For energy generation, people should also use more renewable energy sources (sun, wind, tidal), which doesn't harm the environment, unlike oil or natural gas that cause GHG emission levels rising to the point neither nature nor humanity can handle.
4. Thinking in systems - nature operates within the interconnected and interdependent system, guided by reinforcing and weakening feedback loops, constituting its capacity to self-regenerate and rebalance. Sensitivity to systems would make production and consumption cycles more resilient and self-sufficient.

As numerous cities in Europe claim their transition to a circular economy, it requires understanding how and if the CE principles, originally developed for business and industry, can be translated to the urban context. Jo Williams (2021) from the UCL Circular Cities Hub advocates shifting from an economic to ecological focus for circular urban development. She puts forward the following definition of a circular city: '[it] is a socio-ecological system, consisting of bio-geo-physical unit and its associated social actors and institutions. It is a complex, regenerative and adaptive system, delimited by spatial and functional boundaries, surrounding and ecosystem' (Willis, 2021, p. 14-15). This thinking goes beyond the traditional approach to circularity, highlighting the social and spatial aspects. She also points out three important actions that cities need to take on their pathway to circularity:

1. Looping actions. Linear processes, which are characteristic of many urban processes, should be closed where possible. Closing the loops means reusing, recycling, and energy recovery. Examples include, among others, waste-heat recovery systems, food-reuse cafes, adaptive reuse of buildings and land.

2. Ecologically regenerative actions. These are all actions focused on the natural urban ecosystems recovery, such as the implementation of the blue-green infrastructure, nature-based solutions, increasing and nurturing urban nature.
3. Adaptive actions. Those involve actors of the urban environment and can be described as building people and organisations' capacity for change through participatory approaches to re-designing urban systems and developing systems for learning.

HZ University operates within the urban environment, so strategies towards Greening the HZ falls under all three types of action.

Sustainable Development Goals

The Sustainable Development Goals (SDG) are 17 goals set by the United Nations to make the world a better place by 2030. The SDG's have originated to end poverty, education and climate crisis (see figure 5). These goals are important for everyone, but especially for the government because the 193 member states of the United Nations (UN) have set this development agenda for 2015 – 2030. The government and the municipalities in the Netherlands are committed to making everything more sustainable and ensure equal rights such as good education and healthy food for everyone.

Figure 5. Sustainable Development Goals. Source: United Nations website: www.un.org.

We can specify this to the HZ, where the main goal is to give good education. But the canteen needs to be healthy for the students, teachers and staff. Also, the school is trying to be more sustainable by separating waste and less printing. Aside from being more

sustainable, the Green Office and minor BFF students are trying to have a better environment outside the school by organising clean ups and creating sitting places that are in a green environment built with biobased materials. The HZ is a good example of working on some of the SGDs, because this is important for the school and for the municipality of Vlissingen. There is a good budget to take action and make the school a more sustainable and better place.

Methods

Our project consists of field and desk research focused on collecting qualitative data. We found out that quantitative research (an online survey) on a similar subject, carried out by the previous minor students, did not provide representative results due to the survey's low completion percentage (Minor students: Fien de Vries, Lola vom Hof, Jonathan Lilombo, 2021). In addition, we look into data on the social qualities of nature-based interventions, which can be derived and examined through qualitative research. The research action plan was created upon the stakeholders' mapping.

Activities carried out for the field research involve:
1) Semi-structured interviews with the key internal and external stakeholders.
This method is a blend of structured and unstructured types of interviews. It means that the researchers have an idea of what questions they want to ask but allow some flexibility in terms of order of questions asked, modification of questions depending on the conversation flow, and asking questions not planned in the original plan but relevant for the topic of interview and input given by the interviewees. Our semi-structured interviews encouraged interlocutors to share what they thought was important rather than strictly sticking to the interview scenario.
Our interviewees were:

- Martine van Ommen, HZ University Facility Manager
- Carlien Nijdam, Becoming Fit for the Future minor coordinator and lecturer at Pabo
- Adri Bimmel, the Head of the HZ Canteen
- Ran Kok, Coordinator at the City Seeds Middelburg, a non-governmental organisation growing food for short-income residents of the neighbourhood, whose operational model is based on volunteering work.

We developed a set of questions for each interview that guided our discussion. Those questions differed as we had a diverse selection of interviewees, each providing insights on different aspects of greening the facility, growing food, and outdoors premises' needs and functions. The types of questions asked are presented in Appendix B.

2) Rapid interviewing with students.
We applied street polling methodology to talk with students about green interventions, where respondents were asked to give brief, top of the head answers. As online surveying proved to be an ineffective method in the past, we had to take a more direct approach to reach students effectively. We were approaching students in the canteen, asking for 'five minutes of their time to talk about ways they like to spend time outdoors, why and if they value green surroundings, their impressions of the University and ideas for how to make it more green and attractive. Questions have been quite general to enable interviewees to give spontaneous and honest answers. This activity was supported by distributing the informative leaflets in Dutch and English, pitching the idea of greening the HZ and goals, and calling to action if they were interested in getting involved (see figure 5 - Appendix A). We interviewed forty-seven students. A full description and methodology for rapid interviewing are presented in Appendix C.

3) Unstructured interviews and discussions.

Throughout the minor, we took part in a couple of unstructured interviews and discussions with internal stakeholders and experts. This method relies on running discussions with participants without a clear set of questions and scenarios, leaving room for spontaneity. These were:

- Meetings with Viviane Smit, a permaculture practitioner, to develop ideas on what type of plants and infrastructure is feasible to implement in the school food forest. These meetings resulted in an early food forest design, which fed into Marie's Marcheguay and Paul's Georges minor research.
- A meeting with the Green Office members to generate ideas for greening the HZ.
- Meetings with the school janitor to validate the implementation of particular solutions developed over the collaboration with Viviane Smit.

4) Brainstorming sessions.
We run three brainstorming sessions:

1. With the pupils of secondary school in Goes who visited the HZ University in April 2022. This exercise aimed to think together with prospective students about what place they would wish to study from the perspective of sustainability, greenery, and convenience. The exercise was designed and carried out by CE minor colleagues - Carsten Huiskamp, Twan Hoogester, Niels van Tuil and Romy van Buuren and held in Dutch. Twenty-five pupils took part.
2. With the minor colleagues and Water Management students who were involved in gardening work in the food forest. This brainstorming session aimed to identify challenges and barriers to broad engagement in greening activities and develop ideas for communications and engagement activities to raise students' awareness about greening interventions happening in the University and encourage greater participation. Session delivered rich output for improving and systematising communication activities, pointing out actors who should take a more active part in promoting greening interventions and identifying incentives for greater students' involvement. It was designed and facilitated by us, held in English.
3. With the group of engineering students of Avans University of Applied Sciences in Breda, visiting HZ University in June. The purpose of the workshop was to come up with practical ideas and solutions for greening that would be guided by our user-centred research and observations they made during the visit. The exercise delivered interesting ideas for creating comfortable resting and studying infrastructure, improvements in the existing green corridors and enhancing biodiversity. Workshop was designed and carried out by us in English, in the external green corridor. Workshop methodology and scenario is presented in Appendix D.

5) Focus groups with teachers and research staff.
We conducted a focus group with teachers and research staff using data obtained from the previous research phases. This activity aimed to collect information from the second-biggest stakeholder group - the teachers and research staff of the University on their perceptions, needs and ideas on greening the university. We relied on the voluntary sampling: we sent out an email invitation to all teachers and researchers of the University. Sixteen people expressed their interest in taking part in focus groups, based on which we set two, 1-hour-long meeting dates. Finally, five interviewees participated in the first meeting, and three in the second. We found it challenging to attract academic staff due to a few reasons:

busy time of exams, public holidays period and lack of direct contact with teachers (recruitment was based on cold mailing). Nevertheless, discussions delivered rich and interesting input on academic staff perceptions on greening and Green Office activities in the school, different stakeholders responsibilities, and ideas for fulfilling sustainability commitments. It's worth noting that discussions were attended by volunteers, for whom this topic was important, therefore the results cannot be deemed to be representative for the whole academic community. Findings should be used as a starting point for further, extensive research with this group of stakeholders.
Process was designed and carried out by us, and conversations were held in English. Methodology and run-up of the focus group is explained in the Appendix E.

Interview and brainstorming data are analysed using a coding process and following principles of grounded theory – an inductive, interactive and comparative approach common in social research to generate a conceptual understanding of data. We coded and stored data in a research repository built in Airtable to reveal themes towards categorisation.

Field research activities were supported by the ongoing collaboration with the minor coach Ingrid de Vries. Along with the field research, we also ran desk research to support the fieldwork methodology and deepen knowledge of the circular economy and urban greening, awareness-raising, behaviour science and ownership building.

Apart from the primary research activities, we took part in other activities in minor, which were not directly related to the scope and problem of our project, but aimed to support our learning:

- Gardening sessions in the food forest.
- Painting planters to create a more colourful schoolyard.
- Participation in the Green Office meetings.
- Study visits to the campings De Meerpaal and Weltevreden in Zoutelande to learn about their sustainability practice, combined with the gardening work.
- Participation in the pub quiz on climate and energy.
- Volunteering in the gardening work at City Seeds.
- Participation in the brainstorming sessions organised by the Province of Zeeland with students of the local education institutions to investigate students' ideas for making schools in Zeeland more green and sustainable.
- Participation in the clean-up action organised by the Green Office.
- Attending the film screening: Bigger than us
- Attending the WOW! Conference in Tilburg to learn about the circular approach by matching supply and demand of cellulose, lipids and PHA bioplastics of sewage.

Validation session with stakeholders

Halfway through the project, we conducted a validation session with the invited stakeholders: Martine van Ommen, a person from the HZ nexus, water management students (future minor students), Green Office members, and other BFF Circular Economy minor students.

We gave a poster presentation explaining our research approach and early food forest design (figure 6 - Appendix A).

The reactions to our qualitative research method over the quantitative research through surveys were good. Session participants expressed that we would be getting more information this way. However, there were some doubts about the outside classes because of the noise. The noise of outside classes can disturb the regular classes inside and vice versa. This observation could have been amplified because the session took place in the green corridor, where the noise was a significant disturbance. Therefore, before this plan can work out, there needs to be figured out if the noise does not disturb the classes inside and outside. Reviewers also advised that we need to make a good visual of the stakeholders' and users' wants and needs per group. At the end of the presentation, all reviewers said we explained our project and the method reasonably.

Results

This chapter presents the findings of the user-centred research. It is divided into five sections: first three sections (Staff and decision-makers, Students and Academic Staff) refer to users and stakeholders opinions, needs, preferences and concerns, and analyse how they can be applied to greening. The other two sections are of an issue-specific focus: the Food Forest and Communications and Engagement. In these sections we elaborate on what we learned from stakeholders on the subject matters and propose recommendations.

Staff and decision-makers

Before holding user-centred research, we contacted the internal key stakeholders to investigate their views on the current challenges and ideas for greening the University. We were curious to find out what the idea of 'making the school more attractive' means to them and what measures they would take to fulfil it. We also wanted to understand how the concept of food forest fits into the bigger vision for greening the facility and the conditions for its implementation. We spoke with Martine van Ommen, the facility manager; Ingrid de Vries, the head of Green Office; Adri Bimmel, the head of the school canteen and Carlien Nijdam, the coordinator of Becoming Fit for the Future minor and Pabo lecturer. We also interviewed Ran Kok from the City Seeds, Middelburg, to hear lessons learnt on introducing the food forest and working with the community.

The rationale for greening the University can be explained through the challenges interviewees put forward:

- Shortage of green, natural space around the facility, domination of paved surface ('*No green, only tiles, tiles, tiles everywhere*' - M. van Ommen) - an unfriendly place to spend time
- Lack of proper outdoor teaching infrastructure and unfavourable conditions (noise, scarcity of species for biology lessons), especially for training Pabo students
- A place prone to climate threats, especially during warmer months - heat waves, no shadow, strong wind.

It could be summarised that the primary functions staff and greening leaders strive for in greening the facility are social and educational. Interlocutors mentioned the environmental benefits of thriving natural ecosystems but only when directly asked about the climate change issues and if they saw any possibilities for greening interventions to address climate challenges. One interviewee highlighted the positive impact of a green environment on peoples' physical and mental health (health and well-being function).

Ideas for fulfilling the social function:

- More and better sitting infrastructure in the green environment ('*There is no green environment to seat and enjoy, only a few benches - mores relaxing spaces*' - M. van Ommen)
- More plants around the facility to make it a more pleasant place to spend time ('*People want more green spaces and attractive things, you want to sit on green, not tiles*' - M. van Ommen')

Ideas for fulfilling the educational function:

- Growing vegetables and different types of plants - for teaching biology, biodiversity, and nature in general - a type of content needed for teachers' trainers.
- Working with children - classes about movement and health (relevant for Pabo students)
- Any type of plants can be used in nature education and children's education ('*types of plants used for education can be very broad, flower bed, you can use everything*', '*Vegetables - lessons about healthy food, and try to think with students how you can use herbs and plants, always useable*' - C. Nijdam)
- Reduction of the noise outside.
- Implementation of proper infrastructure for teaching outdoors, for example, an amphitheatre.

Ideas for fulfilling the health and well-being function:

- Implementation of solutions for movement and health using existing infrastructure, for example, a climbing rope at the school facade ('*Infrastructure for movement and health with the fun factor, this is a very important factor*' - C. Nijdam).

If implemented properly, all of the ideas presented above can all serve the environmental function. However, our interviewees did not mention any ideas for which environmental aspects would be their key concern.

One of our interviewees mentioned the challenge of gaining a broad buy-in for greening activities and using outdoors areas for education amongst the school community. C. Nijdam said that '*as an institute for higher education, we want to respond to Sustainable Development Goals (SDGs) - we want to use and endorse them, greening can link to SDGs, and education can link to SDGs. We need to draw peoples' attention to SDGs.*' She pointed out that debate amongst academic staff on running classes outdoors and greening started some years ago, but it has been hard to encourage colleagues to develop ideas. She assumes that one discouragement can be a constraint of little budget, which *'lowers expectations'*. She argued that teaching subjects other than regular Pabo subjects are doable, but teachers' involvement is needed. There was a suggestion that this thinking can be stimulated by coordinators of educators, who could encourage colleagues to pay more attention to greening developments, introduce teaching outdoors, and raise their awareness on these topics, as this angle is not present in teachers' thinking about education at the moment. C. Nijdam also pointed out the role of students in shaping changes in the facility. They should be actively involved in this process - not only as recipients of changes but also as designers and implementers.

We have found another thread of greening the University through our interviews - in the school canteen. It was certified by the Green Key in 2015 for using healthy products produced sustainably. Every year the canteen personnel look for products that they can replace with more sustainable ones or produce themselves ('*Now we produce more soups ourselves'* - A. Bimmel) and have sustainability plans in place. They also try to avoid waste production as much as possible, and organic waste is collected in a green container for compost production. A. Bimmel points out that price is not a deciding criterion for product purchase but certification.

Students

1. User characteristics and perceptions about the school

Based on the rapid, semi-structured and unstructured interviews and brainstorming sessions with students, we learned how they like to spend their time outdoors, use the school's external premises and what they would like to see and have more of - both outdoors and indoors.

The most common answers of preferable ways of spending time outdoors were:

- Spending time with friends - picnicking, shopping, partying, going to the terrace or a lounge.
- Going for a walk - with a dog, alone, with friends.
- Going to the beach, forest.
- Doing specific types of sports, like cycling, jogging, and playing team sports. Interestingly, most interviewees who work out regularly prefer to go to the gym instead of working out outdoors.

Few interviewees mentioned other activities they like to do outdoors: reading and listening to music. Likewise, few students said that spending time outdoors is their preferred way to reset, 'clear mind', relax, and de-stress. One person explained that *'going out is a type of meditation for me*'.

The most given answers to the question about what makes staying outdoors enjoyable are sunny weather (*'resting in the sun*'), green environment - trees and flowers, fresh air, sounds of nature ('*birds, trees, seagulls*'), and going to the beach or a forest (Figure 8 - Appendix A). There were also unique answers like smelling flowers, beautiful skies, '*nice buildings, clean, hygiene, great ambience*'.

Out of the answers to the question 'Do you spend time outdoors at school?' we can conclude that sunny weather is the main reason students go outside (Figure 9 - Appendix A). Some interviewees mentioned that they do not want to go outside because there are many smokers and the smell of cigarettes is off-putting. Many interviewees pointed out that it was not convenient for them to spend time outside due to the lack of tables where they could put their laptops and charging stations. Hence, they prefer to sit indoors, where there is a lot of sitting infrastructure ('*It's easy to sit inside because of tables*'). There are tables in the green corridors, but most of the students did not know they were there or said it was too far from an entrance to get there ('*I rarely see people walking in the green corridors, most people don't know about them*'). Few interviewees mentioned that they did not know they were allowed to use this space. Green Office members also acknowledged that little students' awareness about the green corridors is '*a huge issue*', and Instagram posts (the only channel they use for green corridors communication) is not effective enough. They also pointed out that more accessible access to the green corridors is needed - for example, doors opening directly to the green corridors.

The opinion of students about the schoolyard is that there are many stones, grey, boring and only a few trees and metal benches (Figure 10 - Appendix A) - '*We don't spend time here, it's boring, bricks, grey'*. It is worth mentioning that approximately half of the interviewees

were somewhat enthusiastic about the idea of making the campus greener and eager to make suggestions on what can be done so that the place is more pleasant, attractive and encouraging to spend time outdoors more often. They would like to see a more colourful environment with grass and flowers (*'green - no tiles; grass, maybe meadow flowers*'). Interviewees also mentioned there are more sitting places needed ('*not a lot of options to sit, we're standing awkwardly*'), preferably made of a natural material as the metal benches are very hot in summer ('*benches are not comfortable, made of metal*', '*more sitting spaces in the front, they got very hot in the summer'*). Some respondents said they like to sit on the grass, but usually with blankets. However, most opt for having a sitting infrastructure. There were a few voices that sometimes the yard is too overwhelming to them due to many people - they would prefer having an option to go to a quiet, solitary place. Some students want more private sitting places in the shade, whereas others prefer to sit in the sun. There was also an issue of noise raised, both when it comes to studying, having classes outdoors, and resting ('*It would be nice to have a nice, outdoor place to meet, calm, without noise*', *'noise is an issue in the green corridors*'). Few students also observed that the interior could be more green - they argued that plants indoors provide better air and a more pleasant atmosphere.
About half of the respondents were neutral or disinterested in greening the University. However, they still agreed to talk to us and share their reflections, even if they had not got a lot to say about possible green interventions. Only one group of three people refused to participate in the interview.

2. Ideas for greening the University

Based on the input received from students of the HZ, including those involved in the Green Office and pupils of the Goes secondary school, the summary of proposed ideas for greening the University against the specific functions is presented in Table 1.
Solutions (ideas) have been categorised against specific functions based on the rationale interviewees gave. Some of the solutions (ideas) fall under more than one function - for the sake of clarity, the researchers chose to classify them by the reasons students found most relevant.

Social function refers to the solutions addressing needs and preferences of spending time outdoors with others and resting. Students most frequently mentioned this aspect.
Educational function refers to the ideas addressing different education-related activities, both individual and group.
Environmental function encompasses the ideas that primarily address specific environmental and climate threats, and it was the key reason for interviewees. However, environmental reasons were only raised by Green Office members and prospective students (pupils from secondary school).
Health and well-being function refer to the solutions that support health and provide a favourable setting for well-being improvements

Table 1. A summary of ideas put forward by students for greening the HZ, categorised against functions. Self-reported data.

Function	Proposed ideas
Social function	Increased, comfortable and more accessible sitting infrastructure, including benches, tables, power stations. Preferably placed in front of the school and made of natural materials. Good balance between shadowy and sunny places. Social infrastructure: hammocks, swings, places to organise picnics, an open-air terrace (i.e. on the roof). A designated area for smokers with bins to put out cigarettes.
Educational function	A quiet place outdoors for running classes that do not require using a screen. A quiet, shadowy area for studying.
Environmental function	Installation of insect hotels Improvement of biodiversity through planting wildflowers Installation of solar panels for renewable energy production Rainwater storage solutions - the water could be reused in a lab or for toilets.
Health and well-being function	More greenery out- and indoors for better air quality and its relaxing properties. Trees, edible plants. More sports infrastructure outdoors. Healthy canteen more gluten- and lactose-free products, less meat.

Academic staff

In order to obtain a big picture of the University community's preferences and perceptions, we looked for ways to reach out to the academic staff - teachers and researchers. We acknowledged that our research would be incomplete without input from this important and large group. We decided to take up a focus group as a research method. We assumed that this method would deliver full, in-depth reflections and enable participants to generate new ideas based on intelligence exchange. Focus groups were carried out at the final stage of

the research; therefore, we were able to frame questions and guide discussions based on the findings from the previous phases.

We asked interviewees what the notion of 'greening' means to them. It turned out that greening is used interchangeably with sustainability and is not limited to physical interventions. Participants pointed out aspects such as communications, awareness-raising and behaviour change stimulation, green physical interventions indoors and outdoors, better application of sustainability topics in educational curricula, and greater integration of different actors and programmes (i.e. better connection between research done by the University and application of sustainability measures in University operations) and embedding sustainability angle in all strategic decisions made by the management and directors.

When speaking about greening or sustainability, participants put much attention to communications, awareness-raising and behaviour change. They argued that not enough is done to build awareness of sustainable behaviour, and everything starts with the 'right mindset'. They pointed out that there is no right messaging to stimulate more sustainable behaviours and gave several ideas of what could be done:

- Running an effective communication with the school community using the existing tools and platforms, for example, hanging posters around the school in frequently visited places (i.e. coffee machines) with positive and engaging messages on how our daily habits and choices impact the natural environment - this should address both small and global impacts. Messaging should be friendly and avoid prescriptive language ('*Don't be too patronising, especially with the Dutch mentality'*).
- Organise gamification contests for students with proper incentives, such as 'hall of fame' or personality credits.
- Set-up of a digital platform that would facilitate carpooling for people commuting from distant locations.
- Better connection and interaction with different actors at school. Connecting Green Office actions with teachers who can then pass them on to students, collaborative planning ('*Every team has a meeting on Monday morning so Green Office can join and inform and ask them for ideas. And the teachers are there to give them ideas and also brainstorm with their students. And that is the digital platform where that should take place*.')
- Regular press updates. Hanging interesting climate and sustainability-related articles published weekly in newspapers and magazines in the school corridors.

Interlocutors admitted they did not know much about Green Office activities and agenda and were unaware of its website and location. '*You're not confronted with the sustainability of the green office.*', '*I have never seen the website. Of course if you search it, you find it. It's not that you spontaneously come across it*', '*we have taken a look at the site of Green Office and then we saw a lot of things that we didn't know about. It was there, but actually, we didn't know it*', '*where can you find the Green Office? They should actually have a cubic right at the entrance or in the atrium.*'. Two people said they knew something was happening in the place designated for the food forest, but they could not tell what exactly that was.

In terms of communication, it was pointed out that Green Office should be responsible for initiating, running and coordinating communications, making connections between departments, school organisations, and the management: '*[greening activities should] be*

*fully integrated everywhere. That's the most important thing. I think the role of the Green Office is to make that happen and connec*t'. Participants acknowledged that strategic decisions need to be made at the managerial level. However, they perceived the Green Office as a connector of the community, the board, and the initiator of sustainability-focused decisions. One interviewee was involved in setting up the Green Office at HZ four years ago, so they had more informed insight on what the role of the Green Office was envisaged to be. This person explained that Green Office was set up as an organisation made for and by students to engage them in green, on-the-ground initiatives. It is worth emphasising that Green Office is a student organisation which implies lesser capacity and dependence on students' voluntary work. Considering that it has been four years since the Green Office was established, and the community's expectations and demand evolved over this time, so as the circumstances, it is worth considering re-evaluation of the initial objectives, structure and resourcing. The Green Office may fail to meet the community's needs and expectations in the current operating model.

Teachers and academic staff clearly showed that greening should not be limited to outdoor interventions. They pointed out that students and staff spend most of their time indoors due to weather conditions, equipment and proper infrastructure. Therefore pleasant and comfortable conditions are even more important than greening outdoors. It was said that greening indoors is relatively simple and does not require significant resourcing, for example, placing more plants in classrooms and offices. Interviewees reasoned that plants and green surroundings have a beneficial effect on mental health, support concentration and relaxation, and purify the air indoors:
'*Bringing nature in the building because now indeed there are not a lot of plans.'*
'If I'm home, I have a lot of plants. It gives a good atmosphere and it's good for the climate and also for the radiation from all the electric stove. And here at our Department, the plants that are there are from a few teachers and from the Green Office. The school doesn't really want plants I guess.'
'When you enter this facility it's really plain, like white walls. There's not even a plant in here.'
'I would say: bring the green inside instead of bringing the students outside, because if a plant is there, it will just stand there and it will not move because there's wind or something like this. So it doesn't distract as much as being outside'.
One interviewee pointed out that there are different plans considered as to the future of the building - whether it should be renovated or the University will move to another building, leaving this one for another educational institution. Therefore, light-touch, temporary actions, like placing more plants indoors, would not strain the school budget as much as the large-scale, infrastructural interventions, which are financially not viable if the University were to leave the place in the next few years.

Apart from greening indoors, interlocutors acknowledged the value and importance of reshaping the outdoor facilities towards greener and more natural. They highlighted that currently it is not a very convenient environment due to large paved areas, including parking lots, and too few trees. '*When you're outside you probably see a lot of stones. It's not very interesting to go there. So it would be better if I would go outside and see a lot of green space. Perhaps some animals. Just to change your mindset because that's very important to do once in a while*.'. '*Right now everything is flat. If you make it more like hill, etcetera. You*

can plant lots more plants, flowers, and make all kinds of wandering roads around it. You can do lots of things, make trees.'.
Another rationale for greening the outdoor areas was that it is now dominated by concrete, sealed surfaces that are not good for the environment and climate threats, such as heat stress, rainwater drainage, and scarce biodiversity. '*One of the things that are not so good is to have everything concrete outside because that is the problem. You gotta make it green. You got to make sure that the water is going somewhere.*', '*And even more trees, they already planted a few in front, but trees are also connected underground. So they have to stay much closer together. And that also invites birds to come singing when you come here.*', '*Take a look outside. See outside the window, there's a metal infrastructure for the sun, but there's nothing done with it. You can use it to put plants on it like a green wall. I think if you have a green wall that also helps you to keep the rooms a bit cooler and that's important to work efficiently*.' When speaking about how the building and facility services can be more environmentally friendly, academic staff proposed installation of more solar panels on the roof, implementing solutions for rainwater harvesting and recycling, reviewing the scheme of emptying trash bins (doing this less often to reduce the number of plastic rubbish bags use), introducing more healthy and organic food to the school canteen.

We also asked teachers and research staff how and if they would use the greener external premises for educational purposes, for example, teaching outdoors. It occurred as an interesting opportunity but only for specific teaching methods, like brainstorming or seminars. Classes that require content provision seem to not be very feasible for outdoor teaching, as they require students to take notes and the teacher to present the content ('*Most teachers are hooked up to the slides, including me.*'). One person observed that running classes outside would require teachers to break the routine, develop a new ways of conveying content ('a medium of exchange') and ensure that knowledge is received effectively ('*So you have to make these kind of educational structures that you design it in a way you can do it, and students will be incentivised to do it and that you still have results. Otherwise, you won't reach your goal. We come back and they say: that was nice, great teacher. You were a good teacher, and they just had fun, but learning goals were not achieved'*). Another observation was on how people associate outdoors and indoors in the school context, which means teaching outdoors is likely less effective. For many people, the outdoors is for rest, and breaking down this model is challenging. '*I think most people do not really like [learning] outside. You go for a walk during your break, you see the students outside smoking, reading a book, drinking coffee, talking with each other. That's not something that you immediately think: outside is a teaching space. Outside is a relaxing space. So you kind of mix the thing*'.
For reasons explained above, interviewees gave ideas on what they would need to run more classes outdoors and what would potentially encourage other teachers. A proper teaching infrastructure should involve: a place secured from wind, harsh sun and noise, equipment for content presentation, comfortable sitting infrastructure, and moveable tables. One person also mentioned that they would use the space in the green corridor for running classes if the wood trunks were more comfortable and placed closer together, and there were more of these there.

Another important thread in teachers' and researchers' discussions regarding the school's sustainability concerned the school management's vision and actions. They argued that sustainability actions should be better embedded in the overall school strategy and concern

every area of University operations. This involves, for example, the Green Office activities and sustainability action taken by other units being connected to the overarching visions of the school development and supported by strategic decisions. One interviewee mentioned that sustainable development commitments taken up by the University do not translate into practice and miss the clear goals that would be measured to validate progress. '*Our school signed off saying we will work with the sustainable development goals, but we have no clue how far we are. There are projects, you do stuff, there is a Green Office and things happen. But if you look from a managerial perspective, you should have a goal and then you can see what activities you exploit to reach it, and then you measure if you get there.*' Few interlocutors also flagged that sustainability is about teaching about it and including it in the programmes curricula. They said that it is happening in the HZ, but only now will an external audit be carried out to investigate how well SDGs are embedded in education. Another interesting observation on the strategic level concerned connecting researches with one another and research projects with didactic work. One interviewee admitted that '*before I got the job I was under the impression that the research groups in the HZ work together in a way they communicate more and work on the same projects but all from their own specialties. I haven't seen that, we are kind of isolated. Everyone is on his own island at the moment. I think communication is the most important thing to have. Like in any organisation, if you don't communicate, you can't work towards the same goals. In the end, we all want to be like the best school.*' Another interviewee put forward the idea of closer collaboration between researchers and teachers, which would be beneficial for each party, and for the University to inform strategic decision: '*the research groups have dedicated time, dedicated group of people, and we have it in the education programs - we could use best practices from the research centres. But they teach sustainability and they come from technical engineering. Let's say: 'it's a very new type of solar panel'. If they can give a guest lecture on that and my students from business are asked to make the business case for it, then you have a good match. There are so many things possible.*' '*I think the research centres are much better equipped to understand what the market needs, what they can do and what kind of research projects will be suitable. So I think with them the Board can align where you can focus the efforts plus what they see as a future perspective towards more sustainable research.*'
It can be concluded that all sustainability-focused endeavours taken up by the Green Office, other units, or individual leaders must be supported by the senior management and aligned with the organisation's development vision. Otherwise, people and units will remain isolated, and the results of their actions will not break through and scale.

Food forest

During our research activities, we strived to investigate the reasons and conditions for implementing the food forest. As a result, there were two key functions identified by our interviewees that food forest could serve: educational and growing food.

Educational function was mentioned by Martine van Ommen, Ingrid de Vries and Carlien Nijdam. Different plants could be used for biology education and training Pabo students. Ran Kok (City Seeds Middelburg) observed that a food forest could be an effective tool for engaging children through educational lessons on how nature works, where the food comes from and how to grow food organically (as opposed to industrial, unsustainable food growing systems). Such an approach could also be introduced for higher education, either by

pedagogy students running training classes with children or by HZ teachers of specific specialisations on sustainable food production.

Martine van Ommen and Ingrid de Vries suggested a food growing function for internal school use. We talked to Adri Bimmel, the head of the school canteen, about how the canteen can benefit from the food forest. The biggest concern raised by A. Bimmel was that the canteen needs to follow specific regulations (HACCP), which oblige them to use products from certified sources, significantly limiting the possibilities of growing their food. However, certain products come from the food forest that the canteen can successfully use. These are certain fruits: pears, apples, plums, which can be used for juice production, and nuts (i.e. almonds). Unfortunately, self-grown herbs, which are easy to grow, are not allowed in the public canteen. A. Bimmel declared his support for the food forest idea and offered to donate waste generated by the canteen for compost production. He also highlights that he would not seek economic benefits from using products from the food forest, as it does not seem a viable option, but the value for him would be students' involvement. He also pointed out that canteen personnel cannot commit to maintenance (harvesting). 'Human work is also a problem, if there's too much work, we can't do this', he noted. Maintenance was also raised by Martine van Ommen, pointing out that the gardener can do some work, but most of the work has to be done by students.

Amongst other constraints mentioned by the facility manager were:

- The highest plants cannot be too high ('No 5 metres high because it's also no good when you make it too dark').
- Safety issues - the food forest cannot pose a risk to cars parked nearby, especially during heavy winds.
- Homeless people cannot go inside. Tourists can spend time in the food forest if they do not leave trash.
- A place designated for the food forest is part of the escape route and used by a company doing window cleaning and maintenance work - the route has to stay clear.

Ran Kok (City Seeds Middelburg) gave us a piece of advice on starting with the food forest:

- Think about the bigger goal, the outcome you want to achieve, before starting.
- Learning from organisations with some experience in the field, such as SLZ, prepared a list of plants that can be successfully grown.
- Starting small, learning by doing - testing out specific plants, observing how they grow, and adapting your plans regularly.
- Adopt the implementation and maintenance model to the abilities and capacity of people involved when leaning on voluntary work - be realistic about what you can ask people to do.

These tips should be considered when implementing the food forest at HZ University.

In our conversations with students, themes that could be linked to the food forest did not come up often; students primarily voiced the need for better and more convenient leisure and studying infrastructure outdoors, coupled with more greenery in general. These needs should be addressed by interventions deployed across the whole premises. Only two interviewees mentioned that they would appreciate edible plants at school. Likewise, the food forest did not attract much attention amongst academic staff we talked with, even

though they were directly asked if they knew about this being implemented at school premises. It cannot be assumed that the University community would not appreciate the food forest in their school, but their needs as to greening are focused on other aspects and improvements. We may assume that once the food forest is more advanced, and thus more visible, it would attract more people who would either benefit from spending time outdoors, or get involved in further development and maintenance. However, it's worth noting that as with any other greening interventions, the food forest would require better internal communication and involvement of key stakeholders, for example teachers of environmental sciences or pedagogy. Communications and engagement is elaborated in the following chapter.

Based on our findings we can conclude that school food forest can serve few key functions: educational, as demonstration site and as a publicity means. Secondary function, that can be fulfilled only to a certain extent, is the food production for the school canteen. Implementation of the food forest can also have a beneficial impact on the natural environment, therefore it would also serve an environmental function; however, it's worth mentioning that food forest is a small-scale intervention and alone would not bring a significant environmental benefit if bigger scale planting and de-paving actions are not deployed. Description of functions is presented in table 2.

Table 2. Functions of the school food forest. Self-reported data.

Function	Description
Education	A 'living lab' for running classes - biology, environmental sciences, pedagogy training. A tool to increase community's awareness of the benefits of thriving natural ecosystems.
Experimental / demonstration site	A test-bed for implementation of various nature based interventions to observe how they evolve and being used by the community, to scale across the whole facility.
Publicity	A tool for the University to position itself as a leader in implementation of novel green solutions in the educational institution.
Environmental	Increased biodiversity Improved water retention. Soil remediation. Reduced heat stress.
Food production for school canteen (secondary function)	Production of certain types of fruits and nuts that can be used for meals preparation in the school canteen. **It is advised to examine the soil contamination before products*

	grown in the school food forest are made available for human consumption.

Communication and engagement

In the course of project work and through conversations with different stakeholders, student engagement emerged as a hurdle to effective implementation of greening interventions and other related actions taken by the Green Office (GO). Drawing on our experience and observations, input from interviews and focus groups, and brainstorming session with our colleagues and Water Management students who have been involved in Green Office endeavours, we identified challenges within this realm:

- Too little engagement of teachers in introducing greening and sustainability-themed activities to students and too loose connections between teachers and the Green Office. Teachers of environmental studies do not inform their students about the engagement possibilities, or at least do not do it to the extent that would mobilise a critical mass, which is a loss of potential, as these students, due to their interests and study field, are potentially the most informed and interested groups.
- Lack of transparent and broad communication about the current engagement opportunities. Information about the possibilities of earning the personality credits through involvement in GO actions is not available on the HZ Learn page and is not connected to the HZ Work Zone. This information is spread by word of mouth, and amongst students associated with the Green Office, which for a big student community, is not sufficient. The Instagram account is the only communication channel to inform about ongoing activities, making information dissemination dependent on the algorithms. It can only reach those who actively follow the GO profile (usual suspects syndrome).
- Too late in the process. Our interviewees observed that information about upcoming events is often distributed too late, which results in low participation as people are unable to adapt their plans and schedules on short notice. Another issue that came up was that actions which happen regularly, for example, gardening sessions or insect hotel workshops, occur when students have classes or other school commitments. The events calendar on the Green Office web page is outdated.
- Little diversity. Most offered engagement possibilities usually involve physical work (cleanups, gardening) with little learning value. People we talked to would be more eager to participate if more robust educational activities supported these initiatives, for example, hands-on workshops with experts and practitioners, masterclasses, and seminars.

Our interlocutors agreed that the most effective incentive for students to get involved is personality credits; thus, this tool should be widely used. Although this is a purely instrumental incentive, it could attract ‘unusual suspects’ who would not get involved otherwise and perhaps translate into longer-term engagement. Other incentives mentioned as valuable are the possibility of having a social connection while doing exciting activities

with peers, and tangible rewards, like the possibility to take self-grown food home or monetary incentives.

Based on the diagnosed challenges, we developed guidelines that relevant school bodies should consider to increase community's uptake in green initiatives and raise awareness. These recommendations are presented in Table 3.

Table 3. Recommendations for communications and engagement activities for increasing school's community participation in green initiatives. Self-reported data.

Meet people where they are
Use of the school's existing and well functioning communication tools can be more effective than social media channels (like Instagram), where one has to fight for attention with all types of profiles functioning in the social media sphere. Common source of information which students use for personality credits is a dedicated page on the HZ Learn and the HZ Work Zone. Every student and staff member uses the school mailbox, so monthly newsletters about upcoming events and engagement initiatives can support information spreading. Those need to be sent out well in advance so that people can plan their time accordingly. Better and more frequent use of school displays (screens, information boards) for events. Short, nudging informative notes distributed across the facility, especially those frequently visited, i.e. coffee machines. Those can inform on sustainability related data and be connected to students' and staff's everyday lives - i.e. information of your lunch carbon footprint, CO2 capture single plant abilities. Messaging should be positive to avoid shaming as it would be counter-effective.
Be recognizable
Green Office should introduce a recognizable branding, consistent with the HZ corporate identity, like HZ Sports and HZ Cult. This would facilitate communication and visually connect GO with the University, making recipients recognizing the content and its source quicker.
Long term planning
Like HZ Sports and HZ Cult, the Green Office could issue a booklet that is widely distributed amongst students at the beginning of the school year and available at the school campuses. This initiative would make GO more visible and would raise students' awareness about what the school does in the sustainability domain, and what the involvement options are. This would also allow students to plan their engagement in advance and make more informed decisions about earning personality credits. It is understandable that not all actions, especially those organised by partner institutions, can be announced several months in advance. In such cases, monthly newsletters, and complementary social media channels can work well to fill the information gap. Booklet requires long-term planning on the Green Office end, which can also be beneficial for the organisation in terms of systematising their work over the year.

Make alliances

Involve teachers in greening actions, especially those in environmental science, as they have direct connection and authority with students. Depending on the curricula, some practical classes can be held outdoors, and HZ campus in Vlissingen can serve as a 'living lab'. What's more, as the University plans to rebuild a large part of the facility in the coming years, some of the nature based solutions could be designed by students and teachers of relevant faculties. Such an initiative would boost students' involvement and fulfil learning goals.

One of the important factors when engaging with young people is that the work is fun. Uptaking joint initiatives with HZ Sports or HZ Cult can potentially attract more people, also these traditionally disengaged in sustainability-related actions. Such alliances could also diversify the narrative as constant, 'green' messaging can be dull.

Attract by value

Physical work won't attract students for long term, and is unlikely to support their intrinsic motivation. Diversification of the engagement offer can attract those who are already into greening and sustainability issues, and so are more inclined for a long-term engagement. At the same time, this group is also more demanding - they value evidence-based content, hands-on experience. The key is to offer something they won't find in books and other educational sources, like workshops with experts and practitioners, masterclasses, seminars. Green Office is a perfect avenue for providing these types of activities. Engaged students can in turn act as community champions for promoting the greening interventions and increase community uptake.

Conclusions and recommendations

Facility staff and greening leaders would like to create a pleasant, green outdoor area where students and staff spend time more often and eagerly use it for educational purposes. Thanks to rich vegetation and biodiversity, the outdoors area is climate change proof, provides relief from the heat, secures from noise, and supports water retention. Students primarily would like the outdoor environment to provide more possibilities for rest opportunities, preferably with friends. Interestingly, the environmental benefits that green solutions should provide were not observed by stakeholders and users, or at least it was not their immediate observation, even those inclined with sustainability topics. However, We argue that all changes and interventions taken to make the facility more green and attractive should address the environmental challenges. Thus, the environmental focus plays a transversal function that should always be considered when greening solutions are designed and implemented.

Stakeholders often perceive greening as a complex and holistic approach, addressing not only external premises but also indoor areas. What is more, greening is often used interchangeably with sustainability. It comprises more than outdoor physical interventions, which are: communications and awareness-raising activities, programmes to support behaviour change, embedding sustainability topics in educational programmes, and strategic decisions taken at a managerial level which are supported by adequate resourcing to pursue the sustainability goals. In physical meaning, greening activities should also encompass indoor spaces, as students and staff spend most of the year in classrooms, hallways and offices. Therefore, the facility should look after creating an environment conducive to concentration and effective work through green solutions.

Greening pursuit should not be a mission fulfilled solely by one school unit or individuals. Actors such as the Green Office, facility manager, or engaged community champions should reach out and stimulate the wider community. Their work should be supported by a well-defined, goal-oriented, concrete vision for the University's development. This also means that leaders' work needs to be supported by proper resourcing and applying sustainability measures to every field of the organisation's operations. Through the genuine involvement of the facility's senior management and their buy-in for bold sustainable-focused decisions, bottom-up initiatives will scale up. To ensure the goals are achieved on time, regular audits should be carried out.

Recommendations

We put forward the following recommendations for further research and application of this report.

1. It is advised to conduct in-depth research on the academic staff's perceptions, attitudes, ideas and ambitions regarding greening (or sustainability) in the University. Our research surfaced unique findings on the topic presented by this group, and it would be desirable to carry out a propper, larger-scale research to verify and deepen our results. It is required to reach a diverse group in terms of attitude to greening; as for our research, we only managed to reach enthusiastic actors.

2. In order to increase student participation in greening activities, they should be more involved from the beginning, that is, from the design phase, to build their ownership and awareness and shape environmentally-sensitive attitudes. Students need to feel that their ideas, experiences and expertise impact decisions made by the decision-makers. This could be realised through the involvement of the students of the environmental sciences in designing the engineering solutions to be implemented in the school, greater cooperation between research centres and didactical activities, and co-design sessions with students of different faculties. It also entails greater collaboration of different actors and support provided by the University management so that activities initiated by the Green Office are not isolated and of little impact.
3. We advise findings from this report to be considered by the Green Office, University staff and designers of the greening solutions, including future minor students, to inform their work.

References

12 Principles of Permaculture by David Holmgren. (2010, 14 januari). Reach and Teach's Just Lists. Geraadpleegd op 11 maart 2022, van https://justlists.wordpress.com/2010/01/14/principles-of-permaculture/

Creswell J.W. (2013). Projektowanie badań naukowych. Metody jakościowe, ilościowe i mieszane. Translation: Gilewicz J. Wydawnictwo Uniwersytetu Jagiellońskiego.

Hoyng, J. (2020, 6 januari). Groen als beweegvriendelijke omgeving: een overzicht. Allesoversport.nl. Geraadpleegdop 18 februari 2022, van https://www.allesoversport.nl/thema/beleid/groen-als-beweegvriendelijke-omgeving-een-overzicht/

Global Ecovillage Network. Geraadpleegd op 12 juni 2022, van https://ecovillage.org/permaculture-principles/?gclid=CjwKCAjwnZaVBhA6EiwAVVyv9LZ3s5Dw6hQWrk9hU2KpCFfkAfmVdfR5lDeXjgcfuyfuIei9eSovhxoCr2UQAvD_BwE

Kholod. D. (2019). 4 Principles Of The Circular Economy: Do You Know Them All?. Retrieved 17 March 2020 from https://medium.com/@we_share_ventures/4-principles-of-the-circular-economy-do-you-know-them-all-2c4619b83df6

Learn the 12 Permaculture Principles - With Free Permaculture Workshop. (2022, 15 april). Global Ecovillage Network. Geraadpleegd op 12 juni 2022, van https://ecovillage.org/permaculture-principles/?gclid=CjwKCAjwnZaVBhA6EiwAVVyv9LZ3s5Dw6hQWrk9hU2KpCFfkAfmVdfR5lDeXjgcfuyfuIei9eSovhxoCr2UQAvD_BwE

Minor students: Fien de Vries, Lola vom Hof, Jonathan Lilombo. (2021, juni). Final Report Cicrular Economy comments. HZ. https://myhz-my.sharepoint.com/:w:/r/personal/buur0016_hz_nl/_layouts/15/Doc.aspx?sourcedoc=%7B6E31761A-5B68-4322-B4CD-272E3ACCFEB4%7D&file=Final%20Report%20Cicrular%20Economy%20comments.docx&action=default&mobileredirect=true

NU.nl. (2022, 14 januari). Kuipers wijt toename van zelfdodingen onder jongeren deels aan sluiten scholen. NU - Het laatste nieuws het eerst op NU.nl. Geraadpleegd op 18 februari 2022, van https://www.nu.nl/coronavirus/6178164/kuipers-wijt-toename-van-zelfdodingen-onder-jongeren-deels-aan-sluiten-scholen.html

Rijskoverheid.nl. Data retrieved 25 May 2022 from https://www.rijksoverheid.nl/onderwerpen/ontwikkelingssamenwerking/internationale-afspraken-ontwikkelingssamenwerking/global-goals-werelddoelen-voor-duurzame-ontwikkeling

Schaaphok, R. (2016, 20 april). We zitten meer binnen dan ons lief is. MAX Vandaag. Geraadpleegd op 18 februari2022, van https://www.maxvandaag.nl/sessies/themas/natuur-milieu/we-zitten-meer-binnen-dan-ons-lief-is/

Somarakis, G., Stagakis, S., & Chrysoulakis, N. (Eds.). (2019). ThinkNature Nature-Based Solutions Handbook. ThinkNature project funded by the EU Horizon 2020 research and innovation programme under grant agreement No. 730338. doi:10.26225/ jerv-w202

Staatsbosbeheer. (z.d.). Natuur en gezondheid. Geraadpleegd op 18 februari 2022, van https://www.staatsbosbeheer.nl/wat-we-doen/recreatie/gezondheid

United Nations, The Population Division of the Department of Economic and Social Affairs. Interactive data retrieved 18 February 2022 from www.population.un.org.

United Nations - Habitat III. Data retrieved 18 February 2022 from https://habitat3.org/the-new-urban-agenda/

Wesselius, J. (2013, oktober). Natuur en therapie. Rijksuniversiteit Groningen. https://intogreen.nl/wp-content/uploads/2017/07/wesselius_thesis.pdf

Williams J. (2021). Circular Cities. A Revolution in Urban Sustainability. Abingdon, Oxon: Routledge.

Appendix A

Figures

Figure 6. Informational leaflet in Dutch and English distributed amongst students during the rapid interviews.

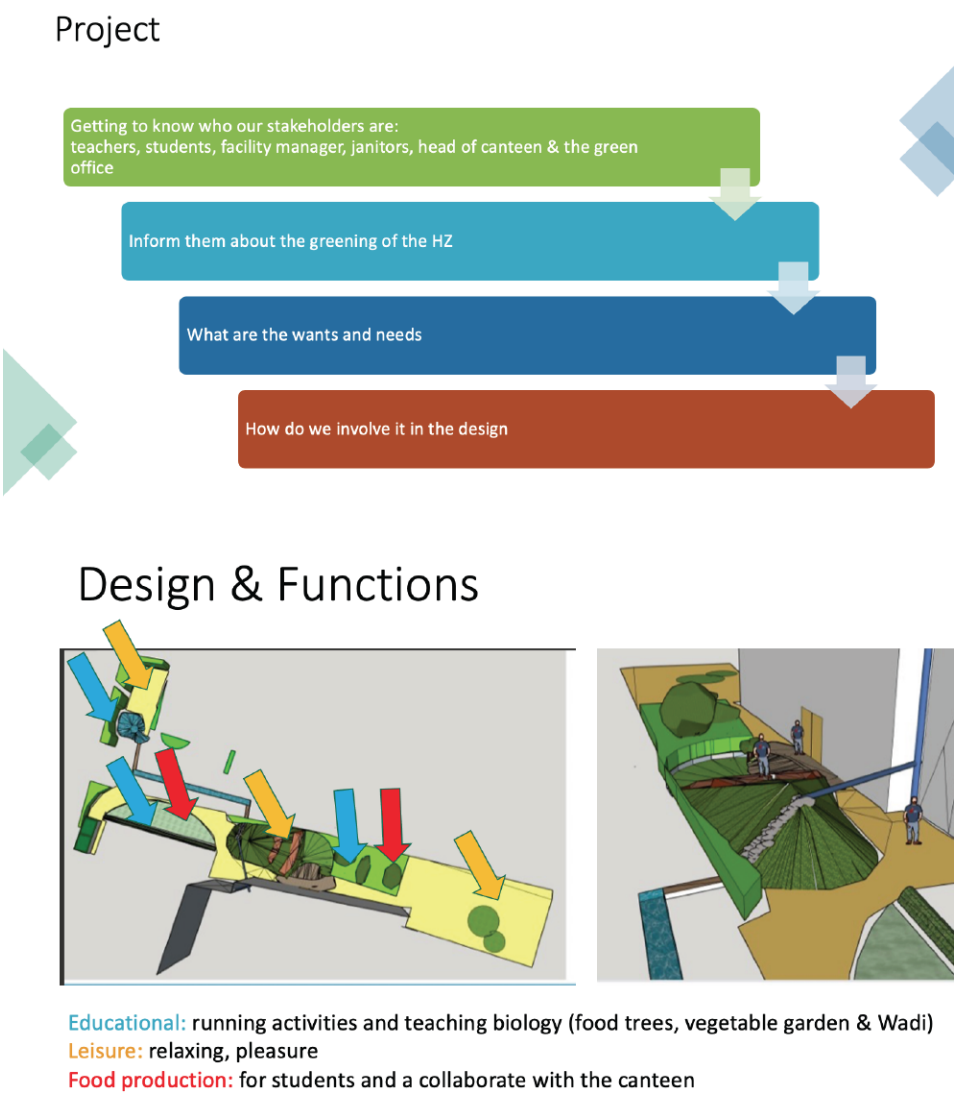


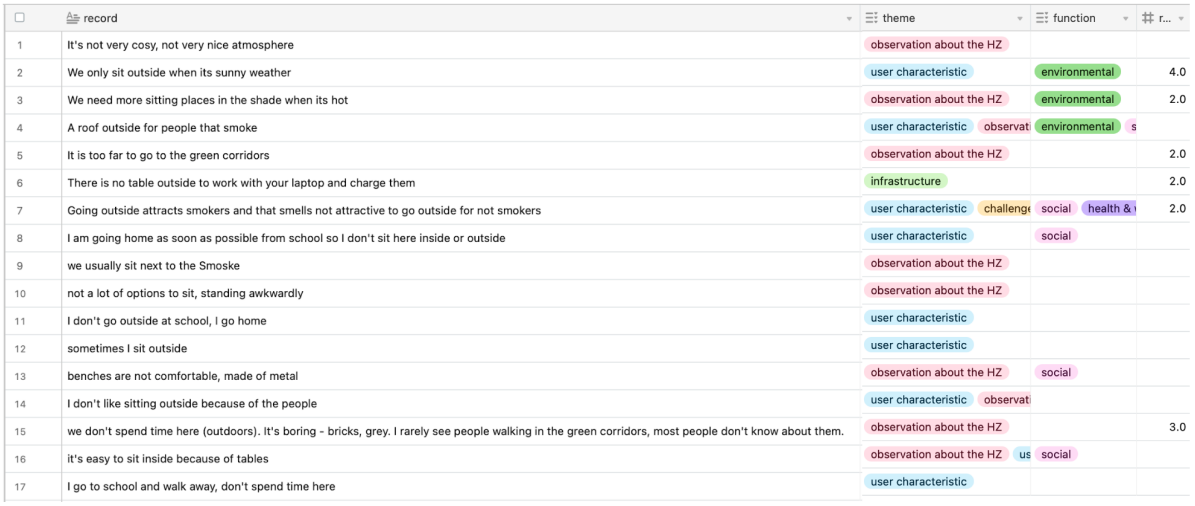
Figure 7. Poster for stakeholder presentation.

	record	theme	function	r...
1	walking	user characteristic	health & wellb...	10.0
2	hanging out with friends	user characteristic	social	10.0
3	going to forest	user characteristic	health & wellb...	
4	biking alone & with friends	user characteristic	social	
5	picinicking	user characteristic	social	3.0
6	Terrace and lounge	nature elements	social	5.0
7	Socializing with friends and family	user characteristic	social	
8	Reading	user characteristic	health & wellb...	
9	I don't like outdoors sports because of the dutch weather	user characteristic	environmental	
10	Walking with the dog	user characteristic	social	
11	Cycling	user characteristic		2.0
12	walking alone or with someone - depending on the mood	user characteristic	social	
13	doing sports	user characteristic	health & wellb...	3.0
14	partyining	user characteristic	social	2.0
15	normally I sit on the benches; on the grass with a blanket	user characteristic	social	
16	gardening - sometimes	user characteristic	social	
17	go shopping - to the city	user characteristic	social	
18	walking the dogs	user characteristic	social	2.0
19	too hot is bad, wind is not a problem	user characteristic		

Figure 8. Rapid interviews. Theme: ways of spending time outdoors. Data coded in Airtable.

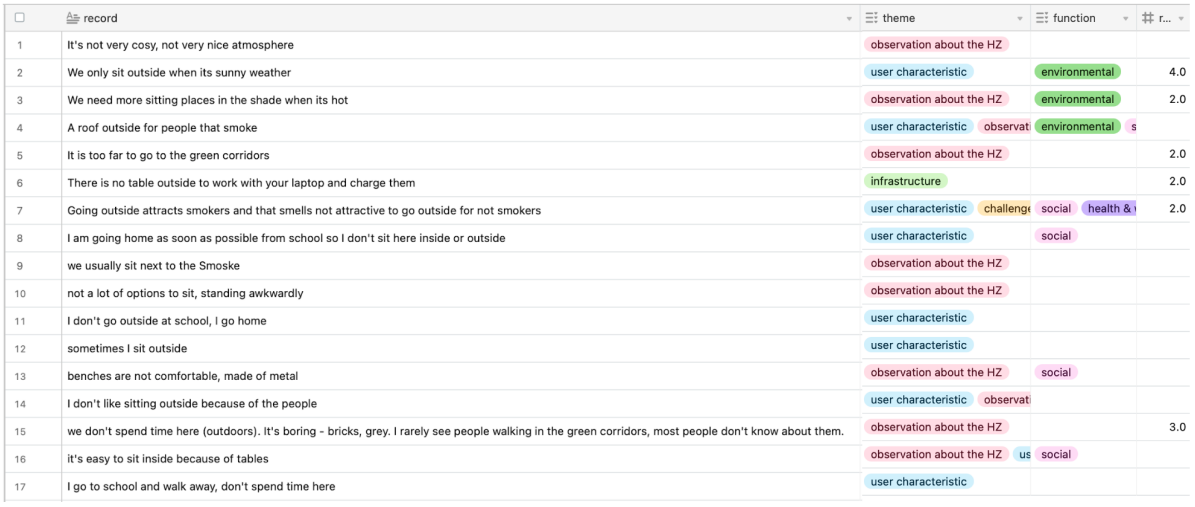
	record	theme	function	r...
1	grass and the green environment	nature elements		
2	forest, beach - during the day	nature elements		6.0
3	beautiful skies	nature elements		
4	feeling of walking in the forest, the 'relieve'	function, user characteristic	health & wellb...	
5	Sunny weather	nature elements	environmental	6.0
6	Going to the city center	user characteristic	social	
7	Relaxing in the moment and don't think of school or work (getting a clear head)	user characteristic	health & wellb...	2.0
8	fresh air	nature elements	health & wellb...	4.0
9	smelling flowers	nature elements	health & wellb...	2.0
10	quiet place	user characteristic	social	
11	listening to the sounds of the trees, dogs, birds, seagulls	nature elements	social	
12	I like moving	user characteristic	health & wellb...	
13	trees	nature elements		
14	good weather,sun shining	nature elements		2.0
15	I like seeing a lot of people outdoors	user characteristic	social	
16	staying outdoors is healthy for us	function	health & wellb...	
17	I like nice buildings, clean, hygiene, great ambience	user characteristic		
18	I need time outside, I need to relax, de-stress, me time. Clearing my head, system	user characteristic	health & wellb...	2.0
19	resting in the sun	user characteristic	social	
20	ducks	nature elements		
21	listening to the music	user characteristic		
22	sun is nice, wind not so much	user characteristic		

Figure 9. Rapid interviews. Theme: enjoyable things outdoors. Data coded in Airtable.



	record	theme	function	r...
1	It's not very cosy, not very nice atmosphere	observation about the HZ		
2	We only sit outside when its sunny weather	user characteristic	environmental	4.0
3	We need more sitting places in the shade when its hot	observation about the HZ	environmental	2.0
4	A roof outside for people that smoke	user characteristic observat	environmental s	
5	It is too far to go to the green corridors	observation about the HZ		2.0
6	There is no table outside to work with your laptop and charge them	infrastructure		2.0
7	Going outside attracts smokers and that smells not attractive to go outside for not smokers	user characteristic challeng	social health &	2.0
8	I am going home as soon as possible from school so I don't sit here inside or outside	user characteristic	social	
9	we usually sit next to the Smoske	observation about the HZ		
10	not a lot of options to sit, standing awkwardly	observation about the HZ		
11	I don't go outside at school, I go home	user characteristic		
12	sometimes I sit outside	user characteristic		
13	benches are not comfortable, made of metal	observation about the HZ	social	
14	I don't like sitting outside because of the people	user characteristic observat		
15	we don't spend time here (outdoors). It's boring - bricks, grey. I rarely see people walking in the green corridors, most people don't know about them.	observation about the HZ		3.0
16	it's easy to sit inside because of tables	observation about the HZ us	social	
17	I go to school and walk away, don't spend time here	user characteristic		

Figure 10. Rapid interviews. Theme: Interviewees' observations about the schools, behaviour patterns. Data coded in Airtable.



	record	theme	function	r...
1	It's not very cosy, not very nice atmosphere	observation about the HZ		
2	We only sit outside when its sunny weather	user characteristic	environmental	4.0
3	We need more sitting places in the shade when its hot	observation about the HZ	environmental	2.0
4	A roof outside for people that smoke	user characteristic observat	environmental s	
5	It is too far to go to the green corridors	observation about the HZ		2.0
6	There is no table outside to work with your laptop and charge them	infrastructure		2.0
7	Going outside attracts smokers and that smells not attractive to go outside for not smokers	user characteristic challeng	social health &	2.0
8	I am going home as soon as possible from school so I don't sit here inside or outside	user characteristic	social	
9	we usually sit next to the Smoske	observation about the HZ		
10	not a lot of options to sit, standing awkwardly	observation about the HZ		
11	I don't go outside at school, I go home	user characteristic		
12	sometimes I sit outside	user characteristic		
13	benches are not comfortable, made of metal	observation about the HZ	social	
14	I don't like sitting outside because of the people	user characteristic observat		
15	we don't spend time here (outdoors). It's boring - bricks, grey. I rarely see people walking in the green corridors, most people don't know about them.	observation about the HZ		3.0
16	it's easy to sit inside because of tables	observation about the HZ us	social	
17	I go to school and walk away, don't spend time here	user characteristic		

Figure 11. Rapid interviews. Theme ideas for greening the university. Data coded in Airtable.

Appendix B

List of questions used for the semi-structured interviews

The list below presents a variety of questions we used for semi-structured interviews. Out of this list, specific questions were posted to different interviewees, depending on their background and conversation flow. Semi-structured interview method favours listening to what interlocutors want to share, over sticking tightly to the interview scenario, therefore we left room for flexibility and allowed interviewees to speak about what they found most interesting and relevant.

- Introduce yourself and tell what your role (in the organisation) is.
- What are the reasons for making the HZ greener?
- What challenges does the greening address?
- What would you like to see to happen in terms of greening?
- What would be the purpose of implementing the food forest at school? What are the (co)benefits?
- What functions outdoors green areas and the food forest should serve? What do you see happening there?
- Who are the users of this place (the school outdoor area)? What do they do and could be doing there?
- How would the users benefit from the food forest?
- What are the physical / administrative / formal constraints we need to consider when designing the food forest? What are the boundary conditions?
- What are the resources in place to implement the food forest (financial, human)?
- Who would look after the food forest? What is the current status and the ideal scenario?
- How could the school canteen benefit from having a food forest?
- What types of plants would you like to have in the food forest? What can you use in the kitchen?
- What do you do with the bio waste (in the canteen)? Would it be possible to collect bio waste from the canteen for compost production?
- Would you like to engage in food forest maintenance (harvesting)?
- How do you engage with the community? Who are your volunteers? What drives them? What do you do to mobilise them?
- What do you think are the biggest challenges of your initiative?
- Tell us about the food forest you have been deploying here - What is the rationale behind having the food forest?
- What tips would you give us on the food forest implementation?
- Regarding Pabo, how do you imagine using the outdoors area of a facility, including the food forest?
- What infrastructure would you like to have there?
- Who else should we talk to?
- Is there anything else you would like to tell us which we didn’t ask about?

Appendix C

Rapid interviews overview and methodology

Date: 25 April, 2022, 10:00-16:00
Location: HZ Campus in Vlissingen: canteen, outdoors resting spaces and green corridor(s), resting areas across the facility (halls),
Participants: HZ students, 47 pax
Interviewers: Circular Economy minor students - Romy van Buuren, Aleksandra Ziętek

Purpose

Rapid interviewing is part of the research conducted by the Circular Economy minor students, aiming to create guidelines for the HZ University greening strategy by identifying the goals of this endeavour and diverse stakeholders' needs and wants. The communications and engagement plan will support the guidelines. This work is envisaged to support the university management in decision making and students and professionals in the future design work.

Students are the largest and most prominent target group of greening interventions. Facility management and Green Office are looking into making the university more attractive to students through nature. At the same time, due to its size, it is a diverse group, representing different preferences, behaviour patterns, and habits. Therefore, we believe it is critical to understand what this group needs and wants so that interventions can be tailor-made and functional and increase the sense of ownership amongst its users. This activity is designed to take a deep dive into the users' perspective.

Methodology

Methodology for rapid interviewing derives from street polling, where respondents are asked to give brief, top of the head answers. As online surveying proved to be an ineffective method in the past, we believe we need to take a more direct approach to reaching students. At the same time, we are aware that people are usually reluctant to fill out surveys unless they strongly relate to the research topic. Therefore, we will ask for 'five minutes of their time' to talk about ways they like to spend time outdoors, why and if they value green surroundings. Questions will be pretty general to enable interviewees to give spontaneous and honest answers. Having a direct conversation with students will allow us to inform them about the upcoming changes in the HZ surroundings and the value of thriving natural ecosystems. We will do it through conversation and distribution of leaflets. We will also encourage students to sign up for further engagement in research or gardening activities.

Interviews will take place in the informal setting - we will approach students in the canteen, on the benches outdoors or in sitting areas inside the school. These can be individual or group discussions (discussing in a group can stimulate ideas and transfer intelligence, thus providing richer input). Interviewers will take verbatim notes to collect input and then analyse

it. Conversations will be held in English and Dutch (if interviewees do not feel comfortable speaking English).

Guiding questions

We will ask three questions in particular order:

1. **Setting the stage** - this is a broad, relatively easy question to enable people to get into the context and encourage them to speak.
2. **Narrowing down - getting to specifics** - a follow-up question, prompting interlocutors to give more concrete information.
3. **School-specific question**; the answer should be naturally formulated based on the previous two questions.

Scenario

1. Interviewers introduce themselves, inform about the research they conduct and ask for consent to be interviewed.

2. Intervierviewers briefly present the context of their research: *greening the HZ to make it more attractive to you and address climate and environmental challenges, such as biodiversity loss, urban heat island effect, poor water retention and soil quality. You may have already noticed some changes happening - the green corridors on the left side or gardening activities taking place on the left (the food forest). We want to find out what your ideal green school looks like.*

3. Interviewers to ask questions in the following order.

Use prompts if interviewees get stuck or miss ideas.
Take **verbatim** notes.

1. **How do you like to spend time outdoors?**
   Prompts:
   - What do you do in your free time?
   - Sports, leisure activities - what types?
   - Walking the dog? Playing with your pet? Farming?
   - Gardening, cultivating plants?
   - Resting - how do you usually rest outdoors? Think big, it doesn't have to be connected to the school.

2. **What makes it enjoyable for you to spend time outdoors?**
   Prompts:
   - Specific types of plants, favourite trees/flowers, fruit/veggies, fresh air, sand on the beach, sun, rain, sitting and sports infra, etc.
   - Refer to what they said in the previous question (i.e. *You said you like going to the beach - what does the beach have/offer you like so much*?)

3. **Do you spend time outdoors at school?**
   What would you like to see/have here, at school?
   Prompts:
   - Refer to what they said in the previous question - Specific types of plants, favourite trees/flowers, fruit/veggies, fresh air, sand on the beach, sun, rain, sitting, leisure and sports infra, etc.

4. Interviewers thank students for their time, hand out leaflets and ask if they're interested in being involved more:

You can leave us your email address if you are interested in:

a) Doing some implementation and gardening work for personality credits
b) Taking part in the 2-hr-long research workshop. The workshop would be about co-designing the tiny food forest in the HZ premises. We plan to organise it in the 2nd half of May.
c) Receiving the report from this research

We'll keep you posted, and your email address will be passed on to the Green Office crew.
Ask participants to write down their names and email address.

Desired outcomes and outputs

- quality input from 50-100 students on how they prefer to spend their time outdoors and their needs in this regards to guide greening interventions in the HZ University
- increase in students' awareness of the greening interventions happening in their school
- increase in students' understanding of the importance and role nature plays in their living environment
- a contact list of informed students interested in getting involved in gardening work and further research activities

Materials

- informative leaflet x 50
- Contact list with consent to be contacted x 2
- Note-taking forms (for interviewers) x 50
- Pens x 10

Appendix D

HZ Greening strategy - a workshop with Avans students

Date: 2 June 2022, 14:00-15:00
Location: HZ Campus in Vlissingen, green corridor (outdoors)
Participants: Avans students following the internship in the bio-based economy, 15 pax.
Facilitators: Circular Economy minor students - Aleksandra Ziętek, Romy van Buuren; coach Ingrid de Vries

Background

Avans students following the internship in bio-based economy visit HZ University to exchange ideas and present research outcomes. This visit presents an opportunity to use their expertise in developing ideas for greening the HZ using bio-based solutions. The BFF Circular economy students will carry out a workshop. The outputs will feed into the minor students' project on greening the University.

Purpose of the workshop

- Identify bio-based solutions that can be applied in the HZ to fulfil the greening strategy goals and serve particular functions of the outdoors premises of the HZ University
- Connect the social research with the engineering perspective of the bio-based economy

Desired outputs

- a set of ideas and solutions for bio-based materials and infrastructure implementation at the HZ University

Scenario

Time	Session description	Facilitator	Materials
14:00-14:10 10’	**Welcome and introduction to the topic** In plenary **Facilitator to:** - welcome students in the green corridor and introduce themselves - Present the goal of the session (developing ideas and solutions for bio-based materials and infra application) **Introduction to the topic** **Facilitator:** - overview of our research focus and methodology - what we found out during the research: students/teachers perceptions, habits, needs and wants - overview of the functions bio-based solutions can address: leisure/rest function (sitting spaces, benches, sports infra); education/studying (areas for quiet individual work); teaching (outdoors classroom, the campus as a showcase of biobased solutions, informing the public at large about biobased innovations and providing inspiration). - brief recap on the ongoing greening interventions at schools: the food forest, green corridors - **Ingrid**	Ola, Romy Ingrid	Flipchart and markers/sharpies for sketching functions
14:10-14:40 30’	**Group work** **Facilitator** to introduce the task:	Ola	Flipchart (1-2 sheets per group) Sharpies - 2-3 per

	We'd like to take the opportunity of having you here today to use your brains on how we can pursue greening interventions with the use of bio-based materials. You'll be working in three groups of 5. Based on what you learnt about users preferences, and what you saw around, think of types of bio-based elements that can be applied here. *These could be elements of small infrastructure: for sitting and leisure or ideas for the outdoor classroom. You may also want to think about bigger-scale interventions that can be used in the reconstruction work of the facility. It's up to you which direction to take and the form of presentation. You'll have a sheet of paper, sharpies and sticky notes. You can collect your ideas in the form of sketches, bullet points, drawings, etc. - whatever you find relevant.* *You'll have 30 minutes for group work. After this time, we will reconvene to present your work - each group will have 5 min for presentation.* *We (facilitators) will be wandering around tables if you have questions.* Group split into 3; one goes to the 2nd green corridor.		group Sticky notes
14:40-14:55 15'	**Presentations** Facilitators ask groups to get back to plenary. Each group presents for 5 min. Facilitators take notes and can ask questions. Ask participants if their work can be included in our report, can we quote them and if they'd like to receive the report when it's finalised.	Ola, Romy	Flipchart
14:55-15:00 5'	**Closing and goodbye**	Ingrid	

Appendix E

HZ Greening strategy - a focus group

Dates: 30 May 2022 11:00-12:00; 3 June 2022 10:00-11:00
Location: HZ Campus in Vlissingen, room PE122
Participants: HZ teachers and research staff - 7 people
Moderatos: Circular Economy minor students - Aleksandra Ziętek, Romy van Buuren

Purpose

Focus groups are part of the research conducted by the Circular Economy minor students, aiming to create guidelines for the HZ University greening strategy by identifying the goals of this endeavour and diverse stakeholders' needs and wants. The communications and engagement plan will support the guidelines. This work is envisaged to support the university management in decision making and students and professionals in the future design work.

Facility management and the Green Office are looking into making the university more attractive to students through nature (‘greening the University’). Although students are the largest school community, the second-largest group of users are teachers and research staff affected by the greening interventions. We heard from the greening leaders that teachers could use outdoor school areas for teaching purposes. In addition, during our research, we found out that some stakeholders believe that teachers' involvement in greening the university should be more considerable. Therefore, we think it is critical to understand what this group needs and wants, verify assumptions as to how and why teachers can benefit from greening so that interventions can be tailor-made and functional, and increase the sense of ownership amongst this group of users. This activity is designed to take the first step to start investigating this group of users’ perspective.

Methodology

A Focus group is a type of qualitative data collection method where a group of six to twelve participants discuss a specific research problem. A Focus group aims to identify people’s opinions on a given topic and enables them to exchange with others, leading to the generation of new ideas. The Focus group is moderated by a facilitator and is conducted according to the predefined set of questions.

1) Engagement questions - introducing participants to the topic and helping them get at ease with talking.
2) Exploration questions - getting to the point of discussion.
3) Exit question - wrapping up the discussion and ensuring participants said everything they found important.

The Focus group takes 45-90 minutes; our exercise takes 45-60 minutes to respect teachers’ busy schedules. Focus groups will be recorded based on the participants’ verbal consent. Data used for analysis will be anonymised. The working language is English.

Our recruitment approach is based on voluntary sampling - we sent out email invitations to all academics at the HZ University, asking them to fill out the form expressing interest and availability to participate. As a result, we have received sixteen responses from teachers and research employees of different faculties, based on which we selected two dates for running the focus groups.

Scenario

1. Participants enter the room and are greeted by facilitators.
2. Facilitators ask participants for their consent to be audio-recorded (present reasons for recording, explain how data is stored and used, and that it will be deleted from students' hard discs after two weeks from the session. Data used for analysis will be anonymised). Start the recording.
3. Lead facilitator to introduce herself and the co-facilitator and briefly explain the goal of their research and the idea of greening the HZ. Then, ask participants to introduce themselves by their names.

4. **Discussion**
    a. *What comes to your mind when you think about greening the school?*
    b. *What do you know about the greening initiatives taken up by the HZ university?*
    c. *What kind of greening interventions would you like to see/happen at the campus? Why do you think they are important?*
    d. *How could you use more green facility for teaching and/or research purposes?*
    e. *Is there anything else you would like to say about the greening of the HZ we didn't talk about?*
5. Closing. Facilitators to thank participants for taking the time to attend the meeting and contributions.

Desired outcomes and outputs

- Information on how much the idea of greening the HZ is in the minds of the academic community
- A quality input from sixteen teachers on the ideas and directions for the school greening strategy
- increase in teachers' awareness of the greening interventions happening in their school

Materials

- Audio-recorder
- Small treat and water for participants