Say NO to Plastic Cups

For a sustainable Wageningen University

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Say NO to Plastic Cups

For a sustainable Wageningen University

A report within the context of the module

ESC31806

"Applied Environmental Education and Communication"

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1. Introduction

"Think about it. Why would you make something that you're going to use for a few minutes out of a material that's basically going to last forever, and you're just going to throw it away?"
(Berrier, J. in BagIt Movie (2014)

1.1.Environmental Issue and Change Challenge

The following chapter is dealing with the environmental issue that was identified in the context of the course. A change challenge was formulated by the group members, as well as a long-term and short-term goal was determined to make the issue tangible. Furthermore, an inventory of stakeholders who are connected with the identified issue and can play an essential role within the change challenge was made.

The issue of disposable plastic

Our world today is dominated by plastic and everywhere you look – starting with computers, furniture, cloth to disposable plastic like cutlery and cups – you will find plastic. In the last decades, the dependence on plastics has continuously grown. Due to that dependence on plastic, there are currently more than 300 million tons of plastic produced every year globally with increasing rates. Some plastic products may be essential in the daily lives, others, especially disposable plastic products, are not essential and are putting our environment under enormous pressure (Earth Day Network, 2014). The problem is that plastic is so common, that many people do not question the necessity of its use. The 'throwaway mentality' is a quite recent phenomenon, because only a few generations ago, products were packed in reusable or at least recyclable materials (glass, metals, and paper). These products were designed to last for the owner – whereas plastic is created to be disposed after usage (The 5 Gyres, 2014). The problem is – plastic is also designed to last and due to the fact that it does not biodegrade, plastic just breaks down in smaller pieces. Therefore, every piece of plastic once used, is still present in one form or another today. Accumulation of plastic is not only found in our oceans, with increasing gyres of plastic where plastic masses are accumulating due to currents, suffering marine animals ingesting or choking on our rubbish and dirty beaches, but also on land we are more and more drowning in plastic waste. This waste does have great influence on esthetic value of our environment but also on the health of our ecosystems, as for example a lot of harmful chemicals, which are used during production, leach in soil and groundwater after deposition (Earth Day Network, 2014). The disposable plastics are the greatest source of plastic pollution as there time of use is only minor and their impact on the environment is huge during the whole life cycle (production, usage, disposal). These plastics offer a small convenience to the user such as plastic bags, straws or disposable cups, and their benefits are therefore not over-weighing their negative impact (The 5 Gyres, 2014). Most of the plastic waste we generate is land filled, down cycled, incinerated or exported to other countries, as the process of recycling is costly and does not stem the production of virgin plastic product (Plastic Pollution Coalition, 2010).

Wageningen University is an environmentally orientated institution and the university mainly focuses on topics connected to sustainability, where plastic pollution is a recurrent topic. Based on this as well as on own experience, it is assumed that knowledge on the global plastic problem is present at the campus to some extent. Nevertheless, sustainable practices are not visibly put into practise in daily life on campus although WUR is teaching sustainability. It is assumed, that therefore the connection with the overall issue is lost, even though knowledge and awareness are there. Creating knowledge and raising

awareness on the direct connection of daily habits and the environmental situation is therefore needed. On the campus the use of plastic is massive. An example, which might seem small at first glance, is the use of disposable plastic cups in the coffee vending machines all over the campus. Drinking a coffee during a break is especially popular with students as well as employees. It is a source of refreshment as well as a social trend on campus. The coffee machines, which serve beverages in disposable plastic cups, are used frequently. These cups are however used at maximum for 5 minutes of time and are then thrown away and with every new coffee there comes a new cup, which adds to the pollution. The university is a place where students and employees spend a lot of time. They are not only attending courses and studying, but also eat and drink on the campus, relying on the resources which are offered. The coffee machines, placed in every hallway are therefore an easy way to buy a drink in the daily university life. It is assumed that alternatives which are more sustainable and easy to reach are lacking and that students are not made aware of these existing alternatives. This is not comprehensible as it would not only be beneficial for the environment, but also for the reputation of the university, to become a plastic free campus and put the knowledge gained in the lectures in practice in the daily life.

Next to the environmental issues connected with massive plastic consumption in our world today, there are also concerns regarding health of users of certain types of plastic. The most commonly used plastic coffee cups at Wageningen University consist of Polysterene (Plastic Type 6) as it can be seen in figure 1, a material commonly used for food containers, cups, cutlery and Styrofoam insulation. There is evidence, that Styrene can affect human health and it has been proven that the substance is causing cancer in different animal species and attacking the central nervous system as a neurotoxin is exhibited by the products. Especially, when coming into contact with hot beverages, polysterene is suspected to partially emit toxins, which are absorbed by human tissue and bloodstream and therefore could pose an immense health risk to the consumer (NIU Dep. Biological Science, 2014). Therefore, using the plastic cups for coffee consumption does not only negatively influence our environment and animals by accumulation and pollution, but also can have a direct influence on the health of the consumers at university. This fact is however not widely known among the coffee consumers.

Figure 1 common plastic coffee cup at the WUR

Group Change Challenge – Say NO to plastic cups

We think that the university should serve as a role model in environmental behaviour and also foster a healthy study environment. We are aiming for a change of behaviour, as we think the awareness for the necessity of change is mainly there, but no or little action is taken. To reach the change, a closer connection between the students and employees behaviour and the plastic pollution needs to be made. The direct identification with a problem is necessary when knowledge shall be transformed into action. The change of course can also be inhibited when the university itself is not promoting the ideas and principles the students learn about in lectures and projects. We think it is crucial that WUR should support and promote environmentally friendly and healthy products and behaviour, as students do not have a great choice when they are at the campus most of the day. Students are likely to copy behaviour, which is common at the university also in their homes and eventually in their future lives. In this sense not to use plastic cups, would in turn contribute to a more sustainable society in and around

Wageningen. Therefore, it is essential that during the implementation of the measure students are actively involved and being part of the development. In this way, it can also be ensured that the changes are possible to be executed. Moreover when the change comes from the students themselves it can be more fundamental with a more far reaching impact. With their actions the students can highly influence the university board and the choice that are being made.

Currently, there are a number of different coffee vending machines in use at the various locations on the campus. In each of the buildings in which primarily lectures and practicals are given, that are Orion, Forum and Leeuwenborch, the coffee machines offer the beverages mainly in plastic cups which contain polystyrene. These coffees are the cheapest for the students and the machines are placed on all levels, so excess even in short breaks is possible. Furthermore, there is the possibility to buy coffee in the canteen, where also other cups (mainly paper) are used. Nevertheless, the main body of the employees, as well as a number of thesis students is relying on coffee vending machines in the office buildings, where the coffee is free of charge.

In the past a number of students have already addressed the plastic cup problem with different approaches. One example of an action is the project of Blair Van Pelt, a master student at WUR. In 2012 Blair created a project which used art as a mean to raise awareness as well as handing out reusable cups to directly provide an alternative to the disposable cups. Blair researched that approximately 2000 plastic cups were disposed on a daily basis in the Forum building. She collected a day's amount of used cups, washed them and hung them up in the Forum building for one week as an art installation. To facilitate a change in behaviour she handed out reusable cups made from hard plastic. With this action she aimed to facilitate the students as well as employees with an alternative to disposable plastic cups. We recently consulted Blair in order to investigate if there were any notable changes after her project. She told us that nothing changed on the institutional level, but there are however still students as well as employees which still use the green hard plastic cup she handed out.

Not only in the past projects targeted the plastic cup issue, but there also initiatives planned for the future. The greenoffice as well as the Annual Introduction Day (AID) committee want to include projects on the use of plastic in general in the coming introduction days as well as in the coming academic year. As the focus of attention seems to be coming back on the topic of plastic cup use, this report can serve as a source of support and inspiration for the planning of future projects.

Underlying goals and objectives

The aim of this project is to make Wageningen University become a more sustainable place by reducing the use of plastic, especially focusing on the massive use of disposable plastic coffee cups. Therefore, we are aiming for a change in the mind-set and behaviour of the students and employees at the university. The goals can be separated into long term goal and short term goal. The short term goal is to engage the above named stakeholders in an emancipatory process and provide knowledge and raise awareness instrumentally on the plastic issue. Combing the two approaches, it is aimed that consumers (students and employees) come into action. The overall long term goal is to reach a fundamental awareness and behaviour-change regarding the use of plastic at university, which can also be expanded to other aspects of daily life.

Stakeholder analysis

On the way to a more sustainable campus a number of different stakeholders are involved. In the table below (table 1) the different stakeholders together with the drivers which lead their behaviour as well the points which the stakeholders are influenced by and the influences they have are listed.

Table 1 Stakeholder Analysis

Actor	Driver	Influenced by	Influence
Students (Bachelor- and Masterstudents)	Perception of sustainability, Wish to change current system	Habits, limited alternatives, costs, effort	Attitude and behaviour of other students; create demand for change, promote change towards a favourable situation, influence student organizations
WageningenUR employees (PhD students, professors, other staff)	Practise sustainability at work, understanding of plastic-pollution	Limited opportunities, difficulties to adapt, habits, time costs	Possibility to change the environment (coffeee machines),create a demand for change, influence the university boards
Student organizations	Promoting environmentally friendly student behaviour	Wishes, ideas, demands and reactions of students, limited by time, costs, people who work on the topic, reactions of WageningenUR employees and university board	Can channel demand for change (campaign), snowball effect, promote a change, influence the students, influence the university board
University board	Better image of the university, create a more sustainable campus	Students, Employees, Student organizations, perception of sustainability, money issues	Can change environment (coffee machines), create alternatives, promote a change in behaviour
Producers of coffee vending machine	Sell coffee and earn money	Demand and behaviour of costumer (students, student organizations and Wageningen UR employees together)	Create environment (coffee machines with plastic cups), influence behaviour

Firstly, the stakeholder group of **students** is mentioned. This group includes students, which are doing their Bachelor as well as older students which are doing their Masters at Wageningen University and are following the curses. The students are driven by their perception of sustainability as well as the possible wish to achieve a change in the current system towards a more environmentally sustainable future. Students are influenced by their own habits as well as limited opportunities to change their behaviour. Furthermore possible costs as well as the effort they have to take to change their habits are influencing students. At the same time students can influence the attitude and behaviour of other students and can

influence student organizations. As stakeholders students can also create the demand for a change and give the opportunity to promote change in a favourable way.

Employees of Wageningen University and research facilities, which include professors, researchers and other supporting staff, are also stakeholders when it come to the use of plastic coffee cups. In this stakeholder group the driver to reduce the use of plastic cups could be a result of sustainable practices at the work going hand in hand with the insight that plastic is a big source of pollution. Wageningen UR employees could be influenced by a limited amount of opportunities to actually change their behaviour, as well as possible difficulties to adapt to a different system. The dominance of habits as well as costs and time can display additional limiting factors. These stakeholders can actively influence their environment by creating a demand for change and also implementing this change (keeping a mug in the office). Furthermore the employees can influence the university board.

Student organizations can also be seen as a stakeholder. There are numerous organizations within the university which have different backgrounds and orientations. A couple of organizations have the wish to increase the sustainability on the campus as well as the care for the environment as a main focus of their work. A driving factor for those organizations can be the wish to promote an environmentally friendly student behaviour. Student organizations are influenced and some might say even depending on the wishes, ideas, demands and reactions of students. Furthermore, they are influenced by the reactions of WageningenUR employees and the university board. Student organizations are also limited by time, costs as well as people who work on the topic. The stakeholder can channel the demand for a change in the system and promote it (maybe with the help of a promotion campaign). By raising awareness and reaching a high number of students a snowball effect might be triggered. In this way student organizations are able to influence the students. Furthermore the organizations also have the possibility to influence the university board.

The **University board** is driven by the concern about the image of the university and at the same time the wish to create a more sustainable campus. The decisions and actions of the board are influenced by the students, employees and student organizations. Additionally their definition of sustainability as well money issues influence the university board. On the other hand the board can change the environment in the university and create alternatives to plastic cups. With their decisions they can lead to a change in the behaviour of students and employees at the same time.

Also the **producers of coffee vending machines** have an important stake. They are driven by the need to sell coffee in order to earn money. The stakeholder is influenced by the demand as well as the behaviour of the consumers, which are the students, student organizations, the employees and the university board all together. If the customers would boycott to buy coffee from the machines the producer for some reason the producer would suffer money losses. With the design of the machines the producer can easily create an environment which in turn influences the behaviour of the users. This influence can happen in two ways, it can have a positive influence on the environment (no disposable coffee cups) or a negative influence on the environment (high use of disposable plastic cups).

Students as target group
It was decided to exclude the catering facilities in the different buildings as possible stakeholders. In the canteens no full-body plastic cups are used. Cups made entirely from paper or cups which consist of a paper coated with a plastic-layer are used instead. These cups are also presenting waste; it is however believed that the plastic cups from the machines present a bigger problem due to more frequent usage. It is estimated that more students use the coffee vending machines, as they are easier to access, have

no specific opening hours and beverages can be purchased for a lower price. As the canteens are run by external providers, a change within the canteen system might be occurring in a more instrumental way. Once a change in the behaviour of students concerning the plastic cup use is reached it could be also focussed on the canteens. It shall be ensured that students who bring their own cups should be able to also use them when buying coffee in the canteen. In this way the general production of waste would be reduced.

Resulting from the stakeholder analysis it was decided to develop a strategy which mainly focusses on a behaviour change in the students. This decision is based on a number of reasons. First of all, the students display the largest group of stakeholders. In the academic year 2012/2013 there were 7.933 students in total (Wageningen UR, 2012). The students outnumber the amount of employees at the campus. Also the students present the biggest group of plastic cup users. After a meeting with the Green Office Wageningen, it became clear that the contracts for the new coffee machines have just been renewed due to the transition in the method of payment (eWallet) and that these contracts will last for another 5 years from now. This was another reason for our team to focus on a bottom up-change, with the top-down change being blocked for another few years. In addition, by only changing the product the underlying cause of massive plastic consumption would not be dealt with and the change would not have a huge effect and influence on the consumers. As it is believed that a change which mainly comes from the students themselves can be more fundamental and in turn might influence the decisions of the university board as well. Furthermore it is assumed that once students really rethink their own habits and behaviour concerning the use of plastic it is likely that a change not only takes place when the students are at university, but has more far-reaching impacts on the whole live of students. This is turn might contribute to a more sustainable future (as students would adapt the behaviour they made up during their time at university in their personal lives and also keep the behaviour in the future.)

2. Strategies and Tools

"Sustainability, is better seen as a measure of the relationship between the community as learners and their environments, rather than an externally designed goal to be achieved"
(Sriskandarajah et al, 1991).

In order to reach the desired change a strategy needs to be developed and applied on the topic of plastic cups use, that meets the needs of the challenge. Within the strategy and framework, a set of tools can be used when aiming for the behavior change, which in turn can also contribute to reach a more sustainable study environment. The most appropriate strategies and tools are discussed below, with a focus on the reduction of plastic cup use at the WUR.

2.1 Education for Sustainable Development
Education for sustainable development (in short ESD) is a term to describe an umbrella for many different forms of education that already exist today and new projects and programs that will be designed in the future. Education is a crucial tool when aiming for sustainable development and citizens need to learn their own way to reach sustainability in order to protect not only the contemporary environment, societal and economic structures, but also give security for future generations to come. The education of today is essential when trying to discover new paths to a better future. In this context, ESD supports efforts to rethink and redesign education and systems which are currently promoting our

unsustainable society and indeed stands for lifelong learning by recognizing that the educational needs of people change over time (UNESCO, 2014). When interpreting ESD in a broad way, it stresses the link between the human and the non-human world, the present and the future and also the local and the global (Wals, 2012). These links are essential when transferring the concept of ESD to the problem of plastic usage at the university. As stated above, the most important issue is that the links between the contemporary behavior and the consequences for the environment today but also in the future are lost as for many the problem is far away but does not affect the daily life. Two main approaches can be distinguished when trying to reach for a change in behaviour. These are the instrumental approach and the emancipatory approach. In the following chapter both main approaches will be described and applied on the topic of plastic cups use. Later in this chapter the strategy which is chosen to target the plastic cup problem will be elaborated in more detail.

Instrumental Approach

In an instrumental approach the change which shall be reached is known beforehand and it is assumed that the desired behavioral outcome is agreed upon. Instrumental approaches are mainly fostered from a top-down level and are based on carefully designed interventions with the target group seen as 'receivers'. Essential to this approach is the pre- and expert-determined direction when applying education to change people's behavior (Wals, et al., 2008). It is assumed that there is a linearity between knowledge and behavior, hence increased knowledge and awareness will lead to a more sustainable and responsible environmental behavior. In case of the plastic cup use, one could imagine an instrumental approach as following: It can be taken as a fact that the disposable plastic cups which are used at the WUR campus contribute to the world's plastic pollution. In order to be a more sustainable campus, the use of plastic cups at the different buildings shall be reduced and there will no longer be plastic cups provided. The goal is set on an institutional level, there is hardly any participation of students and employees and alternative options are not considered as it is assumed that the goal is silently agreed upon. The predefined goal can quickly be reached as there is no time-consuming participatory component included in the approach (Wals, 2012); nevertheless the change may not be carried by the students/employees and will further have only minor impact on their decision-making. As the goals and desired behavioural changes are happening through rather fixed and predefined actions it is questionable to which extend the learners will change their general behaviour (Wals, 2008). Furthermore it could also be the case that the students are not satisfied with the change or the given alternative, so that the desired behaviour-change will not be reached.

Emancipatory Approach

The contradictory relationship between knowledge and awareness on the one hand and behaviour on the other can lead to uncertainties, when dealing with environmental issues and sustainability challenges, such as the massive consumption of plastics. These uncertainties make it even more difficult when deciding on a strategy to implement. In contrast to instrumentally structure the system in which the change shall take place with clear set and measurable goals, it can be more effective to work on capacity building and support critical thinking of participants in order to enable behaviour change which will last long (Wals, 2012) and may not only include the reduction of plastic cups at university but also a fundamental change in personal life. In order to convince the students that the plastic waste at campus is a problem that needs to be tackled, an emancipatory approach can be used, in which it will be tried to actively involve different stakeholders in a dialogue (Wals et al., 2008). Characteristic for such an approach is that there is open–endedness within the process, without a restrain by set goals or limitations and an allowance for spontaneous and constructive changes. By providing the necessary

knowledge and a platform for the students and employees to make their voice heard, this stakeholders shall get actively involved in the process. A transition in behavior namely requires a reflective way of thinking and feeling of empowerment in every single individual (Wals *et al.,* 2008). A question that arises when putting ESD into practice in an emancipatory approach is how optimal conditions and support mechanism can be created by the facilitators that allow individuals to develop themselves in the face of change. This is a rather complicated issue, especially when try to support the change rather than steering it and educating rather than indoctrinating.

Table 2 Pros and Cons of the different approaches

	Instrumental Approach	**Emancipatory Approach**
Pro	- Can be implemented quickly - Measurable - Goals are set - Easier to guide/overlook	- Involve students/employees actively in the process and therefore have wider support - Alternatives are being carried by a broad base - Long-term change - Change could also affect other aspects in daily life due to reflective thinking
Con	- Change could not have much impact on general behaviour - Students could not be satisfied with change or given alternatives	- Outcome is not foreseeable - Risk that there is no fundamental change taking place - Can take a long time

2.2 Suitable strategy to be applied

Both approaches have their advantages, but also disadvantages (see table 2). A strategy that is founded most suitable for reaching the behavior change in consumers on the campus is the Blended Environmental Education, Communication and Participation approach (Wals et al. 2008), which can be seen as a bridge between the classic instrumental behavior and attitude approach and the agency-based emancipatory approach. The instrumental, expert-knowledge driven approach, in particular can be useful when improving the student and employees knowledge, raising awareness and laying the link between the global issue around plastic and the individual behavior and choices, whereas the emancipatory approach can support long-term and far reaching changes which are related to active engagement and involvement in the process. Especially, in ill-defined situation as the plastic issue, where there is no clear solution available as all alternatives have their constraints and there are too many uncertainties whether a general alternative will be better for the environment, it is important to have a transparent process. Furthermore, a long-term change and commitment can only be developed when there is a connection between the participants and the process. Nevertheless, accountability and reaching a large target group (preferable all students at the WUR and employees) can be supported by an instrumental approach (Wals et al., 2008). Based on the nature of the change challenge, and the above discussed pros and cons, it can be concluded that the Blended Environmental Education, Communication and Participation approach is the most suitable to be applied. It is aimed to focus more on the instrumental approach until the point that awareness about the problem is raised and the link to the behavior is laid and transform the process then to an emancipatory approach, where the change is facilitated and a platform for change is created, but is not steered in one direction. An important tool

hereby can be social learning and the empowerment of participants as well as using art-based environmental education.

Social learning and empowerment as a tool to reach behavior change

The concept of social learning is mainly related to learning processes among a group of participants, who want to take action collectively in order to change or improve a current situation. The concept can also include adaptive management and learning, where it is aimed for evaluation and improvement of actions within the process (also called 'learning-by-doing'). Building capacity in a community of participants is, of course, only meaningful when it refers to what it is planned to build capacity in – therefore requires some steering and facilitating at the beginning (Allen, W. 2014). 'One of the key requirements in this regard for capacity building is to recognize that the social whole is more than the sum of its individual components. […] The contemporary view of capacity-building goes beyond the conventional perception of training. The central concerns of environmental management and community building - to manage change, to resolve conflict, to manage institutional pluralism, to enhance coordination, to foster communication, and to ensure that data and information are shared - require a broad and holistic view of capacity development. This definition covers both institutional and community-based capacity-building' (Allen, W. 2014). Important to recognize is as well, that social learning and empowerment are based on and interwoven with each other. Empowerment can here be defined as process of enhancing the capacity of an individual or a group in order to make well informed and selected choices and to carry out desired actions and outcomes as result of these choices. Empowering participants to critically engage as change agents for sustainability is a crucial concept within ESD and it shall support not only critical awareness, but also reflexive consciousness and new, different ways of being and doing. To trigger this engagement, participants need to be encouraged to become part of the solution in a setting that is a crossing point between the classroom (formal education) and society and daily life (informal education). Instrumental (expert knowledge) as well as emancipatory (engaging participants) approached need to be combined when educating for empowerment and social learning (Tassone & Wals, 2014).

Art-based Environmental Education as tool within the emancipatory approach

Arts-based environmental education (AEE) brings art education and environmental education together in one undertaking. It refers to a specific kind of environment education that starts off from an artistic approach. It combines artistic practice and environmental education in which practitioners also make an attempt to formulate an epistemology (van Boeckel, 2013). The visual and performance arts have great potential for assisting in the development of environmental education in the community and in promoting environmental sustainability. Art events can attract people's attention and prompt people to reflect on humanity relationship with the natural environment. The art event exposes people whose environmental behaviour is not sustainable to the environment and provides an opportunity to learn about the issues. Using art as a tool for environmental education is an efficient way to awaken people and trigger enthusiasm, by a direct experience with the environment. For those who are already aware of a sustainable behaviour, AEE can strengthen their beliefs and help them express their attitudes, thus in turn can influence others to reflect on the issue as well.

2.3 The snail for Empowerment

In order to reach a fundamental change in behaviour every student individually has to undergo a continuous process of empowerment. Empowerment is a process of transformation in which individuals gain power and control in order to make decisions which help them meet their own objectives (FRIDE, 2006). To visualize the steps which are part of the empowerment process, a model was created. This

model can be seen in figure 2. The so called snail model for empowerment is based on the EYE model by Tassone & Wals (Tassone & Wals, 2014). The name "Snail for empowerment" is derived from the look of the model, with a bit imagination a snail can be recognized, as well as on the features which are commonly associated with snails. A snail is believed to be slow, but steady and so is change. A fundamental change happens in a rather slow and time-consuming process, but is steady as it has a long lasting impact.

The first step in the model is **knowledge**. Knowledge is the basis for capacity building and critical thinking. It is crucial to facilitate development on an individual basis (Wals, 2012).

Once an individual has knowledge the problem can be recognized and in a phase of **awareness** the link between the general problem and the personal life can be made. In the step of awareness the consciousness and reflection on individual behaviour is crucial.

The phase of awareness is followed by the step of **stimulation**. This step is fostering the awareness-process and stimulates the individual to think about alternatives.

From the third phase, which is stimulation, the individual moves to the steps **awakening** and **positioning**. These two steps are closely related. In the phase of awakening the individual develops the need to do or change something in order to reduce the own contribution towards the problem. This is also called the awakening of the personal agency. The awakening process can be seen as a process towards self-actualization (Tassone & Wals, 2014).

The fifth phase in the model is **positioning**, which follows up the process of awakening. In the positioning phase individuals take and express their own specific point of view towards the problem. In this phase the problem is even more personalized, a meaning is given to the obtained knowledge and a specific position towards the problem is taken it (Tassone & Wals, 2014).

The step in which positioning takes place is ideally followed by **action**. The process of taking action is a result of individuals being aware of the problem, recognizing that they have the power and are able to change and in turn take action to do so. This step is characterized by open endedness, because the decisions, which an individual makes in order to reach a change, cannot be predicted.

The last step of the snail of empowerment is **evaluation**. Evaluation takes place on two different levels. On is the personal level which the students carry out themselves. Once an individual took action, it evaluated afterwards the taken action, and eventually adapts it. Evaluation also takes place on the activity basis. With an evaluation it can be seen if and how the carried out activities contributed to the empowerment of individual students.

All the steps which together make up the snail of empowerment are a cycle. It is continuously repeated and adapted. For this project it was chose to design various activities according to a strategy, which helps individuals to go through all the steps which are part of the snail of empowerment. Activities, which stimulate and support and the students when undergoing the each individual step, shall be carried out. In the paragraph below, a design with a number of specific activities is presented. The design is stated per step in a chronological order which shall be also strictly followed during the implementation.
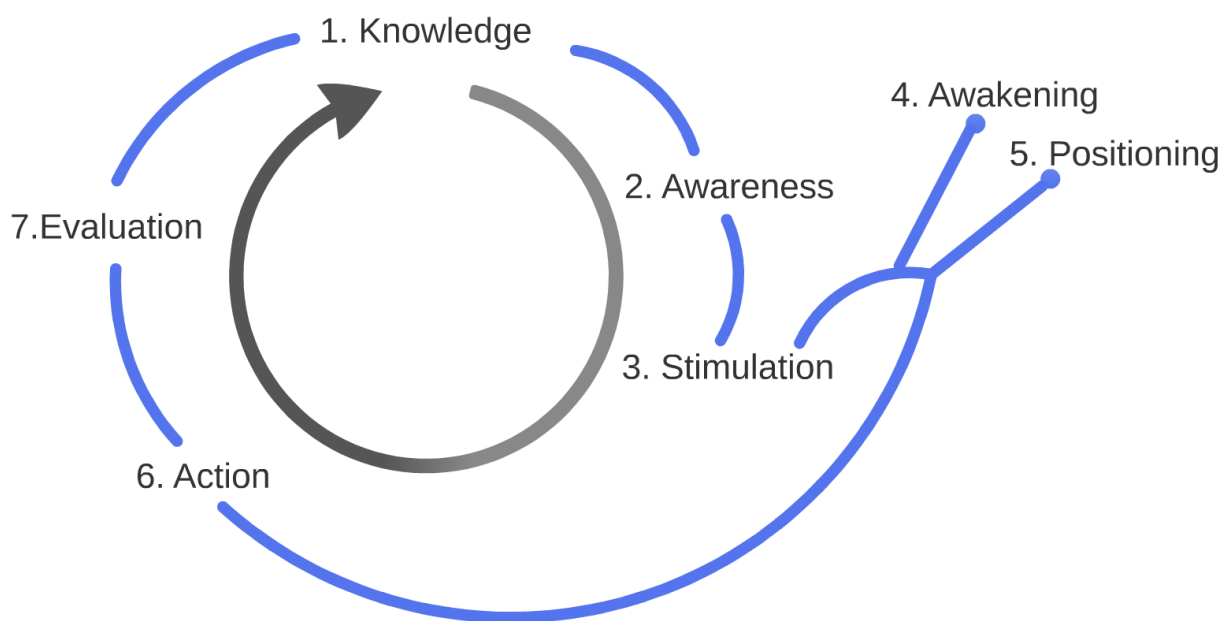
Steps and Actions
Step 1 Knowledge

The objective of this step is to facilitate the students with knowledge about the problem of plastic pollution. It is expected that all the students have heard about the problem already, but it cannot be assumed that the topic is present for all students. In this first step the knowledge shall be brought to the same level, so all students will be provided with an equal level and amount of knowledge. The actions in this step shall be carried out in such a way that they encourage students to critically tackle the problem and consider themselves and their own environment.

Knowledge shall be given in fact oriented way, rather than in a way that focusses on fear.

The given information shall not cause a state of shock in the students. When shocking the students no change will be promoted as the subconscious will blank out facts it cannot deal with and the participant will ignore or reject the issue. Once the state of shock is overcome the usual habits and behaviour will be kept, because of the feeling that they cannot perform an important change. (Wals, 2012) Resulting from this, knowledge shall be given in an objective, not valued way. This is also important in order to not persuade students to think in a certain way or already promote certain actions.

Actions which can be carried out in order to facilitate knowledge which stimulates critical thinking are for example:

- ✓ Publishing an article on plastic pollution in the resource magazine. As a great number of students regularly reads this magazine, a big amount of students can be reached and informed.
- ✓ Documentary evenings with a subsequent discussions can be organized by different student organizations. With the help of already existing media students can be informed. A discussion shall contribute to the building of a critical view on the topic.

- ✓ Furthermore lectures during the lunch break can be organized. In these lectures students shall be animated to engage in an interactive dialogue with other students as well as experts. Through these lectures they students can obtain information which specifically interests them and at the same time listen to the positions of further students.
- ✓ As the above stated actions are on a voluntary basis and it cannot be made sure that all students obtain the same level of knowledge short presentations of about 15 minutes could be given during normal lectures. Also posters with information on the plastic problem can be placed in the canteens and toilet. In this way all students can be reached.

Step 2 Awareness

After the students obtained knowledge through the first step, the objective of the following awareness phase is to activate individuals to think about their own behaviour. It is important that the students recognize their own behaviour and in which ways they contribute to the overall problem. It is crucial that the students are conscious about their behaviour and reflect on it. This is important in order to reach a significant change on an individual base.

To stimulate and support the students in this step the following actions can be carried out.

- ✓ With the help of poster which are placed sequentially on the coffee machines and in slightly different variances in the lavatories, the link between the behaviour of individual students and the global plastic problem shall be pointed out and highlighted. With bringing the issue into the daily life of students visually they shall become aware that they also contribute to the global plastic problem through their behaviour. The posters shall directly address the students and shall motivate them to think about their own behaviour. On these poster sequences information on the amount of used plastic cups and the impact on environment shall be given.
  Because many people think that all plastics are being recycled, they assume that disposable plastics can be used without any regards of the environment. That this is however not the case is not widely known. Only a very limited amount of plastic can be and is actually being recycled. This is one of the facts, which can be made public on the posters. Furthermore the posters shall inform about the possible negative health impact of the plastic cups.
- ✓ With a project that encourages students to monitor their own daily or weekly plastic consumption they shall become aware of the amount of plastic, which is present and often used unconsciously. This monitoring project can be combined with an art project. Students could not only monitor their behaviour, but also collect those kinds of plastic waste, which are only used for a short amount of time. In this way individuals would not only tackle the topic in a theoretical way, but also on a creative way. Through looking at plastic with a different kind of aim in mind, the attention of the students is focussed in a different way onto plastic, which in turn can lead to reflection on their own behaviour. More about this approach can be found under the heading "Art-based Environmental Education as tool within the emancipatory approach" earlier in this document.

Step Stimulation

After the students obtained knowledge and became aware about their own contribution to the overall plastic problem, they need to be encouraged to think about alternatives to their own current behaviour. The objective of the stimulation step is to stimulate and encourage individual students in thinking about alternatives which they can easily apply in their own lives.

Possible actions during the stimulation step are:

- ✓ In order to show the students examples of people who try to live totally plastic free in our environment shall be shown. These rather extreme examples shall wake the students up and encourage them to think about their own behaviour and see how simple it is to take a small step.
- ✓ Another action is to inform the students who obtain beverages from the coffee machines, that a discount is given when an own cup is placed in the machine. This can be carried out by a sticker on the machine as well as through students themselves spreading the word.

<u>Step Awakening</u>

From the step of stimulation the students shall enter the phase of awakening. In the awakening step the students shall be so far that they have processed the knowledge they obtained through earlier steps, applied it onto their own lives and now develop the strong wish and need to change their behaviour in order to reduce their contribution towards the problem of plastic pollution. The objective of this step is that the students recognize that they are capable to change their own behaviour and have an impact. It is important that they see that they can influence others with their own actions and in turn have a positive impact on the system (Tassone & Wals, 2014).

Actions which can support students in this step are:

- ✓ In order to encourage students to use reusable cups, in the awakening phase a place where cups are sold shall be installed in the university. Possible places where cups can be sold are the canteen or the Study Shop.
- ✓ Furthermore an art installation with plastic cups can be displayed on the campus. The creating of the installation could be set up as a joint event in which students show in a creative way how many cups they save because they started using an alternative to disposable cups.

<u>Step Positioning</u>

From the need to change the individual behaviour, which was developed in the awakening step, the students shall now personalize the problem even more and represent an own point of view. The objective of this step is that the students take a position and express an own action with which they change their behaviour. In their article "EYE for Sustainability: A Learning Tool for Change Agents Eye for sustainability" the authors Tassone and Wals, cite the report of Mezirow and Taylor, who identified inquiry and dialogue between people as a key feature of the positioning step. Supposed that learning mainly takes place through dialogue an environment needs to be given in which the students can come up with ideas and discuss them. It is crucial that a kind of community is created in which an individual can discuss ideas, is supported in putting them into action and overall an attitude towards a personal change is possible and desirable. Through this the students are invited to take a personal position, which they are able to represent with regards to their own abilities as well as the university environment.

Actions which can positively contribute to the step of positioning are the following examples:

- ✓ Because it is especially important in this step to discuss own opinions and ideas a workshop could be organized in which a discussion platform is created. In this workshop students could be encouraged to spread their ideas and for example engage other students at the coffee machines in a discussion.

- In order to find alternatives which the students like and the university can support a questionnaire shall be handed out. In this way it could be investigated in which way the reduction of the use of disposable plastic cups can be supported.
- Because reusable cups seem to be a legit alternative and event in which students could swap cups which they do not use at home or do not find pretty with other cups could be organized. At the same event porcelain markers could be offered, so that the students could decorate cups in a way the like.
- Close to the locations of the coffee machines in the hallways pictures with pledges of students who promise to use an alternative to the plastic cups can be displayed. This would at the same time grab the attention of other students and would be a support as well as reminder for the students on the pictures.

Step Action

The action step can be seen as a visual physical application to which all the preceding steps led to. This step is characterized by open endedness, because the action which the students take in order to reduce their own contribution to the plastic problem cannot be predicted. Every students shall be engaged in actions, which contribute to a more sustainable campus in a way that fits their own vision, capability and inspiration (Tassone & Wals, 2014). The objective of this step is that the students transform the knowledge they obtained in earlier steps into real actions and adapted behaviour. Another part of the action step is that the students share their action and maybe inspire others.

Actions which can stimulate students in the action step are:

- In order to support students which are trying out alternative behaviour and to facilitate discussion an interactive platform could be built up. On this platform, which could be a simple blackboard or maybe even an internet platform students could present their ideas, show how they are applied and share thoughts and concerns. Other students could get inspired and/or contribute to finding a solution for specific problems of other students.

- Another action could be to install a picture wall on which pictures of students with their own mugs are displayed. This pictures would present the statements of the students that they are changing and could also stimulate other students to start thinking about a change in their own behaviour.

Step Evaluation

In a first round in the cycle of the snail of empowerment evaluation can be seen as the last step. It takes place on two different levels. First of all a personal reflection takes place, in order to evaluate and eventually adapt the undertaken action. Evaluation also takes place on the activity basis. With an evaluation it can be seen if and how the carried out activities contributed to the empowerment of individual students. The objective of this step is that the students shall critically reflect on their own action as well as on the supportive actions which were carried out. This evaluation might lead to an adaption of the action and shall stimulate an ongoing learning process.

Evaluation can be stimulated through the following actions:

- Evaluation on a personal level can be supported by the means of posters on which critical questions, which lead to reflection on individual behaviour, are displayed.

- ✓ A questionnaire shall be handed on which the students shall evaluate the actions which took place and at the same time give other feedback and ideas.
- ✓ In order to evaluate if a reduction of the use of disposable plastic cups took place a monitoring on the actual use and consumption of the cups shall be carried out. In this way it can be researched if the carried out actions had an impact on the behaviour of students.

Stakeholders

In the process of leading students through the various steps of the snail of empowerment a little guidance is needed. In facilitating the various actions a number of different stakeholders are involved. The exact roles and interested as well as needs and responsibilities cannot clearly be stated at this point, as the above mentioned actions are only suggestions.

Certainly the most important actors in the whole process of empowerment are the students themselves. They shall be active as participants, but at the same time also be an internal change agent, which means that they should change their own behaviour and at the same time motivate other students to also rethink theirs. Students can actively drive the whole process of change.

Because the way towards a change in behaviour can be difficult the students need to be supported. Student organizations, which are interested in making the campus more sustainable, could play an important role during the facilitation. It could be thought about organizations like the green office or the Wageningen Environmental Platform. The role of the student organization are next to others: promoting and being positive about the change itself, planning and coordinating activities, keeping people active, documenting the progress and carrying out evaluations. Furthermore they need to be aware of possible pitfalls and drawbacks when they are facilitating actions. This can in turn support the desired outcome.

3. Evaluation

Our goal of this project is to reduce the use of plastic, especially focusing on the massive use of disposable plastic coffee cups. We would like to change the mind-set and behaviour of the students and employee at the university and inspire them to find an alternative. To achieve that, we would like to analyses the attitude of the students of Wageningen UR towards plastic issue. Attitude is presupposed to influence behaviour. Behaviour cannot be measure by a survey, thus, we will take a survey to collect student attitude. We would like to know what is the difference between before and after the activity of students 'mind and attitude'. And we want to have some open questions that what student and employees thought about finding an alternative to change the plastic coffee cup. The evaluation survey will be formed of 6 aspects. These are:

- *Impact- what changes have resulted?*
- *Relevance-are we doing the right things?*
- *Sustainability- will changes last?*
- *Efficacy- is the initiative working as expected?*
- *Effectiveness- are we doing things right?*
- *Efficiency- is the initiative worthwhile, were inputs used in the best possible way to achieve the outcome? (Source: Adapted from Guijt and Woodhill (2002) and Centre for Development Innovation, Wageningen University & Research Centre)*

In the meanwhile, to monitor and evaluate the behaviour change, we want to make it accountable. We will consult facilitate staff of the coffee machines for the consumption of the coffee cup before and after the activities, to evaluate if predefined results had achieved.

Student organization like the Green Office , Annual Introduction Day (AID) committee and Wageningen Environmental Platform are the key participate stakeholder, they will as evaluation manager in charge of taking the activities to provide knowledge and raise awareness instrumentally on the plastic issue and make consumers(students and employees) come into action. They will hold it periodical to achieve overall long term goal which to reach a fundamental awareness and behaviour-change regarding the use of plastic at university, which can also be expanded to other aspects of daily life. These student organizations take up a bigger role in the actual design and facilitation of the evaluation. During this process, they need to assist in data collection, analysis, critical reflection, communication and feedback of the findings. They can use the result to find out if the predefined result had achieved and find out what they can improve next time.

Evaluations are often carried out in complex situations which can affect their usefulness. To increase the chance of an evaluation being useful, stakeholders in the evaluation process need to be engaged( ). In this case, university board and coffee vending company better to participate in. Wageningen University is attempting to address sustainability with regards to the environmental sustainability of the campus and its infrastructure, and is trying to apply a sustainable operational management. The result can be made to the university board to achieve the sustainable goal. Retailer of coffee vending machine in different buildings can use the result to change their marketing strategy for attracting student and employee consumption.

Table 3 Stakeholder Participation during Evaluation

Stakeholder	Deciding on evaluation purpose	Collect and process data	Analyzing and making sense of data and information	Communicating and reporting on findings	Decision-marking for future programming	Influencing change at different levels
Students	-	_	-	-	-	+++
WageningenUR employees	-	_	-	-	-	+++
Student organizations	+++	+++	+++	+++	+++	+++
University board	+++	+	+	++	++	++
coffee vending machine company	+	++	-	-	++	++

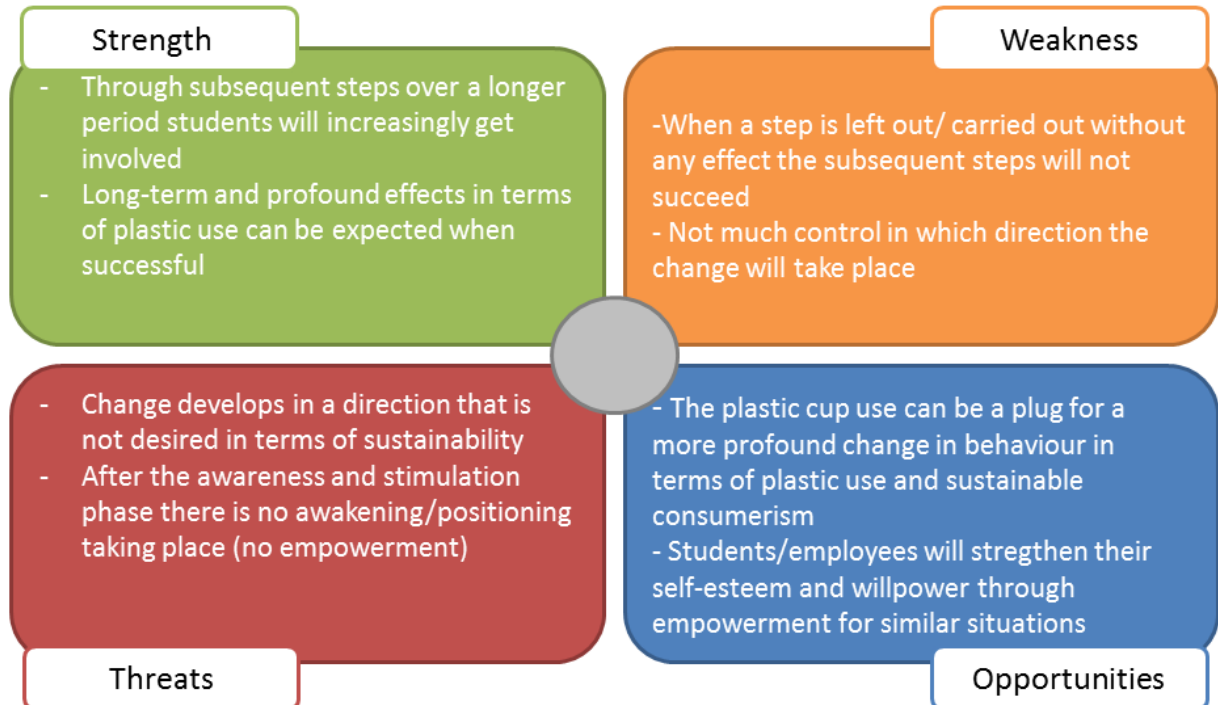− little/no participation

+ − some participation

+− moderate participation

+++− very high level of participation (e.g., decision-making)

4. Discussion

A discussion of potential issues emerges when implementing the design. In the following chapter, strength and weaknesses are shortly discussed and graphically displayed in a SWOT table (Table 4).

Strength
- Through subsequent steps over a longer period students will increasingly get involved
- Long-term and profound effects in terms of plastic use can be expected when successful

Weakness
- When a step is left out/ carried out without any effect the subsequent steps will not succeed
- Not much control in which direction the change will take place

Threats
- Change develops in a direction that is not desired in terms of sustainability
- After the awareness and stimulation phase there is no awakening/positioning taking place (no empowerment)

Opportunities
- The plastic cup use can be a plug for a more profound change in behaviour in terms of plastic use and sustainable consumerism
- Students/employees will stregthen their self-esteem and willpower through empowerment for similar situations

The Snail for Empowerment offers a lot of possibilities in a complex sustainability issue when working towards a behaviour change in consumers, especially when the process includes open-endedness towards the end. By providing knowledge and raising awareness, each single consumer (in this case the students) have enough background information to make a well-informed and founded decision. This decision making is also triggered within the process without leading the precise direction of a 'desired change'. Of course there is the intention, that the students will make a more sustainable choice, but as there are big debates which decision is now really a solution in terms of environmental friendliness and sustainability (for example the argument that when using hard plastic it could still be unhealthy, or when using steel cups the soap for cleaning after usage adds to the environmental pollution), a solution cannot be provided by us. This open-endedness can of course be seen as a weakness, as there is no control of the facilitator and there is always the thread that the change can develop in a direction that is not desirable. One of the major strong points of the snail model is, that through the various steps and the empowerment process, a profound effect and change in behaviour (thus not only direct related to the plastic cup use, but plastic use and sustainable behaviour in general) is expected. This is connected to the opportunity that the students and employees can strengthen willpower and self-esteem after feeling empowered and that the change could also be implemented top-down through the acquisition of new, more sustainable coffee machines by the university board over the long term. Nevertheless, it must also be thought of the possibility that after providing knowledge, raising awareness and stimulation of the students, there will no change and no empowerment take place. In this case, the evaluation plays an essential role and the steps and actions need to be adapted before applying the model again. Through the constant evaluation and the continuous repetition of the steps to include all students (also new students) and keep the subject on the table, it is possible to perfect the process.

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