"The Long Road to Achieving the Impossible"

Sustainable Development in Higher Education

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I Preface

As a final part of my master degree taken at the Norwegian University of Life Sciences, I am required to write a comprehensive thesis addressing relevant issues, which is in compliance to my field of study. The study was conducted as of the beginning of February to and including the first half of August 2013. The reason for the late submission of the paper is because I applied for an extension as a result of necessary courses I had to attend throughout January.

Writing the thesis has been challenging and difficult as well as interesting and exciting. I have encountered a field of study that is much larger than I could ever comprehend earlier, but I finally feel that I have gradually obtained a reasonable understanding when it comes to sustainable development.

First and foremost I would like to thank my supervisor Carl Brønn for his support, introducing relevant theory and being available at all times to discuss the thesis and its content with me. I would also like to thank Tor-Åge Diserud at UMB's operating and service department for providing me with data and information concerning the operations of the university. Finally I would like to thank my girlfriend Helene and my family for supporting and motivating me while I was writing the thesis.

Place and Date **Signature**

II Executive Summary

As a result of greed, selfishness, ignorance and a hunger for success on the competitive market, we are finally witnessing and experiencing environmental sanctions on a universal level. Global warming, climate change, the extinction of animal species and birth defects due to chemical exposure are just a few examples. Sustainable development is therefore a necessity in today's industry. By creating learning institutions that promote and embrace sustainability in their curriculum as well as in their own organization, the younger generations are better suited to face the challenges of tomorrow.

This master thesis addresses sustainable development in higher education where the Norwegian University of Life Sciences (UMB) is being closely examined. Both practical solutions as well as organizational change are relevant in order for the university to improve its situation. The following problems are being examined:

1. How can the Norwegian University of Life Sciences improve their ways of operating sustainably on an organizational level as well as initiating and maintaining practical measures?

2. The thesis will also try to expose the complexity and occurring problems regarding the development and implementation of sustainability, giving the reader a better understanding the extensiveness of the subject.

In addition to these questions, the thesis starts by introducing the term "sustainable development" in order to increase the reader's insight and knowledge regarding the subject, which is essential if one is to grasp the term's importance and complexity. The thesis therefore introduces the traditional "three pillar- model" (environmental -, social - and economic sustainability) as well as the new Sustainable Development Goals (also referred to as SDG's).

The thesis concludes that there are several practical as well as organizational solutions for the institution to take into consideration in order to improve their sustainability. When it comes to organizational change, UMB can prevent further fragmentation by promoting a better shared learning model for the organization by constructing learning labs. In addition, The Norwegian University of Life Sciences should utilize the aid and expertise from professionals in order to come up with a refurbished "sustainability-strategy" and make plans into action (The Natural Step).

On a practical level, UMB can initiate several different measures in order to improve their situation. Below is a list of essential initiatives the institution should focus on

- Reduce private transportation by improving the collective infrastructure and synchronize lectures with bus- and train arrivals

- Improve the utilization of the recycle station by reducing unsorted residual waste

- Improve collaboration with Directorate for Cultural Heritage in order to refurbish the exterior of preserved buildings on campus

The Norwegian University of Life sciences is to a certain degree dedicated to make a positive impact on the environment. By looking at their actions mentioned in the thesis, it is clear that UMB shows a great amount of initiative towards the cause of being sustainable. However, their effort could be improved by implementing suggested measures and actions presented, both practical and organizational.

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1. Introduction

Sustainability is a term that gradually becomes more and more relevant in our time period. Industry worldwide grows at an explosive rate and we can already see the impact on the planet and the climate as a result of pollutant and the excessive production of waste. We are in addition living in a time in history where forces such as globalization connect us closer to each other each day. Distances are continuously shrinking and technology and methodology are increasingly getting more and more complex, making it possible to seek alternate solutions to obtain processes and products that contribute to a more sustainable way of living. Due to this development, a collective moral responsibility starts to emerge and every day this responsibility grows more and more significant, namely the importance of sustainable development.

This thesis will focus on illuminating the complexity of developing sustainability on an organizational level as well as on a societal level by the use of relevant perspectives. The thesis will in addition address how learning institutions can improve their ways of operating sustainably on an organizational level as well as **i**nitiating and maintaining practical measures? To do so, an institution of higher education must be closely examined. The Norwegian University of Life Sciences (UMB) will therefore be used as an object of research. The thesis will explain later on why exactly this learning institution was chosen.

2. Defining Sustainable Development

The concept of sustainable development is a broad one and there are several different definitions and explanations of it. It is therefore important to come to terms with what sustainable development should include so that the framework of the thesis can be defined.

In 1987, the Brundtland Commission introduced and provided the world with a more or less unanimously approved and accepted definition of the term:

"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[1]

This early definition of sustainable development affected both the academic and political language with its core ideas from the beginning.[2]This definition mainly sums up the essence of sustainable development, but it is however quite vague when it comes to its content. What does the term include, and are there other sub-categories existing within the term "sustainable development"? To create a certain perspective over sustainable development and what it consists of, one can divide the term into three subcategories; social-, economical- and environmental sustainability.[3]

[1] United Nations, (1987): ch.2.1
[2] Johnston, F. (2013): p.63
[3] Centre for Environment Education (2007):

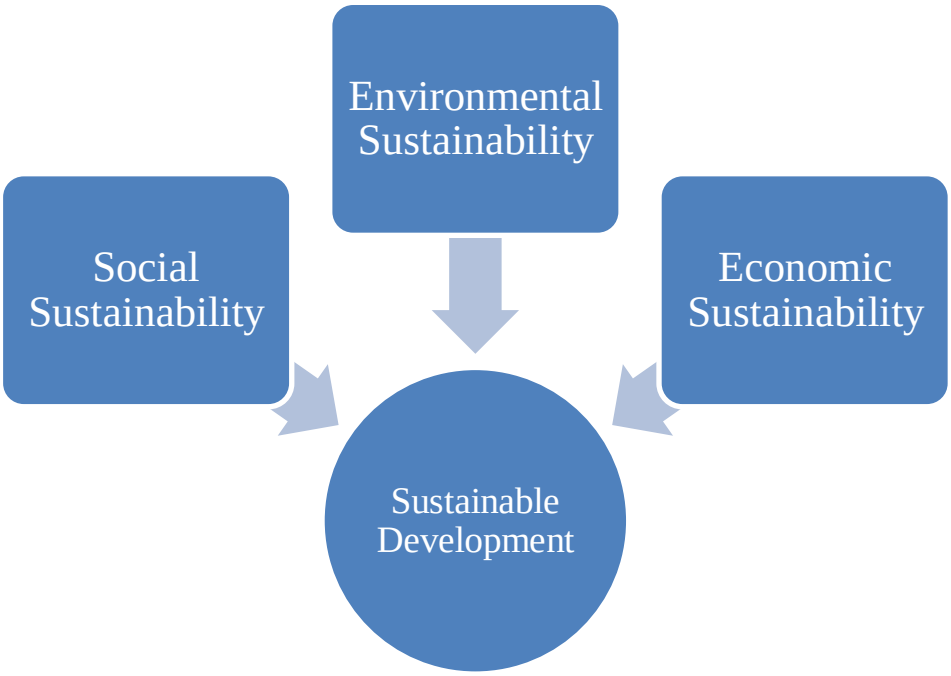


Figure 1-Three Subcategories of Sustainable Development

There is not any definitive answer to what the most precise composition of sub-genres within the term sustainable development should consist of. There are different ways of interpreting what should be included as a part of the term. It is quite common to divide the term up in for instance four sub genres instead of three; politics, economics, culture and ecology.

However, these four alternate pillars are basically consisting of the same elements as the "three-pillar"-prior model. The only difference separating these models is how one chooses to divide up the factors. As one can see; politics can be found in both the economic sustainability-pillar and the social sustainability pillar, culture is represented in both the environmental pillar and the social pillar, economics is already representing a pillar of its own and finally ecology is basically the equivalent to environmental sustainability.

As a theoretical introduction, a presentation of the three subcategories of sustainable development has to be introduced to the reader. By doing so, the reader will find it much easier to create a certain form of clarification and understanding of the theoretical terms.

2.1. Environmental Sustainability

It can be difficult to grasp the concept of what the term environmental sustainability actually includes, due to the countless definitions and versions of it. Below are some well known examples of the term sustainable development:

"The maintenance of the factors and practices that contribute to the quality of environment on a long-term basis."[4] - Business Dictionary

This definition successfully explains the concept of what the term is all about while still managing to keep it short and simple. Nevertheless, the definition above does not reveal any details at all. It is far too general for institutions and organizations to be used in a practical manner.

An additional definition which more or less covers the environmental term is as follows:

"Each new year finds the Earth in at least as good of a condition as the last one. No increasing degree of deforestation, no fewer fish in the ocean, no higher levels of toxic pollution, and the concentration of atmospheric pollutants the same or better the next year as it was the prior one"[5]*- Matthew Stein*

This definition is slightly more specific compared to the prior ones presented in this thesis. Basically the definitions promote the same message, but Stein's definition manages to do so in a way that includes concrete examples. His definition also states the importance of leaving the factors in a state that is equal or better the next year than it was the previous one.

There is however another definition that justifies the term even better, namely Herman Daly's version. He is actually so thorough in his definition of the concept that he chooses to divide it up into smaller subcategories: Daly claims that environmental sustainability is the depletion

[4] Business Dictionary; Sustainable development
[5] Stein, M. (2010) Definition of sustainable development

rates of **a renewable**-and a **non-renewable resource** and **a pollutant** that can be continued indefinitely.

Renewable energy represents sources such as water and forests (since they both regenerate). Herman Daly's definition implies that if one is to be sustainable, one should not extract the source in a rate that surpasses its capacity of regeneration.

The non-renewable sources obviously represent resources that are not renewable. A good example of non-renewable energy is the extraction of oil/fossil fuel. Regeneration of the fossil fuel is essential non-existent due to the plant-to-fossil transformation process that takes millions of years. Daly's theory acclaims that if a non-renewable energy source is depleted, one can actually create sustainability if the capital from the excavation of the non-renewable energy systematically has been invested in renewable energy sources. In other words: Non-renewable energy can be sustainable as long as it is financially supporting the development of a future substitutable and renewable energy source. We would therefore have the opportunity to base our future on sustainable resources that will not be depleted (which is not the case in the world today).

The pollution issue mentioned in this definition is about how we should be restrictive with our waste generation. Herman Daly's definition of the terms states that we should not exceed the environmental capacity rate at which pollutants can be recycled. [6]

2.2. Economic Sustainability

Today's global financial state has raised concern on an international level: The recent global financial crisis has resulted in a general concern regarding the global economy's sustainability. In addition, much has been written about negative impacts of the economic

[6] Daly, H.E (1990): p. 113-118

development on societies and ecosystems. One can in other words witness and experience the ripple effects of non-sustainable organizational activity. Sustainability in an economic format is also desirable because of its ability to prevent inefficient impacts of premature corporate shutdowns. It is therefore important to implement and facilitate the "sustainability term" within the economic aspect. But what is economic sustainability and what does the term include? Just as any other term related to the subject "sustainability", there are many versions of it. Below there are three different definitions of the term "economic sustainability" listed:

1. *"Economic growth can and should occur without damaging the social fabric of a community or harming the environment."*- US President's Council on Sustainable Development
2. *"the degree to which a company actively and constructively uses its resources to support the social and economic development of communities, through direct investments of cash, in-kind support or staff time, or through company policies that generate community capital, such as local sourcing, hiring, partnerships and education."*-Buried Treasure, Sustainability, 2001
3. *"Economic systems support sustainable social and environmental outcomes, where economics is the process through which humans create social and environmental outcomes."*- Adding Values, Chris Tuppen and Simon Zadek, 2001

These are just some examples of relevant definitions extracted from a business report by the company Sigma that captures the essence of economic sustainability. Even though the definitions may vary, one can easily detect a common denominator; the importance of contributing to a sustainable future by using economy as a tool to reach a desired state.[7]

[7]Sigma (2011) ch.3.1

The thesis will not go further into the definition of the economic aspect within the term sustainability, due to the relevance for the assignment.

2.3. Social Sustainability

Social sustainability is one of the three terms which combined the framework of sustainable development. Social sustainability is considered to be quite complex to explain as a theory, due to different versions of the definition. Nevertheless, the Western Australia Council of Social Services (WACOSS) has made their own definition of the term which reads as following:

"Social sustainability occurs when the formal and informal processes; systems; structures; and relationships actively support the capacity of current and future generations to create healthy and livable communities. Socially sustainable communities are equitable, diverse, connected and democratic and provide a good quality of life."[8]

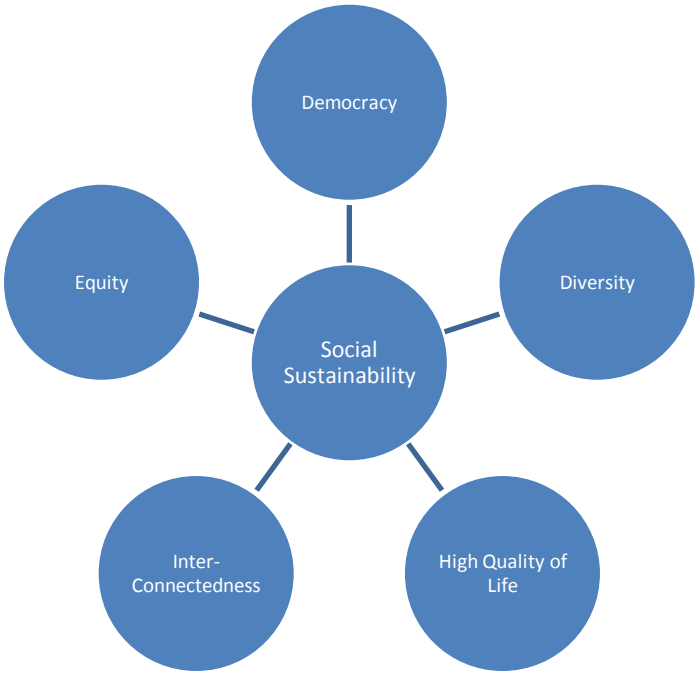


Figure 2-Social Sustainability's Five Components

[8]Western Australian Council of Social Service Inc (2008)

This is a definition that mainly covers the basic important segments of social sustainability. The definition was intended to be used as a tool to educate organizations about the importance of social sustainability and show how one could be a part of it. According to the following definition, social sustainability is based on five principles:

Democracy: It is essential for the government and its institutions to provide a "democratic way of doing things". Democratic processes and accountable governance make it easier to create overviews over happenings and events in society as well as a high level of engagement and commitment without complex bureaucratic processes. Also, a democracy should not be restrictive on the flow of information, on the contrary: Information is one of the keys to maintain social sustainability.

Inter-Connectedness: It is of interest of all stakeholders to facilitate inter-connectedness. In other words; it is beneficial for everyone to be a part of a society that provides and strives for means that connect people with each other and the supportive systems around them. It is critical for sustainable development that factors such as; social inclusion, accessibility and participation are present in the community. This collaborative approach of thinking and operating prevents exclusion of particular groups in our society and leads to more sustainable outcomes.

Quality of Life: Is another principle that is included in the theory regarding social sustainability. Most of us take our physiological human needs (basic human needs such as; sleep, nourishment, shelter and electricity) for granted, but there are nonetheless people that are deprived of such rights. It is of great importance that society does whatever is in its power to prevent its members from experiencing any lack of these necessities. People should therefore have access to services that ensure them of these basic human rights so everyone can live their lives with dignity.

Diversity: We all benefit from having a community that embraces a vide diversity of individuals, religions, ideas and philosophies: Diversity is essential to maintain, because it allows the society to survive and be more organic when it comes to adapting to inevitable change. By accepting and embracing diversity, one can witness and be part of a diverse society that offers a wide range of different elements.

Equity: A socially sustainable society has to address the importance of equitable outcomes and opportunities for the members within, especially for the poorer members of the society. To promote this philosophy of equal rights will be an important contribution to making sure that our society is- and will be socially sustainable.[9]

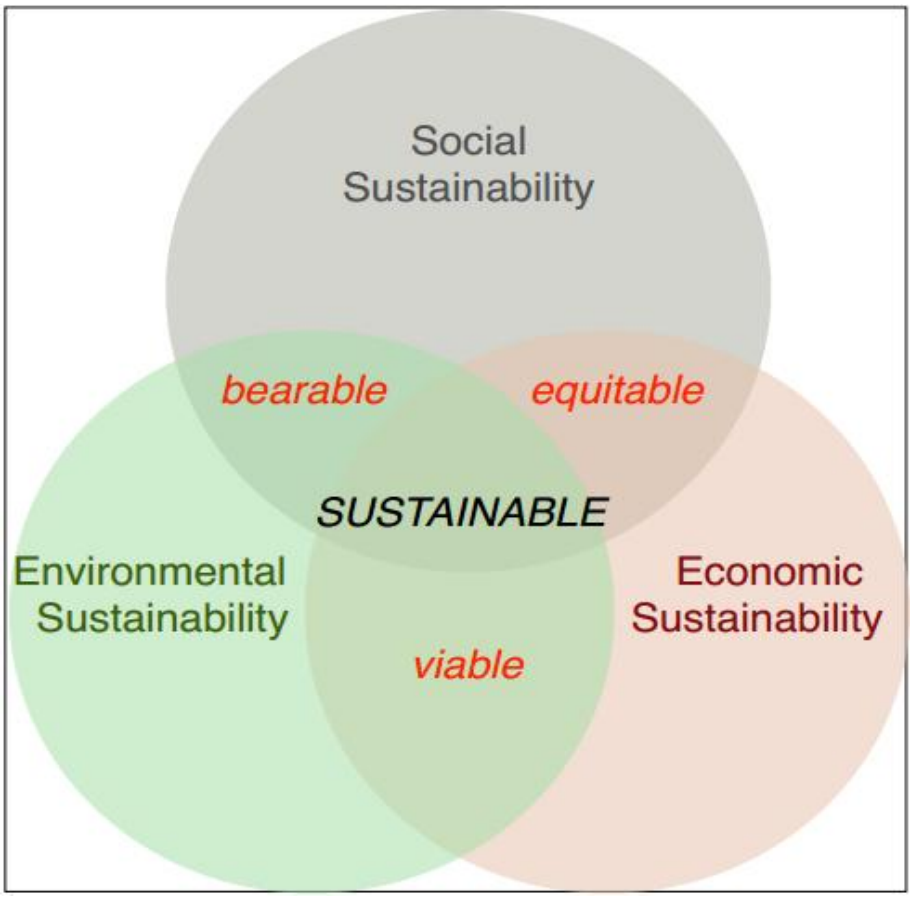


Figure 3-Three Subcategories of Sustainable Development[10]

[9] Western Australian Council of Social Service Inc (2008)
[10] Codrington, S. (2011) p.98

The model above illustrates the relationship and the consequences of a fusion between the subcategories of the term. The model 4 illustrates that the perfect balance between these three subcategories lies in the centre where all three aspects are fulfilled. This will ultimately create a viable, a bearable and an equitable future for the planet. However, it can be quite difficult to fulfill each of the three sustainability-pillars without causing conflicts between stakeholders groups represented in today's pluralistic society. Such problems are commonly known as wicked problems. The thesis will later on elaborate on wicked problems and its relevance to sustainable development.

2.4. Criticism of Sustainability

Despite of the relevance the term sustainable development has experienced, there has been a lot of criticism directed towards it:

First of all, the term itself is quite vague and there are several different interpretations of it worldwide. The definitions and their formulations very much depend on their country of origin and its economical prospects. One can therefore easily get confused if there are different definitions to choose among. It is common for the term and its content to change and vary from different industries and markets and their organizations within. But as said earlier, the Brundtland Commission provided at least a fairly accepted definition, which has functioned as a starting point for definitions of sustainable development in later years. The result of this starting point was that the majority of definitions used worldwide originated from the same source.

Similar to this assignment and its perception of what sustainability contains, the majority of actors also interpreted the content of the term around three essential complementary pillars; economic sustainability, social sustainability and environmental sustainability. Even though these pillars may be the core elements within a definition of sustainable development, others have altered the definition and made it more precise by developing subcategories of the

formulation's main essentials, twisting and redefining the original terms so that it can fit better in a certain environment, market or industry. Although many look at sustainability's flexibility (in terms of the vast numbers of definitions) as a form of weakness, it has made it possible for sustainability to be integrated in different elements of the fabric of our global society such as; the private sector, competing markets, national governments and households on an international basis.[11]

Another critique that has often been associated with sustainability is that the term's "growth" aspect is contradictory. Critics say that it is not possible to maintain unlimited growth, making the definition of sustainable growth a contradiction.[12] Today many people use the term sustainable growth and sustainable development interchangeably. Even though the majority perceives the two definitions as fairly identical, they could not be more wrong. Daly and Townsend addressed the issue concerning growth in sustainability: Impossibility statements are essential in the field of science. They help to create guidelines and functions as laws that researchers and scientists have to act in accordance with. An example of such a law is that it is impossible to travel faster than the speed of light. By respecting these theorems of impossibility, researchers avoid wasting time and money on theories and projects that are bound to be a flop. According to Daly and Townsend, sustainable growth fits in with the other impossibility statements. In other words; it is not physically possible for the world to grow its way out of global poverty and degradation of forests and other essential ecosystems. Herman Daly and Kenneth Townsend defend this statement by further elaboration. They define the global economy as an open subsystem to the whole global ecosystem. As the global economy (or the economic subsystem) gradually grows, it incorporates an even bigger slice of the total ecosystem into itself. This trend will theoretically continue until the economic subsystem has consumed every bit of the global ecosystem. The global ecosystem however does not have the

[11] Godfrey, L. (2012)
[12] Daly, H.E. & Townsend, K. (1993)

opportunity to grow. It is limited to its own natural resources and is therefore finite and materially closed. Sustainable growth is therefore a non suitable term, even a contradiction.

Even though sustainable growth may be an incorrect term, one can on the other hand use the term "sustainable development". Many say that it is reasonable to assume that Gross National product (GNP) consists of a mixture of both qualitative and quantitative factors and is therefore not only just bound to physical laws. Here are some examples to clarify this statement:

Growth: The process of increasing in size, amount or degree.[13]

Development: To start to have a set of abilities, qualities or skills that gradually improves over time.[14]

In other words, when something grows, it gets bigger. When something is developing, it changes to improve its state. The global ecosystem does not grow, but it develops. It is exactly therefore sustainable growth is a term of inaccuracy. If one wishes to use the term sustainable development, it is of great importance that there is no form of "growth" present. [15]

Another critique directed towards sustainability is that many people say that the concept mainly applies just for rich countries. This policy of restricting development for the sake of sustainability affects third world countries dramatically, since their priorities lie somewhere else, mainly development and expansion of industry within the borders of their country. This criticism was made already during the Brundtland Report as representatives of developing countries told the commission that they did not want to have any restrictions concerning demographic growth or industry. [16]

[13] Hornby, A.S.(2005): p.687
[14] Hornby, A.S.(2005): p.418
[15] Daly, H.E. & Townsend, K. (1993)
[16] Drexhage, J & Murphy, D. (2010): p.2

Even though some criticism has been directed towards sustainable development (such as Daly and Townsend's critique on how sustainable growth is contradictory and impossible), does not mean that fighting for its core values is a lost cause. On the contrary, sustainable development is the key to the survival of this planet. It is essential that the philosophy of sustainability is implemented on every necessary level and section of the international society.

One can also look at the criticism illustrated above as "improving factors" that will help developing the term (not "grow") so sustainability will become better adapted and more prepared for challenges faced by Earth's inhabitants today and in the nearer future. But does there exist an alternative form of definition regarding the term sustainable development that questions the traditional model?

2.5. New and Improved

Some individuals disagree with how the subgenres are presented in the traditional model that tries to explain sustainable development. Some say that there exists a "hierarchy of priority" that has not been taken into account. By this one implies that the traditional model presents its subgenres as equally important, which some individuals claim is not the case. Howard Silverman states the following:

"People-planet-profit. Economy-ecology-equity. Society-economy-environment. The problem with these "three pillar" sustainability slogans is that they imply an equal weighting, a balance. And, in that balance, meaningful relationships are lost. We all know the real deal: People depend on the planet's life support systems, and profit only matters as it serves people — so why not develop a more accurate diagram?"-Silverman H[17]

Due to the discrepancy of whether or not the traditional model for sustainable development (the one illustrated on the page above) was outdated, Professor Dave Griggs and nine other

[17] Sustainable development à la Herman Daly (2013)

researchers got together to develop an updated model that covers the term sustainability and the correct sequence priority of the subgenres. The model below is the result of their dedicated work.

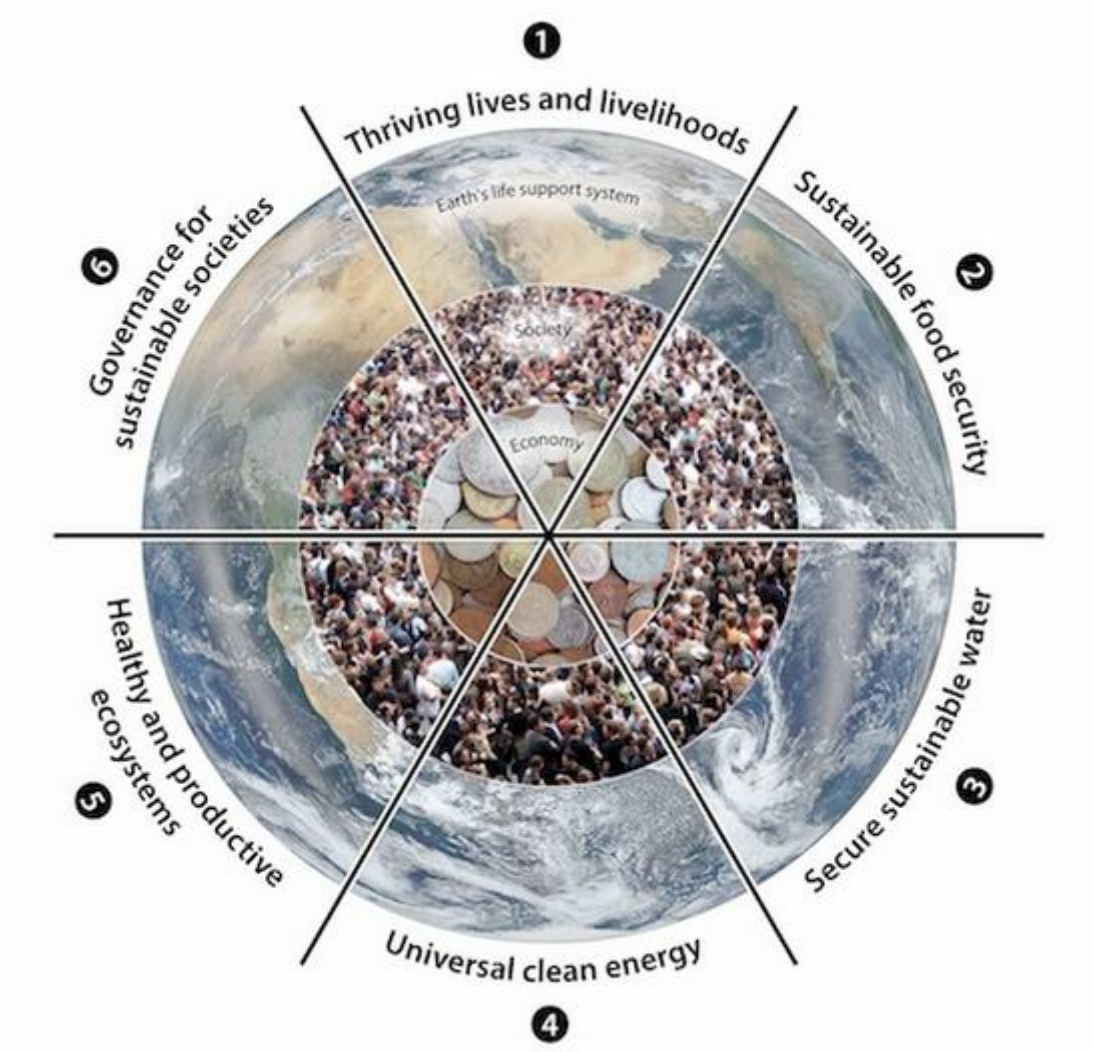


Figure 4-Six Different Goals Promoting Sustainability

The model is divided into six Sustainable Development Goals (also referred to as SDG's): thriving lives and livelihoods, sustainable food security, sustainable water security, universal clean energy, healthy and productive ecosystems and governance for sustainable societies.

The model illustrates a distinct order of the three segments; Earth's life support system, society and economy.[18]

Below is a more elaborate description of the six Sustainable Development Goals and some provisional targets set for the year 2030. Each step has its own section that covers specific measures that need to be initiated if one is to be successful of obtaining global sustainability.

1. **Thriving Lives and Livelihoods:** This point basically focuses on eradicating global poverty and increasing the human well being by a number of different factors such as: increased health on a global level, housing for everyone, better access to information, education and employment and ultimately equality for everyone while moving towards a consumption- and production rate that can be considered as sustainable.

   Sustainable practices for extraction, use and recycling of scarce resources and the reduction in emissions of stratospheric ozone-depleting pollutants are some examples of how one is to improve step one.

2. **Sustainable Food Security:** Eradicating starvation through a successfully developed "long term food security program". In addition, providing for better nutrition through production-, consumption- and nutrition systems that are considered sustainable.

   Nutrient use efficiency should by the year 2020 be improved by 20 percent and the extraction of nitrogen from the atmosphere should not exceed 35 million tonnes. Not more than 10 million tonnes a year of phosphorus should flow into water sources and phosphorus runoff to rivers and lakes should be reduced by 50% by the year 2030.

[18] International Geosphere-Biosphere Programme (2013)

3. **Sustainable Water Security:** Clean water and basic sanitation should be available to every human being on the planet. Through integrated water resource management, efficient allocation should be possible.

   Limit water volumes withdrawn from watercourses to less than 4000 cubic kilometers per year and restrict volumes withdrawn from these sources to maximum 50-80% of mean annual flow.

4. **Universal Clean Energy:** Improve the access to clean energy sources so they easily can be utilized. The increased use of clean energy sources results in a reduction in local pollution and provides an environment that does not have any form of negative health effect on individuals. The effects of global warming will in addition be substantially reduced.

5. **Healthy and Productive Ecosystems:** Secure the safety of ecosystems by providing ecosystem-services through improved management, valuation, restoration and conservation. Biodiversity within the ecosystems are also sustained by applying ecosystem-services.

6. **Governance for Sustainable Societies:** address the other five Sustainable Development Goals by applying governance and management to each one of them.

Griggs and his colleagues claim that if all of these goals are met, not only will we find ourselves in a much better position (speaking in a sustainable matter), but global poverty will in addition be alleviated. As a result of the positive reception of the "new definition", The UN has proposed to replace the traditional model with the new six Sustainable Development Goals (SDG) – model.

The “SDG-model” proves a point addressing the unbalanced equality among the three subcategories of the original model. In addition, the six Sustainable Development Goals are quite detailed and solution oriented (each step specifically describes necessary requirements that needs to be met if change is to occur) compared to the more shallow and general model that was used as its predecessor. It is therefore fair to say that the relatively new SDG-model can prove to be a possible alternative to use if one is to explain or grasp the concept of the term sustainable development. [19]

However this does not imply that the original model should be thrown down the drain. It still serves its purpose, namely aiding individuals to obtain a better understanding of the term in a way that the “new and improved” Sustainable Development Goals will have difficulties succeeding in. What the “three pillar”-model flawlessly executes is illustrating the relationships and possible conflicts between the three pillars. They can all have different effects on each other, whether it is positive or negative. By looking at the model, one gets a picture over how complicated and problematic it can be to successfully implement and integrate sustainability within one of the three pillars without causing any form of destructive effects for the remaining two. This type of problem is commonly known as a wicked problem.

[19] International Geosphere-Biosphere Programme (2013)

3. Wicked Problems

In the first half of the twentieth century, the society's professionals had no problems solving challenges that appeared to be understandable, definable and consensual. Their job mainly involved eliminating the conditions that were less desirable in a socio-political context. By looking at the evolvement of modern society and its prior history, one can quickly see that the professional's record of actions have been quite effective; cities are blessed with a functioning infrastructure such as roads, public transportation and maintenance, clean water is basically piped into every building, dangerous diseases are virtually gone and so on.[20]

Today however, the seeming consensus that existed once that allowed distributional problems to be solved is now quickly fading away as a result of the nation's differentiation of values and pluralism. The professionalized occupational styles in the first half of the twentieth century are not constructed to function and interact in an open system and to contemporary concerns with equity as the key element. One can say that a new form of problems arose from this societal change where equity and differentiation were being emphasized, namely the wicked problems.[21]

Wicked problems are issues that commonly arise in a social setting. In other words; wicked problems are highly relevant when it comes to the issue of sustainability. To simplify the overall picture one can say that there exist two types of problems. The first type of problems can be referred to as "benign" or "tame" ones. These are issues that can for instance occur in a scientific or mathematically explainable setting where the problems at hand have a crystal clear mission of how one can solve it. An example of a setting where such a problem can occur is when car designers try to figure out which physical shape a concept car should have to reduce aerodynamic drag as much as possible or when mathematicians try to solve a

[20] Rittel, H. &Webber, M. (1973): p.156
[21] Rittel, H. &Webber, M. (1973): p.156

complex equation. In both examples, the mission is clear, whether or not the problem facing the individuals has been solved.[22]

The reason why it is called "wicked problems" is based on the complexity of the phenomena, not because it is ethically lamentable. In contrast to "benign" the wicked problems are malignant and vicious like a never-ending circle. Wicked problems can basically be defined by a set of rules consisting of following characteristics:

1. **One does not understand the problem until one has developed a solution**

Dealing with a wicked problem implies the fact that there is no concise problem statement. Each offered solution is contributing to expose new aspects of the problem, making the scenario even more complex than earlier. The problem at hand is in a constant form of evolution where issues and constraints are changing, making it challenging for the socio-political professionals to grasp what they really are up against. The man who coined the definition of "wicked problems" Horst Rittel, stated the following:
"*One cannot understand the problem without knowing about its context; one cannot meaningfully search for information without the orientation of a solution concept: one cannot first understand then solve."- Horst Rittel*[23]

Moreover, the problem at hand varies from individual to individual. Different stakeholders have different concepts about the problem at hand and how one should act to apprehend the optimal solution. [24]

[22] Rittel, H. &Webber, M. (1973): p.164
[23] Rittel, H. &Webber, M. (1973): p.162
[24] Conklin, Jeff (2005): p.7

2. Wicked problems have no stopping rule

Since wicked problems do not have a defined problem (unlike a tame problem), it is therefore impossible to find just one solution. The only factors that affects how and when the problem solving process ends, are limitations concerning time, resources and energy. In other words, solutions to wicked problems are not ended when an optimal solution emerges, but when our own limitations are met.[25]

3. Solutions to wicked problems are not right or wrong, but good or bad

One cannot view wicked problems as right or wrong, it is not that simple. They are either "good enough" or "not good enough". In contrast to a benign problem where the problem can be solved by a set of rules or a mathematical formula, the wicked problems need to be assessed in a social context where every stakeholders is equally equipped, interested and entitled to criticize. The judgment and criticism from the diverse stakeholder groups are more than likely going to vary between them. The key is therefore to find a certain balance between the rivaling groups where all stakeholder parties can agree to that the solution to the wicked problem is "good enough".[26]

4. Every wicked problem is unique and novel

Due to the complexity and the different factors embedded in a social context, implies that wicked problems cannot be identical. The solutions to the different wicked problems are therefore also unique and tailored to each one of them. One will eventually gain a certain amount of experience approaching and dealing with wicked problems, but one is always "green" in the specifics of a newly encountered wicked problem.[27]

5. Every solution to a wicked problem can be considered a "one-shot operation"

In the fields of mechanical engineering, design and mathematics one can try various solutions to overcome a problem without any form of penalty. Trying and failing in these situations

[25] Conklin, Jeff (2005): p.7
[26] Conklin, Jeff (2005): p.7
[27] Conklin, Jeff (2005): p.8

have no critical impact on the course of societal affairs. Wicked problems however are different. Every try to implement a solution to this kind of problem creates "traces" that are irreversible. When actions have been conducted, there is no turning back. For instance, it is impossible to build a hospital to see how it works and later on "erase" it due to unsatisfactory results.[28]

6. Alternate solutions are non-existent for wicked problems

Either there can be no solutions to a potential wicked problem, or there can be several. The possibility for solutions that are never thought up is also a reality. It is therefore a matter of creativity to figure out different ways of thinking out a set of solutions to the problem and then try to figure out which solutions that should be kept and implemented and which should be disposed of.[29]

One can easily use real life events to illustrate the complexity of wicked problems in a sustainable matter. Successfully integrating a sustainable development measure without causing any form of contradictions or inconsistencies is as theory states, impossible. The low-price retail behemoth Walmart is one of the world's largest public corporations and responsible for over two million employees in almost thirty different countries.[30] During its life span, Walmart has been exposed to harsh criticism concerning its employees working conditions and work contracts denying employees to form or join any form of organizing work unions. [31] In addition, Walmart is also known outperforming local competition, such as small family-owned businesses that does not have the ability to stand toe to toe with the giant retailer's low competitive prices. As a result of the local businesses incapacity to be

[28] Rittel, H. &Webber, M. (1973): p.163
[29] Conklin, Jeff (2005): p.8
[30] Walmart-Our story: http://corporate.walmart.com/our-story/
[31] Walmart denies workers basic rights: http://www.hrw.org/news/2007/04/30/us-wal-mart-denies-workers-basic-rights

competitive on the market, shop owners have no choice but to shut down their businesses and apply for a job at the company that caused them to go bankrupt in the first place.[32]

Although Walmart is being questioned on their way of operating their business, they are showing some dedication and effort towards being increasingly sustainable. On Walmart's homepage one can read the following announcement concerning the environment:

"Environmental sustainability has become an essential ingredient to doing business responsibly and successfully. As the world's largest retailer, our actions have the potential to save our customers money and help ensure a better world for generations to come. We've set three aspirational sustainability goals: To be supplied 100% by renewable energy to create zero waste and to sell products that sustain people and the environment"[33]

Whether the company tries to improve their ways of operating sustainable out of sheer concern for the environment or just hoping for a larger market share, is irrelevant. When implemented, this dedication will most likely give results that affect the environmental pillar positively. But if one was to look at Walmart's impact on the local communities in America a certain conflict will arise: Walmart's existence is affecting the local community negatively due to its competitiveness towards small businesses, hence a negative reaction on the social and economical pillar. But Walmart's dedication to an eco-friendly future affects the environmental pillar positively. This example demonstrates problems as a result of a more complex society. There are several factors one should take into consideration before making a choice or taking a specific cause of action, making it extremely hard to choose between the alternatives. For every up-side of a societal group, there is a down-side for another.

[32] Dean, A. & Sobel, R. (2008)
[33] Environmental Sustainability- Walmart: http://corporate.walmart.com/global-responsibility/environment-sustainability

4. Sustainable Development in Higher Education

It is not easy to implement the concept of sustainability into learning institutions. First of all, it can be challenging to compartmentalize such a concept into an already rigid academic structure since sustainable development is a topic that is not specific to just one distinct academic discipline. One of Oberlin College's environmental professors, David Orr states that sustainable development is a subject that is not getting enough attention in education in general. Learning institutions in general choose not to acknowledge the existing crisis this planet is in and colleges and universities go on with their "outdated" curriculum. It is therefore important that change takes place so problems can be solved in a drastic matter.[34]

Second Nature's executive director Anthony Cortese is also criticizing how higher education chooses not to emphasize sustainable development in their daily curricula. Cortese claims that learning institutions choose to go the easy way by avoiding the issue concerning sustainable development and its interdisciplinary collaboration[35]. The whole idea about placing one subject such as sustainable development under several distinct disciplines in higher education can be both challenging and tough to come to terms with. 14th century tradition of clear distinct separation between academics in higher education can be troublesome to let go of, even though change has to take place before improvement can occur. The Association for the Advancement of Sustainability in Higher Education (AASHE) recently published a "Call to Action" document where the organization stated the importance of preparing individuals to live sustainably by offering students a curriculum that provides a better understanding of the issue as well as interactions, consequences and actions. AASHE also emphasizes the importance of individuals being able and capable to apply "sustainability-thinking" to real life situations. [36]

[34] Johnston, F. (2013): p.79
[35] Johnston, F. (2013): p.80
[36] Johnston, F. (2013): p.79-81

4.1. National and International Declarations Concerning Environmental Sustainability in Higher Education

During the past decades there have been several unifying agreements regarding sustainable development (especially environmental sustainability) that have had a considerable focus on higher education. These declarations are operating on both a national and international level. They have had a large impact on promoting sustainability to learning institutions and through national and international cooperation several of these declarations have created a network of institutions and organizations promoting the same cause. On the following page there is a list of declarations that concern sustainability in higher education.

Table 1-Declaration Overview

The Kyoto Declaration (1993)	• Almost 100 international universities has signed this declaration • Consists of six main principles • Shares similarities with the the Halifax Declaration and the Swansea Declaration
The Swansea Declaration (1993)	• A result of international cooperation among 400 universities • Focus is on; literate staff and students about the environment, physical operations, cooperation among institutions of higher education and the emphasis on moral obligations
The CRE Copernicus Charter (1993)	• Has been signed by over 300 Universities in almost 40 different countries • The declaration focuses on the urgency of shifting to more sustainable practices • Offers 10 different guidelines institutions can follow
The Thessaloniki Declaration (1997)	• One of the key issues that were being addressed here was that radical social change must occur before environmental change can initiate • Recognized the importance of implementation of initiatives concerning sustainable development and environmental literacy in learning institutions
The Lüneburg Declaration (2001)	• Followed the results and recommendations of declarations such as the Thessaloniki Declaration • Reaches out to several parts in society such as; Non-Governmental Organizations (NGO's) and institutions of higher education, governments, the United Nations and UNESCO
The Tokyo Declaration of Hope (2009)	• Holistic, Ownership-based, Participatory and Empowering • ESD-framework, which stands for Education for Sustainable Development • Adresses the importance of sharing information that adress sustainable development
Rio+20 (2012)	• The participants of the conference included leaders of the international academic community • Make sure that planned actions concerning sustainable development were up to date and ready to face new emerging problems and challenges
The Stockholm Declaration (1972)	• The earliest declaration concerning sustainability in higher education • Higher education was only a small part of the declaration (1 principle out of 26) • Age and social status is irrelevant
The Tibilisi Declaration (1977)	• A starting point for many initiatives concerning environmental sustainability as a part of the education • Environmental education should be provided to peopl of all ages and at all levels • Echoes the sentiments of the Stockholm Declaration
The Talloires Declaration (1990)	• Established a firm commitment to sustainability among institutions of higher education worldwide • Based on a 10-step action plan • Used by over 350 universities in over 40 countries
The Halifax Declaration (1991)	• stated the universities' importance by acting as leaders in the society promoting the problems of environmental damage • stated the importance of the universities' structure so that their practices and school policies would contribute to local, national and international environmental sustainability in a much larger scale

Each of these declarations represents different forms (and similar) of actions concerning sustainable development. One can easily see that there is a trend emerging by looking at the development of these declarations. Before the Stockholm Declaration there were not any form of actions concerning sustainability aimed at higher education, but just a couple of decades later sustainability declarations in higher education were blossoming internationally. This was certainly a development of great importance, not only for the learning institutions, but also for the general public as well. By reflecting how an organization could become and remain a sustainable institution, signatory universities were/are used as prime examples of the matter.[37]

To make it easier to see each declaration's characteristics, there is a chart included in the assignment that visualizes the features of each of them:

[37] - Wright, T (2002) p. 105-111
- United nations Conference on Sustainable Development (2012)
- Lüneburg Declaration (2001)
- Tokyo Declaration of Hope (2009)

Table 2-Declaration Features

Declaration	Sustainable Campus Operations	Environmental Literacy at the Inistitution	University Cooperation	Moral Obligation	Government and NGO Partnerships	Public Outreach
Stockholm Declaration		X		X		X
Tiblisi Declaration		X		X		X
Talloires Declaration	X	X	X	X	X	X
Halifax Declaration		X	X	X		X
Kyoto Declaration	X	X	X	X	X	X
Swansea Declaration	X	X	X	X	X	X
CRE Copernicus Charter		X		X		X
Thessaloniki Declaration		X		X		X
Lüneberg Declaration	X	X	X	X	X	X
Tokyo Declaration		X	X	X		X
Rio+20 Declaration	X	X	X	X	X	X

Sustainable Campus Operations: Operating an institution of higher education in a manner that contributes to reduce our environmental footprint and maximize economic and social sustainable benefits. Examples of these types of operations can be:

- ✓ Replacing campus lights with energy saving LED-lights
- ✓ Utilization of natural resources (if possible)
- ✓ Buying products locally
- ✓ Reducing waste on campus

By implementing sustainable campus operations, one creates a good example and in addition shows the society how environmental actions can be initiated.

Environmental Literacy at the Institution: Any form of science-based information regarding environmental issues that should be taught in learning institutions (among both staff and students).

Cooperation amongst Universities: By exchanging practices, information and ideas regarding campus operations, teaching and research, institutions of higher education can find it easier to achieve and maintain sustainability.

Moral Obligation: The form of responsibility learning institutions do out of free will. Due to their role as "sustainability facilitators", there is a certain form of responsibility resting on the institution's shoulders.

Government and NGO Partnerships: These forms of partnerships are a necessity if we are to obtain sustainability on every level of society. These partnerships can also contribute to facilitate sustainability on an international level.

Public Outreach: Public outreach concerning sustainability is about universities and colleges providing insight to the rest of the public. Public outreach derived from the belief that all facets of society must be involved if environmental change is going to occur. Even though learning institutions are intended to be a source of knowledge for faculty and students, this knowledge can also be applied to contribute to solving complex issues facing our society.

One can clearly see that there exists a noticeable resemblance among the declarations. The moral obligation to secure sustainability is present in each declaration and the same almost applies to the importance of environmental literacy and public outreach.

Even though we definitely are better off with these declarations, there is one issue that is important to address, namely the lack of practical processing. Of course, the declarations offer a wide array of solutions to a problem that must be dealt with, but none of them actually tell the learning institutions about any direct course of action and implementation. That is for them to figure out. It can therefore be easy for a university or a college to sign up for different declarations and nothing more. Sure it looks good on paper, but it is of no practical use because there will be no form or minimal form of change and improvement.

4.2. Private Sustainability Policies

National and international declarations are not the only options institutions of higher education can pick to secure sustainable development. Some colleges and universities try to achieve sustainability by creating their own tailored action policies that fit their organization just right. These plans of action are often even more efficient compared to national and international declarations, because they are developed especially for the one institution in particular. It also shows a certain level of dedication when an institution decides to spend time and resources to design, develop and implement such a plan to create better environmental results, which is not always the case for other learning institutions which rather choose to implement a declaration or two.

There is a vast selection of universities and colleges that have developed their own local policy that is intended to promote sustainability in both the organization itself, and the general public. One of these examples is The University of Waterloo, Canada. This learning institution has evolved in an environmentally friendly way by creating and implementing their own local sustainability policy without signing any national or international declarations.

They have their own department at the institution, called "Green IT" that is responsible for sustainable operations and initiatives. Environmental actions are being initiated in every sector and department of the university. Some of the examples are listed below:

- ✓ The University bookstores do not offer plastic bags
- ✓ The plant operations at the university try to reduce the energy use as much as possible to minimize the university's environmental footprint
- ✓ The University stores are reducing paper consumption by converting to electronic information[38]

The University of Waterloo is a great example of showing how micro policies may not be a bad choice for an institution of higher education that wishes to contribute to environmental preservation.

A good environmental policy can in addition often result in an improved economic situation for the institution. By promoting a green policy, universities can gain a competitive advantage in their operating market and be a more attractive choice for new coming students, making it easy to fill up their available student capacity-quota. It is also easy to develop closer and more functional relationships with the local community and the government if a learning institution chooses to develop a well-designed environmental policy.

4.3. Sustainable Development in Higher Education in Norway

Norway has spent a lot of resources in recent years (economic, social and labor) to promote and secure sustainability on both a national and an international level. The Soria Moria Declaration of the Norwegian government is a direct result of the country's dedication. The Soria Moria Declaration focuses on several aspects, such as

[38]Green IT (2012)

- ✓ International cooperation among nations and institutions to prevent poverty and promote sustainability
- ✓ Sustainable economic and social development
- ✓ The development and extraction of "green" natural resources
- ✓ Reduction of air pollution

The bullet points above are just some relevant examples included in the declaration. The Soria Moria Declaration is a result of Norway's dedication to promote and show the government's commitment to creating and maintaining sustainable development.

Chapter 7.6 in the Soria Moria Declaration describes the importance of support from learning institutions. Primary schools as well as colleges and universities are important elements of necessity if one is to successfully implement sustainable development in the rest of the society: Children are taught from early on the importance of environmental care and cooperation through developed programs and actions implemented in the school system. "Sustain.no" is a web page designed for children where they cooperate with research institutions to find solutions to problems concerning sustainability. This creates a direct link between child and sustainability from early on, one can actually call it indoctrination.

Environmental literacy is also introduced early in the education. The well known author Klaus Hagerup wrote a series of three books that addresses energy and the preservation of it, and a survey shows that over 57% of children between the ranges of nine to twelve years old are familiar with its underlying message of energy conservation[39].

It is also becoming increasingly common for institutions of higher education to create and offer courses addressing sustainable development and environmental sustainability.[40] But sustainable development in higher education is much more than just environmental literacy.

[39] Enova, Utdanningsdirektoratet & Naturfagssenteret (2007) p.7
[40] The Norwegian Government (2007) ch.7.6

There are several measures and actions universities and colleges can make to promote and sustain the philosophy of having the future in mind, such as

- ✓ Cooperating with other learning institutions
- ✓ Partnering with both NGO's (Non Governmental Organizations) and governmental organizations
- ✓ Initiating sustainable physical operations on school campus
- ✓ Reaching out to the public
- ✓ Reduction of paper waste by focusing on electronic solutions, such as e-mails

These are just some actions learning institutions can involve themselves in, by joining a national or international declaration or by making their own private environmental policy tailored for their own organization (declarations are mainly unifying agreements that concerns sustainable development).

To be able to give good answers and thorough explanations to what this thesis is addressing, a direct interaction with an institution of higher education seems to be necessary. By apprehending contact with a learning institution one would hopefully gain access to different sorts of relevant data regarding energy consumption, building mass, number of staff and students etc. UMB felt therefore natural to use as a "test subject" in this assignment due to the following points

- ✓ The school is relatively big, making it easier to measure development (economic, number of students, energy consumption, building mass etc)
- ✓ Is there a dynamic and collaborative relationship between the departments within the institution?
- ✓ The institution spreads over a vast geographical area indicating that the campus is fairly large. A large campus has the opportunity to implement "a green way of doing

things". It would be interesting to see what plans of actions The University of Live Sciences are putting initiating to assure an environmental friendly campus.

- ✓ There are several buildings connected to the institution (both new and old). What plans of actions have or will be taken into consideration to improve the older ones?
- ✓ Practical circumstances regarding travel distance

Where does the university stand when it comes to sustainable development, what are they contributing with to make students and staff act in accordance with the concept of sustainable development, how have these actions affected school operations and what can be improved?

One can actually say that UMB has chosen to follow a path right in between the middle of the two alternatives (declarations and private policies) of environmental sustainability in higher education. They are namely dedicated to following a set of standards called the ISO 14000 (International Organization for Standardization)[41] which basically is a set of standards closely related to the European Union's Eco-Management and Audit Scheme (EMAS)[42], but by reaching and maintaining these standards, they have created their own tailored environmental policy and set their own personal goals specifically created and designed to be fulfilled by the institution in order to satisfy the "demands" of the ISO-organization.

4.4. Historical Development Analysis of UMB School of Economics and Businesses

The Norwegian University of Life Sciences was founded as early as 1859. At that time it was established as an agricultural school. Almost forty years later, the school became a scientific university college. It was not until recently that the school received a university status (2005). Today, the institution has over four thousand students (of which over four hundred are PhD students) and almost twelve hundred employees.

[41] International Organization for Standardization. (2009): p.2
[42] Eco-Management and Audit Scheme. (2008): p.1

The UMB school of Economics and Businesses is recognized as an international institution of knowledge focusing on research on different subjects, including the environment[43]. It is therefore quite interesting to take a look at UMB's dedication to sustainable operations. They are already contributing to society by offering a fairly wide selection of environmental literacy/specialization to the public, such as; renewable energy, sustainable water and sanitation, ecology and natural resource development. But what about their local physical operations? UMB's three year strategy (2010-2013) states the following:

"During the strategy period, the university will be Norway's most eco-friendly university by using renewable energy and new technology in the operation and development of the university and Ås Campus, and by constantly reviewing its environmental strategy."[44]

By looking at UMB's actions, one can see that they have clearly made some effort of improving their physical operations. For instance, they have agreed to satisfy the environmental standards of the ISO 14001, which is a part of the ISO 14000. The ISO 14000 is a tool/guide that is designed by the International Organization for Standardization, directed towards institutions and organizations that want to reduce their negative impact on the environment. The way it works, is that the institution creates a set of environmental "guideline-standards" they are to follow so they can reach certain environmental goals. The requirements for an environmental management system can be found in the ISO 14000-series.[45]

To be more specific regarding suggested environmental guidelines for the institution, a list of actions set by the university is illustrated below (extracted from UMB's environmental action program), concerning education, public outreach/relations and institutional operations.

[43] The Norwegian University of Life Sciences (2012): UMB in a nutshell
[44] The Norwegian University of Life Sciences (2010): Strategy 2010-2013
[45] International Organization for Standardization. (2009): p.6-9

Education

UMB wants to implement an environmental friendly way of thinking for its students and its faculty in a way that improves our capacity to solve future challenges:

- ✓ Develop and include environmental literacy in all study programs at the university
- ✓ Include an environmental declaration in each subject's course description
- ✓ Increase the span of environmental-related courses at the institution
- ✓ Create an annual prize for the best thesis (doctor and master) concerning the environment

Public Outreach/Relations

UMB wants to be prioritized in case of the need of environmental expertise:

- ✓ Participate in public debates and social controversies that focus on an environmental aspect
- ✓ Maintain and develop strong and close relations to businesses and the government
- ✓ Make sure that UMB's areas of expertise are mediated at the campus
- ✓ Market UMB as "Norway's environmental university"
- ✓ Establish an environmental day at the campus by cooperating with the students at the university
- ✓ Create a website that successfully manages to show UMB's dedication to sustainability and environmental causes of action.

Institutional Operations

UMB wants to create as small an environmental footprint as possible:

- ✓ Reduce waste created at the institution and make sure the waste is sorted

- ✓ Reduce the usage of and replace environmentally hazardous chemicals if possible
- ✓ Use green server technology
- ✓ Reduce energy usage from daily operations and optimize space utilization

If the reader is interested in reading more about these courses of action, the Norwegian University of Life Sciences offers a more detailed description on their website.[46]

By looking at the university's energy consumption contra its increase in building mass and students/faculty as well as its practical environmental initiatives on campus, one can easily get an indication of how the institution is doing relative to operating sustainably.

[46] The Norwegian University of Life Sciences (2012)

5. Institutional Development

In order to collect relevant and correct data regarding institutional development and operations in Norway, one can use the official database called DBH (Database for Statistics on Higher Education). DBH holds data on a vast selection of topics about institutions of higher education located within the country. They have collected data concerning, educational institutions, PhD candidates and students, building mass on the campuses in square meters, rate of employment etc. The collection of data is achieved by a close collaboration with the universities and colleges. In addition to providing a secure and structural archive for the entire public, DBH also functions as a decision making tool for all the Norwegian learning institutions as well as the Ministry, because of its quantitative parameters. [47]

DBH's registered data are excellent to use as parameters to try to measure the university's development towards sustainability. By first looking at for instance building mass and numbers of students and staff contra the institution's energy consumption, one can get a good indication about which direction the university is heading. Is there an increase or a decrease in energy consumption? Or maybe it has been stationary for the last ten years?

The following data and line charts are created out of data from the Norwegian University of Life Sciences, provided by the Database for Statistic on Higher Education. The data analysis shows the institution's development over a 10-year interval:

Number of Students and Employees Located at the Norwegian University of Life Sciences

Table 3-Number of Students and Employees

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Students	2585	2671	2784	2968	2942	3116	3267	3765	4162	4424
Faculty	870,8	866,3	874,1	894,6	940,5	940	987,8	1005,1	1009,4	1032,6

[47] Norsk samfunnsvitenskapelig datatjeneste AS

The data extracted from DBH clearly shows a steady growth pattern for the development of both students and faculty. There are only a few numbers that indicates a minor reduction compared to last year's data (a reduction in the number of attending students from 2006-2007 and a minor reduction in hired faculty from 2003-2004 and 2007-2008).

NB! One of the reasons for this institutional growth can be a result of when UMB changed from being a college of agriculture to a university in 2005.

Norwegian University of Life Sciences Building Mass:

Table 4-UMB Building Mass

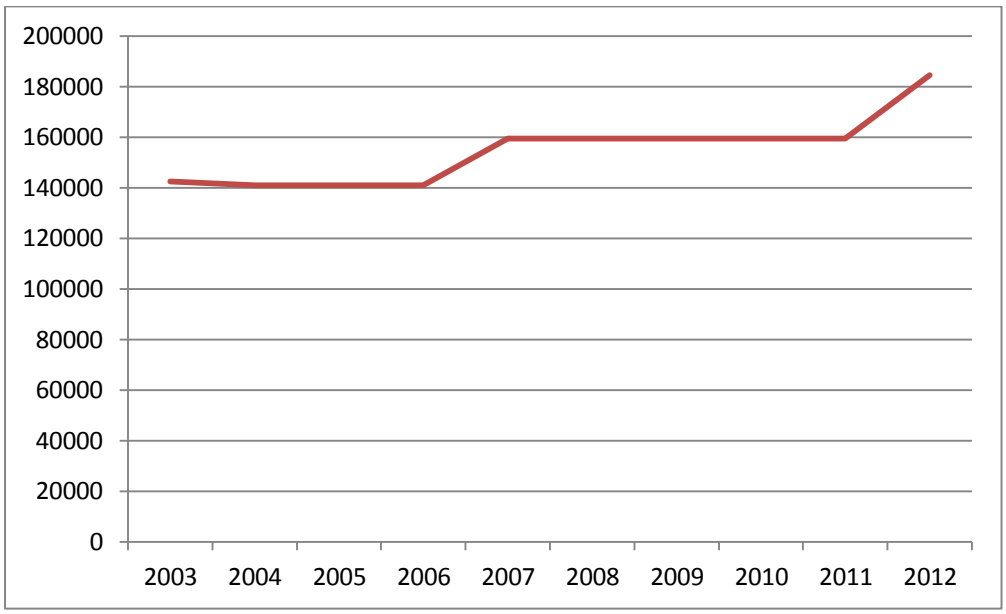


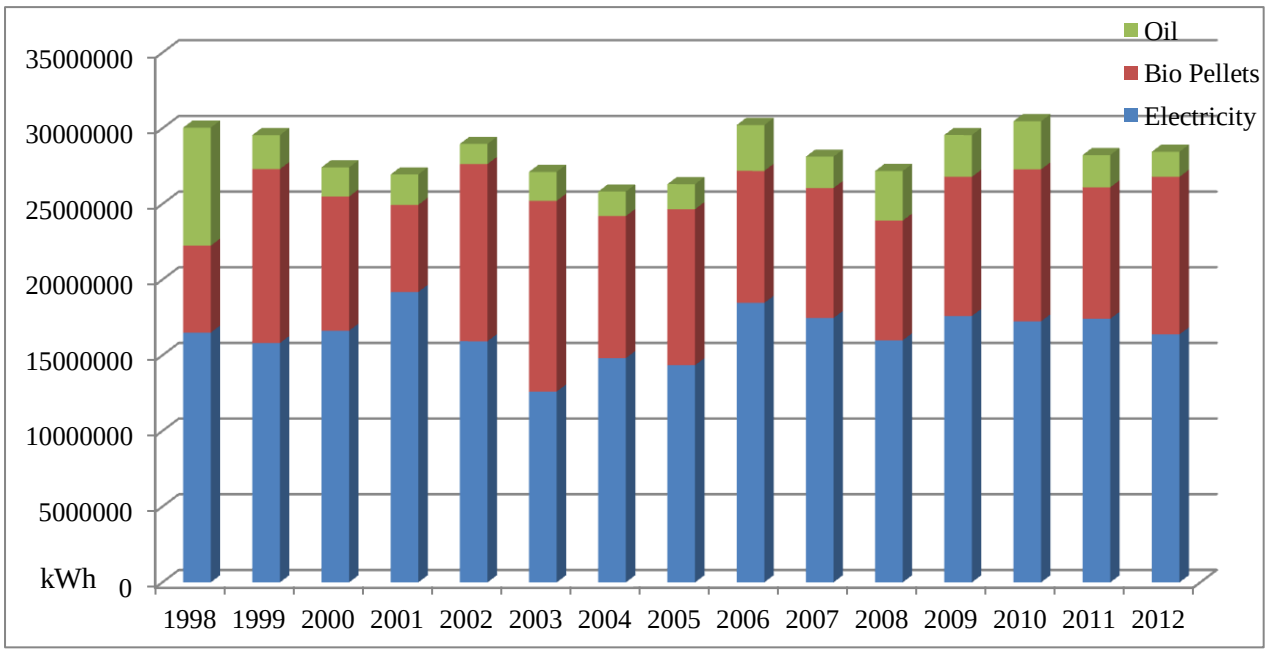
Table 4 presents the Norwegian University of Life Sciences' building mass in square meters. The X-axis illustrates a nine year time span while the Y-axis illustrates UMB's increase in building mass.

As one can see, there have not emerged any significant changes when it comes to UMB's building mass over the past ten years (collected data for 2013 has yet to be published at DBH). The university's building areal was actually stationary for a five-year period (2007-2011). Nevertheless, there has been an expansion of the campus' square mass of over forty thousand square meters.

University Energy Consumption

By contacting UMB's operating and service department, one obtained relevant information consisting of the university's environmental figures stretching over a period of fourteen years.[48] Among those figures was the overview of UMB's energy consumption. The Norwegian University of Life Sciences utilizes three different sources of heating its buildings; gas, electricity and bio pellets.

Table 5-University Energy Consumption



The energy graph demonstrates history of UMB's energy consumption stretching over a time period of fourteen years. There are some variations changing from year to year, but the data presented mainly shows a relatively stable state. One of the biggest changes that can be observed in the graph above is the reduction of oil as an energy source between the years 1998 and 1999. After 1999 the use of oil has steadily been used in small amounts to heat up buildings on the campus.

[48] Excel-Attachment .1

Another positive element UMB has involved itself in to improve sustainability within the university is the use of bio pellets as an energy source. Bio pellets are basically compact biomass briquettes made from waste of renewable sources, such as grass, straw and wood. It is a good alternative to other energy sources, since the briquettes burn and discharges heat over an impressing long period of time making it extremely efficient.[49] Even though the usage of these briquettes is fairly positive, the university has been quite modest in accordance to expanding the use of the bio pellets. The graph shows a doubling in the usage of bio pellets from 1998 to 1999, but if one compares the data from 1999 with the data collected from 2012 one can see that the usage of bio pellets actually has decreased.

All in all, one can clearly see that the energy consumption at the Norwegian University of Life Sciences has experienced a positive development over the last fourteen years. Compared with the usage of kWh the year of 2012 (28455415) kWh) used considerably less compared with the energy usage in 1998 (30048541 kWh). One also has to have in mind that the building mass was considerably smaller in 1998 compared with what it is today.

However, this does not mean that UMB should let their foot slip off the gas pedal. There is always room for more improvement.

[49] Renewable Energy Information Office- Sustainable Energy Ireland

6. Institutional Improvements

By reading UMB's environmental action program, one can fairly say that UMB has big ambitions regarding their dedication towards sustainable development. The proposed actions stretch from environmental literacy in the institution's offered courses to direct physical alteration of their operation such as a reduction in both waste and energy. But what has been accomplished to this point in time and what has not? Presented below are some environmental actions The Norwegian University of Life Sciences has implemented to improve their situation on creating a smaller environmental footprint.

In the nearer future (Fall 2013), The Norwegian University of Life Sciences are converting to an alternate energy source for a considerable large quantity of its buildings, namely district heating provided by the state-owned energy provider, Statnett. Briefly, district heating is the usage of an external provider of heated water (also known as a central heating installation) that is used for various purposes such as heating and tap water. The water flows in a continuous circle, where warm water is pumped out from the district heating provider to factories, homes, public buildings etc. After using the heating from the warm water source, the water gets transported back to the supplier through pipes where it will be heated up once more to again be transported back to its customers considerably warmer.[50]

The use of district heating can be considered as step in the right direction towards a more sustainable future. First of all, district heating often use energy sources such as biomass, pure waste and biofuel, making the heated water a result of an eco-friendly energy source. There are off course district heating plants that use fossil fuel sources to heat up outgoing warm water, but even if that is the case district heating will nevertheless be a reasonably good alternative to other more conservative ways of obtaining energy, namely because of the

[50] Euroheat & Power (2011): District Heating in Buildings, ch. 3

efficiency of the heating. In the graph below one can observe the average energy usage per citizen in our main capital for over the last sixty years:

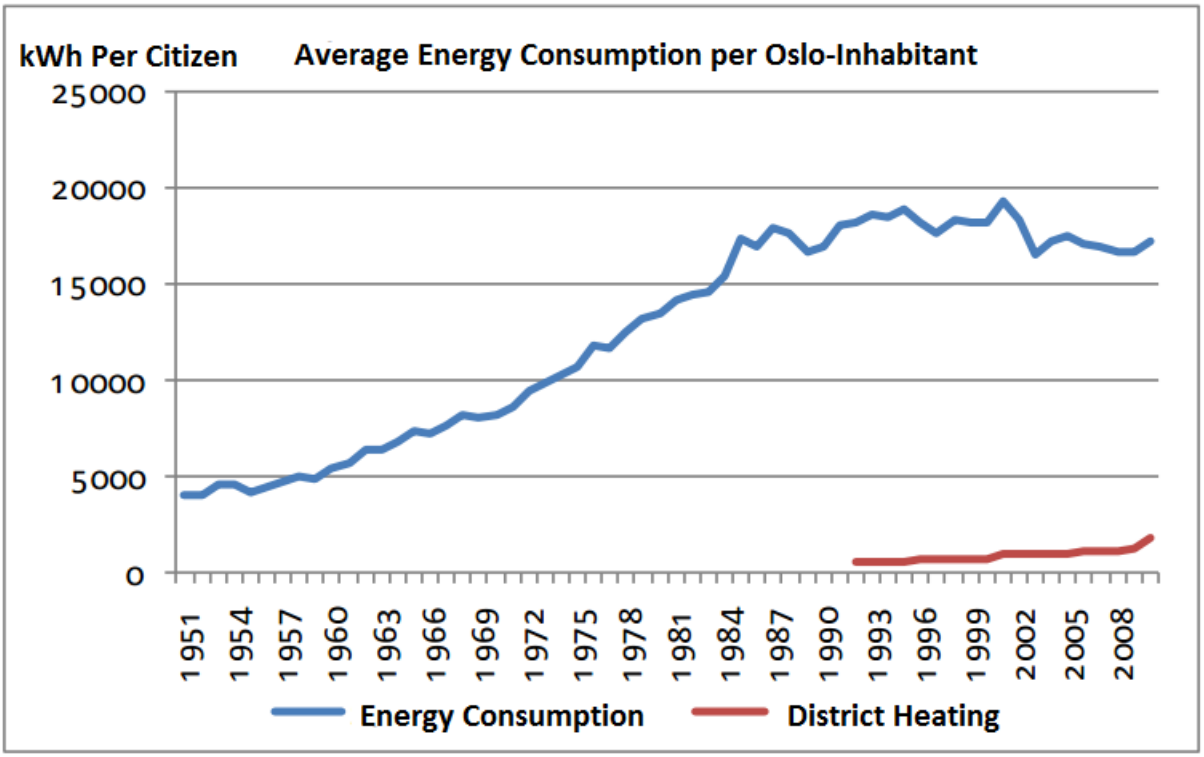


Figure 5-Energy Consumption in Oslo

The graph illustrates a steady growth of energy consumption per capita starting as early as in the 50's. It was not before district heating showed up in the 90's that this increasingly consumption pattern finally changed and leveled out.[51]

Making such a drastic institutional change will create all sorts of temporary insolvencies, such as construction noise, low temperature work environment, lack of heated water etc. but some sacrifices has to be made to make improvements. Most of the work regarding converting to district heating is however finished and only a few buildings are remaining.[52]

UMB's environmental action program lays a lot of its focus on both waste reduction and the sorting of its waste. UMB has therefore invested in a recycling station just for the institution

[51] Statnett & Hafslund (2011) p.15
[52] The Norwegian University of Life Sciences (2013): Conversion to district heating

itself. Waste ending up at this recycling station is being sorted and in some cases reused directly. UMB has namely made an agreement with the humanitarian organization FAIR (Fair Allocation of InfoTech Resources[53]) to help provide developing countries with technological hardware such as; computers, computer screens and printers that are considered by western standards to be outdated and therefore replaced. After a certain period of time when the computers and printers have done their fair share of functioning in developing countries, the electronic equipment is sent back to UMB to be properly discarded of. This is an arrangement that definitively helps aiding both people suffering under bad living condition and the environment, since the electronic equipment and their potential is being fully utilized. In addition, the products will also be properly recycled after their time of functioning has surpassed them.

Even though the recycling station is a good cause for the sustainability issue, does not mean that it is functioning one hundred percent properly. The residual waste ending up at the recycling station contains a large amount of waste that falls under other "categories" of garbage. In other words; garbage being disposed at the recycling station is not properly recycled. This is clearly shown in UMB's registered environmental factors. Residual waste represents almost fifty percent (48.7%) of total waste produced at the institution.[54] The Norwegian University of Life Sciences has to be more thorough and strict when it comes to categorizing its waste, whether it is in the school cafeteria or in the garbage bins stationed outside on the campus. All of the effort trying to create a sustainable environment will be for nothing if the methods of preserving it are failing.

Due to the age, beauty and historical importance of the Norwegian University of Life Sciences, the Directorate for Cultural Heritage has chosen to preserve a vast number of the

[53] About FAIR: http://www.fair.no/om-fair/om-fair/
[54] Attachment 1, Environmental Factors and Residual Waste

university's older buildings. This preservation implies that it is impossible to make structural changes or improvements on both the exterior and the interior (there are some exceptions regarding interior change in some buildings) of the following listed buildings. [55]

Omfang fredning

Byggnavn	Oppført	Bygningsnr.	Gnr/bnr	Omfang
•AUD MAX	1969 - 1970	149078304	42/1	Eksteriør/Interiør
•Botanisk klimalab.	1962	149076093	42/1	Eksteriør
•CIRKUS	1859 - 1902	149076018	42/1	Eksteriør/Interiør
•Damsgård (Kirkeveien 1)	1899	149078290	42/1	Eksteriør/Interiør
•FRUKTKONSERVERINGA	1901	149076123	42/1	Eksteriør
•Gartnerboligen (Åsbakken 3/5)	1887 - 1888	149076077	42/1	Eksteriør/Interiør
•Lindemannhuset (Fougnerbakken 16)	1899	149075747	42/1	Eksteriør/Interiør
•Meieribygningen	1949 - 1953	149076204	42/1	Eksteriør/Interiør
•Meierimuseum (Kirkeveien 2)	1900 - 1901	149078282	42/1	Eksteriør
•PALASSET	1859	149076190	42/1	Eksteriør
•Palmyra (Fougnerbakken 18-20)	1898 - 1899	149075720	42/1	Eksteriør/Interiør
•PARKGÅRDEN	1866 - 1867	15374330	42/1	Eksteriør
•SMIA	1859	179076182	42/1	Eksteriør/Interiør
•STABBURET	1859	149076034	42/1	Eksteriør/Interiør
•TIVOLI	1859 - 1902	149075992	42/1	Eksteriør/Interiør
•TÅRNBYGNINGEN	1921 - 1925	149075984	42/1	Eksteriør/Interiør
•URBYGNINGEN	1898 - 1900	149075976	42/1	Eksteriør/Interiør
•UTOMHUS			42/1	Utomhus
•ØKONOMIBYGNINGEN	1897	149076026	42/1	Eksteriør/Interiør

Figure 6-Preserved buildings at UMB, issued by the Directorate for Cultural Heritage

Due to these restrictions, there is not much that can be improved on these old buildings. It is for example impossible to improve the isolation in the walls, preventing heat escaping from the buildings during winter. Nor is it possible to remove old windows and replace them with a better alternative that can be appreciably better when it comes to energy reduction.

The Directorate for Cultural Heritage's work in preserving historical buildings and cultural monuments is undoubtedly of great importance. However, their work can in certain scenarios (like the one presented above) interfere with sustainable development. If it would be possible to arrange a meeting with the Directorate Cultural Heritage and try to come up with a

[55]The Directorate for Cultural Heritage: p.1-33

compromise regarding the preservation of UMB's historical buildings, the outcome for of the agreement would be in favor of sustainable development. A structural renovation at the Norwegian University of Life Sciences would in addition save the university money in the long run, as a result of better isolation and energy preservation.

In September 2013, the Norwegian government is planning to renovate "urbygningen", an institutional structure located on campus that exceeds a hundred years of age. The Directorate for Cultural Heritage is deeply involved in the renovating process of the building and according to UMB's newsletter for the summer of 2013, the cooperation between the two public agencies (The Directorate for Cultural Heritage and Statsbygg) has so far been successful[56]. This cooperation can as a matter of fact benefit the Norwegian University of Life Science if The Directorate for Cultural Heritage and Statsbygg perceive their collaboration as positive. It can make it easier for both the institution and The Directorate for Cultural Heritage to make compromises (replacement of windows and other structural procedures that for example promotes energy reduction), hence making it easier to facilitate sustainable development at UMB.

Another environmental concern the Norwegian University of Life Sciences should look more into, is the pollution and the emission that derives from private transportation. Both students and faculty attending The Norwegian University of Life Sciences often live in distant locations that require the student or employee to travel by car or other means of private transportation. The Norwegian Association of Master and Science in Business and Administration (also known as Econa) conducted a survey at UMB's business school in 2011 to gain more knowledge about their customer segment including information regarding geographical whereabouts. The survey revealed that almost 65% of Econa members located in

[56] UMB newsletter. (2013): p.8-9

Ås commuted in order to get to school.[57] Due to this geographical distance and/or inconveniency related to public transportation a large amount of emissions from private driven vehicles are being produced, just so individuals can meet up to their daily job or or attend lectures. UMB have already initiated measures like for instance gradually removing parking lots around the institution's buildings, making it gradually more difficult to find a decent parking space close to the learning institution. Hindering the possibility of close-parking is among other reasons an attempt of reducing the use of private transportation, hence a reduction in emission. Even though it is becoming gradually difficult to park close to the institution, there is however a vast number of parking spaces located just a couple of hundred meters away from UMB's campus core. One can therefore say that UMB has not eliminated this problem, just moved it to a more distant location. Their effort to reduce private transportation has therefore been ineffective.

A large number of students have their residence close to- or in the main capital, Oslo. They are therefore dependent on transportation whether it is collective or private. By looking at the Norwegian State Railways' (better known as NSB) homepage and time schedule, one can see that there is only one train per hour stopping in Ås only 28 minutes before lectures usually begin (fifteen minutes past is often the standard). This tight time schedule provides a small and strict window of time and may cause individuals attending the university to rather make use of their own car or motorcycle. NSB is also not known for its punctuality. Their delayed arrivals are another factor that affects collective transportation negatively. The travel distance from the railway station to the university can also be considered relatively long, especially during wintertime when the temperature drops to several degrees below freezing.

[57] The Econa survey is not available online. However, I contacted a former Econa member and got a hold of it. The survey is attached to this assignment (Attachment 2)

"Timeekspressen" is also an alternative to taking the train and they do actually offer two buses per hour which is quite convenient for both staff and students attending UMB. However the travel distance from the bus stop is more or less the same distance as the train station, making the bus as unattractive and exclusive as taking the train. In addition, Timeekspressen is even more costly than if one was to make use of the railroad (which is in the first place relatively expensive).

One solution to reduce private transportation and motor vehicle emissions is to set up a bus route between the main capital to the university that stops right on the doorstep to the university, making it an attractive alternative to getting from A to B. The bus arrivals could also be synchronized with lectures, giving students sufficient time before attending lectures. Installing parking meters at the parking lots is also a way to reduce private transportation. However this action may create more negative effects for the university than positive, like for instance reduce attendance among students.

It is important that these issues are being handled through the scope of both the SDG models as well as the three subcategories of sustainability. As stated earlier in the text, they point out the importance of hierarchy of prioritization and the inevitability of wicked problems. UMB has to be prepared to face the challenges of satisfying a vast number of stakeholders in association with its institutional improvements. Implementing and initiating the previous actions will of course be an economic expense for the institution, but environmental improvements are crucial and should be emphasized in a considerably larger scale.

7. Organizational Optimization

It can be challenging to find ways to improve the environmental state of an organization. Concrete and practical solutions (as the ones presented earlier in the thesis), is only a segment of what can be done to promote sustainability to the organization. It can be a wise decision to look for answers to the problem at hand in the organization itself. This does not imply that the problem itself (in this case the challenge to become more sustainable than earlier) originated from the organization, but one has to look into and perhaps make some necessary changes within the structure of the institution in order to be able to confront the problem. The following theory addresses the link between individual and organizational learning may give an institution better insight of how to share individual mental models in an organization and expand its capacity for effective coordinated action, which in a sustainable matter can be relevant. The following chapter will give the reader a better understanding of how this is possible.

7.1 Individual and Organizational Learning

When one speaks about organizational learning, one addresses the organization's ability to acquire knowledge through the individuals it consists of. Theory regarding Individual learning is therefore absolutely crucial to obtain and understand if one wants to understand how organizations acquire knowledge.

7.1.1 Individual Learning

Individual learning can basically be divided into four fundamental steps; **observe, assess, design** and **implement**. This learning cycle is also referred to as the OADI cycle. The four steps have good connections to actions conducted in an organizational context and are therefore relevant to include in the theory of individual learning. Individuals initiate tests and experiments which they can actively observe directly and see what is happening. Their

experience is later on being assessed followed by a design that appropriately responds to the experiment.[58]

Even though the OADI cycle presents the learning process relatively clearly, it does not explain the role of an individual's memory (which is a critical part of understanding the link between organizational and individual learning). In contrast to learning which basically has to do with acquisition, memory is based on storing that what has been acquired earlier. One can therefore say that there is a tight connection between the two terms even if their definitions are quite different. One can compare a human memory with the hard drive of a computer, where every acknowledged skill, information and perceived experience is stored. This storage device contributes to form an individual's perception of the external world and paints a picture of how and why things are like they are. This "painted picture" is what can be referred to as an "individual mental model". In addition to representing a view of the world by using a collection of memories, ideas and experience, the mental model also chooses what to use, retain and delete of acquired information. It is therefore more accurate to include the individual mental model to the OADI-learning cycle, due to the powerful influence it has on individuals as it forms how each and one of us interprets reality.[59]

[58] Based on Kofman's lecure slides (1992)
[59] Kim, D (1993) p.40

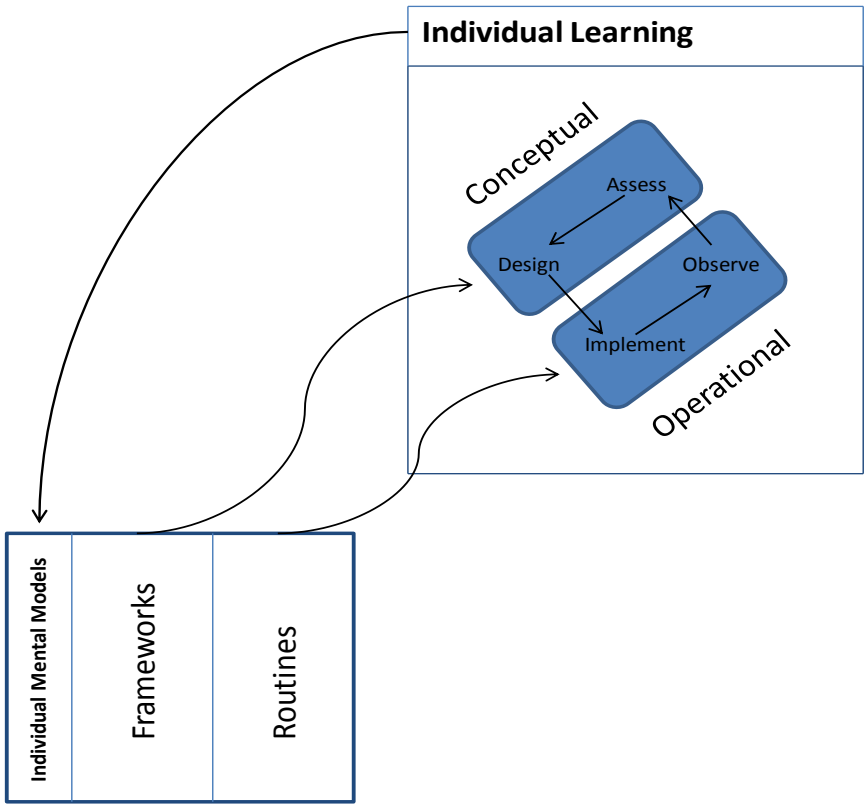


Figure 7-OADI-Cycle and Individual Mental Model

The operational and conceptual parts of learning can be linked up with two parts of the mental model, namely "frameworks" and "routines". The operational part represents the type of learning where an individual learns a particular task by following a set of steps. These steps then gradually become a set of routines. Examples of such routines are easy to come across in a job setting: Assemble computers, operating machinery and filling out forms are some examples of operational learning. Conceptual learning however is quite different. Here the individual ask himself/herself the reason why a certain action is being performed, making it possible for human beings to be critical to already established procedures and frameworks. Questioning these actions opens up for opportunities to improve situations by looking at

problems and challenges from a different angle.[60] There are numerous examples to use to demonstrate actions where learning and mental models operate in a dynamic matter. Driving to the family cabin located in the mountains is mainly operating on an operational level, due to the routines that have been integrated into an individual's memory from driving up and down from the mountains for several years. However, the learning process becomes quite more intricate when the original road to the cabin is closed due to maintenance. Now, the driver has to find an alternate route to the cabin. This implies that the driver has to rethink and restructure the original framework by using conceptual learning.

7.1.2 Organizational Learning

Newly established organizations can in many situations be synonymous with individual learning due to the minimal structure of the venture. However, as the organization continuously grows, the similarities between individual learning and organizational learning become more distinctive. Despite the different distinctions, organization learning will always be connected to individual learning since every form of acquired knowledge is picked up by the organization's individual members.[61]

It is challenging to find out what exactly constitutes appropriate learning and therefore difficult for organizations to decide which routines that are the most efficient. March and Olsen see the organization as a system that can quickly adapt to changes in the external environment by learning from experience. They have therefore designed a model to better explain how organizations adapt in accordance to its environment.[62]

[60] Kim, D (1993) p.40
[61] Levitt & March (1988) p.326
[62] March & Olsen (1975) p.147-171

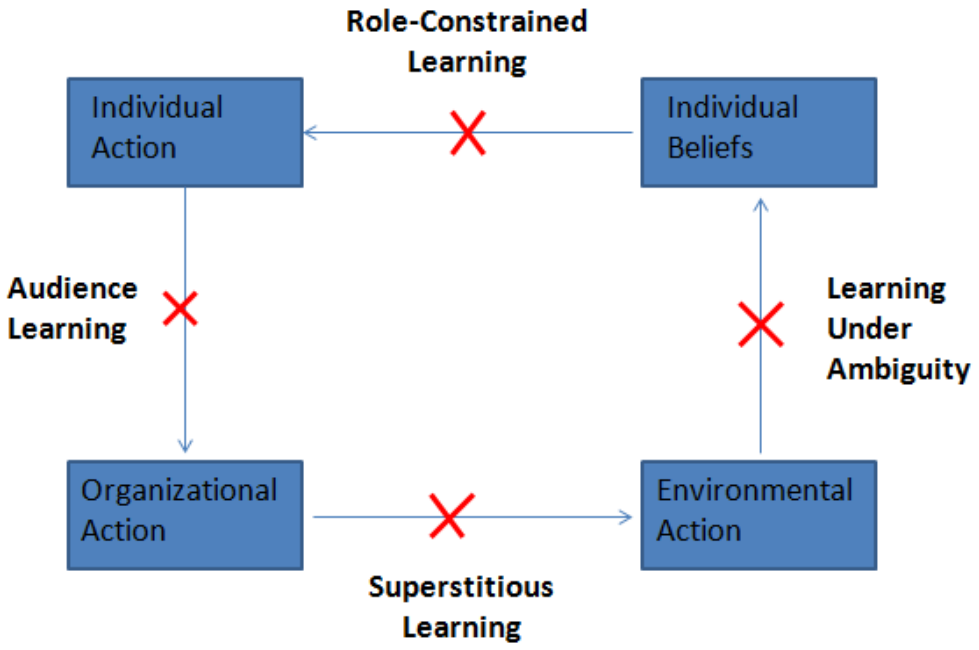


Figure 8- Organizational Learning

Figure eight illustrates how individual beliefs and individual actions lead to organizational action followed by an environmental form of action. The cycle is successful only if the environmental response has an impact on the organization's individuals and their beliefs.

Tracing the loop of organizational learning one will notice that if the environment and its response to organizational action are static and unchangeable, individual beliefs, actions and subsequently organizational action will remain unchanged. However, if there actually are changes in the environment, individual beliefs will most likely be affected by this, thus precipitating a new and different set of individual and organizational actions. Such a change of "paradigm" will introduce a new and updated cycle of learning.[63]

In addition to visualizing the learning loop, model eight identifies four possible scenarios where the learning cycle gets interrupted: **Role-constrained learning** can occur when individual learning has zero effect on individual action. Because of the constraints some

[63] Kim, D (1993) p.41

individuals are bound to, the circle gets broken. **Audience Learning** takes place when an organization's individuals affect it in an equivocal way. In **superstitious learning**, the connection between the actions of the organization and environmental response is cut off. Actions, conclusions and newly acquired knowledge that have no relevance with the correct environmental response are therefore implemented in the learning circle. **Learning under ambiguity** occurs when there is only operational learning included in the loop. Conceptual learning is non-existent, creating a learning circle without any form of causal linkage. Optimal organizational learning is dependent on both ways of acquiring knowledge.[64]

7.1.3 Combining Individual Learning and Organizational Learning

If one is to put the elements of both the individual aspect as well as the organizational aspect into a model, one gets the following result displayed as figure 9. This illustration can be referred to as the OADI-SMM (Observe, Assess, Design, Implement-Shared Mental Models) model that illustrates the process of learning through the exchange of individual and shared models. Figure 9 is thoroughly introduced below the illustration on the next page.

[64] Kim, D (1993) p.42

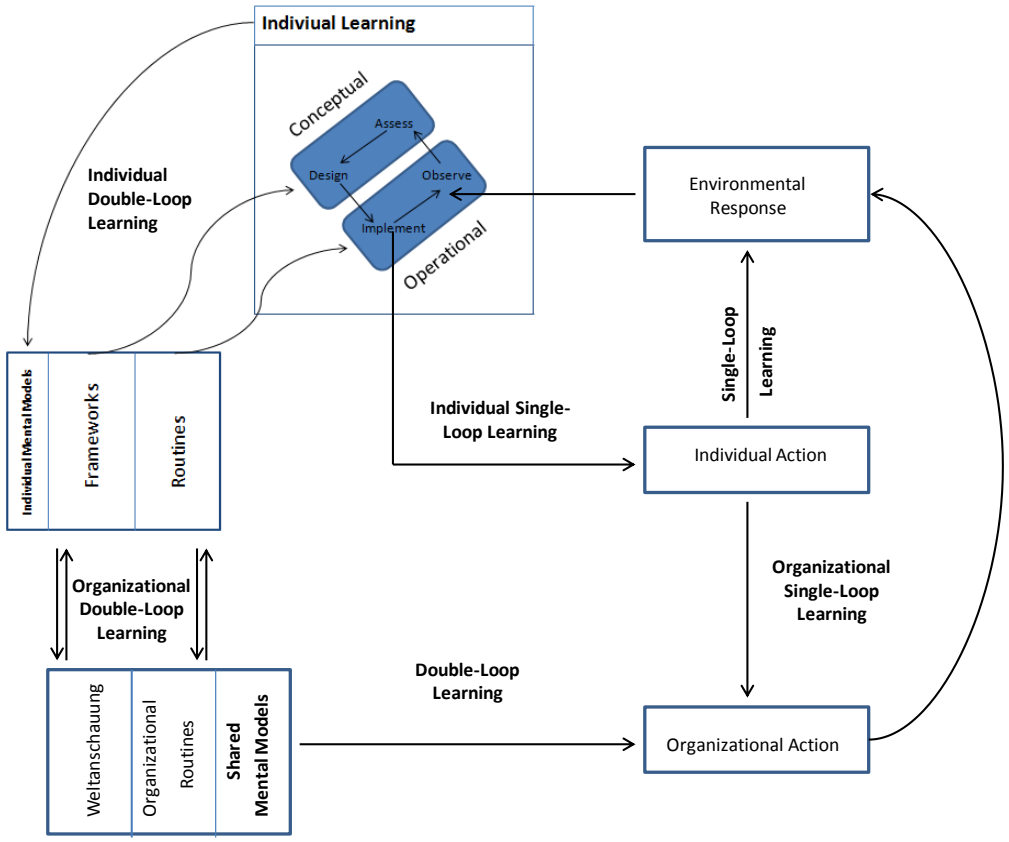


Figure 9- Individual Learning + Organizational Learning[65]

NB! It is important to mention that the individual learning cycles and the individual mental models in Figure 9 do not just represent one specific individual in the organization, but everyone.

Each person has their own individual learning cycle and it is these cycles that affect the organizational learning through their influence on the organization's shared mental models. The organization is therefore dependent on the individual learning cycle to acquire knowledge. [66]

The crucial parts of an organization's memory are those factors that contribute to keep the memory active, as opposed to the more static way of maintaining an organization's memory such as, stored files from earlier projects and strategies. Computer systems, strategies and

[65] Kim, D (1993) p.43
[66] Kim, D (1993) p.43

back up-files are off course important for an organization to possess, however it is not very useful in the context of organizational learning. The important factors that contributes to create an active memory is namely individual and shared mental models. It is within the individual mental models that the majority of an organization's knowledge is acquired. The organization's essence is embodied in a much higher degree amongst its individual as opposed to its systems. It is these models that have the capability to affect the organization's view of the world and which actions it should make use of. Organizational learning is therefore dependent on input from updated individual mental models to be able to develop new shared mental models. [67]

The mental models introduced in Figure 9 can be defined as a cluster of various data that determines viewpoints and methods. Revised mental models include both conceptual learning and operational learning, where conceptual learning deals with change in frameworks and operational learning is introducing new and revised routines. Individual frameworks get integrated in the organization's "weltanschauung" (life philosophy). The organization's weltanschauung is developed in accordance to include the mindsets of the individuals within the institution. If individual routines are proven to be sound, the organization inherits them and makes the procedures a part of the daily organizational life.[68]

Figure 9 incorporates the concept of single-loop and double-loop learning on both individual and the organizational levels. Double-loop learning that involves illuminating norms and assumptions in the organization, is located on the individual level as the continuous process where individual learning change mental models of the individuals which in turn affect future learning. Organizational double-loop learning takes place when individual mental models are integrated into the institution through a shared set of mental models, which may have an

[67] Kim, D (1993) p.45
[68] Kim, D (1993) p.45

impact on the organization's actions. Regardless of type of double-loop learning (individual or organizational), double-loop learning can provide the opportunity to come up with potential solutions by reframing the problems at hand.

In addition to the four scenarios where the learning cycle gets interrupted (Figure 8), Daniel H. Kim has identified three additional scenarios that can halt the learning processes.

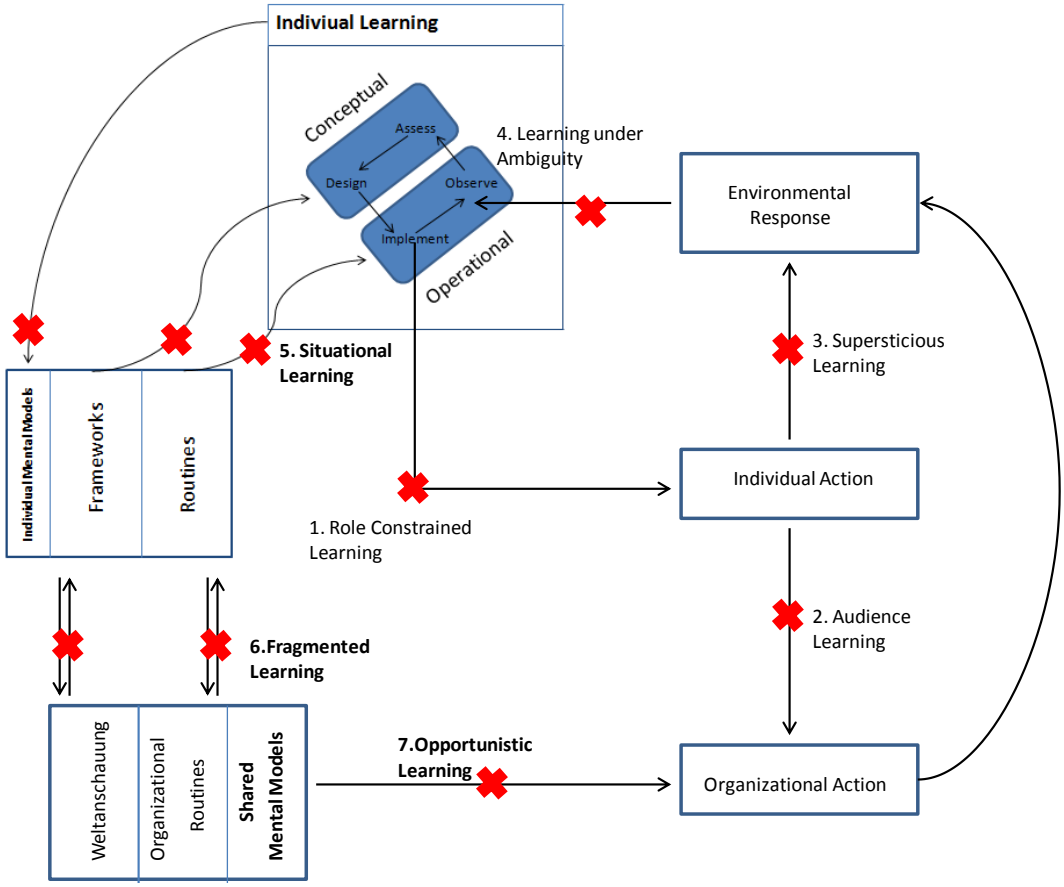


Figure 10-Seven Circle Breakers OADI-SMM[69]

Situation Learning is one of the three additional disconnects of the learning cycle. Situation learning occurs when an individual improvises to solve a problem he or she is up against. When the problem is solved, the individual moves forward to the next task without registering

[69] Kim, D (1993) p.47

the improvised method. The connection between individual learning and individual mental models are therefore severed. **Fragmented Learning** occurs when the link between individual mental models and shared mental models is cut off. The loss of individual mental models implies a reduction in the capability of requiring knowledge for the organization. Fragmented learning is quite usual among learning institutions. Professors at their department are denied the opportunity to share knowledge on their area of expertise to the institution, due to the lack of connection and coordination between the learning institution and its departments. **Opportunistic Learning** takes place when an organization tries to bypass its own standard procedures, because their established tasks are perceived as an impediment for certain projects. Organizational actions that are taken are being based on an individual's action and not the shared mental model of the organization. [70]

By reading Kim's article "The Link between the organization and its individual it consists of", one realizes the importance of individual and organizational learning and potential threats that incompletes the learning cycle. However it is important to address Kim's statement regarding the article and its research.

"At this point, my discussion is more a set of assertions based on anecdotal evidence and preliminary research than a set of facts that has been supported by extensive longitudinal studies and rigorous research"[71]

Kim's citation implies that further research regarding the subject at hand is crucial for better understanding learning in an organizational context. Learning and sharing mental models affects how the entire organization is capable to change and better fit the role as a sustainable collaboration.

[70] Kim, D (1993) p.46
[71] Kim, D (1993) p.49

It is not sufficient to achieve organizational learning only by capturing individual mental models. One has to take a step further and prohibit fragmented learning of individuals by spreading the learning throughout the entire organization. In UMB's case, one solution might be to design and create a learning laboratory or a similar physical location where UMB's professors and administrative personnel would have the opportunity to collaborate and work closer together to address the subject sustainability that concerns them all despite which department they are located in In such a scenario, individual's personal mental models will surface, making it possible for employees to observe and review individual mental models that may differ from their own. Through this process, a shared consensus of the organization's weltanschauung and interrelationships emerges. This is exactly what the Norwegian University of Life Sciences needs in order to facilitate sustainability and its importance as a shared mental model. It is impossible to successfully manage to implement environmental awareness into an institution whose philosophy is ambiguous due to its fragmented structure. By taking a closer look at an organizational analysis of UMB conducted by one of its Associate Professors Sigurd Rysstad (presented during his lectures), it clearly states that the learning institution and its departments are badly coordinated, creating a fragmented workplace. [72] In UMB's three year plan, they are also promoting their efforts towards improving the coordination between its departments and their courses.[73] It therefore seems like it is fragmented learning UMB should have its focus on even though there are seven elements that may hinder an organization from creating shared mental models. In addition, it is important to address the relevancy of shared mental models and practical measures. If an institution shares a set of similar values and philosophies directed towards sustainable development, it would be much easier to implement and initiate practical measures in contradiction to an institution where individual learning and values are scattered. Practical

[72] Rysstad, S (2013) p.12-18
[73] TheLiving University p.7

measures regarding sustainable development may occur in such a scenario, but it would be difficult to turn plans into action due to the lack of shared learning and values. The Norwegian University of Life Sciences is therefore dependent on organizational change before they can initiate environmental actions.

8. Strategy Implementation

Even if the university's shared mental model should become more aware of and focused on taking care of environmental issues, this would not be sufficient. A strategy must be implemented so the institution would have certain supportive guidelines that could point them in the right direction.

The Norwegian University of Life Sciences has acknowledged the importance of striving to create sustainability within its own structure and has therefore taken certain measures as one can see by reading this assignment. But still, there is always more that the institution can take into consideration to become even more sustainable. A more structural approach, such as a sustainability-oriented strategy can help aiding the university to implement and convert all of its elements to a more concrete action plan-guide that promotes sustainability.

8.1. 7 Fronts

7 Fronts is a "sustainability-strategy" created by one of the world's largest designers and producers of carpets; Interface.

Interface was founded in 1973 by Ray Anderson who managed to see the potential market and profit by focusing on carpet tiles. Interface is today an international behemoth of an industry and is located in over eighty countries worldwide. In the early 90's, Interface started to gradually focus on the environmental aspect and by 1994 the company made drastic changes to its structure, vision and mission to make sure sustainability was prioritized. Interface is therefore committing themselves to reducing all sorts of pollutant waste and their environmental footprint, and they are setting a goal to turn the negative emissions to zero within the year 2020.[74]

[74] Interface, about

With this in mind, Interface has developed a strategy that stretches over seven different levels, which hopefully will lead to their desired state as a "zero-emission company". In addition, it may be easier to comprehend the result of the seven-step strategy by comparing the fully integrated-seven step model with a more traditional and conservative organizational aspect on sustainable development.

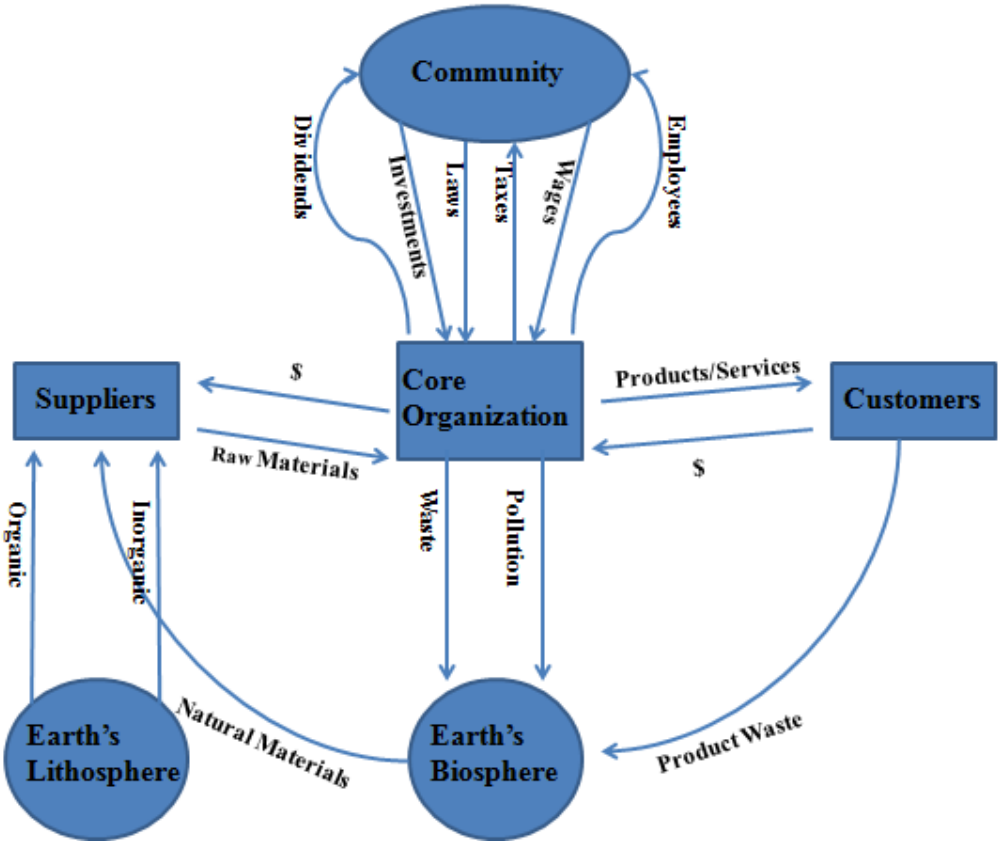


Figure 11-Traditional Organization

Figure 11 demonstrates an organization and its relation to the community and the ecosystem without any drastic measures of conversion to any form of sustainable operation. The Earth's Biosphere and Lithosphere are affected by the organization both directly and indirectly through its customers, suppliers and the core organization itself, leaving a large environmental footprint.

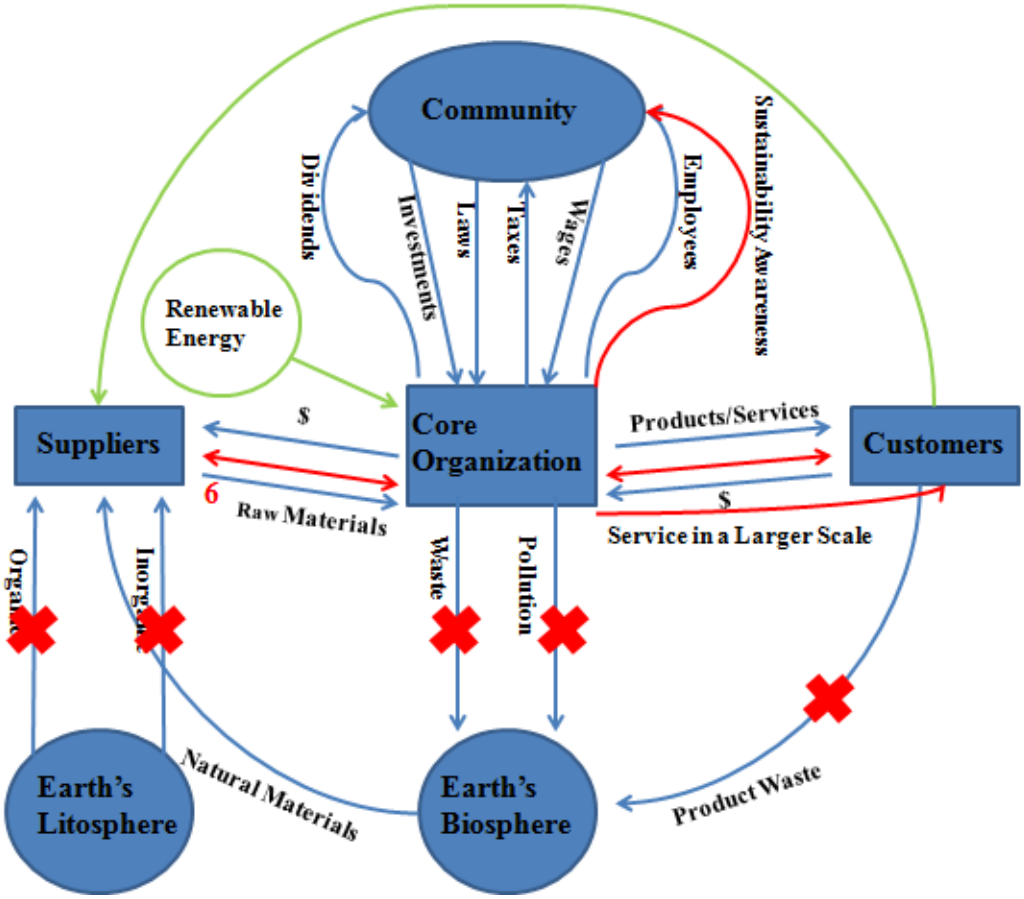


Figure 12-Sustainable Organization

The model illustrated right above, is the alternate way an organization can choose to operate. Through a series of drastic actions, the organization has managed to operate on a sustainable- and to a certain degree, a self sufficient level. The planet is in a much smaller degree inflicted on a negative way by the organization or its customers and suppliers. According to Interface, the following steps an organization should follow to obtain such a level of sustainability are the following:

Step One: Elimination of Waste

Reduce and eliminate waste where it is possible by proper organizational planning. Waste in this setting can be defined as anything that does not create any additional form of value for the company's customers.

Step Two: Reduce Pollutant

Reduce and eliminate every form of emissions that can be considered as harmful and dangerous for the natural environment.

Step Three: Switch to Renewable Energy

Reduce the company's dependency on non-renewable energy, such as fossil fuels by trying to utilize renewable energy sources such as wind and water solar power.

Step Four: Closing the Loop

By encouraging customers to return their old carpets to Interface (instead of just tossing them away), the company can use the waste to make new products. By offering this service to its customers, Interface has created a closed loop system where old products go into the process making of newer ones. This measure will drastically reduce the company's usage of raw materials and helping Interface, getting them a step closer to their sustainability goal.

Step Five: Resource Efficient Transportation

This step is basically all about transporting people and materials/products as efficient as possible so the company can keep transportation emissions as low as possible. This has to be organized through proper planning by the organization.

Step Six: Build Sustainable Communities

Use both time and resources to create an awareness concerning sustainability in the close communities, assuring that everyone is contributing.

Step Seven: Redesign Commerce

Try to influence the business world as much as possible by operating through a sustainability-based business model, creating a better environment for today and the future. This redesign of

the organization's business-model may also lead to the focus on services as well as the original product(s).[75]

It may be challenging to implement some of the steps mentioned above at the Norwegian University of Life Sciences because of the institute's purpose. UMB is providing a service, not products and thus the production of waste is non-existent in a production manner. Although this model mainly applies for companies that are producing a certain type of products, does not mean that it will not be suitable for a learning institution. The model and its different steps can to a certain degree be implemented and used by The Norwegian University of Life Sciences to obtain a better eco-friendly institution that manages to succeed on this level by willingly reorganize and directly change and develop their ways of doing things. By using Interface's model for demonstrating the organization and its relationships to external stakeholders as well as the environment, one can modify it to show UMB's potential scenario if they were to take more measures regarding improvement of their environmental footprint.

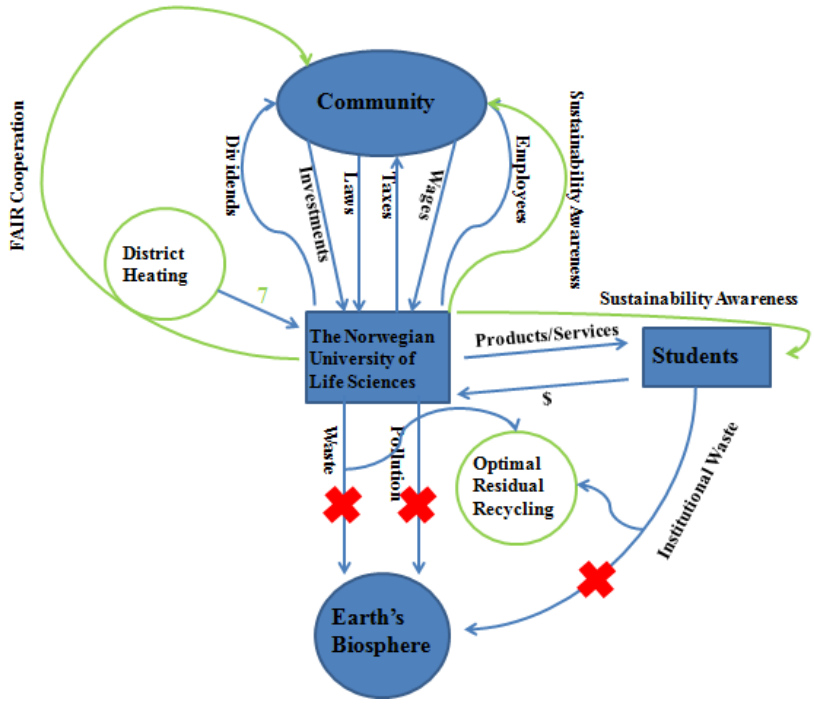


Figure 13-7 Steps Modified for UMB

[75] Interface, Seven Fronts (2013)

NB! The red crosses will in this illustration illustrate reductions of a specific element, not a complete elimination.

Waste includes several factors that are relevant for UMB: paper waste, wood, bottles and cans, glass, metal, plastic etc. As stated previously in the thesis, The Norwegian University of Life Sciences has invested in a fairly decent recycling station where waste from the institution is being sorted to a certain degree. If they were to improve the recycling station, their outlook would look considerably better. Other steps such as "efficient transportation" are also relevant for the Norwegian University of Life Sciences. If the institution managed to reduce private transportation by improving the collective infrastructure and synchronize lectures with bus- and train arrivals employees of the institution managed to travel and which actions, pollutant would be reduced. The reduction of pollutants is in addition another step that UMB can strive after. By looking at their dedication to district heating, one can quickly see that they are gradually improving themselves.

8.2. The Natural Step

Even though Interface's "7 Steps" may be integrated into the Norwegian University and its environmental policy, there may be an even better alternative for the institution to apply, namely seeking assistance and guidance through "The Natural Step". The Natural Step is an organization consisting of a network of smaller non-profit organizations. Their goal is to assist and help organizations in a way so they achieve a better understanding of sustainability and making them come closer to becoming sustainable themselves. The Natural Step has associates and offices in almost twenty countries worldwide and they assist organizations in everything from coaching to education. [76]

[76] The Natural Step, Our Story

To illustrate the challenges our planet and its inhabitants are facing, The Natural Step uses a metaphor to help visualizing the problem and thus creating a better understanding and awareness of what we are up against.

8.2.1. The Funnel

The funnel is basically a metaphor of the awareness of the overall issue when the lack of sustainability is present. It demonstrates the effects when the Earth's capacity to support its inhabitants is on the decline. The funnel's upper wall illustrates the planets capacity of providing for the planet. The larger the upper wall is, the larger availability of resources there are. The lower wall of the funnel illustrates human demands such as; fuel, nutrition, clothes, transportation etc.[77]

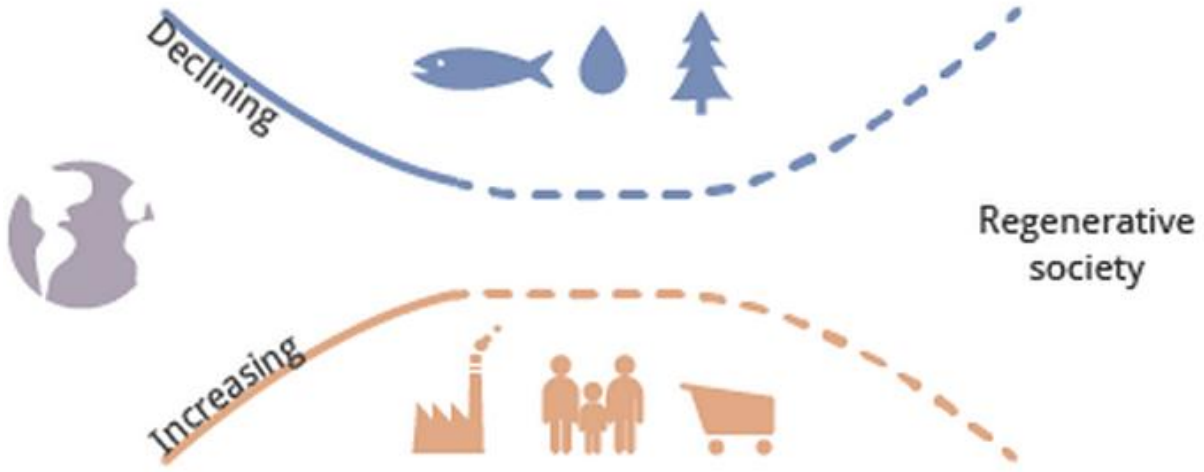


Figure 14-The Funnel[78]

According to The Natural Step, we are experiencing a decline in human necessities such as clean water and air, food, and productive topsoil. Our planet is in addition struggling with keeping up with its rate of regeneration (compared to human consumption). To top it all off,

[77] Robert, K. (2000): p.245-246
[78] Nativa lab, The Funnel

our demand for these human necessities mentioned above is continuing to grow due to the growth rate on the planet.[79]

As a result of these threatening factors, the funnel is over time getting narrower and narrower. The slimmer the funnel gets, the less room there is for mobility and maneuverability. A large number of organizations are therefore highly likely to hit the walls within the funnel and expire.

Expanding the Walls of the Funnel

The concept of the funnel applies for every human on the planet. We all live and work within it. Through innovation, awareness and creativity, we can start shifting towards a more sustainable future and as a result start to expand the funnel's walls. There are certain conditions one is to follow if there is to be a widening of the funnel. In order for the planet to be sustainable, nature is not subject to:

1. Increasing extraction of substances found in the Earth's crust (fossil fuel)
2. Increasing substances produced by the human society
3. Manipulation of the eco-system such as depriving of natural riches; and
4. Available resources are used and consumed in a fair and efficient manner to secure basic human needs on a global level[80]

It is exactly here that The Natural Step seizes its opportunity to aid companies and institutions closer to a sustainable future that allows us to continue our way of living. Even though the concept of "The Funnel" and the four concepts presented above focus on the big picture and not on just one organization with its own distinctiveness and structure is a fact. These are theories that are made to create an easier understanding of what we as humans are

[79] The Natural Step, The Funnel
[80] Robert, K. (2000): p.245

up against. They are an essential starting point for each and everyone who tries to grasp the concept of sustainability.

8.2.2 Backcasting from Principles

Another essential part of The Natural Step and their way of thinking is how they use backcasting as a tool for planning ahead. Backcasting as a tool can be essential to plan a strategic approach of how one should finally reach a set goal in the near future. By asking the question "Which actions do we have to apply today to reach our desired futuristic goal?" one can clearly understand the concept of backcasting. In contrast to forecasting, backcasting can be more effective, due to the limited range of options presented in forecasting. Limited options lead to limited creativity, which is not desirable when one is to come up with a plan of how to reach a desired state and goal. In addition to limited creativity, forecasting offers another backside; the problems of today are projected into the future. A jigsaw puzzle can be used as an analogy to sustainability. The final picture represents a shared idea of a desired future state and putting the puzzle pieces together one by one is the analogy of ideas and actions taken into measure to reach the desired goal.

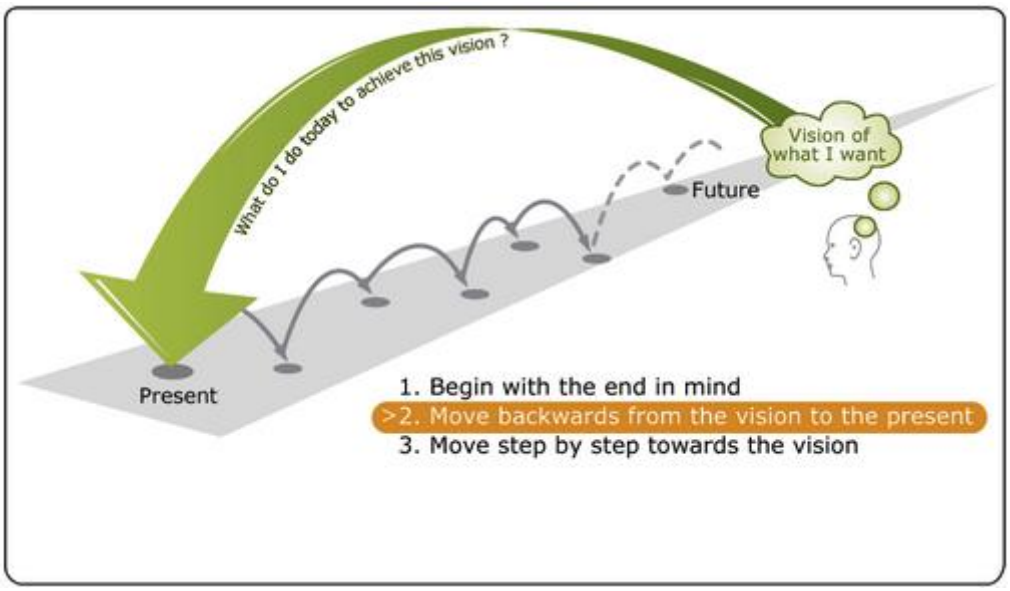


Figure 15- Backcasting[81]

[81] The Natural Step, Backcasting

However, as wicked problems have taught mankind, a pluralistic consensus can be impossible. Strategic sustainable development is therefore relying on backcasting from the four principles of sustainability (presented in "The Funnel") to achieve sustainability. These principles are based on scientific findings and represent something that the majority of the earth's inhabitants agree on: If the four principles of sustainability are violated, the state of the global community is not sustainable. Even though there exist a consensus regarding backcasting and the four principles, the level of details surrounding the matter is quite limited. The four principles do only function as general guidelines that tell the earth's inhabitants what not to do if sustainable development should emerge as a universal phenomena. The concrete actions that should be initiated and implemented to meet the principles' expectations are therefore somewhat unclear and uncertain. The only thing that is clear is what we wish to achieve and fulfill. The big question is therefore which way we should choose to satisfy the four principles? The Natural Step's understanding of how to approach this challenge is to base their strategies on the sustainability principles and through them be able to detect what needs to be backcasted. In other words; detect essential methods and actions that do not meet the requirements for the desired future state and replace them with some that do.

9. 7 Steps versus the Natural Step

By looking at their previous achievements at their website, one can quickly see that The Natural Step's expertise applies for a vast set of various institutions. While The 7 Steps are more restricted to a company's market (products instead of services), The Natural Step are offering their services irrelevant of this. They are offering their services to a vast number of institutions, companies and even communities that seek their knowledge and skills regardless of markets and structures. The Natural Step can therefore be categorized as a more dynamic and organic solution to organizational sustainability contra Interface's 7 Steps. This is of course understandable since Interface created the 7 Steps to be tailored to their own

organization and their own business activities compared to The Natural Steps whose goal and purpose is to be dynamic and flexible to suit the needs of other organizations. By looking at The Natural Step's webpage one can see that they have previously aided learning institutions on multiple occasions. The Natural Step did for instance help Arizona State University, Portland Community College and the University of Minnesota (Morris) take one more step in the direction of becoming climate neutral learning laboratories.[82] They have in addition introduced and implemented the sustainability-term to the organization "College Housing Northwest" that is per days date basing their business on actions that take sustainable development into consideration. These former examples imply that The Natural Step is familiar with guiding and leading learning institutions in the right direction towards a more sustainable set-up. The Norwegian University of Life Sciences can actually gain support and assistance (both organizational and practical campus operations) from The Natural Step. Being able to fully understand and operate the organization through backcasting can be one of the crucial factors that may lift the university to a higher level of sustainability. It is however crucial that a shared mental model exists between the university's students and employees before any form of strategy is introduced. Just like practical measures, strategies are considerably easier to apply if its philosophy and driving force reflects the mental model of each individual within the learning institution.

[82] The Natural Step, College Campuses

10. Conclusion and limitations

10.1. Conclusion

One can certainly say that The Norwegian University of Life Sciences has started their long journey towards becoming a lighthouse for sustainable operations. It is crucial that colleges and universities worldwide as well follow in the same direction. It is in these institutions individuals are taught essential awareness regarding the fragile state our planet is situated per days date. Through relevant curriculum, environmental policies and ethical philosophies the institutions of education contribute to positively enlighten its attending staff and students, preparing them to face a future dependent on change. Even though UMB have initiated several measures in order to enhance their environmental footprint, there are still improvements the institution should look into. **From a practical point of view, the institution has several issues they should focus on in order to improve their situation:**

- Reduce private transportation by improving the collective infrastructure and synchronize lectures with bus- and train arrivals
- Improve the utilization of the recycle station by reducing unsorted residual waste
- Improve collaboration with Directorate for Cultural Heritage in order to refurbish the exterior of preserved buildings on campus

On an organizational level, the following points should be looked closer into:

- Preventing further fragmentation and promoting a better shared learning model for the organization by constructing learning laboratories or a similar gatherings and collaborations where UMB's professors and administrative personnel would have the opportunity to work closer together
- Seek aid and expertise from professionals in order to make plans into action (The Natural Step)

Another element the thesis is trying to expose is the complexity and occurring problems regarding the development and implementation of sustainability. The answer to this "question" is quite simple. Sustainable development as a phenomenon is extremely complex and difficult to deal with, especially when it comes to finding the optimal solution where everyone is satisfied and sustainability pillars are operating in harmony. There is no such thing as "right" or "wrong". Wicked problems have taught us that obtaining total sustainability is practically impossible, and all we can do is aiming for the alternative that seems to be least damaging.

10.2. Limitations

I can definitely say that writing this thesis has been both challenging and rewarding. When one decides to write about such a complex topic as sustainable development, one is destined to encounter elusive situations. There is for instance no exact answer to which of the theories regarding the subject that is the most correct and which is not. This comes out clearly in the first part of the thesis where both new and old theories are being presented in order to fully cover the large magnitude of sustainability. Because this is a theme that is becoming increasingly relevant, new theories regarding the topic is continuously emerging and our perception of the term gradually alters itself. This is mainly a positive effect due to the up to date-theories; they help us understand the topic to a greater extent. However if one is to write an up to date-paper concerning sustainability, one may have to reconsider "older" content written in the paper. I personally experienced my older written content getting outdated while writing the thesis. The theory regarding Sustainable Development Goals or so-called SDG's were developed and introduced in the spring of 2013, putting me in a tough spot, having to decide whether to keep the old theory or replacing it with the new SDG's. I found however a solution. By closely evaluating the theories I quickly found out that they both were essential in order to fully grasp the concept of sustainability. Briefly explained, the old sustainability-

pillars (economy, social and environmental) represent the relationship and the possible conflict of interest that can occur in a form of wicked problems while the new Sustainable Development Goals successfully illustrate a hierarchy of priority among the three sustainability subcategories in a way that the original model possibly could not do.

When it comes to the thesis itself, I feel that I have to point out what could have been done differently. In order to get a better insight of UMB on an organizational level, the thesis could have included a survey or set up a few in-depth interviews focusing on the institution's employees from various departments instead of basing my research mainly on raw data obtained from the operating and service department of UMB and secondary data. I personally think that I would get a better indication regarding the level of interaction and coordination between UMB's departments as well as a good insight of its shared mental models. However I feel that my obtained data has been of good relevance to the assignment and has helped me answer the problems presented in the thesis. In addition, the data collected is of high reliability due to use of credible sources.

I personally feel that the thesis should have included more in the strategy-chapter. Even though the theories introduced were relevant, they could have probably been more detailed and closer linked to The Norwegian University of Life Sciences. However, this assignment includes several different aspects that I have to write about and take into consideration, such as the practical and organizational solutions as well as a comprehensive and thorough introduction of the term sustainable development. I therefore chose to make the strategy-part a bit more "shallow" in order to limit the extent of the assignment.

The Norwegian University allows its students to write their master thesis in English. I chose to do exactly that because I think my assignment may be relevant for individuals residing outside the Norwegian borders. Even though I consider my English writing skills as decent, I

formulate myself considerably better in Norwegian. Due to my choice to make use of the English language, some sentences in this thesis could probably have been better formulated.

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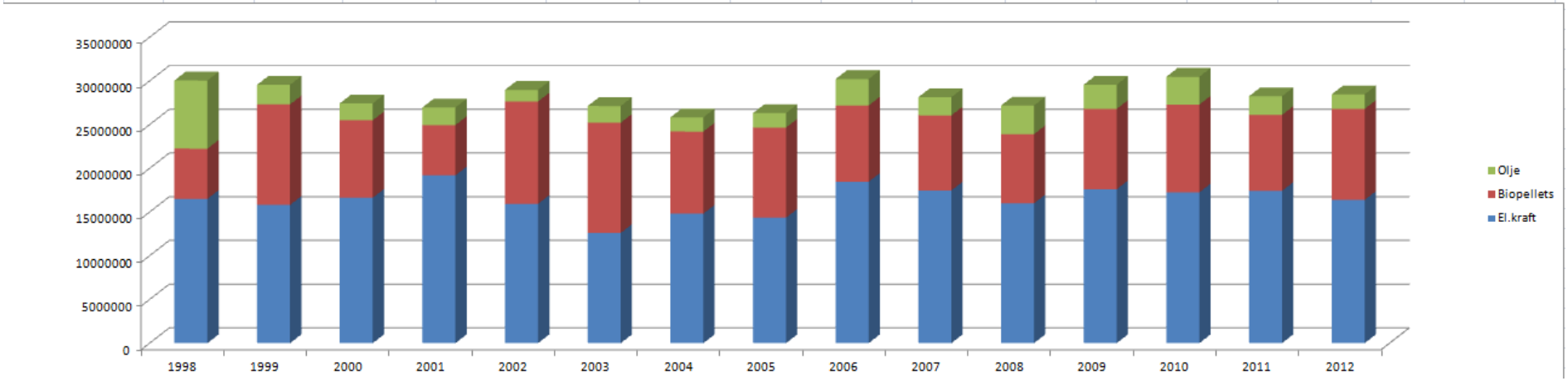
Attachment .1

UMB: Miljøfaktorer: Energi, vann, avfall, transport, m.m.

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
El.kraft	16505266	15816611	16 633 223	19 192 128	15 936 075	12 608 740	14 819 853	14 350 963	18 467 000	17 468 596	15 996 896	17 601 979	17 249 564	17 419 119	16 385 475
Biopellets	5 744 171	11 496 890	8 862 901	5 754 205	11 712 613	12 603 992	9 388 056	10 312 000	8 725 000	8 588 709	7 908 000	9 195 396	10 040 008	8 687 283	10 411 000
Olje	7 799 104	2 244 510	1 928 678	2 010 990	1 327 058	1 914 217	1 617 982	1 654 120	3 028 000	2 075 378	3 276 833	2 763 645	3 183 323	2 132 895	1 658 940
Sum energi (kWh)	**30 048 541**	**29 558 011**	**27 424 802**	**26 957 323**	**28 975 746**	**27 126 949**	**25 825 891**	**26 317 083**	**30 220 000**	**28 132 683**	**27 181 729**	**29 561 020**	**30 472 895**	**28 239 297**	**28 455 415**
Endring fra foregående år i %		-1,6	-7,2	-1,7	7,5	-6,4	-4,8	1,9	14,8	-6,9	-3,4	8,8	3,1	-7,3	0,8
Graddagstall (normal 3899)	3564,2	3503,7	3095,6	3819,0	3747,5	3696	3462	3470,5	3773	3797	3700	4077,5	4541	3822,7	4047
Temp.korrigert forbruk	**31 459 833**	**31 225 431**	**30 983 577**	**27 239 673**	**29 561 447**	**27 871 913**	**27 455 861**	**27 941 758**	**30 724 601**	**28 510 552**	**27 912 697**	**28 913 976**	**28 318 788**	**28 521 121**	**27 935 103**
Temperaturkorrigert endring i %		-0,7	-0,8	-12,1	8,5	-5,7	-1,5	1,8	10,0	-7,2	-2,1	3,6	-2,1	0,7	-2,1
Tempkorr. forbruk pr. pers.	9 931	9 529	9 548	8 202	8 961	8 135	7 842	7 639	7 997	7 352	6 884	6 795	5 961	5 473	5 121



AVFALL

Avfall 2012	UMB	SKP	Sum kg	Sum %
Jern	36 580	4 080	40 660	6,3
Glass og metal, blandet	3 480	1 340	4 820	0,7
Trevirke, behandlet	31 680		31 680	4,9
PP-sekk	25 570		25 570	4,0
Plastfolie, alle farger	620		620	0,1
Flasker, kanner (energi)	5 840		5 840	0,9
Isopor/ESP	840		840	0,1
EE-avfall	10 440	1 260	11 700	1,8
Usortert papp/papir	193 155	12 960	206 115	32,1
Ren fyllmasse	1 600		1 600	0,2
Asbest (ikke mottak)	320		320	0,0
Restavfall	302 248	10 705	312 953	48,7
			Utsortert eksl. spesialavfall 51,3 %	
	612 373	30 345	**642 718**	100

Attachment .2

ECONA UMB

Spørreundersøkelse v/ handelshøgskolen i Ås

En kartlegging av vår kundegruppe

Anders Hilsen

20.10.2011

Innhold

1. Innledende del

1.1 Forord

Denne spørreundersøkelsen ble utført med den hensikt å kartlegge informasjon om Econa sin kundegruppe på handelshøgskolen i Ås. For øvrig blir dette brukt for å forklare medlemsantallet vårt og forbedringspotensiale. I undersøkelsen har det også kommet frem hva studentene mener om de events vi tilbyr og forslag til events studentene selv vil ha. Av ca 550 økonomistudenter på UMB har 87 respondert på denne undersøkelsen. For å spare noe tid grunnet mye innleveringer i diverse fag, har jeg valgt å direkte hente ut oppsett og noen formuleringer i denne rapporten fra en tidligere undersøkelse jeg har utført for Trimius i Kongsberg. Denne rapporten består av mine egne formuleringer og jeg har derfor lov å gjøre dette.

1.2 Introduksjon m/problemstilling og metode

Jeg har valgt å utføre denne spørreundersøkelsen med en kvantitativ strategi der vi ser på kundegruppen (studentene) til Econa på det tidspunkt undersøkelsen ble utført. Spørreundersøkelsen ble utført på nett gjennom Questback.com og link til spørreundersøkelsen ble lagt ut på facebook-siden til Econa UMB og på mail til alle økonomistudentene. Dataene har blitt lastet ned og analysert i spss og grafene i vedlegg 1 er hentet direkte ut fra Questback.com. Disse tallene blir gjenstand for diskusjon og forklaring senere i rapporten.

Problemstilling:

- Hva kan forklare dagens medlemstall?
- Hva mener studentene om vårt tilbud og hva vil de forbedre?

2. Hoveddel

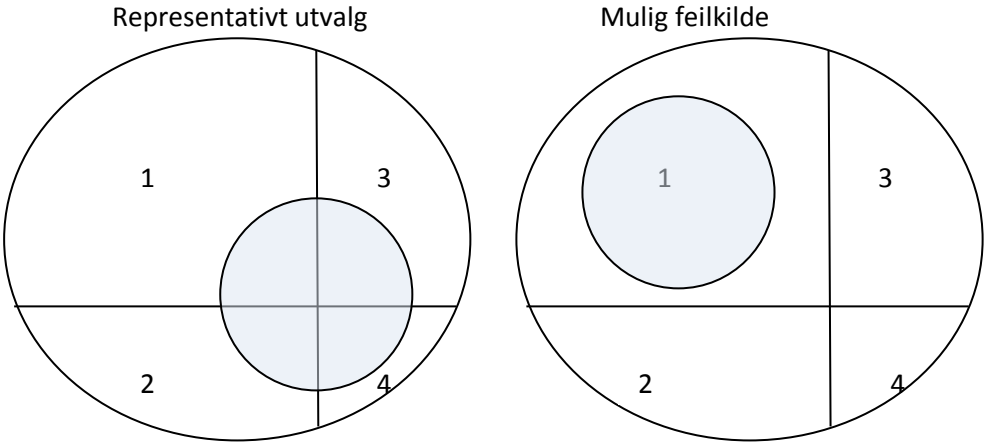
2.1 Teorikapittel

Det finnes ingen tidligere rapporter eller undersøkelser for Econa og jeg har derfor ingen konkret teori å ta utgangspunkt i.

2.2 Metodekapittel

Jeg har valgt kvantitativ metode og tverrsnitt som undersøkelsesdesign. Med tverrsnitt menes en spørreundersøkelse på et gitt tidspunkt. Jeg har valgt dette grunnet at vår problemstilling ikke er så komplisert at den krever dybdeintervju. Utvalgsteknikken jeg har valgt er ikke-sannsynlighetsutvelging. Den metoden jeg har valgt ut fra ikke-sannsynlighetsutvelging er bekvemmelighetsutvalg/slumpmessig utvalg. Spørreundersøkelsen har blitt utført over flere dager. Metoden jeg har valgt for datainnsamling er spørreundersøkelse og metode for dataanalyse er spss. Dette grunnet at spss er designet for å samle en stor mengde informasjon og gi samlet analyse av dette tallmaterialet.

Figur 2: Representativt utvalg/mulig feilkilde



Hvis man eksempelvis deler studentene i fire grupper, er det ikke naturlig at et representativt utvalg av studentene har valgt å svare på undersøkelsen og dette må legges til grunn som en mulig feilkilde.

2.3 Presentasjon/diskusjon av resultater og feilkilder

Jeg vil presentere og diskutere noen av de tallene som jeg mener er spesielt interessante, her følger jeg oppsettet til spørreundersøkelsen.

1) Vet du hva Econa tilbyr deg som student?

57%	Ja	43%	Nei

Jeg synes for så vidt dette er et relativt godt resultat, det viser at vi er flinke til å informere studentene om hva vi tilbyr. Men det viser også forbedringspotensialet vårt. Et ambisiøst mål ville selvfølgelig vært her at alle visste hva vi kunne tilby.

SOM MEDLEM AV ECONA (KOSTER 250,- I ÅRET) FÅR DU:

- MAGMA, Econas tidsskrift for økonomi og ledelse (Verdi 1350,- per år)
- Bank og forsikringstilbud i DnB NOR (Blant annet gratis pc-forsikring)
- Gunstige spareavtaler gjennom Nordnet og gratis aksjepakke.
- Gratis medlemskap i ANSA (Association of norwegian students abroad) Viktig for deg som vil studere I utlandet. (Verdi 250,-)
- Alle studenter tilbys lederkildens standardpakke gratis til og med ut første år i arbeid. (verdi 5 940,- per år.)
- Econas årlige lønnsstatistikk er et nyttig verktøy for medlemmer som skal forhandle om lønn.
- Econa har inngått et samarbeid med Bookboon.no, slik at vi nå kan tilby våre medlemmer gratis kompendier innen relevante fagområder.
- Econa tilbyr sine studentmedlemmer gjennomlesning av CV, søknad og arbeidskontrakter.
- Medlemspriser på kurs (Bl.a. vinkurs, studieteknikkurs, aksjekurs osv)

Dette gir deg som student en medlemsverdi på minimum 7540,- kroner hvis du benytter deg av alle tilbudene.

I tillegg får du en haug med gratis tjenester!

2) Av det som er beskrevet ovenfor, hvor interessant er dette for deg? *(Sett **ett** kryss)*

Ekstremt uinteressant	Relativt uinteressant	Litt uinteressant	Helt greit	Litt interessant	Relativt interessant	Ekstremt interessant	Vet ikke
-3	-2	-1	0	1	2	3	?
0%	1,2%	3,5%	11,8%	11,8%	62,4%	9,4%	0%

Her ser vi en god normalfordeling av svarene sentrert rundt "Relativt interessant". Dette tyder på at tilbudene våre faktisk er interessante for studentene. Men selv om noe er interessant er det ikke dermed sagt at det er interessant nok til å bli medlem.

3) Har du noen gang vært med på et arrangement i Econa sitt regi?

46,5%	Ja	45,3%	Nei	8,1%	Vet ikke

4) Hvis "JA" på forrige:
   a) Hvor fornøyd var du med dette/disse arrangementene? *(Sett **ett** kryss)*

Ekstremt misfornøyd	Relativt misfornøyd	Litt misfornøyd	Helt greit	Litt fornøyd	Relativt fornøyd	Ekstremt fornøyd	Vet ikke
-3	-2	-1	0	1	2	3	?
0%	0%	0%	2,3%	7%	62,8%	18,6%	9,3%

Her ser vi igjen en sentrering rundt "Relativt fornøyd" og jeg må si det virker som vi gjør en god jobb med tanke på våre events. Dette virker det som er noe studentene som benytter seg av virkelig liker.

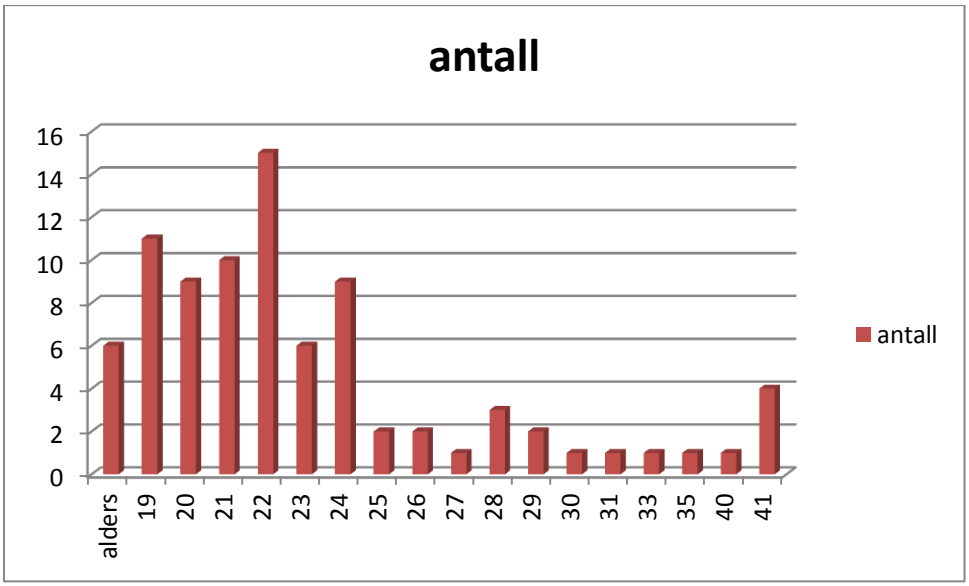
   b) Er det noe spesielt du vil fremheve som godt eller dårlig ved dette/disse arrangementene?

Kun en kommentar ble registrert her og det var følgende: "Likte Peter Warren".

5) Hittil har Econa stilt med arrangementer som: vinkurs, studieteknikkurs, aksjekurs osv. Er det noen andre spesielle arrangementer DU kunne tenkt deg at Econa arrangerte i fremtiden? Her var det relativt få som besvarte, noe som kan tyde på at de er fornøyde slik det er i dag. For øvrig er forslagene oppsummert som følger med antall først:

- 4 stk: "jobbsøkerkurs, motivasjonskurs, CV-skrivingskurs"
- 3 stk: "bra som det er"
- 2 stk: "seiltur"
- 2 stk: "mer omfattende aksjekurs"
- 1 stk: "Etablering av nye bedrifter"
- 1 stk: "foredrag fra noen som har opplevd noe spesielt, eks; årets ildsjel"
- 1 stk: "bedrifters programvare, eks; SAP"
- 1 stk: "ølkurs"
- 1 stk: "skattekurs"
- 1 stk: "Ta ordet" – Dette er et kurs der man skal trene på å bli flink til å holde foredrag.

6) Hvor gammel er du?



For øvrig er dette en grei og ganske forventet fordeling som tyder på at vi har truffet et representativt utvalg.

7) Kjønn:

64,7%	Kvinne	35,3%	Mann

Disse tallene derimot kan virke som vi har bommet på det representative utvalget. Hva som faktisk er fordelingen av menn og kvinner på handelshøgskolen er jeg usikker på og jeg stiller meg skeptisk til at dette er den korrekte fordelingen.

8) Pendler du?

64,7%	Ja	35,3%	Nei

Dette tallet var noe som forventet. Da jeg startet i styret syntes jeg vi godt kunne hatt en høyere andel medlemmer, men den ovenstående fordelingen kan være svaret jeg har lett etter. Da jeg utførte en spørreundersøkelse for trimius i Kongsberg så konkluderte jeg med at det var utrolig vanskelig å verve pendlere grunnet at de er mer knyttet til hjemstedet sitt enn studiestedet. Dersom dette kan legges som en forutsetning her og at vi bruker et medlemstall på eksempelvis 180. har vi reelt medlemsprosent på ca 97%.

2.4 Avslutning

2.4.1 Konklusjon

Som konklusjon vil jeg si at vi kan se oss særdeles fornøyd med måten vi utfører events på og hvor mange medlemmer vi har. Foreløpig har studentene vært særdeles tilfreds med hva vi tilbyr av både medlemsfordeler og events. For fremtiden vil jeg anbefale oss å se mer på variasjon i events fra år til år og tilpasse de enda mer ift hva studentene selv kommer med som forslag.

2.4.2 Anbefalinger og forslag til videre forskning

Det anbefales å gjennomføre en ny spørreundersøkelse etter at tiltak har blitt gjort. Da kan man sammenligne tall før og etter. Det anbefales også at denne spørreundersøkelsen inkluderer spørsmålet om medlemskap/ikke-medlemskap slik at dette kan krysses mot de andre spørsmålene.

Vedlegg 1

Se egen powerpoint sendt ved dette dokumentet.