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Tulevaisuuden tutkimuskeskuksen valittuja opiskelijatöitä 2022–2023

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PREFACE ▪ ESIPUHE

We are proud to present a selection of our finest student papers from the academic year 2022–2023. The Coolest Student Papers publication has already been published since 2016 and it has shown our students' capability to academic working and writing. The aim of this publication is both to give an example of a good student work to others and provide a publication forum for the students.

This issue covers courses from different study programs that are all coordinated by the Finland Futures Research Centre. It includes the international Master's Degree Programme in Futures Studies, the interdisciplinary team work course of Sustainable Development Studies and courses organised by Finland Futures Academy (taught in Finnish). Each course forms its own section with a description of intended learning outcomes, an introduction by the teacher(s), followed by the papers.

The topics range from health data ownership and healthcare scenarios to Disaggregative Delphi Approach and from method comparison to the frameworks of social sustainability and forest utilisation. All the selected papers present good quality academic thinking and writing.

I wish you get inspired while reading!

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Haluamme jälleen esitellä valikoiman parhaita opiskelijatöitä viime lukuvuodelta 2022–2023. Parhaimpia opiskelijatöitä on esitelty jo vuodesta 2016 alkaen Coolest Student Papers -julkaisussa, joka osoittaa opiskelijoidemme kyvyt akateemiseen kirjoittamiseen ja työskentelyyn. Tämän julkaisun tarkoituksena on sekä antaa esimerkkejä hyvistä opiskelijatöistä että luoda opiskelijoille julkaisualusta.

Tässä julkaisussa on esillä töitä Tulevaisuuden tutkimuskeskuksen koordinoimien opinto-ohjelmien kursseilta. Näitä opintokokonaisuuksia ovat tulevaisuudentutkimuksen maisteriohjelma ja kestävän kehityksen sekä Tulevaisuudentutkimuksen Verkostoakatemian opinto-ohjelmat. Jokainen kurssi kuvataan erikseen ja sen alla on opettajan luonnehdinta työstä ennen varsinaista opiskelijatyötä.

Töiden aiheet vaihtelevat terveystietojen omistajuuden ja terveydenhuollon skenaarioista Delfoi menetelmään sekä menetelmien vertailusta ja sosiaalisen kestävyyden viitekehyksien tarkastelusta aina metsien käyttöön. Kaikki julkaisuun valitut työt edustavat laadukasta akateemista pohdintaa ja kirjoittamista.

Inspiroivia lukuhetkiä!

Turku, 22.11.2023

Hanna Heino
University Teacher, PhD, Finland Futures Research Centre
Yliopisto-opettaja, FT, Tulevaisuuden tutkimuskeskus

FUTUS1 Ethics of Futures Studies

Ethics of Futures Studies (5 cr) is one of the compulsory core courses in the Master's Degree Programme in Futures Studies. The aim of the course is to identify ethical issues related to work as a futures practitioner, both within and outside academia. The course assignments have two main focus areas: understanding the ethical responsibilities of a futurist and evaluating ethical dimensions related to possible future developments. A compulsory ethics course is especially important in a futures studies programme because the field is usually considered value-rational by nature. Alternative futures cannot be studied without involving – and examining – one's own values and ethical judgments.

The course emphasises ethical discussions on relevant topics, including both general ethical considerations in futures work and ethical issues in substance areas, such as the potential consequences of developing specific technologies. The course begins with principles of research integrity and research ethics established by the Finnish National Board of Research Integrity (TENK) and continues by considering the value basis of futures studies in relation to contemporary issues and debates. Students take part in interactive seminar discussions and complete a group work assignment in addition to writing a short essay. The primary learning outcomes are awareness of the breadth and depth of ethical issues in futures studies and of the resources and tools that can help the students to deal with them. The teachers of the course are University Lecturer, Adjunct Professor **Katriina Siivonen** and Doctoral Researcher **Morgan Shaw**.

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The theme of **Anne Jackson's** essay, Futures related strategy workshops: ethical issues considered, is a multifaceted, clear and realistic reflection on ethical questions related to strategy workshops. Jackson's reflection is built on a well-justified philosophical foundation.

Burgert Maree's essay, Should I buy and live in a gentrified area? An ethical exploration, examines an important ethical concern in urban development that the author perceptively relates to their own personal experience, putting ethical reflection at the center of the text. Especially appreciated was the way Maree uses insights gained by thinking through his focal question to reframe that question in the essay's conclusion.

Futures Related Strategy Workshops: Ethical Issues Considered

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Introduction

There are various ways in which ethics and futures studies might interact. Poli (2011) points out that, firstly, the values present or inherent in the setting of a foresight-type exercise can bring ethical considerations to play. Moreover, values themselves point towards and indeed require the existence of a 'future' to be functional; that is, we do something in order that some future state of things, or some future action, could be achieved, and we do this because this is valuable. Furthermore, any 'futurist' – or a person dealing with research, teaching or other action in the field of futures studies – by definition should be operating so that they would be adhering to a deontological code. This involves that their action should be ethical simply as it should, per se, be ethical; not just because of a particular goal, but as it is right and important that the action should be ethically performed. To put it in another way, we should treat others as we could possibly wish ourselves to be treated.

In Foundations of Futures Studies (Vol. 2), Wendell Bell (2004) points out that, in addition to the possible and probable futures that futures studies might be researching, there is also the study of preferable futures (also see Bell 1997). As soon as someone involved in futures studies starts being concerned with thinking of, inventing, discovering, exploring or otherwise pointing out desirable futures, then values, morality and ethics become part of the equation. Futures studies and especially foresight are often used for decision-making purposes, and decision-making as well as many other conscious actions by definition always comprise aspects of moral judgement. Ordinary lives are saturated with decision-making and ethical dilemmas – so why not futures studies, even if such studies are not always dealing with 'reality', or things that have already taken place? This is something that Eleanor Masini (2006) described as the 'special responsibilities' of futurists; they have to remember that they are part of the world that they describe, and any kind of futures thinking will always involve a learning process. This will naturally show in the descriptions of the futures that practitioners of futures studies might create – but the descriptions themselves might also reflect their author. Nothing is created in an ethical vacuum.

It is clear that no-one dealing with futures studies – by teaching, researching, or perhaps conducting futures related exercises for a particular audience – can escape the fact that actions are steeped in ethical considerations. Such practitioners can relatively easily – and not always with any particular deliberate intention – overlay the content of their actions, workshops or texts with their own ethics, morals and values. To try to counter this will be difficult in the sense that no futures related action or text – as Poli (2011) has put it – can be totally stripped of the presence of values; they will always be there, from whomever they then may emanate. In this essay, I consider the responsibilities of a futures studies practitioner or another person involved in futures related exercises as they conduct business strategy workshops; how the issues encountered might be managed.

Strategy Workshops in Businesses

Most businesses have at least some regard for the future facing their company, for the next year and even some years thereafter; therefore, most companies have at least some type of strategy, whether written, orally devised or even silently formed in practice. Many companies take the time to develop such strategies further in a conscious manner from time to time; often on an annual basis. For this purpose, they might either use specialists internal to the company, or alternatively, hire an external facilitator to take care of the learning and any inventive creation-and-excavation processes involved. Foresight workshops can be conducted under various formats and guises, and they can involve employees and their supervisors or indeed high-level executives and directors; sometimes people from all these levels and groups are involved. Furthermore, these kinds of workshops can also involve various external stakeholders – and as appropriate, shareholders – of the company. Strategy formation exercises are often looking into the future (say, 5 years, 10 years, 20 years…), and at least in initial stages, they are often completed in a workshop format. (See Mintzberg et al. 1998.)

If an external foresight specialist comes and takes care of the conducting of a workshop, it might appear that the approach is in many ways 'impartial', with the visible leadership for the event coming from outside the company. The leader of such a workshop might even be an academic specialising in futures studies and thus not connected to the company as such. Nevertheless, as we follow the lead of Poli, Bell and Masini as just discussed, even the very action of considering possible futures involves choices and decision-making, as well as values. This is so whether, say, scenarios are designed or a route to a preferable future is backcast, to create a viable route there from the present. Such values might emanate from the company that has proposed the workshops to be conducted – perhaps from one, or some, of the directors there – or from some of the attendees present and participating in the workshop; or indeed from the facilitators themselves. Even the structures and processes of the workshop – what is done, when and how – are oozing with decisions taken, and thus with ethics and values. What is particularly of interest here is that, owing to the nature of such strategy workshops, ethics and values issues discussed there have a relatively high likelihood of ending up in the strategy documents of the company – and then, at least theoretically, into all of the actions that the company subsequently takes. This is not only of interest to the directors and employees of the company, but also to the shareholders to whom the directors bear an agency-based fiduciary duty, and to other stakeholders connected to the firm (see Baker and Anderson (eds.) 2010). It is often claimed that the values of companies are meaningless and do not translate into actions. That may sometimes be the case; but if they do translate, then one should remember such values often have their origins in futures related, foresight-filled strategy workshops. Hence, futures studies linked strategy workshops, in short, have great potential to matter.

Futures, Strategy Workshops and Ethicality

When considering how futures studies related business strategy workshops could be rendered more ethical, the answer will most likely not lie simply in, say, some list of actions to be avoided; were this the case, it would be easy to achieve perfectly balanced scenarios or paths into the future, filled with equality, about to achieve good things for everybody. This is unlikely ever to be the case, as merely removing a particular defect or set of actions from some setting, or slightly adjusting thinking or attitudes, is insufficient for producing actions that actually matter. Furthermore, what is a good future for one may not have the same effect for others involved. Importantly, if the futures workshop in question is not conducted in an inviting, inclusive and empathetic manner, it is also possible that not all valuable thoughts and ideas, let alone stakeholder needs, even come into

light for consideration. Hence, the leader of strategy workshops needs to consider various things in order to conduct such events with as much ethicality as possible.

Futures workshops can – and most likely, should – be democratic, inclusive and empowering when they are used for research purposes (see Alminde and Warming 2020). If they, on the other hand, are to lead to action, also that should arguably bear the standard of democracy, inclusivity and empowerment. Granted, not all business actions are intended directly to progress such values and states of being; but arguably, most actions that businesses take today have the potential to progress these ideals, more or less, as well as one way or the other, if no other contrary values are placed in the way. Alminde and Warming (2020) state that it is especially the marginalised, colonised and silenced groups, as well as the vulnerable situations and silenced or sensitive matters, that can benefit from being taken up in futures workshops; hence, future-related company strategy workshops can also achieve this goal, if they are required and coaxed to do so.

Here, it is important for the facilitator of futures related strategy workshops to consider what Emmanuel Levinas wrote on marginalisation. According to Levinas (1969), marginalising another person or group of people to the position of 'otherness' – that is, presenting them as possessing features that are 'foreign' or strange, or otherwise cutting the 'other' from the main group, from the 'good ones' – is in fact violence towards those persons. Hence, there is always the ethical requirement present – to meet, or to listen to, or otherwise to consider people with openness to their particularities as well as respecting their rights to participate in and influence matters. This is also linked to knowledge, and, importantly – as Foucault (1981) put it – the ability of knowledge to intermingle with power. Knowledge production, where workshops can act as one significant stage of play, should therefore be democratised spaces. Alminde and Warming (2020) state that this issue in fact belongs to some of the key methodological challenges present in the 21st century research, and one might add to this that this is an issue present in all 21st century knowledge creation and learning. Hence, the creation of futures related, strategic knowledge and planned strategic action should also be democratised, steeped in equality, and inclusive in nature.

How could this be achieved in practice? Firstly, as already alluded to, awareness of the issues at stake is paramount. If facilitators know the power of the workshops, the power of the language used therein, the power of strategic focus and the power of action, they can use their powers wisely and ethically. Granted: workshop leadership also brings along certain powers to action. There are, of course, various approaches in which a workshop can be run, and there is no one particular approach that would be 'more correct' than the others; the question may be more about how matters are taken up and processed than exactly what is done. For instance, if one is to run a Jungk and Müllert type of future workshop to consider company strategy, there would most likely be a preparatory phase, where the practical arrangements are made and communicated; a critique phase, where problems are identified and re-lived; a phantasy phase, where utopian ideals and solutions are brought to the fore; and an implementation phase, where the focus of the participants is narrowed again, and practical means are summoned so that visionary ideas can be transformed into realistic action (Jungk and Müllert, 1987; Alminde and Warming, 2020). At each stage, there are possibilities to include – or exclude; to empower – or to disempower, whether we are talking about participants, customers, suppliers or stakeholders; and whether these are present in the room or not, whether even aware of the workshop or not. Every decision reflects someone's values – whether those of the directors, others present, or even the facilitator. Every sentence on futures, mapped out in workshops, or in written-out strategy, is therefore with potential of a speech-act (Austin [1955] 1962), thus leading to consequences that can be measured. In the context of businesses, the key way of measurement is likely to be an economic one; but it is important to realise that there are also ethical measurement scales that are relevant and that should also be considered.

By extension, the same could be extended to scenario-related workshops or backcasting; methods that might be amongst the most employed ones in the coming years (Inayatullah 2002). It is crucial to realise that each scenario – how they are chosen, and who gets to choose them – bears ethical connotations. And in backcasting – if the end result has already been chosen, there is not even a possibility to influence the choice already made by someone else more powerful; merely the route on how one gets there remains. Having said this, naturally, also the routes are of great importance – as the routes might bear all the difference in, say, whether a company opts for sustainable means of action or whether it just operates 'for today', with a certain disregard of times and people to come. Awareness of ethics – and power – is therefore everything, as one respects others despite the powers that one might have; and perhaps indeed, because of those very same powers.

Concluding Remarks

In this essay, we have considered how futures studies methods and ethics interact, and how these can intermingle in the context of business strategy workshops conducted in companies. We have noted that great emphasis must be placed on the simple quality of awareness – awareness of power to influence as a facilitator, and awareness of how various groups of people, either present at the strategy meeting or otherwise linked to the company, can ideally influence – and are in turn influenced by – the strategy meeting and the strategy created there. This is through actual action taken at the meeting as well as the actions created through speech-acts, or the strategy texts put on paper.

Finally, it is also important to have some thought on who the facilitators of such strategy meetings actually are. It was mentioned that, oftentimes, firms can use external facilitators for strategy scenario workshops, for reasons of perceived impartiality, expertise and credibility. In such cases, the facilitator might well be someone conducting research in the area of futures studies and, most likely, therefore conversant on various ethical issues and considerations surrounding futures studies. Nevertheless, it is also important to remember that this is not always the case. The leader of a futures related strategy workshop can also be, say, the Head of Strategic Development of the company, or the holder of a similar internal role. In the context of Finland, such a director would often hold a Business Studies degree.

With the above-mentioned possibilities in mind, it is important also to take into account the role of business schools – and business school students, who graduate to become tomorrow's company directors – when the future of companies is discussed, and when future strategy is prepared for. Arguably, it is the responsibility of all of us connected to business schools to acquire sufficient knowledge and understanding of the ethical and power-related issues involved in discussions of possible futures, futures workshops and strategy creation. Since, we do not know – we might just be the ones who are facilitating such workshops in the future. The ethical choices might be down to us next time – whom to include; who can decide; how decisions are made; and how goals are chosen.

Are we ready for such ethical choices?

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Should I Buy and Live in a Gentrified Area? An Ethical Exploration

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Introduction

Recently friends of ours were able to buy a new house, their first, in Cape Town, South Africa. After months of research, continuous decision-making around their needs and availability of finances, as well as utilising the residential property expertise of a family member, they acquired a renovated property in Observatory, Cape Town. As middle-income young professionals, it is a well-known challenge to get into the property market in Cape Town. Cape Town, situated within the Western Cape province, is known to be South Africa's "most active and most expensive market" (Prevost, 2022). Tongue in cheek, Capetonians refer to this phenomenon as "mountain tax", referencing the famous Table Mountain.

As excited as we were about this news, and as excited as we were about the future possibilities that this would open up for them, there was one thing we did not mention out loud. The area of Observatory, the area that our friends bought into, has and is experiencing continuous gentrification. Although it often crossed our minds, the ethical dilemma surrounding the issue made it difficult to verbalise the obvious. We were excited for our friends, yet we knew that this decision could impact someone somewhere else, either directly or indirectly. Gentrification is a complex issue. Depending on your point of view, looking at gentrification from the angle from where you are standing at this moment, and considering the ethical framework you use, the issue looks differently every time.

Thinking about, and reasoning through, ethics can be a debate within itself and oneself, not always knowing where to draw the boundaries, and always stumbling onto new revelations, if you allow yourself to think and be challenged. Some paths of thinking lead you down a dead-end, others down rabbit holes, others to better understanding. This essay feels similar in nature, and it is my hope that the reader will be challenged and gain some food for thought from it.

In this essay, I will investigate the complex, controversial, and ever-relevant issue of gentrification. Although the introduction references Cape Town, South Africa, the phenomenon of gentrification is a universal one and it will be approached in this manner. I will briefly look at the definition of gentrification, the driving forces that shape gentrification, as well as the consequences thereof. Gentrification as a middle-class phenomenon will be introduced, whereafter I will motivate aspects of consideration when buying and moving into a gentrified area.

Gentrification has, historically, experiences numerous waves (Hackworth & Smith, 2001) and areas of gentrification experience various phases, which is why, for simplicity, 'an area of gentrification' will be used to refer to already-gentrified areas, areas in the process of being gentrified, as well as areas that could likely experience gentrification.

Gentrification – a Brief Summary

It is impossible to look at gentrification comprehensively within the scope of this essay. Volumes of books and articles have been written on the topic. Its definition, complexities, drivers, and impacts are comprehensive and multi-layered. Therefore, a brief and fit-for-purpose overview will be provided.

Firstly, a distinction needs to be made between upgrading and gentrification. Marcuse (2015) identified three forms of upgrading, as processes, that can take place in any given urban area, that would be of benefit to that area. These processes of upgrading, namely economic upgrading, physical upgrading, and social upgrading does not necessarily imply gentrification. When one, or all three processes occur without displacement taking place, one might argue that there are very few ethical considerations, in light of gentrification, present. When any of these processes, or a combination of these processes, occur, which results in displacement, the theoretically intended meaning of gentrification is touched on and it becomes an inherently ethical issue.

Although one wants to believe that upgrading can occur without displacement, Marcuse (2015, 1265) states that upgrading without displacement, by any of the three processes mentioned, has historically been very exceptional. Even if upgrading without displacement is intended, displacement is not always immediately tangible, as it can occur within a short or a long period of time. Upgrading in any neighbourhood will, therefore, most likely eventually lead to displacement, with only the degree to which it occurs being up for debate. This is neatly captured by the heading of an article by Schlichtman & Patch (2014, 1491), entitled ‘Gentrifier? Who, me?’.

The term, gentrification, was first coined by Ruth Glass in 1964, when she referred to the displacement of the British working class, particularly in inner-city areas, by the so-called ‘gentry’, who were financially in better positions than the working class (Brenner & Patch, 2007). According to Wyly (2017, 116), aiming for a generalised and consensual definition, gentrification is a “transformation of inner-city neighbourhoods, where poor and working-class residents are replaced or displaced by middle- or upper-class residents, through the combined effects of wider societal changes that alter the socio-cultural meanings of urban living, and the land-market economics that can make reinvestment into ‘downgraded’ inner-city districts extremely profitable.” Hyra (2016) notes that gentrification is often characterised by the movement of educated younger individuals from middle-income areas to low-income areas, which has previously been unthought of to enter, often at the centre of cities, where economic activities once occurred (Hyra, 2016). The historic shift of economic activities to the outskirts of cities left these areas to decay, with the consequence that these city centres continued to be neglected (Patch & Brenner, 2007). Red lining, a discriminatory practice by which economic institutions, often banks and insurance companies, identified so-called troubled areas and withheld financial services, exacerbated the situation already experienced within these areas (Gallagher, 2022). These areas became undesirable, with the result that predominantly lower-income families continued to reside there, without deliberate and required action from authorities to maintain these areas.

Reasons for the movement of middle-income, often educated, younger professional individuals, to inner-city areas abound; some of these reasons include lower housing costs, short(er) commutes to work, the developing network of services, and the social status that accompanies living in areas that are perceived to be edgy (Hyra, 2016). Schlichtman & Patch (2014) have done extensive ethical research on what they refer to as “the gentrifier’s dilemma” (1493) and identified six inter-related indicators that serves to ‘pull’ individuals into areas of gentrification. These pulls include economic, practical, aesthetic, amenity, social, and symbolic pulls. To illustrate, the reasons for movement mentioned before by Hyra (2016) could be classified, therefore, as economic (lower housing costs), practical (shorter commutes to work) and social (developing network of services) pulls.

According to Hyra (2016), not only the causes, but also the consequences of gentrification are complex and multi-layered. Clark (2015) emphasises the conflicts that occur within gentrification: there are typically two distinct groupings when it comes to gentrification, namely those who will benefit and those for whom it will be detrimental. The first group, those who would benefit, are typically individuals who are considering investing in areas of gentrification, either to move there or for the investment itself, or who are residents within the area already, but not financially vulnerable. The consequences for this group are almost always positive (and cannot really be called 'consequences', but rather 'advantages'). Increased property values, economic growth, improved infrastructure, and a reduction in crime, to name a few, are what these individuals can look forward to. The second group, those for whom gentrification could have detrimental consequences, are often residents living in these areas, who are financially more vulnerable. For these residents, the consequences vary, ranging from relatively manageable consequences, such as the increased costs of living and the potential relocation of business, to more severe loss and, in worst-case scenarios, being faced with displacement due to the unaffordability of staying on.

Consequences include not only tangible, but also intangible effects. Residents who stay on in gentrified areas suffer in other ways too, such as with the loss of cultural identity, as well as diminished minority political representation in the gentrified areas, which turns gentrification into a vicious circle of its own (Hyra, 2016).

What complicates and shades the issue even more is that the gentrification of areas almost always exclusively involves and affects minority groups, and very often across racial boundaries. Lees (2016) warns against profiling gentrification as solely a race-issue, although the narrative has been prevalent to date in the United States and is generally visible in cities around the world. Gentrification does not only happen across racial lines, but even within them (Lees, 2016). Minority groups, no matter the distinguishing factor, are often more vulnerable to change, because of a historical discrimination that left them with fewer options. They have often lost their individual agency and are evermore at the mercy of what happens around and to them. When money enters a previously neglected area, an area where some residents are already more vulnerable, with less agency to adapt to change imposed on them, these residents are at the mercy of the current neoliberal principles that govern the economy.

In summary, the mechanism of gentrification effectively involves the influx of private capital (Clark, 2015), by ways mentioned above and other, that leads to social, economic, cultural, and physical transformation within the identified area (Brown-Saracino, 2010a). The result is the improvement and upgrading of areas, to the benefit of some and to the cost of others.

Gentrification – a Middle-Income Dilemma

No matter the income bracket, whether low-, middle- or upper-income, individual needs continuously change over time, according to numerous factors. Moving to a different area can become necessary when those needs are driven by financial pressures. The range in possibility for the different income groups is what is at stake here. When financial pressures necessitate moving, higher-income individuals are able to move into middle-income areas, which are not areas vulnerable to displacement. When financial pressures are a driving force for middle-income individuals, they are able to move into lower-income areas. Lower-income individuals have very few places to go when financial pressures necessitate them to move. The ethical dilemma here is concerned with displacement – displacement occurs when middle-income individuals decide to move to lower-income areas, for any of the various valid reasons mentioned before.

So, the middle class, when considering buying and moving into gentrified areas, is challenged ethically as to whether they are doing the right thing, or not. It is their actions which, in the short or long run, directly or

indirectly, can have severe impact in areas that they are buying and moving into. In describing the dilemmas that gentrifiers face, those who consider buying and moving into a gentrifying area, Marcuse (2015) alludes to gentrification as an effectively middle-income phenomenon, or dilemma.

Erring on the side of caution, it has to be reiterated that gentrification is a complex and multi-faceted issue. It needs to be noted that gentrification can, and often is, for various reasons, driven by upper-income individuals, investors, real-estate developers, and cities themselves, within the context of globalisation (Brown-Saracino, 2010b). Those are topics that also need to be addressed in the bigger context of gentrification. This essay, however, focuses on the personal question of buying and moving into a gentrified area. From that perspective, these role players are seen as creating the space in which others can act. In my academic readings and personal reflections to date, middle-income individuals, with the financial freedom of choice, are able act on the opportunities created by upper-income individuals, investors, and real-estate developers in areas of gentrification. It is this choice brings them to an ethical challenge.

Gentrification – Asking Alternative Questions

In my opinion, the question on whether or not to buy and live in an area of gentrification, should be reconsidered. In my readings and reflections to date, it seems to become more apparent that needs drive, and sometimes dictate, decisions. The decision not to buy and live in an area of gentrification will be made by a very few, and credit to them for evaluating their decision based on the negative impact their decision could generate. Gentrification is highly unlikely to cease from being, considering the complexity of the matter. Schlichtman & Patch (2014, 1492) note that “structural pressures enable gentrification and that these pressures are part and parcel of a capitalist economy”. If the way in which the economy operates is not restructured, one cannot expect the pressures that it creates to dissipate. The rapid rate of urbanization is also anticipated to play a significant role, with the expectation that 60% of the world population is expected to live in urban areas by 2030 (ITU, 2020). In addition, the so-called ‘green (re)development’, which exist under many guises, including climate gentrification, sustainable cities and circular cities, will also, very likely, exacerbate and attempt to legitimise gentrification to some extent (Clark, 2015, 455). Despite all these factors, one must be willing to look at one’s own role within all of these structures and exercise one’s own agency.

I have to come to the belief that the best contribution to be made to this discussion, would not be to ask whether to buy or not to buy. The best contribution would be to provide considerations for buyers (and therefore, gentrifiers) when they have made the decision to buy and move into an area of gentrification. Marcuse (2015) mentions the two-fold nature of impact that gentrifiers have in the process of gentrification. Firstly, they impact the area with the economic act of buying and moving in and, secondly, they impact the area through their conduct, once they have moved in, doing so both “politically and socially” (1267). It is the latter part of the two-fold impact than I am concerned with. Gentrifiers, we, will make an impact either way. Deciding to have a positive, might I say regenerative, impact, politically and socially, could redefine gentrification. Redefined gentrification might very well be more just and fair, in other words, equitable.

Hyra (2016) suggests that “equitable gentrification” (2016, 169) would ensure low- and moderate-income individuals to “receive maximum benefit from the revitalisation of their neighbourhoods” (2016, 169). Hyra (2016) focuses extensively on policy reforms to ensure affordable housing opportunities, which should be advocated for by gentrifiers. Gentrifiers should be open to, even encourage, a neighbourhood that is characterised by different income groups. Challenges will abound in this diverse setting but gentrifiers should not only buy property to live in gentrified areas – they should also buy in to be part of the fabric of the society, positively contributing to and uplifting it where they are able to.

Relationship is key to the fabric of society. Without relationship, one remains an individual, without becoming part of something bigger. There is an understandable resistance from long-term residents towards those buying and moving into areas of gentrification, which Schlichtman & Patch (2014) have experienced first-hand. To assist in establishing relationship between gentrifiers and long-time residents, Hyra (2016, 173) advocates for "meaningful and productive" interactions between long-time residents and newcomers. The identification and use of so-called "third spaces", effectively neutral spaces, within gentrifying areas could be useful to facilitate and build these bridges (Hyra, 2016, 173). Gentrifiers should help establish these spaces, that are shared by gentrifiers and long-time residents alike, which would allow the establishment and characterisation of these relationships.

Liz Ogby, an architect who focuses on spatial justice, poses the question, What if gentrification was about healing communities?' (TED, 2018). She elaborates extensively on the meaning and power of stories in communities, in particular communities that experience gentrification. Gentrified communities fear that their stories might become lost as the area changes in numerous ways. As humans, we hold on to and protect our stories, because our stories are evidence that we lived, that we had a place, and that we had meaning. Remembering the stories of the communities who have experienced gentrification, whilst constructing new stories, could be key to building bridges between gentrifiers and long-time residents. We should not buy and move into communities with an ignorance of its history and all its stories. We should respect it, help preserve it, and build our own narratives within it.

Conclusion

I have started my exploration into the ethics of gentrification by asking the question whether I, or anyone else for that matter, should buy and move into an area of gentrification. I anticipated that my answer would be a definite 'no', and that I would find clear arguments against the proposition. Instead, I have embarked on a journey of reading and reflection, intrigued and challenged by the concept of gentrification. This is, I realised profoundly, because I am a middle-income individual and will, therefore, likely be challenged by the prospect of buying and moving into an area of gentrification in the future. By considering the readings to date, I have concluded that it seems unlikely for gentrification to screech to a halt. Where economic gains can be made, actors will always follow, guided by the current neoliberal philosophy that is dominant worldwide. To advocate against gentrification might have its merit, but it is unlikely to have a significant, global effect. To advocate for equitable gentrification might be a better strategy for a more just and fair society in the future. A society that is extensively focused on humans and our collective humanity.

Gidley (2017), a well-known futurist, is a strong advocate for human-centred futures. Human-centred futures is "based on a view of humans as kind, fair, consciously evolving, peaceful agents of change with a responsibility to maintain the ecological balance between humans, earth, and cosmos. Human-centred futures involve ongoing psychological, socio-cultural, aesthetic, and spiritual development, and a commitment to the betterment of earthly conditions for all humanity through education, cultural diversity, greater economic and resource parity, and respect for future generations." (Gidley, 2017, 101). Although the scope of this essay does not allow a much-needed discussion around our relationship with our planet, Gidley's sentiments regarding our treatment of each other is more than applicable in the conversation around gentrification. Simply put, we need to do better on the "commitment to betterment of earthly conditions for all humanity" (Gidley, 2017, 101). Her words also find their echo in Wyly (2017), who wrote about the evolution of gentrification. Wyly (2017, 122) concludes his writing with the need to "becoming more kind, compassionate, and egalitarian". In South Africa, we have a concept called 'ubuntu', which means "I am, because you are" (Ifejeka, 2006). We are inter-related

and inter-dependent, what affects me, will affect you, and vice versa. Your displacement, or upliftment, will affect and become part of me. We have a desperate need in the world today to encourage and work towards collective, human-centred futures. We need to embrace ubuntu. We need to live the concept of equitable gentrification when we buy and live in areas of gentrification.

And this is why the question, 'should I buy and live in a gentrified area?' is pertinent. We all have expectations for our respective futures, as well as images of how it should look like. We make decisions now to increase the possibility of those futures to occur, including buying and living in areas of gentrification. Changing the question to 'should I buy and live in a gentrified area?' to 'what should I do when I buy and live in a gentrified area?', we could shift our view from individual to collective futures. If the actions toward our own preferred futures can uplift, and not displace, others, and enable them to imagine their own preferred futures, alongside our own, then perhaps we can work our way to new, collective, democratic, and preferred futures.

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FUTUS6 Cultural Sustainability

The course **Cultural Sustainability (5 cr)** belongs to the optional courses in the Masters' Degree Programme in Futures Studies and as an optional course in several other programmes, as the Sustainable Development minor. The course is organized in collaboration with University of Coimbra (Portugal), Jagiellonian University (Krakow, Poland), and University of Jyväskylä (Finland). However, in spring 2023 University of Jyväskylä did not join the course. The course brings together lecturers and students from various backgrounds in interdisciplinary discussions about how culture, power and ecology interact in human-environment relations. The course critically investigates the challenges of achieving sustainability at local, regional and global scales and the role of cultural policy. The course highlights both philosophical and conceptual issues surrounding the relationship of cultural sustainability and cultural policy.

The course engages students in practical case studies, for instance studies associated with conducting urban planning and rural development. Students conduct a group assignment in international groups and an individual essay about a topic they can choose in relation to one of several different themes of cultural sustainability.

The teacher of the course at University of Turku is University Lecturer, Adjunct Professor **Katriina Siivonen** with assistance of **Maria Granlund**.

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Lumi Aalto-Setälä's essay, Can culture save the planet? The role of culture in Sustainable Development Goals concerning environmental dimension, is internally logic and very clear with well defined concepts, for them relevant references and well driven conclusions. The author uses a definition of culture as a structure as a ground for her thinking and build a coherent whole in the essay. As an evaluator of this essay, I highly appreciate this, even though my understanding is that by defining culture as a process would shed light to a more relevant perspective in relation to the central question of the essay. However, the author can show in an excellent way what kind of value her perspective can give to the discussion on culture in relation to environmental sustainability.

Charlotte Oertel's essay, Historical gardens and urban greenery in cultural heritage, the importance of green spaces in cultural sustainability and the places they might conquer in the future, has very interesting perspective to the interface of nature and culture in a less common context, an urban environment. The essay gives a critical, clear, well-justified, and well-defined perspective to historical and urban gardens and their relationship to cultural heritage and cultural sustainability. The discussion is thought-provoking and gives refreshing perspectives to the theme.

Can Culture Save the Planet? The Role of Culture in Sustainable Development Goals Concerning Environmental Dimension

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Introduction

Culture, sustainability, and development are each somewhat complex concepts. As Dessein et al. (2015, 20) indicate, these all have several varying definitions and thus their relationships can be challenging to examine. According to Merriam-Webster (2023a) dictionary, culture can be defined as "the customary beliefs, social forms, and material traits of a racial, religious, or social group" or as "the integrated pattern of human knowledge, belief, and behavior that depends upon the capacity for learning and transmitting knowledge to succeeding generations". Sustainability is defined as "a method of harvesting or using a resource so that the resource is not depleted or permanently damaged" and development as "the act, process, or result of developing" (Merriam-Webster 2023b, 2023c). The most popular description combining the latter two, a definition of sustainable development, comes from the Brundtland's report: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Dessein at al. 2015, 22).

By adding yet another complex concept, policy, we can tie all of the mentioned terms together with the Sustainable Development Goals by the United Nations. The 17 goals aim transform our world The Sustainable Development Goals (SDGs) provide a comprehensive framework for governments, organizations, and individuals to create policies respecting the goals. Policies can be binding rules, such as law, or suggested regulations, and they can influence on any level (Dessein et al. 2015, 25). For example, governments may create laws concerning food waste management, or an individual household might have a rule around the house to clean one's plate and not throw away edible food.

Culture is a powerful tool when it comes to shaping norms and values, but where does it stand related to succeeding in sustainable development? Dessein et al. (2015, 22) consider culture as a helpful foundation or a positive outcome of development. However, culture can also act as a barrier to sustainable practices. The questions I want to focus on in this essay are: What is the role of culture in achieving Sustainable Development Goals related to environmental sustainability? How can cultural factors influence the implementation of policies based on the SDGs?

The SDGs can be divided into the three dimensions of sustainability (social, environmental, and economic) in various of ways with differing reasonings. I will follow the division to people, planet, and prosperity presented in an article by Zheng et al. (2021, 309). According to the article, people dimension consists of SDGs 3, 4, 5, 10, and 16. Planet dimension includes SDGs 6, 7, 12, 13, 14, and 15. Prosperity dimension comprises of the remaining ones, SDGs 1, 2, 8, 9, 11, and 17. Culture plays a role in achieving all of the 17 SDGs and almost 80% of the targets in them. However, in this essay I will focus on the environmental dimension of sustainability and related SDGs.

Cultural Sustainability

To understand where culture stands in relation to sustainable development, I will explain the different roles of culture in sustainability discourse presented by Dessein et al. (2015, 8). First, culture in sustainable development refers to culture having a supportive and self-promoting role. It means that cultural sustainability would be introduced as an equal dimension alongside with social, environmental, and economic sustainability. Second, culture for sustainable development interpret culture as an influential and meditating force between the three dimensions. Culture could therefore be used as a tool to guide sustainable development towards its goals. Third, culture as sustainable development considers culture to have a transformative role in creating sustainability. These different roles do not form a consecutive path from one to another, but all of them can be put into practice in different occasions when it comes to achieving the Sustainable Development Goals. The authors of this framework of the different roles suggest that it could be used in sustainability policy making. (Dessein et al. 2015, 28–33.)

Before familiarizing myself with the topic of cultural sustainability and enrolling in this course, I along with many others have considered culture to be part of the social sustainability pillar. Dessein et al. (2015, 24–25) recognize this phenomenon of cultural aspects being discussed within the social setting. Culture and society have a two-way effect on each other, as culture builds the framework for society with traditions and values. Society on the other hand can shape cultural norms and values. But because of this albeit very interconnected relationship, I see that it is important to consider them separately so neither is neglected nor forgotten in sustainability discourse. By recognizing that culture has various roles in sustainability, whether as a self-standing pillar, a tool, or a holistic entity, we gain deeper understanding of the norms and values that shape society.

Culture shaping sustainability policies

The Sustainable Development Goals (SDGs) provide a comprehensive framework for governments, organizations, and individuals to create policies recognizing the goals. The SDGs do not, however, respect any specific culture but are a product of collaboration between all United Nations member countries. They are based on scientific evidence and objective criteria, sometimes neglecting cultural factors. Achieving the SDGs requires a sensitive approach that identifies diverse values and means of all cultural communities.

Sustainable Development Goals have emerged from the climate crisis leading to severe negative consequences on other than environmental dimensions as well. SDGs include social and economic targets, ignoring the potential of a fourth pillar, culture. The international cultural community, as Thorsby (2017, 141) expresses it, argues that culture should be considered to provide a holistic view of sustainability. Policy makers must harness culture, as it can facilitate and drive development, and generate growth and employment in developing economies while preserving local cultures. Despite of this acknowledgement within specific peers, culture is only briefly mentioned in few of the SDGs. In fact, only 4 of the 169 targets mention it in forms of cultural diversity appreciation and cultural heritage protection (Zheng et al. 2021, 308).

As I have divided the SDGs in to three dimensions already, in this essay I will exclude the role of culture as a self-standing pillar of sustainability. Instead, I will focus on the reinforcing and connecting role, culture for sustainability. Zheng et al. (2021) notes that culture has gained attention as a facilitator of sustainable development. However, an interesting piece of information provided by Dessein et al. (2015, 31) is that the mediating role of culture has not been utilized much, possibly explaining why sustainable development has proved to be so difficult to achieve. Culture for sustainability recognizes the existing diversity of cultures, traditions and knowledge, and the potential of them to contribute to sustainable policies.

I see that culture as sustainability could also be worth examining at when shaping sustainability policies. A holistic paradigm grants culture the role of a core issue when transitioning towards true sustainability. Culture is a way to envision new sets of values and means to achieve a sustainable society. This is different from the mediating role, as transformative role of culture emphasizes cultural change, whereas culture for sustainability aims to integrate existing cultural information into policy making.

Culture for Sustainable Development Goals

Cultural aspects highly influence the achievement of all SDGs, as there is evidence that culture plays a role in 133 of the 169 targets. A comprehensive literature review of over 300 publications by Zheng et al. (2021, 308) suggests that culture has vital effects on sustainability policies, as the 133 of targets cover each of the 17 goals that can then shape those policies. Duxbury et al. (2017, 222) introduce four strategic paths of cultural policies in achieving Sustainable Development Goals. These roles and the primary objectives are:

1. Regulator and Protector
    - To safeguard and sustain cultural practices and rights.
2. Translator and Politicking
    - To 'green' the operations and impacts of cultural organizations and industries.
3. Animator and Catalyst
    - To raise awareness and catalyse action about sustainability and climate change through arts and culture.
4. Educator and Promoter
    - To foster global ecological citizenship to help identify and tackle sustainability as a global issue.

I see that the first role focuses on culture in sustainable development as a self-standing pillar, therefore not directly relating to environmental sustainability as such. In the second role, however, cultural policy aims to create a positive environmental impact withing the cultural sector. This way doing good for the planet can be embedded into cultural actors, assisting the achievement of environmental SDGs. The third role of cultural policy highlights the power of artistic expression in raising awareness of cultural transformation towards sustainable practices for the planet. Artistic activists can help to create sustainable policies by generating discussion around the topic, utilizing culture for sustainable development. The fourth and final role emphasizes the global scale of awareness and common challenges, calling for united humanity to tackle climate change. (Duxbury et al. 2017, 222–225.)

SDGs related to the social dimension, equality, physical health, and mental well-being are especially affected by cultural factors, such as traditions and stigmas around specific issues. For example, culture influences the resources and possibilities that women have access to, thus influencing targets related to women's education and work life. Also, cultural norms can outline the way how women and girls are treated when it comes to early marriage or female genital cutting, for example. (Zheng et al. 2021, 308–310.)

Sustainable development goals concerning economic sustainability, the prosperity pillar, are likewise affected by culture. Cultural environment impacts the economic system and can help to explain why some nations possess economic wealth when others lack prosperity (Zheng et al. 2021, 310). Next, I will focus on the third dimension of sustainability, the environmental pillar, by answering to my research questions.

What is the role of culture in achieving Sustainable Development Goals related to environmental sustainability?

In Climate Heritage Manifesto (2022, 2) it is stated that “culture from arts to heritage, with its power to help people imagine and realize low-carbon, just, climate resilient futures is a missing force that can address these shortcomings.” The missing force being cultural actions. The Sustainable Development Goals included in the environmental dimension are SDGs 6 “Clean water and sanitation”, 7 “Affordable and clean energy”, 12 “Responsible consumption and production”, 13 “Climate action”, 14 “Life below water”, and 15 “Life on land”. Evidence suggests that culture has an impact on all of the environmental goals and 37 of the 51 targets. (Zheng et al. 2021.)

Only one of these goals, SDG 12, is associated with moderate engagement to culture, while the remaining are considered to be least prominent compared to other SDGs (Culture 2030 Goal Campaign 2021). Nevertheless, culture plays a significant role in shaping production practices, consumption behavior, and people’s overall awareness of environmental challenges. Unsustainability for the planet is partly deeply rooted in cultural factors. An example presented by Zheng et al. (2021, 310) narrates the way how in a culture of hospitality cleaning one’s plate completely is considered as a sign that there was not enough food, which is an embarrassment for the hosts. This leads to unnecessary food waste as large quantities of extra food is prepared. Although leaving leftovers is in this culture a right thing to do, it conflicts with environmental SDGs.

Traditional symbols of wealth and social status may also create disagreements between culture and environmental sustainability (Zheng et al. 2021, 310). Biodiversity loss only accelerates if exotic animals are slaughtered for clothing or entertainment. Same applies for consumption of foods with high carbon footprint, like meat and dairy. Having access to meat has been a luxury and is still considered as one in many parts of the world. Meat industry has gained a huge foothold in many cultures’ traditional food cuisines. With this conflict of interest between culture and the planetary boundaries, I would like to pose an important question: should we aim to sustain cultures as they are, or make them more sustainable in all dimensions?

Another example comes from the United States, where it is hard to live without a car. The car industry has created a whole new culture around it when embedding itself into the society. Now there are drive-in movies and restaurants all around the world. (Geels and Schot 2007, 409.) Driving cars individually is not an act of sustainability for the planet, yet the infrastructure doesn’t allow to do much else. By contrast, in most old European cities the streets cannot support such large amount of traffic and they have sufficient public transport. In Finland we have a mixture of both worlds. While it is not necessary to own a car in Helsinki or Turku, smaller rural municipalities in the middle of Finland lack public transport and the distances are too long for one to walk. Car can also be a status symbol for some, perhaps also supported by the individualistic culture where we pull away from sense of community. This might make it hard for some to adapt to a world with carpooling and sharing of vehicles, which would be more sustainable for the planet.

A cultural transition of urbanization in Finland is pulling people towards bigger cities, with universities and jobs, which is contributing to a shift away from the traditional cultures of agriculture and forestry. This transformation has been significant, predominantly after the wars when Finland was only a small country with minimal resources. The war reparations accelerated industrial economy activities in Finland making us very efficient. We have lived in abundance since the compensations were paid. While it has led to Finland being ranked as the happiest country on earth, it has also resulted in a very high carbon footprint per individual.

How can cultural factors influence the implementation of policies based on the SDGs?

Culture Action Europe (2019) states that culture is highly relevant for implementing the SDGs and demands all EU institutions to integrate culture into the policymaking. For goals towards environmental sustainability, they encourage supporting cultural and artistic actions and initiatives that raise awareness and create buzz around the topic. Improving multidisciplinary collaboration while promoting a coherent policy approach to culture and climate crisis is also suggested. Culture 2030 Goal Campaign (2021, 10–11) suggests that to promote SDG 12 sustainability standards should be integrated into cultural and heritage management, and the culture of waste management should be promoted.

It is confirmed in the Universal Declaration of Human rights that there is a fundamental right to participate in cultural life, as Culture Action Europe (2019, 1) points out. Culture is a way to connect people to each other and to places. Culture can create a sense of togetherness and willpower to battle against a common threat, climate crisis in this case. Cultural institutions, like museums or festivals, are able to provide platforms to share knowledge and ambitious means. (Climate Heritage Network 2022, 2.) Cultural factors can however hinder other sustainability pillars as well. How can a specific culture accept global or local policies based on international goals?

Local authorities and decision-makers constructing regulations to further the achievement of SDGs are not immune to cultural influence. Similarly, the people who are to follow these regulations have cultural beliefs and values of their own. There are almost certainly contradictions between local cultural factors and international policy guidelines. In some cases, there is a choice to be made whether to follow policies based on SDGs or to sustain one's cultural traditions.

I spent my exchange period in a city in Spain where bullfighting is still legal and considered as a deeply rooted cultural tradition. In many regions this kind of behavior is completely banned. Some argue that because of this strong traditional position it should be preserved as cultural heritage. Others argue against this by proving its unethical and brutal side. Bullfighting does provide economic and social benefit to those it employs directly or indirectly through tourism. For environmental sustainability, I can't find any valid reasons to continue this tradition, as it is not responsible in terms of animal well-being and impact on our planet. The decisions whether to preserve or abandon this tradition thus lays on the values of different cultures. Could the preservation of this tradition happen in a way that respects both animals and humans?

Conclusions

The role of culture in achieving Sustainable Development Goals is significant, even when talking about the environmental pillar and planetary boundaries. Culture shapes the values and means of a society, thus influencing how people feel, think, and interact with others and the nature. Environmental policies based on the SDGs are at the mercy of cultural factors, and their success is often based on the beliefs and traditions of a community.

Cultural factors also influence the implementation of policies based on the SDGs. Culture should be taken into account when policymakers create regulations and guiding principles for the people. Constructing global sustainability goals is one thing but implementing them locally into the daily life of a society can be challenging because of cultural aspects. These influencing factors can be social norms and traditions, but also education and governance, that affect how policies are received.

Can international organizations with their requirements lead to harmful nationalism if a culture is being attacked by foreign policymakers, causing people to be against a faceless organization? Often the underlying

reasons behind contradiction of a regulation and the issues implementing it come from deeply rooted cultural factors such as values and norms.

How does the cultural shift from poverty to prosperity in Finland during past decades, for example, influence the environmental sustainability? Being used to living in need and suddenly having access to great resources is understandably a difficult position to think about the environment. Having wealth often means consuming more, but on the other hand being educated might increase environmental awareness. Along with creating and exploiting more, Finland has adopted rather strict regulations on industries polluting the planet and generating high emissions.

Even though international policies or frameworks to make ones are vital for a coherent understanding of a sustainable future, local needs must be met to some extent. Neither traditions nor the people are to be blamed for being unsustainable in a certain dimension, but they should be given assistance and know-how to promote more sustainable practices. Cultural values and means can change over time, without neglecting their past.

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Historical Gardens and Urban Greenery in Cultural Heritage – the Importance of Green Spaces in Cultural Sustainability and the Places They Might Conquer in the Future

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Introduction

This essay explores the role of historic gardens and other urban greenery in cultural heritage as integral part of cultural sustainability. It upholds the notion of "applied heritage" as the most meaningful contribution of gardens to sustainability (Auclair & Fairclough, 2015, 4). Gardening has been intertwined with human civilization for thousands of years (Rohde, 2019, 33). In the Christian tradition, the Garden of Eden symbolizes both paradise and the first home of the first humans, who were instructed to both cultivate and care for it. Thus, the mission to maintain this piece of land is deeply rooted in the culture of societies shaped by Christianity. The cultural appreciation of gardens is not restricted to the Christian world (Rostami, 2014, 310). However, more extreme weather conditions as an effect of climate change and intensifying urbanisation pose challenges to the preservation of these delicate heritage sites and raise conflicts between the social needs of local communities and economical interests. The research questions that motivated this essay were thus: What is the value of historical gardens and other urban greenery in cultural heritage and which present and future opportunities could improve their resilience and underpin their influence on sustainability in times of extreme weather conditions and urban densification?

The essay is structured as follows: To better understand the position of gardens in cultural heritage, a classification is undertaken, followed by a closer examination of the twenty-first century challenges historical gardens are facing. Subsequently, a closer look is taken at the worth of non-historical greenery and its worth in cultural heritage. The last chapter discusses future opportunities and is rethinking dimensions and spatial arrangements. The essay closes with a summary of the main points.

Locating Gardens in Cultural Heritage and Their Relationship to Sustainability

For this essay, the definition of 'heritage' provided by Auclair and Fairclough (2015) serves as a foundation for a detailed analysis of gardens through the lens of cultural heritage. According to Auclair and Fairclough (2015, 3), 'heritage' is a constant process of 'remaking, firmly rooted in social construction, individual and collective perception, and [its] specificities of time and place'. The definition of 'culture' this essay is following draws on Hannertz' (1992, 4) metaphor of culture as a river that continuously develops along its journey and only endures because of its continual evolution. Culture is thus interpreted as consisting of and being shaped by the active contributions of the individual and the collective.

Currently undertaken measures to manage historical gardens aim at their preservation so as to safeguard their structure and appearance as it is now and has been in the past, the underlying interpretation of culture being that of culture as "fourth pillar" in sustainable development (Dessein et al., 2015, 29–30), and of culture as a structure (Geertz, 1957, 33) that has to be maintained. Because gardens consist of living plants that are sensitive to climatic fluctuations and because garden usage has not been static in the past, a focus on the

preservation of the historical garden “as it is and has been” has implications for the sustainability of such a management approach, which will be explained in detail. Moreover, it does not do justice to the manifold roles gardens take. They are sites where heritage is actively ‘done’ (Auclair & Fairclough, 2015, 4) as they demand the continuous (cultural) engagement and active care of their community, this is the value they have to add to sustainability. Gardens are places of ecological knowledge passed along through social interactions (Barthel et al., 2010, 263). As an expression of culture, gardens and our interactions with them have shaped our traditions and sense of identity for over four thousand years (Rohde, 2019, 33). Historical gardens in particular are also historical evidence of the societies and ideas that built them (von Buttlar, 2019, 7). Gardens through their design reflect the relationship between the humans and nature (Rohde, 2019, 40), they were traditionally designed to serve a variety of social needs, ranging from theatre to the cultivation of fruit and vegetables and theatre, even the exhibition of technological innovation (ibid., 46). Heritage sites such as the Real Alcazar gardens in Seville have been built and continuously developed for centuries (Pérez-Urrestarazu et al., 2018, 193). Different from other cultural heritage sites such as castles, gardens are no static constructs, their histories are characterized by constant adaptations according to changes in the tastes and needs of the time. I therefore argue that the management of gardens undertaken from the perspective of culture as a process offers additional ways of preserving while using gardens as cultural aspects for and as sustainability.

21st Century Challenges for Historical Garden Management

Von Buttlar defines historical gardens as gardens and parks that have historical or art historical value and thus fulfil the requirements to be included in cultural heritage ambitions (von Buttlar, 2019, 7). According to Bushnell (2013, 65), they are evocators of a time in the past, despite being quite literally alive in the here and now. This makes them passable images of the past designed as pieces of art through their design, the choice of plants, physical elements such as statues and fountains, and (as can be observed in Shakespearean gardens) a strong emphasis on the links to other pieces of art (David & Salge, 2019, 4; Bushnell, 2013, 68). The effects of climate change in particular, but also changing societal needs, and ignorance are the central threats for the preservation of historical gardens in the twenty-first century (David & Salge, 2019, 4). At the center of the debate that explores appropriate preservation and management efforts stands authenticity. Von Buttlar (2019, 7) argues that any measure taken that relate to the management of historical gardens must be value-based in relation to both history and art. Historical gardens are designated by von Buttlar as evidence of prior epochs (ibid., 7), but this argument has been contested. Hunt (2016, 230) points out that ‘any authenticity tends to be our own’, referring to the restoration of Kenilworth Castle’s Elizabethan Garden in Kenilworth, England, and Aberglasney Garden in Wales. In the case of the former, Hunt argues, visitors bring their own *assumptions* into a garden that is itself historically anachronistic but manages to meet its visitors’ expectations of an Elizabethan garden (ibid., 230). In case of Aberglasney garden, the historical physical features of the garden were restored, but as most knowledge about the original design and planting has been lost, its renewed version is a simulation rather than a reconstruction and makes no authenticity claims (ibid., 232). Yet, Aberglasney appreciates its own past by putting the emphasis on its historical stone features, notably the cloister.

Making the preservation of authenticity the central concern of historical garden management poses multiple challenges that are related to ecological sustainability. The water management of historical gardens constitutes a main concern as water remains too often treated as self-evident resource which reflects in inefficient irrigation and excessive waste of water (Pérez-Urrestarazu et al., 2018, 193, 196). Technological possibilities and attention to hydrozones that could improve the irrigation in historical gardens stay too often neglected as aesthetics remain the main concern of the garden management (ibid., 197–198). Pérez-Urrestarazu et al.

(2015, 197–198) thus suggest the introduction of centralized irrigation systems, the use of local and best-adapted plant species, and the formation of hydrozones to reduce water waste and improve sustainability.

Other approaches to enhance sustainability in historical gardens focus on biodiversity, the creation of closed material cycles, and the re-establishment of services gardens fulfilled in the past to supply the needs of local communities, as described by Butenschön (2019). She argues that such approaches that were integral features of historical gardens in past centuries were increasingly outsourced or became neglected during the twentieth century due to their unprofitability from an economical standpoint (Butenschön, 2019, 138, 142). Her suggestions for sustainable garden management are threefold: To improve the gardens' resilience and genetic diversity, historical gardens should re-establish internal tree nurseries where the garden's next generations of plants are bred, instead of purchasing plants from profit-oriented external tree nurseries that offer less place-specific plants (ibid., 142). Historical gardens should furthermore re-introduce fruit and vegetable garden sections in a people-centered approach to improve the knowledge about local ecology among the public (ibid., 138). A cultivation from an ecological standpoint has the additional benefit of redefining the perception of the historical garden as art historical relic (ibid., 140) toward the garden as food supplier and place of social interaction. By keeping and using organic materials produced by the plants instead of selling or disposing of them, material cycles can be closed, and historical organic substance can be generated over time, enriched by local minerals, and precisely adjusted to meet the needs of the plants (ibid., 140). Butenschön's suggestion embody what a management of historical gardens in a sustainable manner that accentuates heritage as a people-inclusive *action* can look like.

Another approach to the sustainable use of garden heritage that has been heavily criticized has been presented by the European Commission's Horizon 2020 expert group on cultural heritage in their publication *Getting cultural heritage to work for Europe* (2015). The report advocates for a perception of cultural heritage as an essential part in reaching the European Union's GDP, growth, innovation, and competitiveness ambitions (European Commission, 2015, 6). Plieninger (2019, 290), with reference to garden heritage, attests this interpretation of cultural heritage an understanding of nature as resource that should work *for* people. Opponents of the report condemned the approach as anthropocentric and criticized it heavily for its valuation of cultural heritage from economic standpoints and of its commodification of Europe's identity-conveying heritage sites (ibid., 291).

Worth and Potential of Urban Greenery in Cultural Heritage

Urban greenery includes all kinds of public green spaces, parks, community and allotment gardens, green sidewalk areas, as well as private gardens, rooftop gardens and, more recently, vertical green spaces (Cameron et al., 2012, 129). Urban gardens foster civic engagement with the local ecology (Langemeyer et al., 2018, 79), they represent a potential source of resilience (Barthel et al., 2010, 255), both in relation to food production and storm and flood attenuation (Cameron et al., 2012, 132). The maintenance of gardens to establish food security but also as symbol of wealth is as old as human civilization itself (Rohde, 2019, 33), and took central positions both in ancient city design as well as mythologically (Barthel & Isendahl, 2013, 226). So-called *guerilla gardening*, which is the illegal planting of public areas by citizens, is a form of form of public protest (Cameron et al., 2012, 130) can be recognized as fragment of our political culture, as I understand protest to be an essential part of a healthy democracy. Allotment gardening started as a social movement of the working class (Barthel et al. ref. Nolin, 2003). Both allotment and community gardening are space for the creation of socio-ecological memory that is of fundamental importance for the transmission of traditional

knowledge, tools, and practices (Barthel et al., 2010, 258–259). They are places of communal self-organization, celebration, and daily interaction characterized by shared practices and a shared terminology (ibid., 259–261). In urban landscapes, the access to a green space individuals have autonomy over increases the chance that the local population engages in the stewardship of ecosystems services (ibid., 263; Langemeyer et al., 2018, 79).

Green infrastructure is a holder of narratives, although this might not be self-evident in all cases. Public gardens and parks with a long history, such as Hyde Park in London, tell stories, they are 'storyscapes' (Robischon, 2019, 294) where history and mystery mingle. The entirety of a city's green infrastructure expresses the relationship between the habitants and nature, it is a narrative of the shape nature is allowed to take, its role in the city. Prominent parks in large cities are often described as "lung", indicating the need to breathe, or suffocation if this space disappeared.

However, the increasing density in urban areas as a result of continuing urbanization has a negative impact on the amount of urban green infrastructure, impeding the availability of the local population to engage in gardening culture: Di Pietro et al. (2018, 145) observed a 12% drop in community gardens in the city of Tours, France, within ten years. In Marseille, France, a growing number of inner-city communal garden projects to support the social needs of locals are getting into conflict with real estate interests existing for the same space (Consalès & Dacheux-Auzière, 2018, 221). Cameron et al. (2012, 130) found that modern-style housing in urban areas has a historically low amount of garden space connected to it but argue that this decrease in garden space does not entail an overall decrease of urban green infrastructure. With increasingly densely populated cities that are expected to continue their growth in the upcoming decades, Hunt (2016, 113) argues that vast urban green areas are unlikely to characterize city landscapes in the future.

Rethinking Spacial Arrangements and Dimensions: Future Gardens

Hunt's (2016, 113) notions on future garden concepts in urban spaces include linear and vertical gardens. A realignment of green spaces from horizontal to vertical would inevitably contest and eventually alter our assumptions about our coexistence with plants in urban landscapes as they would "break out" of their traditionally assigned place and become architectural elements. Tavares Martins et al. (2019, 10) suggest that vertical gardens allow for a new architectural language to emerge that can support the restoration of cultural heritage in interdisciplinary cooperations that were impossible in restauration projects of the past.

A concept that I believe will have the potential to strongly support historical garden preservation and enhance accessibility to gardens as learning and identity-shaping spaces in a sustainable manner in the future will be gardens conserved in the virtual space. An example for current implementations of this concept is *VersaillesVR* (Google Arts & Culture, 2023), a virtual experience of the palace of Versaille in France. As countries around the world are already now experiencing more extreme weather conditions as an effect of climate change, regions that will be altered by severe droughts, floodings and other phenomena are at danger of losing the incredibly fragile constructs that are historical gardens to these new conditions. The manifold applications of virtual reality already now touch upon many aspects of our life from medical treatment to gaming and firefighter training. In regard to historical garden management, they might offer in the future a unique and novel possibility to preserve the gardens in their current state and make them accessible for educational purposes, as virtual tourist attraction that would reduce the pressure the pressure on the local ecosystem, and as passible heritage site in a new dimension.

In this context, I would like to raise the issue of unequal access and social justice in relation to garden heritage sites and green spaces. Public parks did not exist in parts of Europe until the eighteenth century, they

were previously owned by aristocratic families and would only open occasionally to the wider public (Hunt, 2016, 95). Today, higher income properties owned by the wealthy and well-educated part of society are the ones in possession of larger and more elaborated gardens (Thompson, 2012, 130). Existing projects to transfer ecological and gardening knowledge to local citizens were reduced in recent years due to the pandemic, and efforts to reach communities of diverse backgrounds to participate in the remaining projects are not always successful (Pham et al., 2022). Having discussed the value of historical gardens in all its roles, a debate about the parameters that will decide who will be given access to future virtual historical gardens must be held. As the example of *VersaillesVR* demonstrates, VR replications of heritage sites as virtual travel destinations have already been recognized as source of profit by leading tech companies.

Regarding urban green spaces in general, Pham et al. (2022) make suggestions how to overcome class barriers, incorporate gardening into urban culture and enhance sustainability. The factors knowledge, access to land, and the availability of time build the foundation for their argumentation; they suggest that future urban design should designate more of the suitable available space to food production and gardening. This refers to rooftops and sidewalk greenery on one hand, but they go further than that: To bring people of different generations and social backgrounds together, property owners should be asked to open their gardens up for communal gardening to bring those with the available space in contact with those that have the necessary amount of knowledge and time (Pham et al., 2022).

Conclusion

This essay aimed at exploring the meaning of historical gardens and other urban greenery in cultural heritage, the challenges they are facing, and the opportunities held by the futures, all in the context of cultural sustainability. The countless roles of gardens as places of history, identity, art, social encounters, stewardship, narratives, and education that have been mentioned in the past chapters reinforce the importance of gardens as heritage and their protection in our societies. The essay has also shown that a number of approaches to make gardens active contributors to sustainable development consist of traditional knowledge and practices that have been neglected at least since the end of World War II. These approaches offer a unique chance to rediscover cultural traditions and use them meaningfully. Novel approaches to gardening that are still unfolding, such as vertical and virtual gardens, offer entirely new methods of preservation and integration thanks to technological innovations previously unheard of. Gardens differ from other cultural heritage sites due to their fragility and demand for constant care and constant renewal. Consequently, the methods to preserve them have to be somewhat unique as well.

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FUTU2 Systems and Complexity Thinking

For the students, the two aims of the **FUTU2 Systems and Complexity Thinking 2023** course were the following: firstly, to gain knowledge about different paradigms of systems thinking and, secondly, to build linkages between systems thinking and futures studies. The general objective of the course was to learn key concepts and methods of systems thinking, and to apply them in the context of futures studies.

The content of the course was divided into two parts. The first part was lectures that introduced the broad historical lineages of systems thinking, discussed a selection of its key thinkers, and outlined core characteristics of the theories. The second part consisted of brief reflective discussions in which systems thinking was applied to specific future-oriented topics. As the outcome of course, the students wrote essays on future-oriented topics by utilising varied systems thinking approaches. The FUTU2 course teacher Professor **Toni Ahlqvist** has reviewed the course essays.

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In the 2023 course there were several essays that could have been chosen as the “coolest” papers. Thus, I had to make a selection from a wider pool of fine essays. Finally, I selected three essays based on three criteria: 1) the use of systems theories and literature, 2) the quality of the argument, logic and visualisations, and 3) the creative aspect of the topic.

My first selection is **Burgert Maree’s** essay entitled “Mitä kuuluu? A Systems Thinking Approach to L2 Learning”. The topic of the essay is creative and complex: language learning from the perspective of systems thinking. The theoretical framework is well constructed and the argument flows nicely. The essay includes captivating system visualisations. The steps of Maree’s personal systems thinking journey are opened in a transparent fashion.

My second selection is **Charlotte Oertel’s** essay entitled “Systemic view of misinformation as a tool to gain and hold power in U.S. politics”. The topic of the essay is quite abstract and challenging, as can be perceived from the title. In the essay, Oertel shows a strong grasp of systems and complexity theory, especially when setting the work against the small number of lectures in the course. The system visualisation is impressive in how it captures and connects varied spheres of societal reality.

My third selection is **Orma Aarnos’** essay entitled “Transforming the paradigms of nonbinary medical care. Transformative forces and conditions-for-change in the Finnish transgender healthcare system”. The topic is highly original and challenging. Nonetheless, Aarnos is able to provide a clearly flowing argument that is endorsed with innovative visualisations. Essay’s style is nicely analytical: the theoretical framework is well selected and Aarnos is able to discuss the conditions for systemic change in a convincing way. The essay is spiced up with a robust set of scientific references.

Mitä kuuluu? A Systems Thinking Approach to L2 Learning

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Introduction

Hoe gaan dit?

Unjani?

Mitä kuuluu?

How are you?

These are the four ways in which I am able to connect with other humans through language. According to research, there are just over 7000 languages spoken in the world today (Michaels, 2019), although that number fluctuates on an annual basis. The ability to communicate with someone else in their language can be a very enriching experience. It is Nelson Mandela who famously said that “if you talk to a man in a language he understands, that goes to his head. If you talk to him in his language, that goes to his heart.” His exact words are said to be slightly different, but the sentiment remains (De Galbert, 2019). If you can speak to someone in the language that they have grown up in, you cross many boundaries and speak to their heart, fuelling human connection. That is why learn-ing a second or foreign language is vital in our global effort to connect with each other.

The experience of learning a second or foreign language is an experience most indi-viduals either enjoy or suffer through at some stage of their lives. The ability to converse in a foreign or second language can be a highly enjoyable experience. Most humans will have this experience in their lives, as education systems worldwide support and encourage learning a second or foreign language. It is therefore a topic that lends itself to a global audience.

Personal interests in this domain include a background as a secondary language teacher (in Afrikaans) for 12 years in South Africa and currently learning a foreign language here in Turku, Finland. Apart from personal interests, a keen and passionate interest in South African education and the potential of South African youth is another motivator. Many youths are required to learn in environments which are not supportive of their home language, and they are forced to acquire information and knowledge in a second language that is foreign to them. All these reasons were reason enough to understand the learning of a second or foreign language better and, potentially, an attempt at finding the best leverage in the system to aid in efficient language learning.

The learning of a second or foreign language will be looked at through the drawing of Causal Loop Diagrams and applying systems thinking to show the complexity of the topic at hand. A brief introduction on systems thinking follows, thereafter a literature review and applying systems thinking to the field of interest. The essay also briefly looks at leverage points within the system and concludes by making suggestions on how the process of language learning can be assisted optimally.

Systems and Systems Thinking

The scientific reductionist approach is a discipline that looks at the different components of a system and tries to gain a better understanding by looking at the properties of the different components. Each of these properties would have a specific purpose to fulfil in the system and, by understanding the components' roles, a better understanding of the system develops. This is the way thinking is taught in education systems worldwide. Systems thinking, on the other hand, is a discipline which not only considers the different components within a system but, more importantly, explores the properties that exist within the systems by the interaction of the components. As we live in a continuously complex and volatile world, systems thinking must be taught in school systems worldwide.

Brief history

Ludwig von Bertalanffy, an Austrian biologist, observed that "the customary investigation of the single parts and processes [of the living thing] cannot provide a complete explanation of the vital phenomena" (von Bertalanffy, 1972, p. 410). Peter Senge has called systems thinking "a way of seeing and thinking that honours profound inter-connectedness, that nothing exists separately." (2020, p. 57). Peter Bishop introduces systems thinking as a discipline and way of thinking that is considerably more difficult to fully understand, requiring one to travel a journey with it (2008).

To start understanding systems thinking, it is important to define what a system is. Peter Bishop has defined a system as "a set of parts that interact to produce observable effects (behaviours) outside the system" whilst behaviour is described as "a change in or the stability of an externally observable or measurable unit or quantity associated with (or produced by) the system over time" (2008, p. 10). This definition echoes more or less what others have defined a system to be (Jagustović et al., 2019). Aristotle is often quoted in relation to systems, having supposedly said that "the whole is greater than the sum of its parts" when he said, "the whole is something beside the parts" (Martin, 2019) but the sentiment remains.

In essence, systems thinking is an approach to problems, rather than a subject area. Systems thinking has, for the most part to date, developed through two main periods, namely the 1950s and 1960s and then again in the late 1970s and 1980s. These two distinct developments are categorised broadly as hard systems thinking and soft systems thinking, respectively.

Hard systems and soft systems

Hard systems are easier to identify and describe than soft systems. Hard systems consist of elements within the system that work together towards a common and shared outcome or goal (Checkland, 1985). The definition of a problem within hard systems is simple, the standards of which are set outside the system itself and the outcome is understood and shared by all role players (Checkland, 1985). The purpose of a hard system is goal-seeking (Bishop, 2008), meaning that the specific and determined outcome of that system can be engineered, controlled, and optimised to deliver what it has been engineered to deliver. Soft systems, on the other hand, are significantly more complex than that. They are typically identified as human systems (Kirk, 1995). The standards for soft systems, the elements that determine what it is supposed to do and achieve, are not set outside of the system but arise from within (Kirk, 1995). Soft system behaviour and goals are dependent on the interactions between the different elements in a system, which makes it less predictable and, therefore, less inclined to goal-seeking and more to learning and maintaining relationships (Checkland, 1985). Although

the system might have goals, these goals are not always interpreted in the same way or even met (Kirk, 1995). Emergence, a novel outcome that is unexpected, is often observed within a soft system and is a distinct quality of complex adaptive systems, systems that fall within the broad category of soft systems (de Haan, 2006). The methodology of hard systems was initially applied to soft systems, but it fell short and soft systems methodology was developed to model and understand soft systems better. Hard systems are more continuously seen as a component within soft systems (Checkland, 1985), especially in complex systems where humans are involved.

Soft systems methodology

Ludwig von Bertalanffy is credited with the development of the early phase of the General Systems Theory, on which soft systems methodology was built. Geoffrey Vickers, a respected and very experienced public servant, and the author of several books on governance was heavily influenced in his working life by systems thinking and cybernetics. According to Checkland, Vickers rejected the idea of goal-seeking for human systems and the idea that standards for the system are set outside the system itself (1985). This rejection led him to develop a new intellectual base for the framework and methodology of soft systems, which “maintains desired relationships and eludes undesired ones” (Checkland, 1985, p. 762). It is from this base and the realisation that the methodology for hard systems did not work on real-world problems, that soft systems methodology (SSM) was developed by others who followed in the field.

Soft systems methodology does not aim to understand a system by breaking it down into its individual parts and focusing on the purpose of these parts on their own. Soft systems methodology aspires to see the different relationships between elements within any system rather than be focused solely on linear cause-and-effect relationships that could exist in any system, as well as the notion of goal-seeking (Checkland, 1985). Goal seeking determines that we presuppose every system has specific goals and that we should engineer it to achieve those goals, a definition rooted in hard systems methodology. Checkland refers to the observation by Vickers that goal-seeking is "a poverty-stricken model of human behaviour" (1985, p. 762).

Complex Adaptive Systems (CAS) are a unique set of dynamic systems within the soft systems family. Since CAS are open systems where the environment impacts its functioning and it, in return, it impacts its environment (Jagustović et al., 2019), the behaviour in these systems “emerge as a result of nonlinear inter-relations, on different spatial and temporal scales, among a large number of elements without central control” (Jagustović et al., 2019, p. 66). The aspects of this definition are certainly prevalent in the learning or acquisition of a second language, which makes it an ideal topic for discussion.

Literature Review

The process of learning or acquiring a second or foreign language speaks loudly of complexity. Literature regarding the learning of a second or foreign language – very often referred to and known as SLL (second language learning) or L2 learning (which will be used from here onward) – are vast and the approaches and aims vary significantly. There are so many variables to consider, which include but are not limited to the environments in which the learning takes place, cognitive and non-cognitive elements within individuals, motivation for learning and language anxiety.

To understand the landscape of L2 learning better and to scope the research, systems thinking was utilised and different components of L2 learning were mapped out by using mind maps. It required four attempts for

the main variables to emerge that would aid the drawing of boundaries for this essay. These key variables focused on but were not limited to the following:

- an individual's ability in L2 (reading, writing, listening, and speaking),
- motivation,
- anxiety and
- the learning environment

The first three variables are inherently part of an individual's cognitive and non-cognitive (emotional) make-up and can be highly and diversly influenced by numerous factors, either related to the environment of L2 learning or everyday living. Boundaries were drawn to include factors that related directly to L2 learning (as mentioned) and exclude any factors of everyday living, for example, joy from other activities, heartbreak, everyday stress, etc. Factors in everyday life would certainly influence an individual's ability for L2 learning but they are, for the sake of some simplicity, not considered for this essay. The learning environment affects the first three variables and has, therefore, been included in this essay.

As the literature review has been done with numerous and varied sources related to L2 learning, it is important to clarify that the learning of a foreign language can be interpreted as a third, fourth or even fifth additional language, as defined by Rieder-Bünemann (n.d.). This is also confirmed by Dixon et al., who state that L2 acquisition "includes second (or foreign) language learning in both naturalistic (unschooled) settings as well as classroom-based learning, including both oral and written forms." (2012, p. 9).

It has to be acknowledged that L2 learning can be influenced by the quality of instruction received (Dixon et al., 2012), however, a focus on teachers' ability would fall outside the boundary of this essay. It has been mentioned where a teacher's ability impacts on the key variables identified. With the boundaries drawn to highlight ability in L2 (reading, writing, listening and speaking), motivation, anxiety and the environment, the literature review was conducted to find out how these variables are at play within the L2 learning process and what their effects are.

It is also important to take note that optimal conditions for L2 learning are not set in stone because "optimal" is not the same as "the best"; there is no "best" way and numerous variables are at play (Dixon et al., 2012). One should therefore aim to optimise the variables at play and find the most conducive aspects to L2 learning, although it will inevitably vary for different individuals.

Environmental aspects

A familiar and controllable environment is very important to L2 learners. According to Rieder-Bünemann, the social context is complex and will influence the attitude of the L2 learner and determine the availability of opportunities within an environment (n.d.). Where learning takes place in a formal environment, the organisation must be clearly organised, meaning that instructions are given clearly and students know what is expected of them (Dixon et al., 2012). Grammar and the understanding thereof (how it functions) need to be explicitly communicated by educators and repeated with contextual exercises and practice (Dixon et al., 2012). Older L2 learners can be affected by their self-awareness, making them less open to communicating in L2. According to Eguz, this self-awareness often lies in stereotypes of age and care should be taken to create a supporting environment with this in mind (2019). Content-based approaches should be considered in these scenarios to allow learners more familiarity with their environment (Eguz, 2019). Although there are differences between

young and adult learners, these differences can be bridged by increasing the learning time for adult learners to accommodate for longer reaction times and difficulty in spoken production for older learners (Eguz, 2019).

The intensity of teaching and learning has also been shown not to be a determining factor in improving L2 learning. The same number of hours can be stretched over a longer period without a significant difference in outcome (Dixon et al., 2012). This is as valid for younger as older learners, encouraging the learning environment to be structured as a safer space than when teaching and learning take place at a rapid rate.

Despite the accepted truth that proficiency in an L2 can be obtained in a short period in younger learners, late learners in L2 language classrooms showed more promise than early learners, especially when an increase in hours of instruction was considered (Dixon et al., 2012).

The effect of motivation

Motivation has emerged as a very strong component in the complex adaptive system of L2 learning, with many references that indicate it plays a central part in the L2 learning process. The importance of motivation in L2 learning has officially been recognised by many researchers (Dixon et al., 2012; Noels et al., 2003) and a distinction has been made between two types of motivation: firstly, the motivation to have contact with and identify with L2 communities and, secondly, a practical goal (Noels et al., 2003). Students who are internally motivated, for example, the desire to travel, for friendship and knowledge, appeared to be more comfortable and persevering (Noels et al., 2003). The motivation for older individuals to be L2 learners is key to their success, and it is often shown that older learners' motivation is higher than younger learners' motivation (Eguz, 2019). A positive attitude to the L2 culture also results in higher confidence and, therefore, higher motivation (Dixon et al., 2012). The ability of technology and the gamification of learning to increase motivation is also worth considering. In a study conducted by James & Mayer, the online language learning game, Duolingo, improved motivation for students to continue their L2 learning despite it not having had any noteworthy effect on the results of learning (2019).

Communication abilities

Vocabulary is the starting point for all L2 learning, without which L2 learning cannot be initiated. L2 learners all acquire vocabulary at different rates but Dixon et al. have found that an increased vocabulary can be achieved by studying a particular subject rather than studying L2 language arts (2012). Practical themes, considered for groups based on how often they would interact in their environments within those themes, could also fall within this description. Reading is one of the best and easiest ways to improve L2 learning and have been recommended strongly. Dixon et al. have found that reading books at home contributes to later L2 oral language proficiency and that spending more time reading had a positive effect on overall L2 acquisition (2012). On the other hand, being able to use L2 in informal settings had the largest effect on L2 oral proficiency (Dixon et al., 2012).

Anxiety

The boundaries of this essay do not allow an in-depth discussion on anxiety, but anxiety has been extensively looked at as its own complex adaptive system within language learning. Whilst a small measure of stress can be a great initiator of action and motivation, stress that becomes overwhelming and causes anxiety can have a significant negative impact on learning. Anxiety can inhibit learning from both a cognitive as well as non-

cognitive perspective. Anxiety, in relation to L2 learning, has been noted to “form part of an interconnected, constantly in-flux system that changes unpredictably over multiple time scales” (Gregersen, 2020, p. 67). Gregerson, in an extensive and in-depth study of language anxiety, concludes that anxiety "influences and is influenced by … [numerous] variables such as motivation and a willingness to communicate” (2020, p. 68).

Discussion

The aim of this essay is to show the complexity of the L2 learning system and, where possible, leverage points to help facilitate and encourage L2 learning. For these purposes, and to illustrate the complexity of the system visually, a Causal Loop Diagram was drawn as seen in Figure 1 and will be referred to in the text discussion that follows.

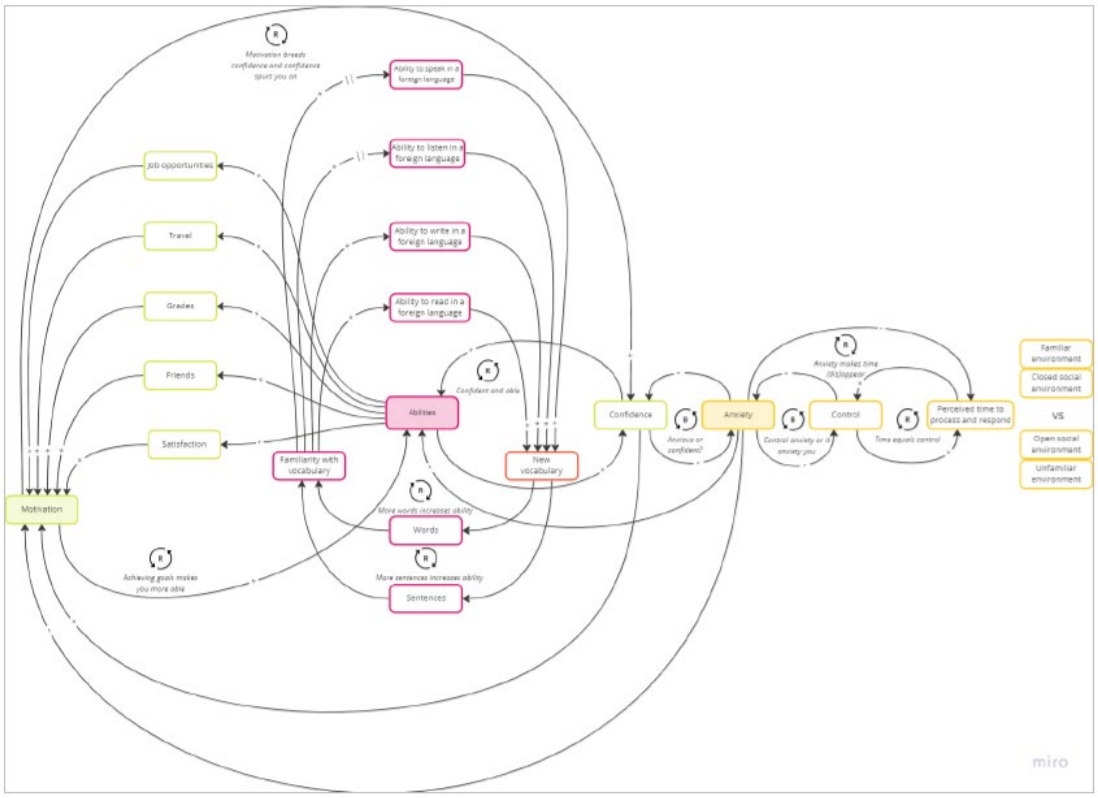

***Figure 1**. Causal Loop Diagram of the L2 learning experience.*

Language learning is dependent on many factors and environments, as the literature review has highlighted. The main learning takes place in the human brain, by allowing the acquisition of skills to develop to communicate in the language being learned. The human brain and the human body are systems of their own (not deeply considered for this essay), whereas the environments where the learning takes place, either formally or informally, are also systems in their own right. Drawing the boundaries of this essay was therefore challenging, as many factors could influence any of these environments. As a new L2 learner (*“minä puhun vähän suomea!”*), the boundaries of this essay were drawn to include environments and factors that would influence the initial stages of L2 learning. The initial stages of L2 learning are critical to motivation to continue the learning journey and motivation was highlighted significantly in the pre-reading, which makes it an ideal focal point.

Language abilities are the most logical starting point. Any language learning is very dependent on the acquisition of four different skills, namely the skills of reading, writing, listening, and speaking. These skills are learnt at a different pace and usually in the beforementioned order, as reading and writing can very often be practised and executed by the learner without outside interference, allowing manageable anxiety, whilst the skills of listening and speaking inevitably involve at least one more individual and, thereby, opening up the initial learning environment to outside influence. This changes the dynamics of the learning environment and adds to the anxiety experienced. Speaking, confirmed by numerous studies, is believed to induce the most anxiety in foreign and second language education (Pawlak & Waniek-Klimczak, 2014). In the Causal Loop Diagram for L2 learning, these language variables have been placed slightly further away from the centre and indicated with a delayed symbol, to illustrate that reading and writing practice and learning occur more frequently than the skills of listening and speaking, at the very least in the initial phase of L2 learning.

When we look at Figure 2, the centre of the Causal Loop Diagram drawn in Figure 1, all L2 learning starts with the acquisition of vocabulary (indicated in red). Words are memorised and practised at a quicker rate than sentences, which is also indicated visually by placing the sentences node further away. When an L2 learner becomes familiar with new words and sentences, it positively re-enforces their ability to read, write, listen to and speak those words and sentences which they have learnt. This, in return, encourages them to acquire new vocabulary and the cognitive ability process repeats itself, in an enriching and magnifying manner with reinforcing feedback loops. If this process did not take place within a complex adaptive system, the outcome would have been definite fluency within a new L2 early on. Learning would not have been inhibited and the outcome would have been predicted, certain and easily measurable, very likely within a projected timeframe. We are, however, dealing with the human brain and the human psyche, which are both influenced by a myriad of cognitive and non-cognitive factors at any given moment, which are complex adaptive systems of their own. Let's consider the non-cognitive factors first.

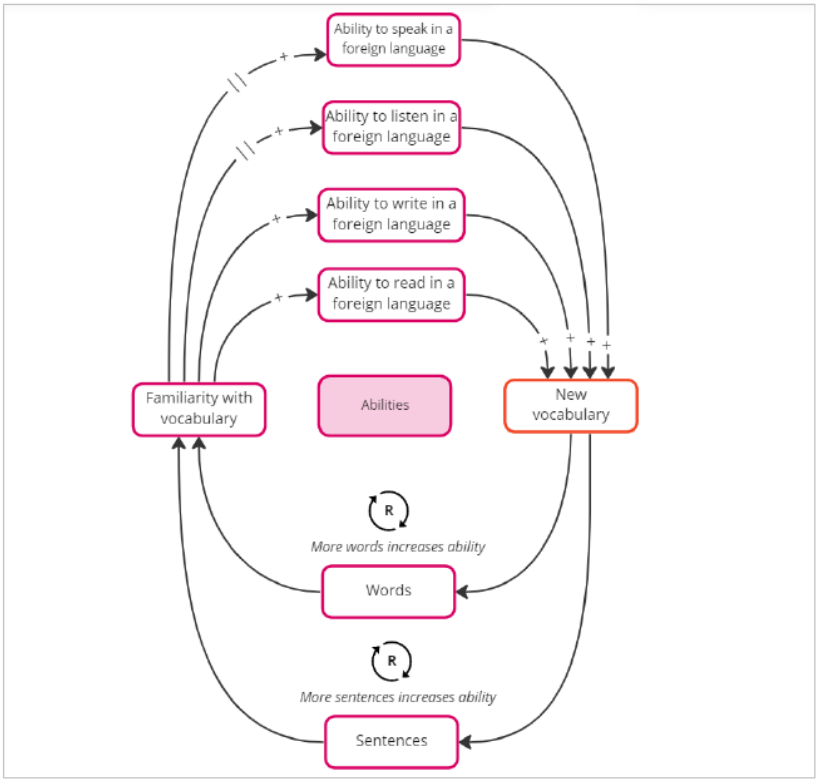

Figure 2. *The relationship of the four language abilities in the original Causal Loop Diagram.*

Motivation and **confidence** are two major contributors to the L2 learning experience, as highlighted in Figure 3. Both these contributors are enhancers of learning abilities or detractors thereof as they function as reinforcing feedback loops, where they can contribute either positively or negatively to L2 learning. When either motivation or confidence increases, learning abilities increase. The opposite is also true, when either motivation or confidence decreases, learning abilities also decrease. What makes the interaction here so complex is that, apart from the direct causal loops that both motivation and confidence have on learning abilities, they also have a reinforcing effect on each other. When confidence increases, motivation also increases as a result of a reinforcing feedback loop. The opposite is also true.

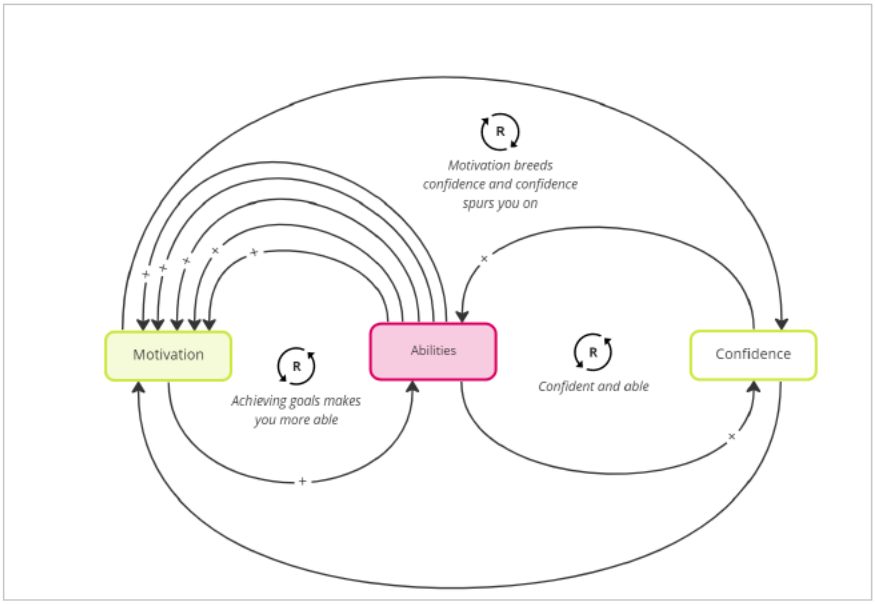

Figure 3. *The relationship between Motivation, Abilities and Confidence in the original Causal Loop Diagram.*

Anxiety is another major variable to consider in the L2 learning experience, as seen in Figure 4. When anxiety increases, confidence decreases and when anxiety decreases, confidence increases. This is an example of a balancing feedback loop. Apart from the effect that anxiety has on learning abilities through its effect on confidence, it also has a direct effect on both motivation and the four learning abilities themselves. Anxiety, therefore, carries significant weight in the L2 experience by influencing the confidence, learning abilities and motivation of the L2 learner. It is perhaps here again where we are reminded of the complexity of the human individual and his/her relation to the environment – not only do variables influence each other directly but they also have additional impacts on so many other variables, which can lead to a compounded effect. Results from a study by Piniel & Albert indicate that, in the L2 learning environment, anxiety is one of the two emotions L2 learners experience mostly, the other being enjoyment (2018).

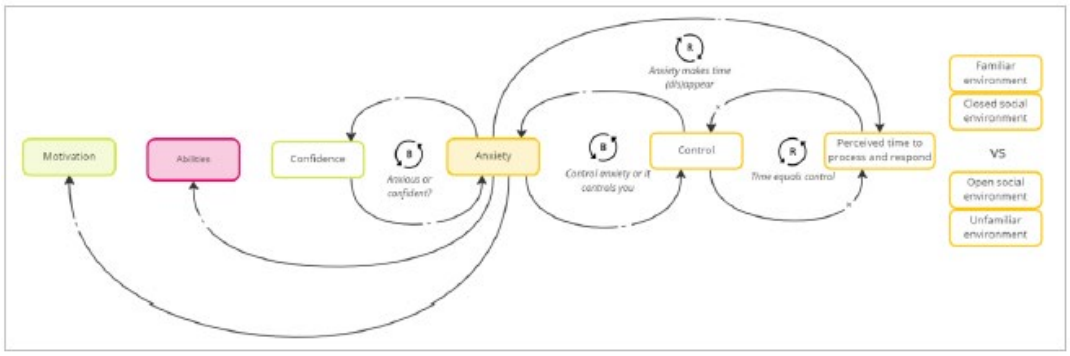

Figure 4. *The relationship between Anxiety and the Learning Environment in the original Causal Loop Diagram.*

The L2 learner's perception of the control they have in a given **environment** is directly related to the anxiety they experience, especially in environments where L2 learning takes place. The same study by Piniel & Albert determined that, apart from L2 learners' skills, the context of L2 learning (in class or outside) was the main influencer that determined which emotion was experienced and to what extent (2018). Environments that are more familiar and closed, act as a reinforcing feedback loop, increasing the control an L2 learner has on his/her learning, thereby reducing the anxiety in which the L2 learning takes place (in a balancing feedback loop). These environments can be the classroom itself (especially at the early stages of the L2 learning experience) or social environments which the L2 learner identifies as an opportunity that they can contribute or engage in the L2. Environments that are less familiar and open, with no clear boundaries, also act as a reinforcing feedback loop, decreasing the control an L2 learner experiences, thereby increasing the anxiety in which the L2 learning takes place (in a balancing feedback loop). These environments can be environments where the L2 is prevalent, especially in spoken form but where the L2 learner feels as if they are coming short, for example in a shop, marketplace or any other foreign environment where vocabulary falls short.

Leverage Points

Donella Meadows developed a system as a methodology to influence complex adaptive systems and shift them in their behaviour. Finding points of interest, where you can change and influence the system's behaviour, are called leverage points, as seen in Figure 5. These leverage points are ordered in a system from easy and superficial leverage points which will change the system in small ways to difficult and deeper-lying leverage points that will shift the system considerably. According to Meadows, it is not easy to find these leverage points as they are very often counterintuitive (2008). The more leverage points you can identify and utilise, the more likely you are able to shift the system. Meadows suggests that you find the deeper leverage points to assist you in shifting the system more effectively (2008).

Looking at L2 learning in the context of this essay (based on the causal loops drawn) the following leverage points might be considered as identifiable and significant to shift the system's behaviour and allow L2 learning to take place more efficiently and effec-tively, by influencing the numerous variables in such a way that it is conducive to the L2 learning experience. As motivation has been cited as a key variable, the leverage points here try to address the optimisation of motivation, either directly or indirectly.

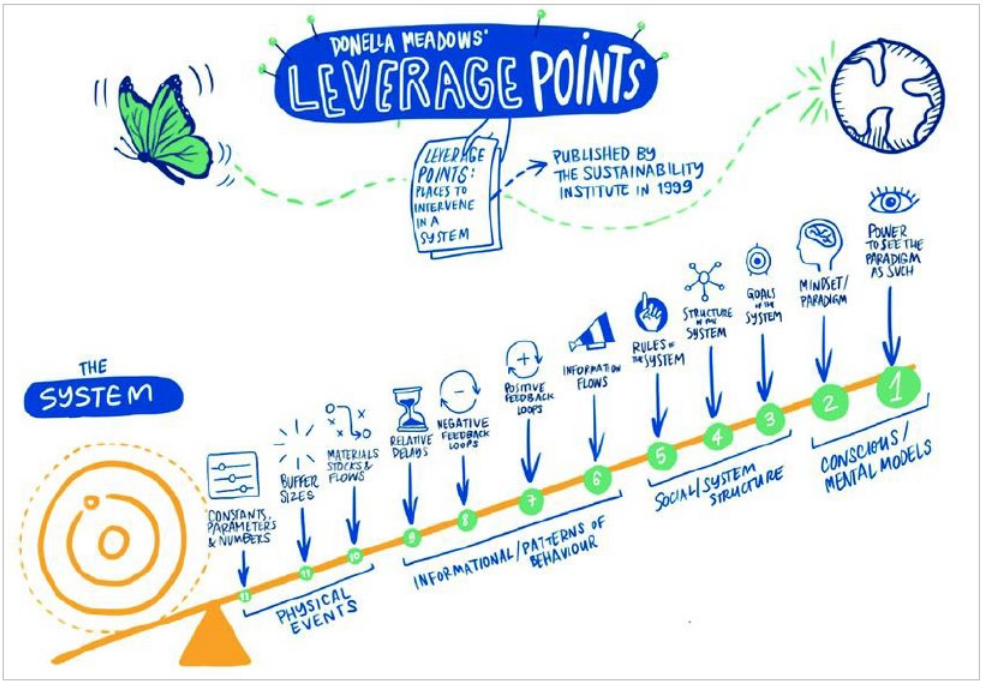

Figure 5. *Donella Meadows' leverage points (Source: based on Meadows, 1999; credit: UNDP/Carlotta Cataldi).*

Numbers

Numbers, in terms of constants and parameters, are important but, according to Meadows, “there is not a lot of leverage in them” (2008). This is why they are ranked lowest (twelfth).

In terms of L2 learning, one could always increase the time spent in the formal learning environment, like a classroom, to allow an L2 learner the maximum time needed to be comfortable at the start of and with each progression in learning. As was mentioned in the literature review, the number of hours can be stretched over a longer period, thereby decreasing anxiety and still achieving the same outcome (Dixon et al., 2012). The reality, however, is that most people do not have the luxury of unlimited time and they have numerous other responsibilities too. If you increase the time spent learning in the formal learning environment, you might relieve some of the anxiety in L2 learning but you might very well increase the stress in everyday life. Increasing the time spent as informal learning time, however, could make a difference. Reading in the L2 at home, when more time is available, always comes as a recommendation in the initial stages of L2 learning. Reading will contribute to later L2 oral language proficiency and have a positive effect on overall L2 acquisition (Dixon et al., 2012).

Delays

“Delays in feedback loops are critical determinants of system behaviour” (Meadows, 2008). They are ranked ninth.

The auditory language abilities of listening and speaking are two feedback loops with noteworthy delays embedded in them. The two abilities take time to develop, as they are dependent on a greater set of vocabulary and are linked to an increase in anxiety (they put the L2 learner on the spot). Decreasing or minimizing the delay experienced in the acqui-sition of these two abilities would go a long way in assisting the L2 learner in the L2 learning experience. Becoming more efficient in these abilities sooner would lead to an impressive

combination of positive experiences: an increase in confidence, a decrease in anxiety and an increase in motivation. The challenge would be to structure both the formal and informal learning environments in such a way that it would incorporate and foster these abilities sooner.

Balancing and Reinforcing Feedback Loops

According to Meadows, balancing feedback loops, ranked eight, are “critical to the long-term welfare of the system” (2008, p 153). They give valuable feedback and are there to keep the system safe and in equilibrium. To eliminate these would be unwise. Reinforcing feedback loops, ranked seventh, can speed up a process significantly. If one can strengthen the reinforcing feedback loops in the L2 learning system, one would have a highly motivated, highly confident and highly able L2 learner. These reinforcing feed-back loops can be enhanced and strengthened, at least deliberately in a controlled envi-ronment like a classroom, but the balancing feedback loops will play their role in the practical, informal L2 experience, as is the nature of the L2 learning experience.

Goals

The goal of the L2 learning system is to introduce and facilitate the learning experience for an L2. This is done in consideration of the constraints within everyday life, under-standing that individuals have other commitments and priorities they have to tend to. Per-sonal motivations and goals also play a role in this system. The goals of a system is ranked third.

If one was to change the goal of the L2 learning system, one would have the oppor-tunity to change the way one looks at the system and find many leverage points one could activate. As Meadows puts it, “everything further down the list … will be twisted to con-form to that goal” (2018, p. 161). In L2 learning, such a change in goal could be the absolute prioritization of the L2 learning, so that all other priorities would become secondary until such a time that enough momentum and motivation have been gained to make everyday conversation, in all four abilities, manageable. L2 learning is typically eased into, but if one desires to change the goal of the L2 learning experience, individuals who enter new countries, students entering foreign universities, and employees starting at foreign companies can all be placed in mandatory learning environments until they are proficient, whereafter they may continue with their everyday lives. This type of approach would be an extreme one, sounding very much like a dictatorship. It is, however, theoret-ically possible, at a great cost.

Conclusion

The system of L2 learning is a prime example of a complex adaptive system. Not only are there numerous complex adaptive systems within the L2 learning system itself, with components acting with each other within those systems, but the systems themselves also interact with each other, forming the L2 learning experience. There are too many components (variables) that make up the whole system and it is significantly more complex than this essay’s boundaries. This essay looked at the learner in an L2 learning environment to determine which factors play significant roles in L2 learning, especially in the initial phase of L2 learning.

Key components were identified, namely the environment in which the L2 learning takes place, the motivation and confidence of an L2 learner as well as the numerous stressors an L2 learner could experience during the L2 learning experience, with the main focus on anxiety.

Considering the levers of change, the system can be optimised in a setting where general life responsibilities can still be maintained. This means learning over a longer period and, therefore, motivation is a key element in maintaining the momentum of the L2 learning journey. To learn optimally within these conditions and expectations, the following variables need to interact with each other in the following manner:

- the learning environment needs to be perceived as within control, which will
- lower the anxiety of the L2 learner, thereby
- increasing the perceived time to process and respond,
- improving the abilities of the L2 learner and
- giving the L2 learner more confidence in their ability

If the above can be achieved for as long a period as possible, the L2 learning journey should be a more successful and enjoyable one for the L2 learner, especially in the early phase of language learning. The more we can communicate in one another's languages, the more we would be able to connect, which appears to become even more critical in the volatile world we currently inhabit. And let us not forget the simple joy to connect with each other!

Dit gaan goed met my en met jou?

Ndiyaphila unjani wena?

Ihan hyvää, kittos, entä sinulle?

I am well, thank you, how are you?

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Systemic View of Misinformation as a Tool to Gain and Hold Power in U.S. Politics

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Introduction

This essay offers a systemic view on the use of misinformation by domestic political forces to gain political power in the United States and the consequential dynamics that unfold throughout society as a result of this strategy. An approach to understanding the system of misinformation shall be regarded as most helpful since misinformation as a political tool is being used outside the U.S. as well. Given the complexity of the topic, the essay provides a system visualisation using causal loop diagrams to depict the system's actors, relationships and their polarity.

In the beginning, an overview of systems and systems thinking will be given; thereafter, the motivations behind the use of misinformation as a tool in politics will be discussed, followed by an analysis of the system, its mechanisms, and impacts. Subsequently, the essay discusses possible leverage points of intervention through a systemic lens, having a look also on the challenges and limitations of each possible point of intervention. The essay concludes with a summary of the most interesting impressions taken from the system analysis.

Overview on Systems & Systems Thinking

According to Meadows (2009), a system represents a set of interconnected elements serving a purpose (if it is a human system) or function (if the system is of non-human nature) (p.11, 15). Carlsson et al. (2002) follow the definition of a system as being composed of components, relationships and attributes defining those relationships, highlighting also the presence of a common objective to where the elements are working (p.234).

One possibility to classify systems is by evaluation of their level of interaction; systems can thus be divided into closed, open and dynamic systems. Different from closed systems, open and dynamic systems have external connections to the environment in which they are embedded and are thus subject to influence from outside their own system as well as influencing force onto their environment. Whereas closed systems can be subject to control and their behaviour can be predicted, remaining in control over the system becomes increasingly difficult if the system is open and shows adaptive capabilities. Dynamic systems are impossible to control due to their ability to reflect on their own actions as well as on changes in their environment and act according to their reflections, their ability to plan their own actions based on prior learning provides their behaviour with an anticipatory dimension (Ahlquist, 2022.)

Systems thinking recognises that behaviour results from the interactions of actors and is followed by consequences, whereby the actions and influences at force may not be always openly visible (Fusso, 2012, 806). This initial understanding inaugurated two major modes of systems thinking, the 'hard' systems thinking of the 1950s and 1960s that was strongly embedded in the positivist approach to social sciences at the time, and later the ascending 'soft' systems thinking which first took hold during the 1980s and 90s (Ahlquist, 2022). Underlying the 'hard' systems thinking was the assumption that models can accurately depict reality and are

thus able to provide analysts with the ability of predicting behaviour. The ‘soft’ mode of systems thinking contradicts those notions. Since having control over the system is not deemed possible following the ‘soft’ systems thinking philosophy, the focus shifts to learning from the system through observation (ibid, 2022.)

A crucial aspect to the soft systems approach is the belief that a system in fact does not provide an accurate account of reality; rather, representatives of this approach describe systems as “powerful heuristic concept” (Funtowicz & Ravetz, 1994, 569), limited because the knowledge of the systems analyst was already limited and in some parts potentially incorrect in the first place (Meadows, 2009, 87).

The understanding that a system is more than the sum of its parts is ubiquitous through-out systems literature (Dufva & Ahlquist, 2015, 113–114; Meadows, 2009, 7; de Haan, 2006, 294; Carlsson et al., 2002, 234). This characteristic is a necessary preliminary for emergence, defined by de Haan (2006, 294) to be about the properties of the whole in contrast to those of the parts: interconnected actors on a lower level produce a property that is effective beyond the lower levels of the system. Emergence, according to the non-linearity argument, can only occur where the quantum mechanics principle of superposition fails. In effect, higher hierarchical levels reach a certain level of autonomy, as the combined causes on the lower levels are no longer in proportion to the effects that can be observed on the higher hierarchical level (non-linearity). In a practical context, this means that even minor ongoings on a lower level may cause significant changes on higher hierarchical levels whilst major disruptions on a lower level may be entirely insignificant to the higher level (de Haan, 2006, 294–295.)

Non-linear developments require a system to be open; both properties are considered characteristics of complex systems (Ahlquist, 2022). In complex systems, each actors can have multiple connections, may be subjected to more input than they produce output, and fulfil more than one function. These systems have no central control; hence each intervention potentially causes a number of unwanted outcomes at some other point in the system (Preiser et al., 2018, based on Poli, 2013, 144).

Complex systems are subject to six major concepts discussed by Derbyshire (2016, p.52): They are sensitive to the *irreversibility of time* – once changed, the system cannot be brought back exactly to its former state within the same time frame in which the change took place (Shaw, 2022). Complex systems are *path dependent*, their past trajectories will therefore have an influence on future developments but will not predetermine them. The third concept complex systems are subjected to is the *sensitivity to initial conditions*, whereby the slightest differences in a system’s starting coordinates at the beginning of a process can cause a wide spectre of different outcomes further down the road, but whether a trajectory will develop into a major trend or remain meaningless as the process unfolds so far proved to be hardly predictable. Fourthly, *emergence and hierarchical layering* is a core concept of complex systems. Emergence has already been defined in previous paragraphs; Derbyshire (2016) however points out the dual function lower and higher hierarchical layers fulfils in this context in a complex system – no part of the system is present simply as a passive receiver or active influencing power, both micro layers and macro layers affect and are affected by each other. Fifthly, complex systems can *organise around attractors* and thus follow developments that are all organised around the same attractor (or outcome). Lastly, complex systems are contingent on *complex causation*, meaning one event does not simply set of the next one but might feed back into its own causes (feedback loops) or built up over time and result at some point in emergent phenomena (Derbyshire, 2016, 52.)

Through existing feedback loops the system develops persisting behaviour; the loops may stabilise the system elements but can also enhance or weaken them. (Meadows, 2009, 25–26). Feedback loops by which the system elements maintain their level are called balancing feedback loops; aiming for maintaining stability, they are thus reluctant to change.

Feedback loops which enhance the current direction of change are called reinforcing loops; they operate through a snowball mechanism which non-linearly amplifies the system's tendency toward growth or decline. Consequently, reinforcing loops have the capability to push a system into destruction (ibid, 2009, 30–32, 75.)

In system visualisations, feedback loops are depicted in Causal Loop Diagrams (CLDs). As depicted in figure 1, a balancing loop is marked with a **B**, reinforcing loops with an **R**. The polarity of the behaviour through which the independent variable influences the dependent variable is described through the letters s and o; if the dependent and independent elements' behaviour exhibit a similar polarity, the arrow is marked with an **s**. Whenever the dependent element's behaviour moves in the opposite direction, the letter **o** is used. (Fusso, 2012, 807.)

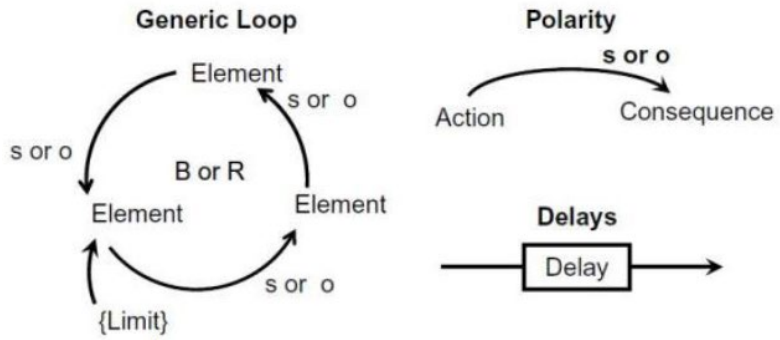

Figure 1. *Generic depiction of Causal Loop Diagrams (CLDs) (Fusso, 2012, 807).*

Importantly, the presence of a feedback loop, no matter what it tries to achieve, does not guarantee that they will also reach their goal due to manifold reasons: The strength of the feedback may decline over time, the produced behaviour can turn out not strong enough or be expressed at the wrong time or place – it may also prove altogether useless. In other situations, an element might be missing to close a feedback loop (Meadows, 2009, 30). Another cause of failing feedbacks are delays, which are present in every system (ibid., 2009, 103). Delays impact the flow of information; they also describe changes in the stock that take time to unfold. Consequently, delays can cause problems because changing their length can entirely change the system's behaviour, yet they are also crucial for the stability of the system (ibid., 2009, 104–105.)

According to Meadows, a highly functional system has three important characteristics: resilience, self-organisation, and hierarchy. Resilience in systems can be achieved through learning and adapting processes which help the system to stay intact even if under attack. Self-organisation, or the ability to complexify, therefore enhances both resilience and hierarchy, but requires freedom to do so. Hierarchies, developing from the lower levels upwards to higher levels, are useful to complex systems as they have a stabilising effect (Meadows, 2009, 75–84).

The System of Misinformation

The system of misinformation being used to shape narratives and increase the power of the group of people benefitting from it is no phenomenon of the 21st century. The difference is the level of attractivity misinformation possesses today as a tool in the fight over power. Significant changes and developments and their still unfolding consequences in the field of technology, in society, in political prospects and global interconnectedness are what turned the use of misinformation from a ubiquitous, often local phenomenon into a consciously chosen

global weapon fundamentally changing our images of reality and posing a threat on democracies in an unprecedented velocity and ferocity. The gradual change in pace is largely tied to technological innovations. Landmark innovations reach from the invention of the letterpress to rise of the cinema in the early twentieth century, the radio in the 1920s and the television. Each of these innovations to transmit information (and misinformation) marked a step in overcoming geographical distances, a delaying factor that was more and more dismantled before becoming completely irrelevant in the era of the internet and global social networks, that is, unless people are denied the access to it, in which case a certain delay is still active.

The system of misinformation used as tool in the fight over political power today in-filtrates and feeds upon a number of other systems, most prominently it seeks to lever out the system of democracy by means that will be explained in the upcoming chapters. The system of misinformation as a political tool is a dynamic, complex system that can also be characterised as a perverse system, in that it is working toward negative escalation via the sowing of mistrust and fear (Meadows, 2009, pp. 111, 124).

Meadows (2009) argued that whilst systems cannot be controlled, one can improve them, but before any measure to disturb the system is undertaken, it is important to ask how we came to where we are today (pp.169–170).

Conservatism in a crisis

The Merriam-Webster dictionary defines conservatism as “a political philosophy based on tradition and social stability […] calling for lower taxes, limited government regulation of business and investing, a strong national defense, and individual financial responsibility for personal needs” (Merriam-Webster’s Collegiate Dictionary, 2022a). The promise conservative parties thus give to the public is one of permanent stability in which survives what proved useful in the past. On the surface, this offer appears to be a recipe for success in times of accelerating change and instability, yet the Republican party lost seven popular votes in the last eight presidential elections, their last victory dating back to 2004 (Beckett, 2019).

In the increasingly heterogeneous U.S. society shaped by globalization and urbanization, support for the Republican party increasingly derives from rural areas of the nation and former industrial hotspots. Liberal world views of younger generations may prove to be long-lasting mindset changes in reaction to a permanently changed, globalized society, a trajectory most beneficial for the Republican party of today (ibid., 2019.)

Misinformation in a system: fear, distrust, and the pursuit for power

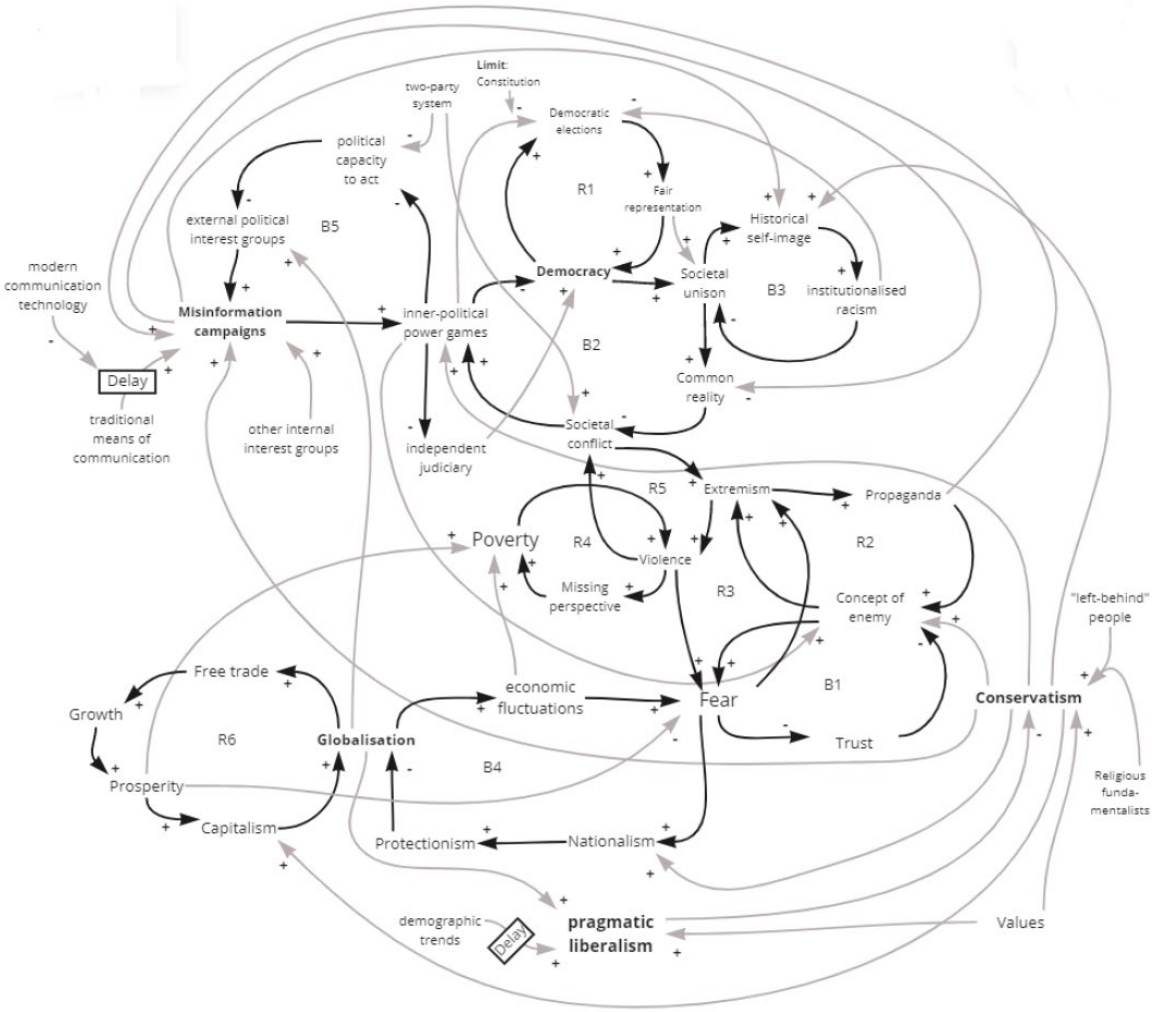

Figure 2. *Depiction of the system of misinformation using CLDs (authors own work).*

Figure 2 presents a depiction of the system of misinformation used as a tool to gain political power in the United States. Instead of the variables **s** and **o** to describe the polarities of the behaviors, the symbols **+** and **–** have been used for better understanding.

As explained in the previous subchapter, the GOP is facing potentially permanent changes in society that are disadvantageous for the party. A “pragmatic liberalism” (Beckett, 2019) emerges in response to a permanently more heterogenous society and increasingly globalized environment and has the potential to threaten Republican majorities. The reactions or strategies of the GOP in response to this threat are manifold: (i) a populist rhetoric and propaganda that fuels the concept of an enemy from the political left, driving fear and damaging trust within the society, (ii) the usage of misinformation to benefit their power games, (iii) gerrymandering, which is the strategic division of land into election districts and is a practice adopted to giving one party an advantage in up-coming election (Merriam-Webster Collegiate Dictionary, 2022b), (iv) new laws that complicate voting (Harte & Trainor, 2022), and (v) a return to and glorification of a historical self-image that feeds from nostalgia and is at least partly shaped by *older* misinformation that rigidified in the image of the nation that many people hold, images that often amplify racist stereotypes and simplify the history of the nation.

Propaganda used by conservative populists, such as former President Donald Trump, in past years has often been taken on by politically close media. Fox News was founded in 1996 by Rupert Murdoch specifically to

spread pro-Republican propaganda and de-fame the Democratic party – it was also the first national television channel of the United States (Beckett, 2019). Retrospectively, this could arguably be seen as a weak signal of the formation of the opposed media bubbles that cover left and right politics in America today. This propaganda amplifies the picture of the supposed enemy which, in combination with rising fear, has the potential to culminate in extremism. Keeping in mind the existence of armed far-right militias such as the Proud Boys, potentially violent conspiracy theorists (there is an overlapping area between these two groups), and the number of firearms distributed in the society, growing extremism can encourage violence that in turn fuels an overall conflict in society which benefits extreme trajectories in both political camps.

There is a certain tragedy in the need for and simultaneous problem with societal unison in the United States. This is because a unified society assumes that a state of harmonious agreement has been reached (Merriam-Webster's Collegiate Dictionary, 2022c), but I argue that in a society, being unified on a societal dimension interconnects strongly with one's perception of the own position in society and one's image of the identity of the society, which comes back to a historical self-image. A strong dissonance between the own image of reality and received information from outside a like-minded environment does not benefit societal unison if those feelings remain unresolved, without reflection and are possibly augmented by fearsome misinformation that steam from a similar image of identity. Challenging your own images of reality is an uncomfortable process, hence not every individual will be willing to allow it to happen. Currently, we are observ-ing a crumbling historical self-image as the people who demand their rightful say in defining the identity of this nation are growing more confident and organized. Unsurpris-ingly, this shift in narrative is accompanied by an equally emphatic countermovement from those whose image of reality is being pressured; this phenomenon is called policy resistance (Meadows, 2009, 112–113).

Democratic elections in a representative democracy such as the United States are held to determine the people who represent the interests of their voters. On a general level, fair representation is thus achieved when a candidate has been voted by the majority of peo-ple. However, how fair representation is defined has become highly debated in recent years: Can only women represent women? Can a white man represent Native Americans? Can representation be ever truly fair (Faas, 2022)?

It can be argued that if the representation is no longer perceived as fair, societal unison is getting damaged as well; consequently, a representation that is perceived as fair posi-tively affects democracy itself because voters perceive their vote as meaningful and feel 'seen'. A strong societal unison also supports a image of reality on which society can agree upon. The concept of a shared reality in this context does not mean that people make similar experiences in life or share a common life standard, but that society can agree on what is real. What an individual perceives as 'real' is, however, not only de-pendent on the individual themselves. Toffler wrote (1970): *"No man's model of reality is a purely person product. While some of his images are based on first-hand observation, an increasing proportion of them today are based on messages beamed to us by the mass media and the people around us"* (p. 156). He furthermore argues that the individual's image of reality must be somewhat accurate if a society is to succeed (ibid., 1970, 156). However, parts of the media intentionally spread false information, thus distorting the sense for reality. What misinformation does is trying to interfere with voter's image of reality, the reality that the democratic mechanisms *work*, that they can be *trusted*, and that a democracy in which one party aims for the destruction of its only opposition is no democracy at all but a system at the brick of "destructive conflict" (Funtowicz & Ravetz, 1994, 573).

The economic dimension is important to understand the motivation behind using mis-information: On one hand, less and less people profit from the capitalist system, the rein-forcing feedback loop that generates prosperity through globalization and free trade is a weakening feedback loop (Beckett, 2019). Simultaneously, globalization is shaping soci-ety, changing the values of its younger generations to the disadvantage of the

Republican party. On the other hand, conservative parties are traditionally strong allies of capitalism, preferring business-friendly policies to restrictive ones. Due to global supply chains and interconnected economies, economic fluctuations whose causes lie outside the sphere of influence of the U.S. President are much more likely. In the worst case, those fluctuations develop into full-grown recessions which in turn can push a large number of people into poverty. The prospect alone of impactful fluctuations and structural changes caused by globalization may increase fears of losing one's livelihood, fear of the *other*, fear that the GOP learned to use for to their benefit, fear that is continuously fueled by misinformation.

An independent judiciary is one of the foundations of a healthy democracy. Meadows (2009) argues that real power is held by those who have control over the rules, constitu-tions being an example of a set of rules that defines social rules (p. 158). In the United States, on the highest level, it is the Supreme Court and its judges that interpret the con-stitution, making landmark decisions that point the way and sometimes pave the way for follow-up decisions on the state level. In recent years, the Supreme Court has become part of the political power game, despite being supposed to be free some political influ-ences, because of the potentially decade-long influence a judge can have (Supreme Court judges traditionally serve for life) on the outcome of cases that touch politically sensitive topics, such as abortion rights, LGTBQ+ rights or voting rights.

With a strong 6-to-3 conservative majority, accomplished through the three controver-sial judges nominated and accepted by former President Trump, the current constellation of the Supreme Court has been criticized for potentially not being able to represent a society that holds more liberal views on these issues than the court does (Liptak & Kao, 2022.)

Lastly, the two-party system of the United States intensifies polarization and can may increase the potential for societal conflict in an already overheated socio-political climate. Moreover, the government's planned policies can be blocked if the President's party does not hold the majority in both chambers, as is the case for Joe Biden's government after the midterms due to a Republican majority in the House of Representatives. This state of paralysis can be further instrumentalized and used to trigger feelings of anger among the public over a government that is unable to solve the most urgent problems. More than anything, a government that has been deprived of its capacity to act does most of all ben-efit external political interest groups who seek to benefit from internally weak United States and are themselves heavily invested in infiltrating the political discourse with mis-information.

Infamously, Russian misinformation campaigns targeting Hillary Clinton during the 2016 election campaign, aiming to helping Donald Trump into office and damaging the trust in democratic mechanisms in the American society, an offence of which the Trump campaign knew (Abrams, 2019).

Intervention

The twelve leverage points framework created by Meadows (2009) will be used to demonstrate where and how intervention into the system of misinformation could possi-bly succeed. Meadows (2009) describes leverage points as points where "small changes could lead to large shifts in behaviour" (ibid, 2009, 145). The framework is depicted in figure 3 below.

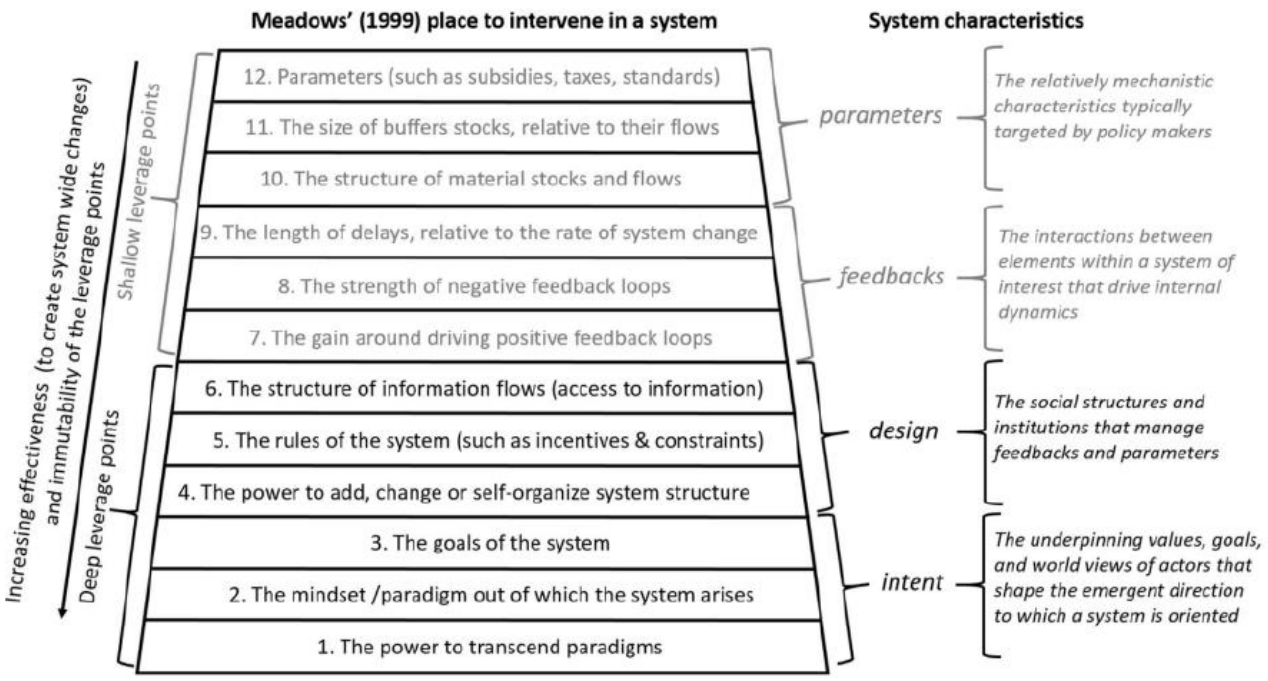

Figure 3. *Meadows' leverage points framework (Abson et. al, 2017, 32).*

The system of misinformation is perverse and thus has to be changed. Aiming for the complete eradication of misinformation is not realistic; however, the systems and balanc-ing feedback loops it is attacking can be strengthened.

Thus, successful intervention may succeed if the emphasis is shifted onto *the goal* of the system which the system of misinformation is damaging first and foremost: the goal of democracy (leverage point 3). Meadows (2009) argues that a figure in a powerful position at the top of a system can change the goal of the system (p. 162); this approach appeals to both Democratic and Republican party, it demands (i) commitment to democratic values, (ii) commitment to discourse and agreement, and (iii) it demands a leader who inter-nalises both. Particularly the first two necessities may appear unthinkable at the moment, however, a weak signal that could be extracted from the midterm elections result is that the public is getting exhausted of the incitement of the public and of the absence of the will to negotiate.

The results of this year's elections indicate the third loss for Trumpism after the 2018 midterms and the 2020 federal election (Haberman & Barbaro, 2022). Misinformation is far from exclusive to Donald Trump but are nonetheless a crucial part of his rhetoric. The question the Republican party has to face now is whether to continue loyalty to Donald Trump and the use of misinformation he stands for. More than anything, I argue, the Republicans as the party that makes use of misinformation, must return to honouring information and understand its worth and their responsibility not only for political discourse, but for their own sake as well: A responsible conservative party is needed that acknowledges the world we live in (a world they co-created) instead of looking back-wards, otherwise the right political spectre will be taken by more extreme parties. Time is irreversible (Derbyshire, 2016, 52), by answering the question what their purpose as a party in a democratic system is, they may find answers about what the future demands from them.

Secondly, given the complex nature of the system of misinformation and the systems and subsystems it is interconnected with, the ability to self-organise may be exploited (leverage point 4). Meadows (2009) claims that this is the systems most powerful form of resilience (p.159) and it may lead to the creation of entirely new

technological or po-litical structures or agreements that can establish balance. Information flows (leverage point 6) offer a third powerful leverage point. Missing information makes people vulner-able to misinformation. The cost of modern communication technology is the overflow of contradictory information modern societies are continuously exposed to. Adding new information makes seemingly little sense, unless the information is introduced in form of tools that help separating information from misinformation. While this approach is seemingly predestined to be implemented in schools, curricula are dependent on the govern-ments that compile them, thus a government that seeks to benefit from misinformation would be less likely to supply the public with a tool through which their internal interests can be debunked. An advantage of this approach is that it does not *necessarily* have to rely on a party or a government. Specialised NGOs or businesses can take on the task to teach people of all age groups about the mechanisms, narratives and appearances of mis-information.

Lastly, stock-and-flow structures (leverage point 10) can be rebuilt. The two-party sys-tem of the United States benefits polarising movements; other parties do exist but play at the current moment so significant role, therefore voters can choose between two political camps between which there is no seamless transition, no middle ground. The midterm elections can be criticized for enabling hasty changes in the chambers that can paralyse the government and thus cause exactly the motionlessness disappointed voters criticised in the first place. However, rebuilding the system is most likely the weakest option of this list as it is hard to execute and time-consuming. Moreover, more parties do not automat-ically result in less polarisation and more truthfulness, there is no better prove for this than the fall of the Weimar Republic.

Conclusion

The system of misinformation is a perverse system that threatens democracy, trust, and solidarity in society. It is fostering and feeds back into itself by abusing and provoking fear and hate. Although having existed and used for centuries, modern communication technology was needed as an additional element in the system to eradicate delaying fac-tors such as geographical distances and the quantity of (mis-)information that could be communicated. These rather recent changes gave misinformation an unprecedented level of attractivity as a tool in the political sphere where swift strategy changes and quick communication are essential. The use of misinformation in this context can therefore not be automatically attributed to a specific party per se but should be seen as an unethical yet available tool of ascending importance to any party or social group that finds itself under increasing pressure from the changing environment in which it is embedded.

In case of the United States, the Republican party is currently holding the responsibility for the damage that has already been done to the political institutions and to society. Their reasons for letting misinformation being used can be found in social trajectories: The American society is becoming more diverse, globalization has increased the interconnect-edness of the U.S. to other nations – a development to which Republican politics in the past has contributed. As American conservatism at large is resisting change, misinfor-mation can be seen as defense strategy to gain and hold power wherever a democratic majority cannot be attained anymore.

This system can be disarmed by recollecting the worth and goal of democracy and reflect as a party on one's responsibility in keeping democracy alive. Signals from voters them-selves which may indicate exhaus-tion can guide the party into this process. Other future possibilities arise from the self-organizing properties of this system, as the lower levels are not only exposed to misinformation but have the ability to defend them-

selves and change their behavior which can affect and change the system's behavior overall. While a restructuring of some political mechanisms and structures is not impossible, it has been identified as least plausible due to the immense cost and expenditure of time it would take.

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Transforming the Paradigms of Nonbinary Medical Care – Transformative Forces and Conditions-For-Change in the Finnish Transgender Healthcare System

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Introduction

The topic of this essay is gender-affirming healthcare for nonbinary transgender individuals in a society built on a binary notion of gender. The transgender healthcare system is analysed with the help of the clover model conceptualisation, explained in detail in chapter 2. The three conditions-for-change – intern tension, bottom-up pressure, and top-down stress – emergent in the society are illustrated with a visualisation.

Chapter 3 relates the theoretical concepts of transitional change to a more specific setting, that is, to the transgender healthcare system. First, the concept of gender binary as well as alternative notions to gender are illustrated. After this, a brief introduction to transgender identities is provided. The chapter ends with a description of the main features of transgender healthcare in Finland.

The 4th chapter explains how the pre-treatment medical evaluation process of transgender individuals, conducted by Gender Identity Clinics (GICs), serves to replicate and reinforce binary understanding of gender. A visualisation is used to demonstrate the norm-preserving mechanisms of the transgender healthcare system designed to maintain the cultural and societal status quo.

After introducing the systemic setting, the essay will move on to detect forces disrupting the dominant binary-oriented constellation that have the potential to push the transgender healthcare system to a point of major transformation. Clover model conceptualisation (de Haan & Frantzeskaki, 2009) is utilised to detect the origins of these formative, supportive, and triggering forces.

Views presented are based on peer-reviewed academic literature found in databases Volter and Finna. In addition, I have gathered information from news articles and personal contacts through a Discord server for trans people based in Uusimaa region. For the convenience of the reader, throughout the essay, abbreviation GIC is used to refer to Gender Identity Clinics.

Theoretical Framework

This chapter first introduces the clover model conceptualisation of societal systems and related transformative forces. After this, drivers of transitional development, referred as conditions-for-change, are presented. The concepts are presented more profoundly in the article of de Haan and Frantzeskaki (2009). In later chapters, this theoretical frame is used to describe the interplay between the transgender healthcare system, representing the dominant functioning of our society, and its surroundings, including more deviant constellations present in the societal system.

The Clover Model and Conditions-for-change

de Haan and Frantzeskaki (2009) applied the so-called clover model to map out the structures, cultures and practices that societal systems consist of to identify and understand forces underlying societal transitions. These drivers of transitional development, or conditions-of-change, create three distinguish categories depending on whether mismatches occur between the dominant functioning in a societal system ('regime') and its surrounding systems ('landscape'), internally within the regime, or between the regime and existing subsystems ('niche-regimes') (de Haan & Frantzeskaki, 2009). Figure 1 visualises this systemic interaction in relation to which transformational change takes place.

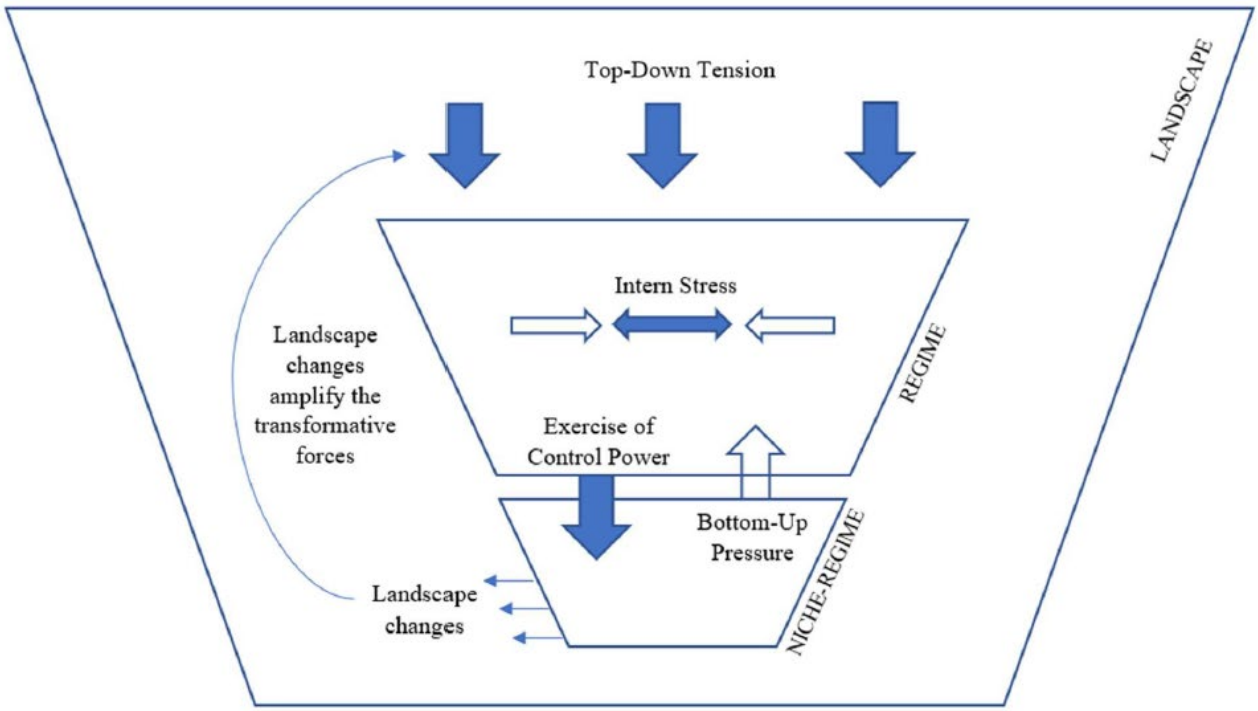

Figure 1. *Transformational Change in a Societal System (as per de Haan & Frantzeskaki, 2009). Picture: Osma Aarnos.*

As per de Haan and Drantzeskaki (2009), discrepancies between the regime and the landscape are called 'tension'. Tension arises when "the 'world' moves on leaving the regime behind with outdated functioning" (de Haan & Frantzeskaki, 2009, p. 596). In this essay, the regime refers to the Finnish healthcare system, specifically the GICs, that operate in a way that replicate and reinforce binary gender norms. This exercise of self-preserving control power is described in more detail in chapter 4.

The landscape covers other societal systems, such as the Finnish political and legislative systems, the larger cultural context, such as the established gender system and its manifestations, global events and foreign influences, such as English language development and opinions of the European Court of Human rights ECHR), and other systemic dimensions with which the regime is in co-evolution.

de Haan and Frantzeskaki (2009) use the term 'stress' when talking of internal mismatches within the regime that give rise to self-regulation and self-protection on one hand and reform schemes on the other. 'Pressure', in turn, describes the mismatch between the regime and niche-regimes, i.e., less powerful yet competitive alternatives to the regime. Once such constellation of deviant functioning has emerged it can co-exist with the regime, die out, or grow into a point where it becomes an alternative to the dominant constellation of cultures, after which it throws over the old societal functioning and becomes the new regime. (de Haan &

Frantzeskaki, 2009). In this essay, the niche-regime refers to the people who recognise that gender is not binary, such as nonbinary trans people (representing the gender-diverse niche) and those who support the niche functioning (the socalled 'allies').

The Clover Model and Dimensions of Society

Following the system's approach of Blanchard and Fabrycky (2005), de Haan and Frantzeskaki (2009) divide the clover model into three conceptual blocks – material, action, and structural – which represent the practices, structures, and cultures of the society. In the material dimension, transformative changes originate from the area of science and technology, and environment. As for the action components, both culture and civil society provide important arenas for transformative forces to operate. When it comes to the structural dimension of society, transformative forces are strongly present in institutions and markets. (de Haan & Frantzeskaki, 2009). This conceptualisation is later used to classify forces of transformation and their origins (see Chapter 5 The Societal Transition Analysis).

Conceptual Framework

In this chapter, the functional subsystems of the societal system, as per de Haan and Frantzeskaki (2009) are introduced in relation to the topic of the essay. These subsystems are, in respective order, the gendered landscape, the niche-regime of gender-diverse thinking, and the transgender healthcare system as the regime. In this essay, the latter is viewed through the lenses of complex systems thinking (Hyytinen & Nieminen, 2015), i.e.., it is preserved as an adaptive, open, and constantly evolving set of subsystems with a history, a social context and a strong capacity to develop in relation to its surroundings.

The Landscape: Gender Binary and Beyond

The Finnish Healthcare System and its subsystems, including GICs, operate in a multidimensional landscape of historical, cultural, and societal elements, co-existing systems, and versatile influences. An important part of this landscape is the gender system, in this case the gender binary, which can be described as a multi-level stratification system consisting of social relational contexts and cultural beliefs about gender (Correll & Ridgeway, 2004).

Correll and Ridgeway (2004) point out that gender systems are most often taken for granted. This is due to their self-sustaining nature: Widely shared ideas about gender turn into cultural rules and stereotypes on the basis of which gender is enacted in social contexts in relation to other people. So, how individuals experience gender is only a fraction of the gender system as every person is also given a script of cultural and social rules to follow or act against. The gender system is mostly created on the social arena where we define ourselves in relation to others. (Correll & Ridgeway, 2004).

One example of a gender system is the gender binary in which people are divided in two distinct categories, male and female (Krylova, 2016). The former is associated with masculine qualities, traits and body parts, the latter with feminine. To this point of time, gender binary has become a widely shared system of hegemonic cultural beliefs and related social practices that operate on all levels of society in every part of the world, as described by Stryker (2017). However, even to this day, many indigenous cultures hold more diverse understandings of gender, despite that Western theories of gender have gained a strong foothold at the expense of

more fluid and dynamic gender systems (Stryker, 2017). Figure 2 illustrates the binary notion of gender in comparison to gender diversity.

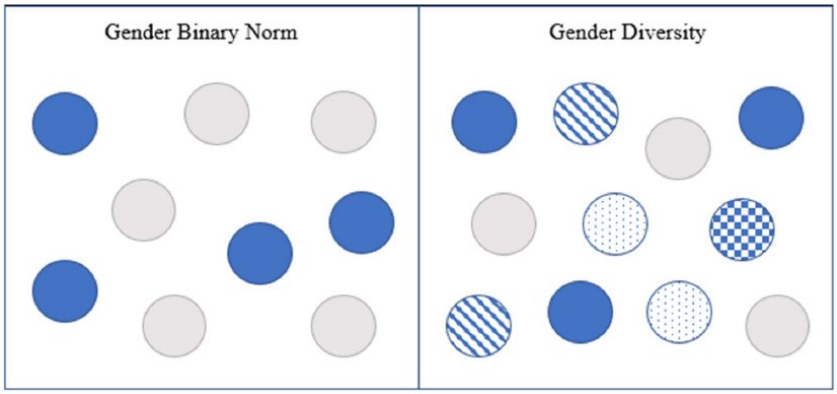

Figure 2. *Gender Binary Norm in comparison with Gender Diversity. Picture: Osma Aarnos.*

Even the two rigidly defined gender categories of the binary gender system have evolved through times, meaning that the feminine of one era has sometimes represented masculinity in another era and vice versa (Stryker, 2017). So, in our collective past, notions thought to be permanent (or “natural”) have only been permanent in theory. Despite this, our notions of gender are highly normative, and therefore, breaking the gender expectations, for example, by having a gender non-conforming appearance or behaving in ways that do not follow the established gender stereotypes, is evaluated more negatively than conforming to the gender norms (Cochran et al., 2016). Some evaluations are made subconsciously in people’s minds, others can be found contained in lawbooks and diagnostic manuals. Institutionalisation of gender takes place in multiple ways, one of which is explained in more detail later (see Chapter 4 Preserving Status Quo: Exercise of Control Power from Regime over the Niche).

The Niche-Regime: Transgender People and Allies

Even in our binary gender system, some diversity is recognized, and so, a glossary of gender-related terms and concepts has been created. The term ‘cisgender’ is used of people whose sense of gender identity corresponds with their assigned gender at birth, while ‘transgender’ (or simply ‘trans’) refers to people who have a different gender identity than the one they were assigned at birth (Stryker, 2017). The term 'transgender' is sometimes incorrectly thought to refer only to binary trans people, i.e. those who wish to transition from one end of the binary to the other, from male to female or female to male (Vincent, 2020). However, some transgender individuals consider themselves non-binary (Vincent, 2020), which brings the whole concept of gender binary under discussion. In this essay, the term 'nonbinary' is used to refer to all gender identities deviating from traditional binary thinking, e.g. people who identify in between or outside the binary categories (third gender), who identify with more than one gender either simultaneously or in a fluctuating manner (intergender), or who have no gender identity at all (agender) (see e.g. Bosson, Buckner & Vandello, 2018; Brooks, Torgler & Whyte, 2018; Winter, 2020). These people represent the ‘niche’ that exists in contrast to the binary notions of gender.

Being cisgender does not automatically imply that the person would accept or support the binary gender system, its strict gender roles and established gender norms. Despite identifying with one or the other of the binary gender categories, there are people who believe that our society should operate in terms of a gender

system that allows gendernonconformity and recognises nonbinary identities. In queer circles, these people are called ‘allies’ (Eichler, 2010).

Transgender people (both binary and nonbinary) and their allies create the niche-regime of this essay. These are the people who recognize that gender binary is just one gender system among many and who wish to extend gender categories beyond male and female, making space for nonbinary identities. Due to its vision, this niche-regime strongly criticizes the current regime, the transgender healthcare system, for neglecting the needs of nonbinary people and favouring gender norm-conformity over nonconforming identities.

The Regime: Transgender Healthcare

In this essay, the term ‘transgender healthcare system’ refers to an organization of institutions, people, and resources responsible to deliver healthcare services for transgender individuals. As all systems within the society, the transgender healthcare system is built on constellations of cultural beliefs and social practices, such as the gender system. The formally recognized notions of gender play an important role in transgender healthcare, arranged as follows: The two main units for trans medical care in Finland are the Gender Identity Clinics (GICs), one of which operates in Helsinki as a part of Helsinki University Hospital and the other in Tampere at Tampere University Hospital. GICs are national specialist units where patients with gender dysphoria are examined and assessed “hoping to strengthen and/or correct their gender” (HUS, [n.d.]). Gender dysphoria refers to feelings of discomfort, distress and impairment related to gender incongruence, reducing functional capacity in transgender people (Nieder & Strauss, 2020).

GICs are also responsible for coordination of psychosocial and somatic treatments associated with gender dysphoria (HUS, [n.d.]). These treatments are generally more widely and easily available for people who are binary trans than for those whose gender identity contradicts the established gender system (see e.g. Bork et al., 2021; Clark et al., 2018; Vierula, 2018; Virtanen, 2020). Individuals who are deemed too "uncertain" about their gender identity may be "shelved", meaning that their assessment period may be suspended for a period time (see Chapter 4.1 Dissolving Non-Binary Identities).

An important factor in the development of any societal system is the co-evolution between the regime and the landscape. In this dynamic relationship, the regime allows incremental adaptation to the changing environment, “keeping the system in a dynamical equilibrium” (de Haan & Frantzeskaki, 2009, p. 595). During the last decades, such adaptation within the Finnish healthcare system has led to dismantling institutionalised gender norms. One example of this is transvestism, the (sexual) desire to wear clothing associated with “the opposite sex”, that was considered a disorder until 2011 at which point pathologizing the desire to cross-dress was no longer deemed medically justified (Saloheimo, 2021). In other Nordic countries, similar reforms had already been put to action, which for its part proves that the systemic transformation in Finland was preceded by general attitude shifts in the landscape.

Preserving Status Quo: Exercise of Control Power from Regime Over the Niche

This chapter describes a set of mechanisms that is used by the regime to exert control over the niche-regime. The purpose is not to take a position on whether these mechanisms are legitimate, nor to take a stand on whether the use of these mechanisms is justified, but to show how certain systemic actions reinforce certain kinds of behaviour, which in turn preserves the established norms on which the system has been originally

built. Examining the regime functioning in relation to the niche-regime reveals the current power positions in relation to which all future shifts in control power take place.

Brief Remarks on the Visualisation Design

This chapter includes a visualisation (see Figure 3) representing the norm-preserving mechanisms of the transgender healthcare system. According to Unger (2010) every model (that is, an informative representation) is affected by the beliefs and preconceived views of the model developer. Even Luukkanen (1994) points out that the modeller's conception of the system always leaves its mark to the model. It is important to understand that the visualisation created for this essay is built primarily on the basis of trans people's experiences, that is, from their perspective, as well as on literature that mostly covers failures of the transgender healthcare system when treating nonbinary and gender nonconforming individuals. So, even if the visualisation does improve knowledge of reality as experienced by transgender people navigating in the transgender healthcare system, it is a simplification that leaves out various systemic interactions (e.g., between GICs and other societal systems).

Reward-Mechanisms of Norm-Conformity

A transgender individual experiencing gender dysphoria may ask for a referral to a GIC for a care needs assessment to receive gender-affirming treatments. The issue is that GICs are known for being reluctant to provide medical care for non-binary individuals (see e.g. Bork et al., 2021; Clark et al., 2018; Vierula, 2018; Virtanen, 2020), which is justified by lack of research data (Palveluvalikoima, 2020; Virtanen, 2020). Intergender individuals, for whom changeability and fluidity are an essential feature of gender identity, are at especially high risk of being shelved, as shifts in gender presentation might look like uncertainty in the eyes of in the eyes of professionals who perceive stability as an essential feature of gender identity. To avoid being shelved or to get off the shelf, nonbinary people sometimes pretend to fit the binary to ensure that they will get the gender-affirming care they need to manage their gender dysphoria (Mulhall, 2022; Personal communication on a Discord Server for Finnish Transgender Individuals, autumn 2022).

In the light of the above-mentioned, Figure 3 illustrates the reward mechanisms of norm-conformity in the transgender health system, showing how binary gender identification and norm-conforming gender presentation get the patients through the gatekeeping system more effectively, allowing them to start medical treatments to alleviate gender dysphoria earlier on with a wider range of treatment alternatives. Triangular shape symbolises pre-treatment state of gender dysphoria, while the round shape represents posttreatment state in which gender dysphoria has been alleviated. Solid blue colour represents the binary norm while patterns and lighter colours imply nonconformity, either in terms of gender presentation, e.g., general appearance (outer layer of the shapes), or in terms of identity, e.g., identifying with both genders (core colour of the shapes).

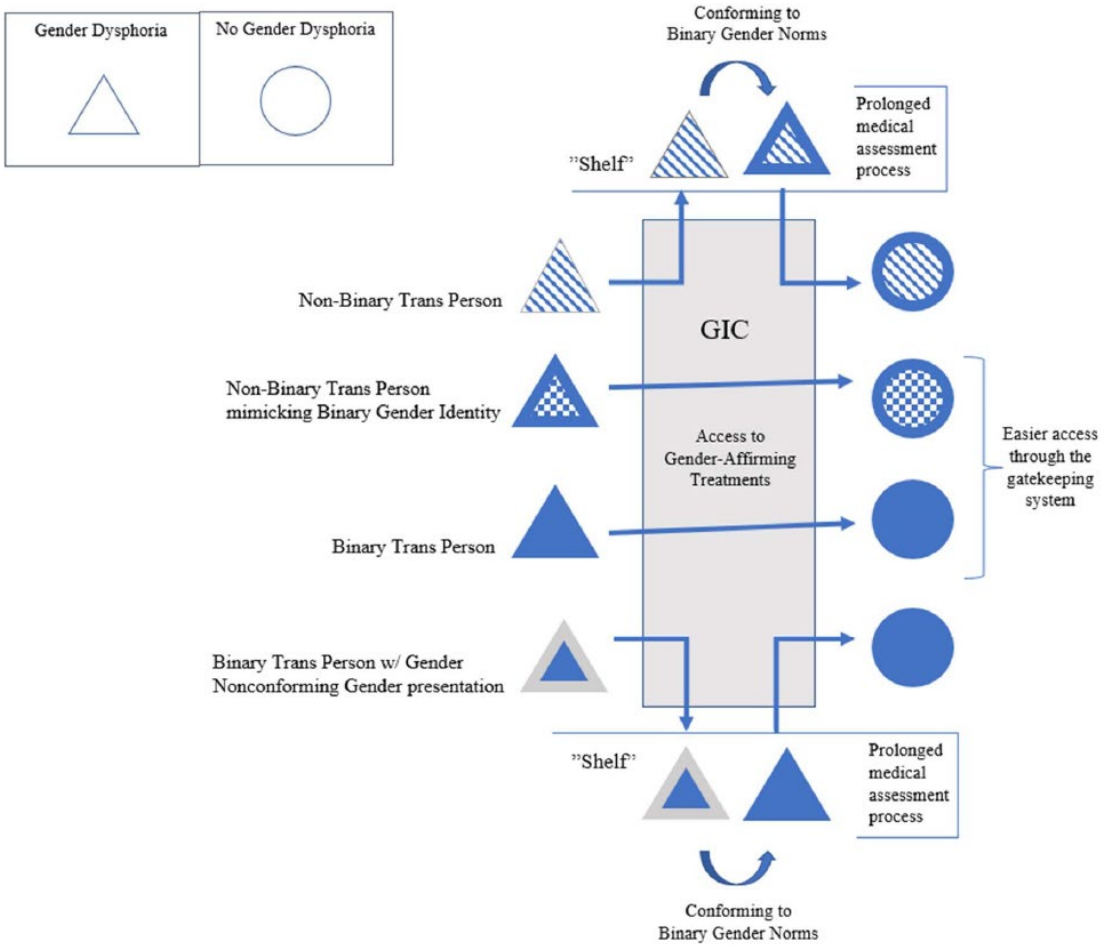

Figure 3. *The Reward Mechanisms of Norm-Conformity in the Transgender Healthcare System. Picture: Osma Aarnos.*

As a consequence of the practices described above, the number of nonbinary people in need for treatment appears smaller than it actually is. In addition, the experiences of nonbinary people who have received treatment after having pretended to fit the binary remain hidden from statistics. Resources for research and healthcare development projects are allocated based on needs, but the current situation creates a false impression of the actual number of nonbinary individuals and their real wishes and wants.

Even binary trans people whose gender expression does not align with the established gender norms might feel the need to conform to the expectations of GIC in order to avoid being shelved and/or to get the gender affirming care they need (Cleary et al., 2018; Eckstrand, Ng & Potter, 2016). To be considered real or valid by the gatekeepers, these gender nonconforming people sometimes choose to adopt gender-stereotypical behaviours, speech patterns and clothing styles (Personal communication on a Discord Server for Finnish Transgender Individuals, autumn 2022). The binary performance of gender is rewarded with easier access to treatments, and so, the stereotypes are once again reinforced.

Here, it is important to note that preserving and reinforcing the gender binary is not necessarily a conscious intention or underlying purpose of the trans healthcare system, but rather, the trans healthcare system operates as a subsystem of a larger healthcare system, following the Legislation on social and health services and decisions made by the Ministry of Social Affairs and Health. None of the mentioned are free from the legally recognised and well-accepted gender system of our society. Norm-making in the healthcare system can be seen as a derivative of the system premises. In other words, the norm-making process is a larger systemic phenomenon, not a deliberate act of individual professionals.

The Societal Transition Analysis

In this chapter, transformative forces present in the conceptual blocks of society are presented. The spreadsheet table in which the identified forces and their origins are compiled can be found after the references section (see Appendix). After explaining the nature of formative, supportive and triggering forces as well as conditions-for-change driven by these forces, potential systemic developments in the societal arena are briefly outlined.

Transformative Forces

To better understand the system dynamics of the current regime (binary healthcare system), the niche-regime (transgender people and their allies), and the landscape in which these both operate, a spreadsheet table of the components of our societal system and related transformative forces has been compiled (see Appendix). The societal dimensions correspond to the material, structural and action components of the Clover model conceptualisation. However, the environment and market aspects have been left out of the spreadsheet as these subdimensions were not as relevant to the subject matter at hand as science and technology, institutions, culture, and civil society.

The first column presents formation forces, that is, new demands and new ways of functioning arising from the niche. Whether these formation forces will get stronger or weaker depends highly on supportive forces that are tightly interconnected with themes of power, control, and resources (see the 2nd column). Triggers (the 3rd column) can have surprising effects on the strength of other forces, spreading their influence on all dimensions of society. On one hand, a sudden crises, systemic failure, or extern influence might build support for the niche-regime, leading to landscape changes that eventually force the regime to adopt its ways (e.g., the criticism that Finland has received from international human rights organizations due to the compelled sterilization of trans people). On the other hand, triggers can also arouse counterforces that grow opposition towards the nicheregime. An example of such a trigger could be articles published in the media about people who have lied their way through the transgender care assessment process, and later regretted their choices.

The spreadsheet reveals that even if transformative forces for a more diverse and flexible understanding of gender in healthcare systems can be spotted in most dimensions of society, the obstacles standing in the way of change are largely related to supportive forces linked to power, control and resources, all preserving the status quo.

Conditions-For-Change

After identifying the formative, supportive and triggering forces driving the transitional development, these were grouped based on origin. de Haan and Frantzeskaki (2009) connect formation forces with bottom-up pressure, systemic failures with internal stress, and standardization practices and resources provisioning with top-down tension. Exercise of power can occur either as internal stress or top-down tension. For example, a situation where the regime imposes new functioning can be a result of both dynamic internal development processes and more direct reactions to the changes in the landscape.

Identifying the origins of transformative forces – that is, analysing whether these forces are external (top-down or bottom-up) or internal – discloses conditions-forchanges that need to be considered when investigating the transitional development of the transgender healthcare system. In the spreadsheet table of transformative forces (see Appendix), these three conditions-for-change are marked with different colours.

Within the regime (GICs), there is stress stemming from internal mismatches in the regime's functioning. Examples of such mismatches are knowledge gaps and resources deficiency leading to general dissatisfaction, and situations where current practices prove to be insufficient, causing disagreement on desired courses of future development as old norms clash with new ways of thinking. Within GICs, there might be some willingness to impose new functioning, but individual people do not have the power to act on their own against the larger system. In situations where the system tries to develop itself, it needs to deal with self-protecting forces and general limitations: lack of research and funding, resistance to change, use of protection power, slow decision-making, bureaucracy, lack of the right kind of expertise...

The norm-preserving mechanisms of GICs (see Figure 3) work only as long as the members of the niche-regime play by the regime's rules. Resistance, in turn, creates bottom-up pressure. In practice, this can be seen, for example, in situations where, instead of conforming to the binary norms of GIC, nonbinary and gender nonconforming transgender people end up seeking gender-affirming treatment abroad while waiting to get off the shelf in Finland. Such a financially costly decision becomes a message to the outside world that the GIC has failed in its mission to provide treatment.

The vast number of transformative forces compiled in the spreadsheet (see Appendix) shows that the empowered niche-regime has already left its mark to the landscape. As the niche-regime gains support and gets reinforced, the tension between the regime and the landscape increases. A recent example of such built-up tension is the citizens' initiative submitted to Parliament proposing that the legal side of transitioning should be separated from the medical treatments. If the social, political, and cultural shift continues in favour of the niche-regime, eventually, the old regime must accept that its practices no longer meet the expectations of the outside world, which makes transformative change necessary.

Future Developments

After recognising conditions-for-change – tension, stress, and pressure in the system – it becomes possible to theorize whether these have the potential to overthrow the current regime or at least fundamentally change it.

It seems that our current regime is currently in a predevelopment phase: There is builtup tension between the regime and its surroundings. This is because societal support for niche functioning has grown, helping it expand and become empowered. In line with the landscape changes, even the regime has adopted new ways of operating that go against the traditional binary perspectives – after all, nowadays, the existence of nonbinary identities is recognized, if not legally, at least in the field of medicine. At the same time, the landscape changes keep accelerating. If the transgender healthcare system lets itself develop in line with the landscape, in the near future, old norm-preserving mechanisms are likely to be revised. This could restore transgender patients' trust in the healthcare system, which reduces the need to conform to the expectations of the outside world.

Furthermore, the above-described conditions-for-change might keep building up until reaching a point of no return in which the mechanisms preserving the gender binary are dismantled and replaced with a more diverse notion of gender, leading to major transformation in the functioning of the societal system. If the more diverse understanding of gender becomes institutionalised, a new niche-regime is likely to be formed of those who believe in a binary gender system, seeing it as more safe, traditional, natural, or otherwise more justified, and those who for some other reason oppose to gender-affirming medical care of nonbinary individuals. Consequently, a new set of systemic interaction patterns would be formed. However, when considering the likelihood of this kind of future, it is important to keep in mind that the current regime still has strong historical and cultural support, meaning that it has potential to resist change and maintain its current modes of operation for many years to come.

Conclusions

In this essay, I have investigated transformative forces and conditions-for-change in relation to the transgender healthcare system and its patients, and a larger systemic landscape. Figures have been used to illustrate, how the current regime preservers gender norms by gatekeeping medical treatments for nonbinary and gender-nonconforming transgender individuals. To categorise different transformative forces and their origins, a spreadsheet in line of the Clover model conceptualisation (see Appendix) has been compiled. Some potential courses of future development have been presented, but since these were not the main topic of the essay, no guesses about the probabilities of changes have been presented.

I hope that in the future, scholars will delve more deeply into the transformative mechanisms behind changing social structures, such as the gender system. Viewing culture shifts from a systemic perspective gives an interesting outlook on the sociology of transformation. In addition, it would also be fascinating to know if there is any way to measure the magnitude of pressure, stress, and tension in a system. How can we identify which conditions-for-change will eventually dissolve, and which are sufficient to drive societal system to change?

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Appendix: Transformative forces and related conditions-for-change

Grey: Bottom-Up Pressure

Red: Top-Down Tension

Blue: Intern stress

	Formation forces: related to the potential for societal innovation	**Support(ive) forces: strengthen or weaken present transitional trends**	**Triggers: perturb or shock the system**
Institutions	F1: Presence of a niche: - alternatives to GICs (e.g., private healthcare clinics outside Finland) - actors within GICs advocating for change - non-normative "clientele" of the healthcare system	S1: Standardization of practices - assessment and examination practices - medical and care practices - interaction practices	T1: Systemic failures - inefficiency - ineffectiveness - discrepancies between resources and care demand
	F2: Presence of a (new) demand - demand for recognition and equal care for non-binary individuals	S2: Provision of resources - state funding	T2: Crises - bad publicity
	F3: Introduction of new practice - GIC patients helping one another to get through the gatekeeping system, e.g., by giving advice	S3: Exercise of power - in Finland, there are no private healthcare options to receive genderaffirming care - legislation, guidelines - political control - international critique - self-regulation of the system	T3: Exogenous events - influences from other countries
Civil Society	F1: Presence of a niche - people who reject the gender binary - people who identify as nonbinary trans - social movements - human rights organisations	S1: Standardization of practices - new norms (e.g., interaction practices, safer space principles) - recognition of diversity in everyday practices (e.g., gender neutral toilets)	T1: Systemic failures - habitual thinking vs. new realities - transphobia vs. diversity-thinking - values and action inconsistency

		- gendered spaces, traditional gender norms	
	F2: Presence of a (new) demand - demand for trans rights - citizens' initiatives	S2: Provision of resources - resources on social movements and human rights organisations	T2: Crises - political crises - public outrage, demonstrations
	F3: Introduction of new practice - new interaction practices (e.g., asking for pronouns)	S3: Exercise of power - increase in number of supporters of the new trans law and new care practices - activism - political resistance - priorisation (trans rights as "a minority problem")	T3: Exogenous events - influences from other countries
Culture	F1: Presence of a niche - spaces for trans and nonbinary people - visibility: queer culture, literature, and arts	S1: Standardization of practices - safer space principles - evolving language (e.g., use of they/them) - everyday life practices (e.g. gender roles, clothing)	T1: Systemic failures - Cultural clash between binary gender norms vs. diversity thinking, between history vs. new interpretations
	F2: Presence of a (new) demand - demand for safer spaces, recognition, human rights…	S2: Provision of resources - funding for queer culture, arts, and literature - queerbating (using queerness as a marketing technique)	T2: Crises - Cultural crises: tradition vs. new interests and practices of everyday life
	F3: Introduction of new practice - cultural artefacts (e.g. trans pride flags) - language development - new interaction practices (e.g., asking for pronouns)	S3: Exercise of power - trans rights movements - protection of old beliefs and traditional ways - priorisation (trans rights as "a minority problem")	T3: Exogenous events - influences from other countries - increased critique against colonialist heritage (e.g. binary gender system)
Science and technology	F1: Presence of a niche - organisations such as SMOK and Seta - university research projects - individual researchers and advocates	S1: Standardization of practices - new gender affirming care practices - new medications	T1: Systemic failures - knowledge gaps - knowledge deficiency - research inefficiency and ineffectiveness
	F2: Presence of a (new) demand - demand on new knowledge	S2: Provision of resources - funding for research programs	T2: Crises
	F3: Introduction of new practice - new knowledge - new research - experience expertise	S3: Exercise of power - priorisation (trans rights as "a minority problem") - control over funding of research projects - control over whether new knowledge can be applied - control over which care practices and medications are introduced and for whom	T3: Exogenous events - international research

FUTULAB3 Participatory Scenario Planning

FUTULAB3 Participatory Scenario Planning invites students to 'learn by doing'. In the Masters' Degree Programme in Futures Studies at University of Turku, it serves as a key opportunity for students to engage in participatory methods and scenario thinking while taste-testing what it could be like to be a foresight practitioner. This course introduces the wide variety of scenarios which could be made and is organised around conducting simplified version of now-classic approach to scenario planning for a company or organization.

In FUTULAB3 2023, the case company was Bayer, a global enterprise with core competencies in the Life Science fields of health care and agriculture. During the course, small teams of students followed a modified version of the Global Business Network's scenario process to produce a set of scenarios for the case organisation. The grand finale was presentations of their completed work to the case organisation and writing a report about it. Their presentation slides and group reports were delivered to the case organisation. The selected 'coolest paper' for FUTULAB3 2023 is one of these group reports. The course teachers were University Teacher, PhD **Hanna Heino** and Project Researcher **Amos Taylor**. The selected paper was reviewed by both teachers.

• • •

The group report written by **Alisa Belmas**, **Samaneh Ebrahimabadi**, **Shahriar Rahman** and **Truc-Mai Jenny Vien** is an example of well mastered scenario process and academic thinking. The report 'The Futures of Health Data Ownership in the Nordics – 2050 Scenarios' presents clearly the procedures of scenario planning and shows an understanding about the concepts and facts. The selections and use of references are excellent. The scenarios are well formulated and have clear differences. They have tested their scenarios with wind tunnelling and give well-grounded recommendations to Bayer.

The Futures of Health Data Ownership in the Nordics – 2050 Scenarios

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Introduction

Who owns your health data? According to a recent study by Deloitte, less than half of healthcare consumers feel that they have control over their own data (Betts & Korenda, 2019). Since wearable technology and the digitization of medical records have enabled the collection and analysis of vast amounts of health data, clarifying data ownership has become more crucial than ever. Who benefits from the cliché "data is the new oil of the 21st century", and at what cost?

As novel technologies and data sources continue to emerge, the topic of health data ownership is expected to become increasingly intricate in the future. Since Bayer AG is a life science company with divisions in pharmaceuticals and consumer health, the topic of health data ownership is crucial to them.

This report will explore the futures of health data ownership in the Nordics in 2050. The authors use the method of explorative scenarios to provide a powerful approach for searching for potential future developments, identifying key drivers of change, and promoting strategic thinking and dialogue. Our team proposes four possible future scenarios – Data Empowerment, Health Inc., Data Monopoly, and CommonHealth of Nations, shaped by two critical uncertainties of the centralization of power and level of data literacy in society. Drivers such as political ideologies, economic inequality, willingness to share data, the rise of infectious diseases and possible new pandemics, cyber insecurity, and the development of security technology played a key role in building scenarios.

The report discusses the use of scenarios in decision-making, specifically concerning the biobanking strategy of Bayer AG. Ultimately, this essay attempts to provide an imaginative and versatile approach to explore the complex and uncertain issue of health data ownership, leading to not only more informed and nuanced scenario narratives but also pathways while providing more robust insights and guidance to stakeholders.

Method

Scenarios as a futures research method

Scenarios are an effective research method for exploring potential future developments. They can encourage decision-makers to think outside of the constraints of the present and to consider a broader range of possibilities. Additionally, scenarios offer a way to identify key drivers of change to explore how different variables may interact with one another to shape the future. This can lead to a more nuanced and holistic understanding of potential future developments and can help individuals and organizations make more informed decisions in the present. (Ralston & Wilson, 2006) Through employing a cooperative scenario planning process that involves stakeholders, individuals, and groups, they can collectively recognize shared objectives and priorities and envisage a more appealing future. Scenarios can uncover latent conflicts and assumptions, encouraging dialogue and shared understanding. Such a participatory and democratic process of decision-making is conducive to consensus-building and action towards a cohesive vision for the future. (Kahane, 2012)

Strategic conversations can benefit significantly from the use of scenarios, as they provide a powerful tool to stimulate discussion and debate around alternative futures developments. Scenarios offer a means to engage stakeholders in envisioning the futures and can foster diverse perspectives and ideas. Moreover, scenarios can be leveraged to question assumptions and mental frameworks, leading to fresh insights and innovative ideas that may not have otherwise emerged. (Van Der Hejden, 2005)

According to Schwartz (2012), scenarios are valuable for futures research because they help decision-makers to think about the future in a structured and systematic way. Scenarios offer a way to navigate the inherent uncertainty of the futures and provide a framework for considering how different events and trends could interact. They can help individuals and organizations anticipate potential challenges and opportunities and prepare for different futures.

In general, scenarios are a suitable research method for exploring potential future developments, identifying key drivers of change, and promoting strategic thinking and dialogue. Scenarios can help individuals and organizations anticipate potential challenges and opportunities, and prepare for different possible futures, leading to more informed decision-making in the present.

Approach and procedures

The team decided to use the exploratory scenarios approach for this project. Exploratory scenarios are a useful method for exploring uncertain and complex issues. According to Van der Heijden (2005), exploratory scenarios are designed to explore possible futures and identify key drivers of change, rather than prescribing a specific course of action. Unlike normative scenarios, which are developed with the intent of influencing a particular outcome, exploratory scenarios are open-ended and seek to uncover a range of possible futures. This approach can be particularly helpful in examining the futures health data ownership, which is subject to rapidly changing technological advancements and regulatory environments, hence, a complex and uncertain issue.

Ramirez and Wilkinson (2016), note that exploratory scenarios can help stakeholders to prepare for a range of potential outcomes and to make informed decisions based on scenarios that are most likely to be realized. This approach is especially important in the context of health data ownership, where there is a high level of uncertainty and multiple stakeholders with competing interests. Exploratory scenarios can facilitate a more open and transparent dialogue among stakeholders and they can help to identify areas of consensus and disagreement. This, in turn, can lead to more effective decision-making and a more inclusive and democratic approach to addressing complex issues. Therefore, exploratory scenarios are more suitable than normative scenarios for examining the future of ownership of health data, as they allow for a more open-ended exploration of possible futures and encourage a collaborative approach to decision-making.

Consequently, we decided to use exploratory scenarios, which provide an imaginative and versatile approach to examining complex and uncertain issues, as they are a useful tool for exploring the landscape of health data ownership. The procedure of scenario building (Figure 1) is comprised of several steps:

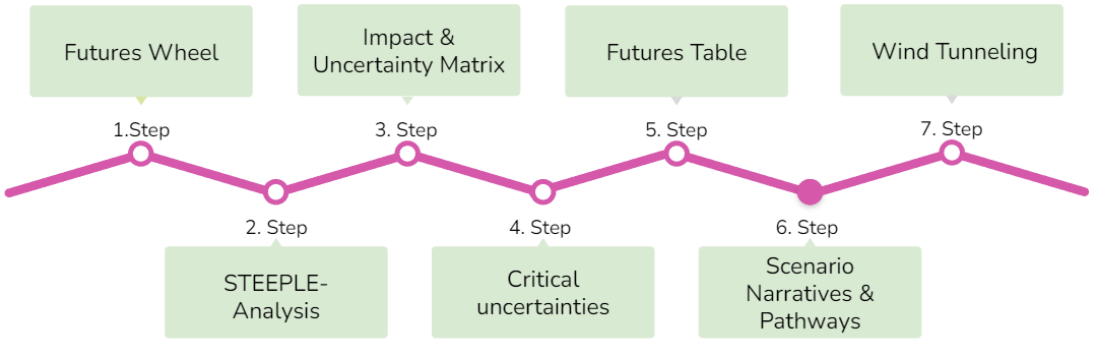


Figure 1. *The procedure of scenario planning.*

1. We started by creating a Futures Wheel, which allowed us to identify factors to consider in our project. This tool allowed us to map out the various drivers, trends, and uncertainties that could shape the future of health data ownership. We began by brainstorming all the potential factors that could impact the topic at hand and then organized them into a visual diagram. From there, we analyzed and prioritized the factors to identify the most important ones to consider in our research.
2. The PESTEL framework is particularly functional for assessing the impact of macro-environmental factors on an organization or business, and for identifying both opportunities and threats (Yüksel, 2012). PESTEL stands for political, economic, sociocultural, technological, environmental, and legal factors. The method involves analyzing the various trends and drivers that could impact the organization's operations. However, we felt that for the subject of our project, it was important to add an additional focus on ethics, which is not explicitly included in the PESTEL method. We then conducted a STEEPLE analysis to assess the various macro-environmental factors that could impact the future of health data ownership. This analysis considered socio-cultural, technological, economic, environmental, political, legal, and ethical considerations. By including the STEEPLE method in our futures research, we were able to identify various trends and drivers that could impact the issue, such as changing cultural attitudes toward data privacy and increasing technological innovations in data management. Ultimately, this allowed us to develop more informed and nuanced scenario narratives and pathways, and to provide more robust insights and guidance to stakeholders.
3. From this analysis, we identified critical uncertainties that could significantly impact the future of health data ownership and used an Impact & Uncertainty Matrix to prioritize these uncertainties and their potential impact.
4. After identifying the most critical uncertainties with high impact, we used a Futures Table to map out the different combinations of these uncertainties and their potential outcomes.
5. Next, we developed detailed scenario narratives and pathways that described the most likely future scenarios for health data ownership and how they might impact different stakeholders.
6. Finally, we conducted wind tunneling to stress-test the scenario narratives and pathways, identifying potential weaknesses or gaps in our analysis. According to Porter and Heppelmann (2014), wind tunneling enables decision-makers to stress-test their strategic plans under a range of potential futures, rather than relying solely on historical data or extrapolations from the present. This approach allowed us to identify the strongest strategic options, those that are flexible and adaptable enough to perform well under a wide range of conditions.

Key drivers

Schwartz (2012) claims that futures scenarios should include observations from the present, namely, key driving forces in the macro-environment. Schwartz proposes to gather observations according to the PESTE checklist: political, economic, sociocultural, technological, and environmental forces. We decided to proceed with a variation of this framework – STEEPLE – where legal and ethical drivers are explored additionally, since health data is a sensitive topic causing ethics-based discussion, and since it depends on laws and policies (Skovgaard et al., 2019). Drawing from Van der Heijden's (2005) Iceberg model, a list of larger-scale drivers and uncertainties was derived from initial observations of events gathered from a literature search and the team's background knowledge. Then we ranked drivers twofold: according to the degree of uncertainty as to what future state this driver will turn to between now and 2050; and the level of impact on the futures of health data ownership. The final ranked list of drivers is presented in Table 1.

Table 1. *Final ranked list of key drivers.*

	Low Impact	High Impact
High Uncertainty	- Shifts in the worldwide power structures.	- Centralization of decision-making and governance; - Data literacy; - Political ideologies and beliefs about the role of the government in controlling and regulating data; - Economic inequality; - Willingness to share data; - Rise of infectious diseases and possible new pandemics; - Cyber insecurity; - Development of security technology.
Low Uncertainty	- Technological advancement in ML, connectivity, and processing power (quantum computing, federated learning, etc.).	- Cost of building and maintaining data infrastructure; - Amount and types of data gathered in the future & role of wearables; - Aging population; - Rise of natural disasters; - Greater interconnectedness; - Tech development of processing; - Political pressure or lobbying from businesses or special interest groups with a stake in data ownership and control.

Let us now consider the most important drivers (i.e., those in the "High Impact / High Uncertainty" quadrant) in more detail. Two of the drivers were determined to form the scenario logic and will be discussed in the next subsection. Other key drivers can be listed as follows:

- ***Political ideologies and beliefs about the role of the government in controlling and regulating data.*** Since the ownership of data is regulated by law, the political beliefs of those in power will have a significant impact on the futures of data ownership, sharing, and usage. Responses to Covid-19 highlighted this relation: for instance, in the UK, a conservative health secretary enabled police to access

healthcare data to enforce self-isolation, while the technocratic South Korean government used data from credit card transactions and smartphone movement to track infected individuals (Downey, 2020; Greer et al., 2021).

- ***Economic inequality***. The level of economic inequality and the related divide in access to healthcare, technology, and information will influence individual experiences with data in the future. In the worst case, it will lead to a polarization between well-informed citizens that can leverage health data for their benefit, protect their privacy, etc., and less-informed citizens who will not be able to do that. That divide can be even more prominent for groups who experience other sources of inequality (McMichael et al., 2006; Shoup et al., 2022).
- ***Willingness to share data***. In a recent review, Skovgaard et al. (2019) discuss the attitudes to sharing and repurposing health data in the EU and UK. In general, the attitude is conditional to the purposes and perceived beneficiaries of data reuse: sharing data for the improvement of treatments is perceived positively, but sharing data with insurance companies or marketers is perceived negatively. Another study suggests that in the Nordics, willingness to share health data is generally high, and concern about privacy is low (Patil et al., 2016).
- ***Rise of infectious diseases and possible new pandemics.*** While there is a consensus about the relation of infectious disease outbreaks with climate change (McMichael et al., 2006), the possibility of a new (or recurring) pandemic is a wild card driver. However, we assume that it may influence both the governmental interests in the collection and use of health data and public attitudes to data ownership. For example, Deloitte reports that the willingness to share health data increased during the Covid-19 crisis (Betts et al., 2020). At the same time, the deployment of data collection and use by governments across the world caused discussions, both public and academic, regarding the ethical and legal boundaries of such actions (Greer et al., 2021; Zhang, 2022).
- ***Cyber insecurity*** affects both public trust in health data sharing, and stakeholders' security and ability to make use of data. Skovgaard et al. (2019) report that people are generally uneasy about data security and possible breaches. There is also evidence that the healthcare sector is vulnerable to cyber-attacks, for example, a cloud compromise occurred in 45% of healthcare organizations in the US in 2020-2022, with an average of 22 incidents (Ponemon, 2022).
- ***Development of security technology*.** Linked to the previous driver, the state of cybersecurity technologies in 2050 will impact both the attitudes toward data ownership and the opportunities to use data. Recent advancements in the fields of cryptography (e.g. zero-knowledge protocols), database mechanisms (e.g. blockchain), and identification (e.g. biometric identification or self-sovereign identity) lay the grounds for further development. We can see weak signals of the adoption of these technologies on the governmental level: in Busan, South Korea, a Blockchain ID App provides access to public services through decentralized identification (Lim, 2021).

Critical uncertainties

The following is a brief explanation of the remaining two of the most important drivers, that the team chose as critical uncertainties. The health data ownership scenarios are scaffolded by two axes, that visualize two critical uncertainties that can shape the futures of health data ownership in the Nordics until 2050 (Figure 2):

- The x-axis represents a systemic societal characteristic: centralized versus decentralized governance and decision-making. In political studies, centralization and decentralization refer to the ability to sanction decisions and initiate actions either on the central (governmental) or local level (Gaskel & Stoker, 2020). However, our team decided to expand this notion to explore power distribution in society in general, for example, between tech giants and their users. This critical uncertainty raises questions such as, how would financial or policy power be distributed in society? What role will hierarchy play? What type of governance will prevailing public values endorse? One extremity of the x-axis, *"Decentralized decision-making & governance",* distributes decision-making around data management. Regulations exist but they put fewer limitations on citizens or companies in handling data. Engagement and innovation are some of the prevailing public values that support decentralization (Witesman, 2020). An opposite extremity – *"Centralized decision-making & governance"* – describes a society with a strong central governmental capacity to make decisions about the collection and use of health data. Prevailing public values, such as power and efficiency, favor centralization (Witesman, 2020).
- The y-axis shows two endpoints of data literacy in society. Data literacy can be defined as "the ability to think critically about data in different contexts and examine the impact of different approaches when collecting, using, and sharing data and information" (Tarrant, 2021). Our team refers in this report to the data literacy of individuals. This critical uncertainty raises questions such as do citizens understand the value of their data? Are they able to recognize how data is collected, used, and shared? Are they able to critically assess the implications of sharing data and make informed decisions regarding their data? The first alternative, *"Low data literacy"* represents a society where individuals, in general, have limited ability to think critically about their data; it echoes the current low level of awareness about the reuse of health data (Skovgaard et al., 2019). An epistemic inequality between better- and less-informed citizens can arise (Shoup et al., 2022), with only a small share of society being data-literate. In contrast, the *"High data literacy"* alternative describes a society without the above-mentioned divide, with equal opportunities to educate oneself about data and an overall high ability of individuals to critically assess how data is handled and understand data value.

Having discussed the forces shaping the futures of health data ownership in the Nordics, the next section proposes four alternative futures in 2050.

Scenarios of Health Data Ownership in the Nordics

The four alternative futures, that the team created for health data ownership in the Nordics in 2050 are visualized in Figure 2. Every scenario constitutes five parts: *Pathway to the scenario* describes a chain of events that can possibly lead to the scenario; *Main concepts and policies* provide an overall description of the future, with a focus on ownership and management of health data; *Unintended obstacles & challenges* highlight unforeseen effects and developing counterforces, as well as social dilemmas; *Outcomes & consequences* focus on the results of the main concepts and hint to possible further developments; finally, *Personal narrative* offers a first-person human-scale perspective to the scenario.

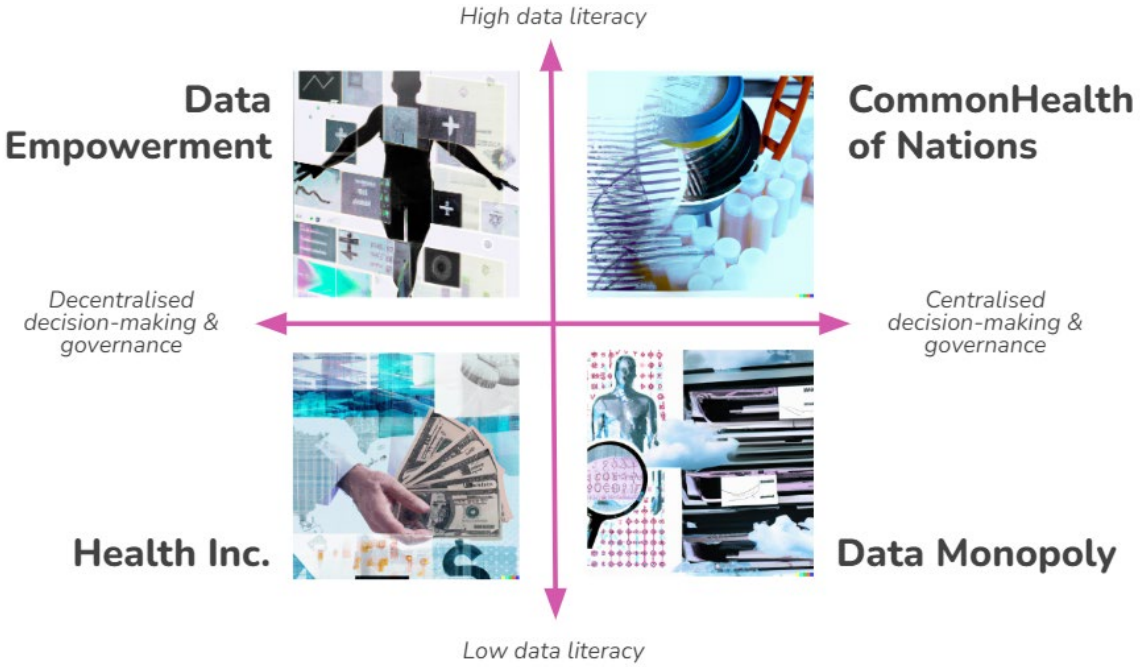


Figure 2. *Scenarios of health data ownership in the Nordics in 2050.*

Scenario 1: Data Empowerment

Pathway to the scenario: Democratic values were reinforced in Europe after Ukraine's victory in the war. The Nordic governments have taken the path to liberalization and equal distribution of power in their societies. The 2020s became a decade of numerous data breaches from major tech players, some of them possibly orchestrated from abroad and some being internal faults. Companies increased cybersecurity investments, but societal tension already mounted until a sensitive health data leak quickly snowballed into a full-blown crisis. Protests for data rights emerged which had a significant impact on attitudes to data in societies and legal data regulation. In 2030 data literacy rates boomed with training in schools, communities, and online resources, created by data rights NGOs. Major technical progress took place in the 2030s and 2040s, including secure identification, and robust development of Web3 and blockchain; at the same time the cost of health data mining, e.g., genome sequencing or self-tracking digital biomarkers, dropped significantly. When automation forced many people out of work in the late 2040s, getting the economic value of personal data became one solution for loss of income. This chain of events resulted in a *Data Empowerment* scenario in 2050, where people own their health data and can create value out of it. Products and services, such as data marketplaces,

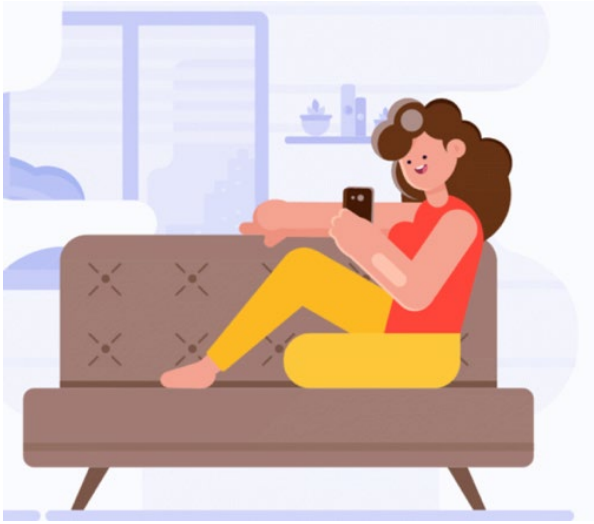
connect people with organizations, competing by offerings, security measures, and fees; cloud services offer cheap storage, and hardware producers offer local secure servers.

Main concepts and policies: In this scenario, health data is mainly owned by individuals with autonomous sharing opportunities. With a sense of personal ownership over data, individuals can decide to what extent their data is used by others, especially companies or service providers based on various modes of consent (Skovgaard et al., 2019). These different modes of consent can fulfill different needs of the consumers, which can allow them to have full control of their data. Data literacy training is also an integral part of this society. Investment in this area is highly encouraged and with the help of the funding several voluntary organizations work to ensure data safety, especially in healthcare. Data literacy training is provided through various mediums such as online resources, training that is offered in schools etc. Legal measures with punitive action[1] are implemented. Preventive measures are also taken into account for data manipulation. Biobanks are becoming popular day by day. Therefore, the government is planning intensive investments in biobanks to develop the infrastructure. The government also enacted a new law to use the data from biobanks for research purposes and it also provides people with the opportunity to utilize their consent according to their will. This law helps companies to have more access to health data from general sources and biobanks. However, some of the members of civil society are not content with the regulation. The health-based companies use their experience to expand their business in developing countries which gives them access to more data.

Unintended obstacles & challenges: One of the main unintended consequences is a demand for privacy from individuals. As people become more aware of their data and its value, they may become more protective of it. This can lead to a demand for increased privacy and security measures to prevent unauthorized access or use of their data. The demand for privacy can create tension between individuals who value privacy and those who believe in sharing their data for their profit. Moreover, economic inequality can also affect the protection of data. Individuals with greater financial resources may be able to afford more advanced privacy and security measures, while those with limited financial means may not have the same level of protection. Besides, underprivileged people could be pressured to sell their data to make a living, while more privileged have more freedom to decide. This divide can exacerbate existing social and economic inequalities.

Outcomes & consequences: Since individuals are more aware of data through educating themselves with information that is available on the internet or through attending classes on data literacy, they thoroughly understand the implication of data sharing and want to spread data awareness. As a result of this, individuals require more possibilities to protect their data and to make informed decisions. Due to their demand, technology companies have invested in the further development of technologies that would offer individuals the chance to protect their privacy and give various modes of consent. In addition to that, technology companies invest to create a cost-effective data management tool for a society that allows easy data access through an interface. Products and services, such as data marketplaces, connect people with organizations, competing by offerings, security measures, and fees; cloud services offer cheap storage, and hardware producers offer local secure servers. Health organizations on the other hand also apply technologies such as blockchain and SSI to allow their customers to protect their privacy.

[1] Punitive actions are defined as any measure that might result in a disciplinary termination, reassignment, suspension, pay cut, letter of warning, or relocation



Personal narrative: Johanna is a 17-year-old student from Norway whose favorite subject in school is data literacy which allowed her to gain fundamental knowledge and skills regarding data. “Data is an integral part of our life. We should all know how data is collected and analyzed.”, she expertly declares. Even though Johanna claims to be an expert in data, her entire family is equally well educated about data, even the grandparents who received extra lessons on data through the community. The family is subscribed to an app that allows them to use blockchain and SSI for a cost-effective price. Through that app, their data is protected and they can decide who can get access to their data. Their health data is also organized through that app, so during doctor visits, they can easily give their consent to the usage of their health data. Revoking their consent is designed effortlessly since they can organize their consent through this app. As a result, this app allows them to customize their sharing options depending on their preferences.

Scenario 2: Health Inc.

Pathway to the scenario: The «data is the new oil» mantra of the 2020s resulted in all major companies embedding data in their operations with the help of powerful ML (Machine Learning) models. Much emphasis was made on data protection since data breaches were both reputational damage and risks of losing the competition. U.S. leadership in AI has determined the development of data-based technologies as predominantly commercial tools in the 2030s and 2040s. Criticism of the welfare state, such as immigrant politics, led to the popularity of neoliberal parties in the Nordics in the 2030s, which in turn led to the rising power of corporations (Big Tech, Big Pharma, and other «Big…» players in their respective industries). The neoliberal turn also resulted in economic inequality in the region being exacerbated over the decade. Health companies started to compete in the number and type of data they could collect, investing money into tracking and diagnostics, and a boom of affordable wearables and lab services occurred in the 2030s. The gradual increase in the cost of ML models peaked in the 2040s, and only corporations could afford such computing power, which allowed them to strengthen their influence over authorities. A *Health Inc.* scenario emerged in 2050, where health data belongs to companies and is used according to their objectives. With a significant economic divide, the ability of people to keep their data depends on both data literacy and purchasing power.

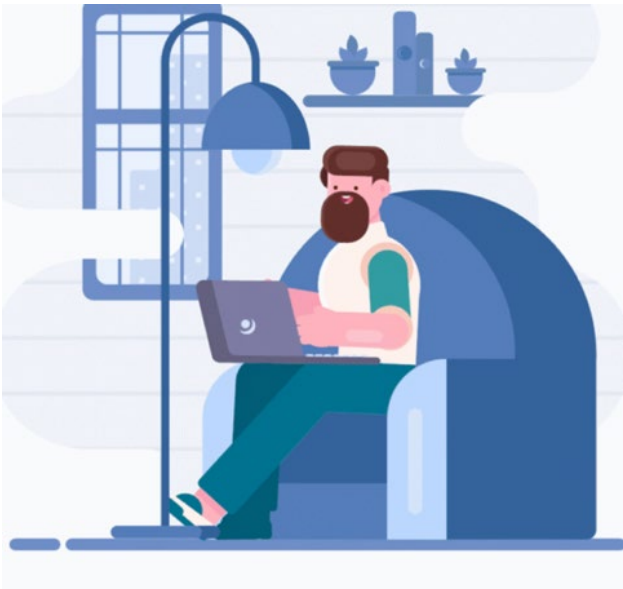
Main concepts and policies: Corporations have more power than government authorities since they control the general flow of data. Health data is not only valuable for the health sector but other companies are interested in using it because it can provide insights into an individual's lifestyle; therefore, health companies sell this data or even merge with other companies to make their business more profitable. Companies have to bear high costs to ensure security and privacy as there is always a danger of breach of data from competitors. For compensating the expenses, companies determine the price of available data to gain financial benefit. Some people gather momentum by protesting the companies and government because of its inability to regulate. Therefore, the government is taking steps by enacting a new law to "protect" people but there are still loopholes for companies. Wearable devices have become a significant part of controlling data by companies. By providing individuals with wearables that would support preventative treatment, health companies can receive a high amount of real-life data that could be utilized for further research, while consumers can get ad-

vantages like free health check-ups or discounts on specific products. With the opt-out mode of consent, patients must actively let the relevant authority know if they do not want their health data to be used (Skovgaard et al., 2009). Otherwise, health companies will use their data by default. Health companies are seeking ways to broaden their influence throughout Europe reaching developing countries.

Unintended obstacles & challenges: As individuals become aware that their health data is being collected by corporations and that they have little control over how it is used, they may begin to feel uneasy about the situation. This uneasiness can stem from concerns about the potential misuse of their data, such as for targeted advertising or insurance purposes, as well as worries about the security and confidentiality of their information. Another unintended consequence of this scenario is that economic inequality can affect the opportunities for data protection, as lower socio-economic citizens may be targeted more frequently for data collection. This is because these individuals may have less access to information and resources to protect their data. Furthermore, the opt-out mode of consent, with data sharing included as the default, can lead to individuals unknowingly sharing their health data with corporations. This can further exacerbate the above-mentioned issues, as those who are less aware of the default settings or unable to opt-out may be at a disadvantage. In a society where corporations have more power than government authorities, there may be limited opportunities for individuals to advocate for their own data protection. This lack of protection can result in individuals feeling powerless and potentially losing trust in both corporations and government authorities.

Outcomes & consequences: Government favor health organizations which allows them to have more freedom in the way they manage their acquired data to build their own databank. However, in this scenario, the increasing competition between a variety of health organizations increases the pressure to protect and hide information from their competitors. As a result, health organizations invest heavily to ensure the security of their own databanks in case of a cyberattack. Furthermore, health organizations are utilizing biobanks to support their research. The development of wearables and preventative treatment is also in their focus.

Personal Narrative: 55-year-old Oliver from Stockholm has had Type 1 diabetes since he was a toddler. Compared to his youth, he now wears a watch that monitors his glucose level 24/7. The watch was complimentary when he purchased his monthly insulin subscription. The watch alarms him in real-time, when his sugar levels drop rapidly, so he can take action immediately to avoid life-threatening situations. In addition to that, he no longer needs to inject insulin. A small sensor is attached to his stomach which is connected to his watch, so the needed amount of insulin will be administered through the sensor. “I love that I can live a normal life without thinking about how many gadgets I have to bring with me to stay alive. These wearables saved my life and my sanity.”, he laughingly claims. Despite only suffering from diabetes so far, he is confident that other health issues won’t be a problem in the future due to the technologies that are offered today.



Scenario 3: Data Monopoly

***Pathway to the scenario**:* The rise of authoritarian ideologies worldwide was a consequence of failed attempts by Ukraine and Taiwan to defend their interests in conflicts with Russia and China, respectively. Populist movements across the EU and long-lasting economic recession only worsened the situation and soon the whole world was watching in disbelief as EU disintegration unfolded. Right-wing parties came to the power across the Nordics. In the meanwhile, China's AI leadership along with a crisis in the US changed the world order and made Beijing the most powerful political actor in the early 2030s. As data sharing became a «price» for cooperation with China, the Nordics had to adjust data regulation, centralize its governance and sign international data-sharing agreements. Significant investments were made in data storage and cybersecurity. Several new pandemics followed in the 2040s, further exacerbating government control of health and leading to rising government spending on data management at the expense of other needs. This was a turning point for a *Data Monopoly* scenario, where the government has ultimate ownership of people's health data. There is a polarization in the attitudes between parties and social groups, some are afraid of the «China model» emerging, while others see it as a necessary thing for pandemic control.

Main concepts and policies: In this society, data is controlled, managed and in most cases owned by the government. The government enforces the culture of only sharing data for governmental use. Health organizations are required to share their data with the government. Wearables became mandatory justified by pandemic control, and other data from healthcare is stored in a universal health data bank. The government adopted a new law, termed as a “black law” by newspapers, which ensures their control of data management including mandatory usage of wearable devices. On top of that, a universal health data bank is established by law. The consent process now includes an opt-out option: in order to prevent the usage of patients’ medical records, they must make such requests to the appropriate authorities. They risk having the data used by authorities if they do not take action.

Unintended obstacles & challenges: Patients may be concerned about the use of their health data, even when the government has positive intentions. Their concern may stem from a perceived lack of authority over the handling and application of their data, leading to potential breaches of privacy. Besides, some people believe that government is more focused on improving the data infrastructure than contributing to improving social conditions. Furthermore, the government's acquisition of data from marginalized populations may raise ethical questions about informed consent and data usage. This implies that mentally ill individuals, children and incompetent adults must share their health information, even though they are unable to fully give informed consent. Since individuals have a low data literacy, they follow government orders. Moreover, corrupt officials could exploit their position by sharing health data with tech giants for benefits. In this case, the government could introduce anti-corruption policies to counteract the negative turn. Conspiracists may also be a source of concern by disseminating misinformation about the government's use of health data, causing fear and suspicion. Such misinformation can harm the public's faith in government agencies and may even prompt individuals to seek ways to withhold their health data, thereby hindering public health initiatives.

Outcomes & consequences: The government creates a data infrastructure for a universal health data bank. It is a requirement for all citizens to offer their health information with no exceptions to create a well-rounded data bank. Additionally, everyone must provide a sample to a government-owned databank. Heath organizations also have to share their data with the government, so the government can centralize all existing data relating to the health of society. This enables for example the early detection of rising pandemics before the health of all members of society is endangered. To fully manage the amount of data, the government must

invest in advanced analytics tools and security technologies. A separate department with trained personnel to analyze the data will be introduced.

Personal narrative: Benedict is a 30-year-old medical professional who immigrated to Finland in 2040 from the States. He is currently employed at a government-owned biobank and is responsible for research on genomes. Although he felt uneasy about the requirement of the government for everyone to provide their health information, he believes that research can be fueled through the increase of health data. “Biobanks are used to improve our comprehension of human health and diseases. Only when the government controls our health data, data leaks and misuse can be controlled”, he states.

Scenario 4: CommonHealth of Nations

Pathway to the scenario: In the 2020s, strengthening socialist ideologies across the Nordics set the stage for the future scenario, building a shared view of data as a resource that should benefit the whole society. At the same time, the Web3 bubble popped leaving disbelief in decentralization. Nordic governments’ data literacy education program was organized in schools, universities, and industries such as the healthcare sector. Public investments in cybersecurity, storage capacity, and education of future data managers in the 2020s and 2030s ensured a well-functioning infrastructure, while advancement in AI, computing, and 5G networks made it possible to analyze data in real-time. The regulations in the field ensured high transparency of data use and defined a clear scope of entities that can own the data, some of them being Nordic joint institutions. Finally, exceeding 1.5°C global warming in the 2040s triggered epidemics of infectious diseases, and exacerbation of some medical conditions due to heat waves, pollution, and dietary changes. Driven by fear of uncertainty, governments and citizens alike hoped that data can help to solve these issues, leading to the unprecedented number of donations to biobanks and a rise of data shared by people in real-time. These events ultimately led to a *CommonHealth of Nations* scenario, where the governments in the Nordics allow for collective ownership of data by research institutions and biobanks, with the possibility for citizens to access their data and withdraw consent. A joint Nordic Organization for Data Regulation helps other countries to implement the same model.

Main concepts and policies: In this society, data is in collective ownership between certain institutions, such as the government but also research institutions. In this scenario, the meta-consent mode is considered to be the standard. With that, individuals can provide consent for one particular field of research or one research registry (Skovgaard et al., 2019). Various health data banks are established by institutions, so individuals could contribute by providing their health data based on their free will. Moreover, the government is subsidizing the purchase of wearables for individuals, so even more data could be collected for research purposes. The government promotes data awareness by issuing mandatory data training for various industries but especially in healthcare. As a result, hospital staff and doctors can properly inform patients about data usage. The overall goal of the government is to form cooperation with health-related industries to advance medical research. For implementing its plan, the government is supporting companies that are dealing with health data and medical research by providing various incentives. A tax reform bill is implemented to cut taxes for the benefit of the companies. On top of that, the government enacted a new law to strengthen its control and supervision of health data management.

Unintended obstacles & challenges: While centralization of data can have benefits for society, it also raises concerns about data privacy and security, resulting in a demand for stricter control of who has access to the data. This can lead to protests against companies that have undermined public trust, for instance, by sharing data with for-profit organizations, instead of utilizing health data for the common good. A mass withdrawal of consent for data use from such companies is becoming one of the common forms of public censure, with the slogan “My Data – My Right”. Patients and privacy advocates may demand greater transparency and accountability from these companies, as well as stronger laws and regulations to protect their privacy.

Outcomes & consequences: Individuals are more willing to share their health data since they are aware that their data is going to be used for the common good of all people. Their reasoning lies in the saying “Health is wealth” which is vital for all humans and should be facilitated through data sharing which the government enables. The government is transparent in the usage of the data they receive and fully explains to the individuals how the data is stored, managed, and analyzed. Biobanks and health organizations are required to be more transparent in how they process the data they receive. Furthermore, health organizations and the government collaborate on research. Technology and research quickly evolve due to the high investments that are fueled by the government.

Personal narrative: Maria is a 27-year-old mother of two young girls living in Copenhagen. Ever since the government announced its plans for a universal health data bank, she was interested in the possibilities that the research could offer. When her youngest child was diagnosed with leukemia at the age of 5, her world fell apart. The doctors told her that precision therapy was possible. Since her youngest daughter provided a sample for the biobank, the specialist performed several additional screenings for the first steps of her treatment plan. The goal was to create a customized treatment plan based on genomic data to identify suitable treatments for her daughter. “I cannot believe that research developed at such a pace that treating my daughter with such a personalized plan was possible. I am truly thankful for the effort the government has made in research otherwise my daughter wouldn’t be alive today”, she tearfully exclaimed.

Discussion

Futures Table

The drivers that were identified as having a high impact with high uncertainty in the Impact & Uncertainty-Matrix are structured based on the STEEPLE categories to explore the possible alternative states in the year 2050 of each of the four scenarios in the table of the future, which is illustrated in Table 2. With the futures table information about the futures is systematically gathered and organized, as a result, images of the future emerge. (Lauttamäki, 2014.)

Table 2. *Futures table in the year 2050.*

	Drivers	Data Empowerment	CommonHealth of Nations	Data Monopoly	Health Inc.
Socio-Cultural	Economic inequality; Willingness to share data	NGO & data rights activists emerge to protest; low-socio economic citizens would use basic technologies to protect their privacy; data is shared when purposes are well-communicated	Government will support citizens from lower income through supporting them with wearables, clouds etc.; data is considered a property not a right; high willingness to share data when shared for the common good	Economic inequality remains; data sharing is enabled through the government's regulation	Economic inequality remains, no further education possible due to missing resources; lower socio-economic citizens might be targeted due to them not having opportunities for data protection; uneasiness from the citizens to share data
Technological	State of cybersecurity	Easily accessible ways of data management; usage of SSI and blockchain to protect privacy	Investment in network security technologies and encryption	Emergence of hacker communities to avoid surveillance or to delete data → conspiracy theories arise	Security measures will be heightened by companies in case of cyber-attacks; protection of privacy-related technologies (blockchain, SSI) will not be prioritised
Economic	Government's responsibility to create higher data literacy; Cost of building & maintaining data infrastructure	Investment in data literacy training; cost-efficient data management for the population (e.g., cloud storage)	Compulsory data literacy training; government invests in advanced technology; health companies collaborate with government for research	Cost-efficient data management for the population; investment in data analytics tool and technologies	Companies invest to ensure privacy and security of their own infrastructure due to the increased competition; competition in the trade of data
Environment	Rise of infectious diseases; IT infrastructure are vulnerable to natural disasters	Safe IT infrastructures and cloud services	Research institutions in the Nordics collaborate together to prepare for pandemics; universal health data bank is used to also monitor and regulate pandemics	Pandemics will be handled through a centralised health databank and biobanks	Health companies heighten the security measures in case of natural disasters → disease outbreaks will be a new opportunity to gain more insights about the disease
Political	Political ideologies and beliefs about the role of government in controlling and regulating data	Autonomous data sharing through the individual	Centralisation of data; trust that government will manage data for the common good of people	Regulation and control of data through the government for maintaining security and stability → no misuse of data	Higher influence of health organisations, corporations therefore gain more power
Ethics	Informed consent	Data is owned by individuals; various modes of consent available; SSI & blockchain support the data permission	Data is a collective ownership between institutions; meta consent mode	Data is owned by the government; health organisations share data with the government; opt-out consent, ethical issues relating to the collection of data (children, mentally-ill individuals are required to share their data)	Data is owned by companies; informed consent is not a priority; opt-out mode of consent (data sharing included as default); data is collected through cost-effective wearables offered from heath companies

A detailed description of the scenarios has been provided in Chapter 4. However, an overarching analysis revealed that some variables have a greater effect on some scenarios, while other variables only play a smaller role. The ethical driver regarding offering informed consent is essential in each scenario since it relates to the ownership of data. In addition to that, the political drivers that include the political ideologies and beliefs greatly shape the government in terms of regulation, etc. in every scenario. During our discussions, we felt that the environmental drivers did not have a substantial impact such as the ethical or political drivers, since the topic of data ownership does not closely relate to the environment. However, we found that the pandemic could be a potential driver for the centralization of data, which is part of the scenarios "Data Monopoly" and the "CommonHealth of Nations".

Strategic decision-making based on scenarios

As was pointed out in Section 2, scenarios support decision-making by allowing for a more nuanced understanding of alternative futures (Ralston & Wilson, 2006). Apart from mere discussion of the alternatives, decision-makers can apply special tools to stress-test their decisions. Wind tunneling is one of the tools that help to assess how different strategic decisions might be affected by alternative scenarios' context, which strategic options are robust in all futures, and which need modification according to changing conditions. The options robust enough against the full range of scenarios provide the most flexible opportunities. (Government Office for Science, 2017)

Our team was drawn to the fact that Bayer AG, the case company for our study project, has established relations with Finnish biobanks and Finnish Biobank Cooperative (FINBB), aligning research objectives, such as exploring molecular characteristics of various diseases (FINBB, 2021). A biobank is “a collection of biological samples and associated health data… [that] are an important resource for medical research” (FINBB, n.d.). In the future, an opportunity to use this resource can be affected by circumstances of alternative scenarios. Hence, we seek to answer the question “What should Bayer's biobanking strategy be in the future?” and to stress-test various strategic options against four scenarios. The strategic options were developed by team members, using a brainstorming technique:

- The first option is to build an in-house biobank, which can be a reliable source of samples and data, controlled by the company and used to support internal R&D, marketing, and operational efforts and attract external collaborations. However, this option requires investments in infrastructure, sample collection, and preservation techniques, data management systems, and compliance.
- The second option is to use data from existing biobanks which is a cost-effective and flexible way to access biological samples and health data without the need for significant investment in infrastructure or elaborate assessment of the supplier. But the benefits from that option can be somewhat limited due to using existing datasets that can also be available to competitors.
- The third option is to invest in existing biobanks, which can bring additional value from closer cooperation, allowing for joint research projects, alignment of R&D goals, and shared decisions about which data to collect. This option requires a thorough assessment of the biobank's operations, data security, and compliance. This option represents the current strategy of Bayer.

The result of assessing these options in light of four alternative futures is presented in Table 3. The second option proved to be robust in all scenarios. The third option is robust across three scenarios and will need to be modified in the Data Monopoly scenario. The first option is the most affected by context change in different futures. Given the benefits of the option to invest in biobanks, discussed above, we may advise Bayer to proceed with the current biobanking strategy, yet decide what modifications may be implemented, should the context trigger the need for them.

Table 3. *Wind tunneling of strategic options.*

	Data Empowerment	Health Inc.	Data Monopoly	CommonHealth of Nations
1. Option: To build an in-house biobank	Opportunity to support R&D with reliable data; Risk of financial losses: have to pay for data to every individual.	Opportunity to get profit from giving access to biobank data; Opportunity to support R&D with reliable data; Threat of competition with other in-house biobanks.	Threat of government control over in-house biobank and loss of control over data.	Limited opportunities due to fewer donations to for-profit companies' biobanks.
2. Option: To use data from existing biobanks	Opportunity to have cost-effective access to data, but the majority of data will be sold, not donated (limited collections in biobanks)	Opportunity to have cost-effective access to data, however, competitors would also have the opportunity to access the same pool of information	Opportunity to have access to a wide range of data due to mandatory data collection	Opportunity to have access to a wide range of data due to a boom in donations
3. Option: To invest in existing biobanks	Opportunity to support R&D due to funding, investment in SSI or blockchain possible due to extra funding	Opportunity for a competitive advantage due to the cooperation with a biobank	Threat due to the affiliation of the biobank with a health company, government-owned biobanks would be more popular with individuals	Opportunity to acquire cost-effective data that is supported through donations from society

Concluding Remarks

We are living in the age of the data revolution. With the current emergence of technology, data is going to be like crude oil. For creating value, we need to find, extract, analyze, and monetize it. Among all types of data, health data possesses great importance, and the recent pandemic has also shown us the inevitable use of health data. Along with better health of society, health data also affects socioeconomic conditions.

Therefore, we analyzed the future ownership of health data ownership from the perspective of Bayer. Bayer, being a leading life science company, will be dealing with data ownership issues. People are getting more concerned about their data day by day. However, whether data will climb its place a property is still in doubt. Deeming it as a property or a human right, as every asset comes with ownership, data is going to be the next lucrative commodity by 2050. So as a company, Bayer will face significant challenges in this specific area.

To aid Bayer to prepare for this challenge of the futures, we developed four explorative scenarios of health data ownership in the Nordics in 2050. We found that the two critical uncertainties that can shape the futures

of this issue are data literacy and centralization of governance and decision-making. The four alternative futures that we have explored are *Data Empowerment, Health Inc., Data Monopoly* and *CommonHealth of Nations.*

Based on our scenarios, we assessed possible biobanking strategies for Bayer. Three strategic plans (to build an in-house biobank, to use data from existing biobanks, and to invest in existing biobanks) were evaluated in light of four scenarios to find out the most effective one. In our opinion, the most robust strategy for Bayer would be to invest in the existing biobanks.

We aim to provide Bayer with comprehensive future images of data supremacy in the health sector in the year 2050. As a leading pharmaceutical company, Bayer will play a pivotal role in the upcoming data revolution. With the four developed scenarios, we hope that Bayer can utilize these to be a driving force in the next decades.

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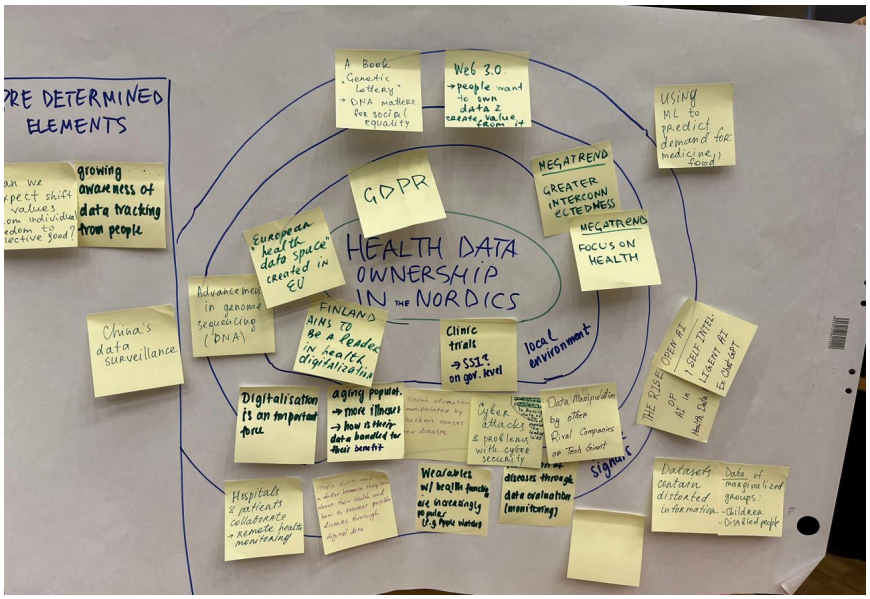
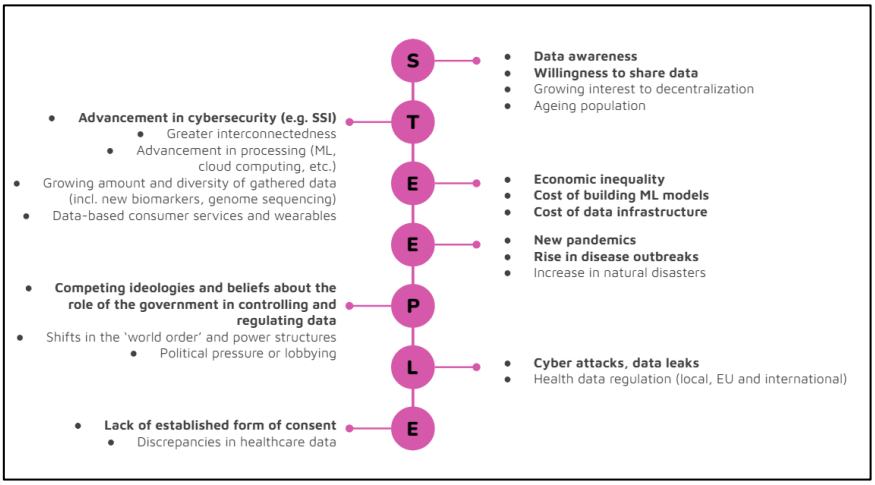
Appendix



Futures Wheel

The Futures Wheel was the first step that we did to understand the broad picture of health data ownership in the Nordics and thus it contains only our preliminary thoughts on the chosen topic. However, as we conducted the STEEPLE analysis and created the Futures Table many other key drivers emerged during the brainstorming that were not included in the Futures Wheel.



STEEPLE-Analysis

STEEPLE framework was used to guide the analysis of the environment and collect information about the forces shaping the futures of health data ownership.

FUTULAB4 Hybrid Futures Research Methods

FUTULAB4 Hybrid Futures Research Methods (4 cr) intensive course is one of the optional methods courses of the Master's Degree Programme. The aim of the course is to provide students with a hands-on experience of carrying out a small research project.

During the course the students work in teams and design and execute together a hybrid method futures research project combining data gathering and data analysis methods into a comprehensive seamless study. The method combinations offered this year were thematic interviews & CLA and Delphi questionnaire & cluster analysis. All teams share the same research topic, which this year was the future of student assignments. The timescale and geographic scope of the study were chosen according to the teams' own interests. In the "mini-reports", the students are especially expected to reflect their practical experiences and thoughts that have arisen when using the methods.

The FUTULAB4 reports were reviewed by the course teachers, Senior Research Fellow **Sanna Ahvenharju** and Doctoral Researcher **Akhgar Kaboli**.

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Alisa Belmas, **Mohammadhadi Erfanian** & **Burgert Maree** utilised the Disaggregative Delphi approach as their method in the study. Their report is well-written and logically consistent providing good reasoning for most of their choices. It shows they have a good understanding of Delphi and the way the delphi questions were set up demonstrates how carefully they considered the essence and particularities of a Delphi study.

The report describes in detail the learning journey of the team: the work process is carefully reported and mention the challenges and limitations throughout the work. The author's analytical approach is reflected in several parts of the report regarding both the topic as well as the methods including discussion on the shortcomings of the study. The resulting six future images provide interesting and clearly different alternatives for future student assignments.

The Futures of Student Assignments – Using a Disaggregative Delphi Approach

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Introduction

Student assignments are important components of academic learning. Recent developments in technology and the changing nature of work have heightened the need for revisiting the relevance and effectiveness of student assignments in preparing students to participate in society. There are two primary aims of this study: 1. To investigate the futures of student assignments in 2035, 2. To better understand the application of the disaggregative Delphi method (Tapio, 2003) to study images of the future.

Research questions for the investigation were suggested to the group. The two questions the group addresses in this report are: "*How will student assignments be in the year 2035?*" (RQ1) and "*How will students be tested for their skills and knowledge in 2035?*" (RQ2). It is necessary to define what "assignment" means. The term "assignment" can broadly be defined as a task or piece of work that somebody is given to do, usually as part of their job or studies (Assignment, n.d.). Whereas assessment refers to the general process of evaluating student learning, often by measuring and grading it, an assignment may, but not necessarily have to, form part of assessment. This report will make use of this distinction.

The group had several face-to-face meetings during the process and established a routine of recording reflective voice notes after every stage. This routine ensured capturing details of the process, as well as individual and group learnings from performing different tasks. Insights from this research "audio-journal" form the basis of the discussion section of the report.

The group followed the four phases of the Delphi process, as suggested by Linstone & Turoff (1975, 5-6). The first two phases were characterised by the exploration of the subject and reaching an understanding of how the respondents view the issue. The third and fourth phases, namely exploring disagreement where it was required, as well as a final evaluation, were done within the time limitations set by the course, resulting in those phases not followed through thoroughly. In what follows, the process of applying disaggregative Delphi to investigate the futures of student assignments in 2035 is explained in detail and reflected on, and the results are provided and discussed.

Data Gathering and Data Analysis

Topic exploration

First and foremost, the group conducted an initial exploration of the various aspects of the focal issue (student assignments) that served as a starting point for further investigation. The group established a shared definition of the term, as discussed in the introduction. Then, key themes and areas of interest for data gathering were identified:

- design of student assignments (e.g., type of the task, methods, etc.),

- assessment of student assignments (e.g., ways to evaluate the assignment),
- skills that will be valuable in 2035,
- modes of studying,
- DEI (diversity, equity, inclusion) aspects of education,
- technology use in education.

The exploration leveraged the background knowledge, expertise and experience of the group members: for instance, the theme of teacher's experience of designing and evaluating student assignments was put forward by a group member with extensive background in teaching. This discussion was valuable to reveal and incorporate different angles to the topic and, thereby, maximized the potential for a rich and diverse range of images of the future from respondents' responses. By doing that, the group avoided potential biases or skewing the images of the future to a particular aspect (e.g., assessment design) or a hyped topic (e.g., AI in student assignments), acknowledging the multifaceted nature of the topic.

Data gathering

A Delphi study requires a carefully considered and meticulously constructed set of questions, the construction process of which Linstone & Turoff (1975, 7) refers to as "very much an art". Key themes and areas of interest during the data gathering process included an in-depth consideration of the research questions given, the principles of questionnaire development, as well as the selection of participants.

Areas of interest within the topic were individually explored by the group members and brought to the first meeting. During the first meeting, questions were initially constructed that covered the whole spectrum of student assignments, essentially addressing both research questions given. However, as the conversation ensued, all of the questions were rigourously interrogated and altered. The initial principles by which the questionnaire was to be developed were decided on, which included the following:

- The consideration of each question brought to the conversation by the group members.
- Narrowing the scope of the questionnaire to address mainly RQ1 (addressing the nature of student assignments, not student assessments).
- Setting some questions as counterfactual to challenge respondents, create heterogeneity in opinions, and eliminate some bias (Rowe and Wright, 2011, 1489).
- Seriously considering, as well as reconsidering, the linguistic value and weight of the research questions (Rowe and Wright, 2011, 1489).

The last principle became especially emphasised throughout the data gathering process. The weight that words carry, and their implied meanings, became a key factor when the group reassessed and tweaked questions, to ensure that the intended meaning did not get lost in translation by the potentially diverse recipients the survey will be sent out to. The issue of language is particularly emphasized by Rowe & Wright (2011, 1488). In the end, after the first meeting, a total of 11 questions were constructed, of which eight questions addressed RQ1, and three questions addressed RQ2.

The questions were sent for feedback to the group's two supervisors, who gave feedback on numerous factors. Through this feedback, the group learnt a lot about the efficient structure of a questionnaire, in particular identifying redundant questions by looking at similarities between questions, as well as using fit-for purpose numerical grading systems (a 7-step Likert scale was agreed on, as well as reconsidering the initial extreme measures used in the wording of the questions). Practical advice to allow a simpler data analysis process to take place, was also favourably received. Acting on the feedback, a second round of conversations

resumed, where questions were tweaked even more to allow a wider possibility of diverse, alternative images of the future.

The sample questions were tested a second time before being sent out, and slight technicalities were improved on. These included the following: revising the last question to be less comprehensive and confusing, giving a timeline for completion on the introduction page, reminding respondents to participate in discussions on the introduction page, rearranging questions to allow respondents to re-evaluate and change their answers easily, as well as adding an image to the introduction page to help the respondents imagine the year 2035. This image was created with the assistance of DALL-E, a generative AI tool. An expertise matrix was added to the survey to assist in data analysis, when and where required.

The total of 11 questions remained, although the focus shifted more to include student assessments more prominently. Six questions focused on addressing the nature of student assignments (RQ1), whilst five questions addressed the nature of student assessments (RQ2).

The final 11 questions used in the survey, compiled as statements, can be seen in Table 1 below.

Table 1. *Questions used in the Delphi survey.*

1. In 2035, most of student assignments will be individual assignments
2. Most courses, where possible and applicable, will have mandatory case-based student assignments in 2035
3. In 2035, student assignments will rarely be used as a form of evaluation, instead, exams and tests will be utilised
4. In 2035, there will be no student assignments in most universities
5. In 2035, classes, where possible and applicable, will increasingly give students an option to choose a form of student assignment that fits their individual needs
6. Most students will use generative Artifical Intelligence (AI) in their student assignments in 2035
7. In 2035, use of generative Artifical Intelligence (AI) in student assignments will be banned by universities
8. Advanced technology will be used extensively by teachers in evaluating student assignments in 2035
9. In 2035, any given student assignments will evaluate soft skills extensively, meaning that the grade will depend more on showing those soft skills, rather than hard skills
10. In 2035, teachers will increasingly use grading based on the performance of other students
11. In 2035, there will be no student assessments in most universities

The group feels strongly that conducting interviews, where possible, before the survey was finalized, would have been very beneficial. This would have allowed the group to not rely on their own experience alone, as well as fine-tuning of questions to create even more diverse images of the future.

The survey was sent out to individuals who were involved in the fields of futures studies and education, either as students or teachers, or both. The survey was sent out by email to a total of 27 recipients, of which 19 responded. The eDelphi platform was used, allowing respondents' real-time feedback to their answers and the discussions around questions from other respondents. The geographical spread included Finland, South Africa, and Belgium. Gathering results from a larger representation of recipients are always more ideal, as the results from a "small elite group may lead to gross misconceptions" (Linstone & Turoff, 1975, 561). Unfortunately. time constraints limited the number of recipients the survey could be sent to. Time constraints also limited respondents to 18 hours for completion of the survey. More time for the group to send out the survey, as well as respondents to complete the survey, would have gathered more reliable data, but the group feels that the number of respondents were sufficient for a confident data analysis.

Data analysis

Data analysis plays a pivotal role in research, enhancing the efficacy of study outcomes (Alem, 2020, 1). It encompasses the collection, transformation, cleansing, and modelling of data with the objective of uncovering the necessary information (Alem, 2020). The survey conducted yielded a comprehensive set of data comprising both quantitative and qualitative aspects, based on explanatory comments provided by the respondents alongside their numerical responses. Additionally, two participants deviated from completing the questionnaire (one discontinued midway and another skipped a question). While these instances did not impede the data analysis process, they served as valuable learning experiences in managing such situations. To examine the data collected from the questionnaires, the data file was initially entered into the SPSS software for analysis. It is noteworthy that SPSS provides a wide range of outputs and results; however, in the context of the Delphi method and futures studies, the aim is to identify and analyse clusters.

Cluster analysis is a methodology utilized to categorize comparable observations into distinct clusters, determined by the observed values of multiple variables for each individual (Sinharay, 2010, 5). Cluster analysis has experienced a surge in popularity since the 1960s (Blashfield & Aldenderfer, 1978, 239). Clustering is a valuable activity during data mining as it enables the identification of new and intriguing patterns within the data (Frades & Matthiesen, 2010, 81). By employing clustering algorithms, data objects can be separated into groups, or clusters, based on their level of similarity or dissimilarity (Frades & Matthiesen, 2010, 81). This method of clustering is beneficial for futures researchers, as it allows them to create rich images of the future, oftentimes unexpected.

Various methodologies exist for cluster analysis, among which the group employed the hierarchical clustering method. Through the utilization of hierarchical cluster analysis, meaningful structures were revealed. However, due to the constraints of this report, the group abstain from providing an in-depth exposition of the intricacies underlying this analysis. Within the realm of hierarchical cluster analysis, the Agglomerative (bottom-up) approach enables researchers to proceed from individual clusters to pairs of clusters, persistently merging them until ultimately culminating into a single cluster. For futures studies, this method is valuable for choosing a particular number of images of the future or scenarios.

The group made use of six clusters. The merging of clusters was determined by utilizing the Ward's method with squared Euclidean distance measure. The outcome of this procedure, denoted as the Dendrogram, can be observed in the appendix. To compare the clusters, a spider graph was employed for visualization purposes, although upon reflection, it may not have been the most optimal choice. While it served its purpose in facilitating the comparison of clusters and informing decisions regarding potential mergers, subsequent interpretation of images of the future indicated its inadequacy. Therefore, the group acknowledges the importance

of experimenting with various graph types to enhance data representation and analysis on different stages of research.

Results

Once the clusters were obtained, it was necessary to critically assess the number and distinctiveness of images of the future stemming from them. This stage will be discussed in the next section. Short narratives were then written by the group to bring the images to life, which can be seen and compared in Figure 1. When creating narratives, it was important to enrich the quantitative clusters with qualitative data, because clusters themselves do not reveal the reasoning behind development of certain images (Tapio, 2003, 96).

Figure 1. *Images of the future of student assignments in 2035.*

Discussion and Conclusion

The initial objectives of the project were to investigate the images of the future of student assignments in 2035, and to better understand the application of disaggregative Delphi for that purpose. Let us now turn to discussing the findings related to both.

A major source of uncertainty for the group was the decision on the final number of the images of the future to be reported on. Initially, the group's understanding was that the clusters can only be merged hierarchically, following the dendrogram, i.e. the closest clusters must be merged first. However, further explanation by one of the supervisors revealed that, in fact, researchers are to decide on the sensibility of grouping any clusters, taking into consideration the human capacity of handling alternatives, distinctiveness of the clusters, and participants' reasoning behind numerical values in each cluster. In general, a balance of simplification and width of alternatives should be sought. (Tapio, 2003, 94–96). The group revised the clusters again, but decided not to group any, for there were distinctive characteristics for each image of the future. However, with a small sample size, the results should be interpreted with caution.

It is generally not that difficult to find consensus among participants with the Delphi method, but Rowe & Wright (2011, 1488) highlights how equally important consensus and dissensus is, as it is often within the dissensus where interesting and important issues can be found. An unexpected result that emerged from the data was the fifth image of the future, which represented a desirable future of one participant. After consideration and discussion, and being reminded of the value of dissensus, the group decided not to discard the fifth image, constructing it as a potential wild card.

As stated before, both quantitative and qualitative data were used to build the images of the future. Individual images were first constructed to highlight the most probable/desirable aspects; "unprobable/undesirable" aspects could be included if necessary, yet, neutral (ranging from "somewhat unprobable/undesirable" to "somewhat probable/desirable") aspects were generally omitted. These images were then compared and revised to highlight differences even more. In retrospect, it might have been more effective to explore the distinctive features of the narratives for all the images, as a group, when comparing the clusters at the previous stage, and then build upon those features.

It was beyond the scope of the project to analyse the groupings of the responses. However, Tapio (2003, 98) suggests that cluster analysis can reveal unexpected groupings. In our results, it is noteworthy that in Cluster 1 ("Collaboration between academia and corporate") all but one response belongs to teachers, or that Cluster 4 ("Driven by business demand") consists only from probable future statements, but not desirable. The group believes that these findings can serve for deeper analysis of the images of the future and more precise interpretation of the results.

Unless purposefully approached differently, Delphi surveys typically include at least a second round of questions (Tapio, 2003). This is done by way of feedback of all answers to participants, challenging them with alternative views from the other recipients, and allowing the recipients to change their opinions (Rowe & Wright, 2011).

By making use of real-time Delphi, as supported by the eDelphi platform, a second round can often be negated if respondents engage with each other in real-time. Interviews could also be used for a second round to obtain more qualitative data. Recipients to the survey were able, as well as encouraged, to engage with other recipients' answers by way of online discussion. The time-limit of completing the survey, however, might have hindered this from taking place effectively and conducting interviews would subsequently have been helpful to iron out uncertainties form the data. If these interviews were conducted, they would most likely have been done as contra-arguments, effectively playing devil's advocate. Contra-arguments imply stating opposite arguments to the views and responses by the respondents (Tapio, 2003, 89), to challenge their original responses. A second round, constructed as interviews, would have been very helpful and could have given more in-depth information for the group to create even richer images of the future. This was again evident in the group noting that many of the images, although different in one or two distinct aspects, did often overlap. If

time allowed the third and fourth phases of conducting a Delphi study to be followed more rigorously, as suggested by Linstone & Turoff (1975, 5-6), it would likely have yielded richer images of the future, and the group recognises the importance of these phases in future Dephi studies.

During the process of applying the disaggregative Delphi method for creating images of the future of students assignments, the group realized the use and value of the Delphi method to effectively leverage the combined knowledge and expertise of a group of individuals, to produce valuable insights, and ultimately create images of the future. The process encouraged the group to thoughtfully consider ideas, highlighting the importance of language to eliminate confusion and ensuring sufficient time set out for a second round. Using the disaggregative Delphi method in research, by engaging participants in a structured and iterative process, could enable the generation of valuable future images, and contribute to the Delphi method's relevance and applicability across various domains.

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FUTULAB5 Futures Case Evaluation

FUTS3115, FUTULAB5 Futures Case Evaluation (6 ECTS) belongs to the curriculum of the Master's Degree Programme in Futures Studies as an obligatory course. In this course, students are provided material of different ongoing projects at the department they study, the Finland Futures Research Centre. While ongoing projects act at study-cases for students, researchers working of the ongoing projects act as guest-lecturers in the course. The projects are evaluated by the students in groups, and each group looks and one project in-depth.

The aim of the course is manyfold. While practicing how to critically evaluate and compare futures research cases, they also learn how to give, and to receive constructive feedback from peers. Students learn how to analyse the logic, structure and process of scientific research on a specific content, and also understand the dynamic character of research processes in their own department. As the study-cases they analyse are real ongoing projects, students get acquainted not only with the research personnel of the department, but also with the reality of dynamic research projects of different sizes and with different aims.

The course is assessed in two parts, groupwork, and individual reflection. For the groupwork, students practice evaluating a study case, and based on the course material reflect on the main positive and problematic aspects of their study-cases. They look at aspects such as research integrity, ethical considerations, scientific rigour, transparency, theoretical background and suitability of methods for answering the project´s research questions.

For the individual reflection, students write an essay based partly on given articles presenting different evaluation methods in futures research and partly on literature of their own choice. In this publication we have an opportunity to read one group report and one of the individual essays.

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In the 2022 course, the projects presented were European Research Infrastructures in the International Landscape (RISCAPE) Presented by Project Researcher **Mikkel Stein Knudsen**; Ruokavarma, Presented by Research Director **Tuomas Kuhmonen**; Bounce Forward, presented by Project Researcher **Martyn Richards**; and Cuban energy transformation. Integration of renewable intermittent sources in the power system (IRIS) Presented by Project Researcher **Osku Haapasaari**.

The essay by Master´s degree student **Pinja Parkkonen** was chosen for this publication because the student successfully reflected on the course materials and brought in reflections from other fields and previous learnings as well. The responsible teacher for this course is Doctoral Researcher **Marianna Birmoser Ferreira-Aulu**, who has also assessed this essay.

Comparison of Two Evaluation Methods in Futures Research – The Impact Evaluation of Foresight and Blue Marble Evaluation

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Introduction

The evaluation of futures work and foresight is an emerging field which has drawn increasing attention within both the futures studies and evaluation professionals during the past years. It was addressed first time in a special issue of *Futures* in 2012 (Van der Duin & Van der Martin 2012). It was the first full issue dedicated to the evaluation of futures studies. The issue focused on evaluating three areas of futures studies: the quality, success and impact, and provided various useful evaluation approaches and methods. Each of the three areas can be evaluated ex ante and ex post.

The connection between foresight and evaluation has been explored further in a more recent special issue of *World Futures Review* in 2019 (Gardner & Bishop 2019). The issue explores the connection from three points of view. It discusses evaluation approaches and methods suitable for evaluating foresight, introduces evaluation of foresight work in organizations and as part of long-term thinking and decision making, and presents evaluations of specific foresight activities.

The Association of Professional Futurists APF set a Task Force on Foresight Evaluation in 2020 to strengthen the evaluation capacity of the foresight professionals and to develop a model for evaluating foresight (APF). In addition, the evaluation of futures work is an emerging topic in the evaluation community. It was discussed in the European Evaluation Society Biennial Conference held in June 2022. The Finnish Innovation Fund Sitra together with the APF organized a session on “transformational evaluation practice – infusing foresight into evaluation”, which aimed at considering why and how foresight and futures thinking can be infused into evaluation practices (Vataja & Thompson Coon 2022).

In this essay, I will study two evaluation approaches suitable for assessing futures work, foresight and futures studies. First, I will examine the impact evaluation of foresight in public policy making introduced by Van der Steen and Van Twist (2012). Then, I study the Blue Marble evaluation approach developed by Michael Quinn Patton (2019). I will conclude by comparing the two approaches.

Impact Evaluation of Foresight in Policy Making

One of the tasks of foresight is to provide futures knowledge to support decision-making in different contexts and levels. Van der Steen and van Twist (2012) examine the impact of the foresight processes in policy making. They aim to answer the question: how can the impact of futures studies be evaluated in the context of government level policy making? Their motivation for developing an evaluation framework stems from the observation that futures knowledge remains poorly used and disconnected in policy making in the Netherlands. It is the case despite the fact that more futures knowledge is available all the time. (Van der Steen & Van Twist 2012, 475-476.)

The core problem is often that the foresight does not match with the policy needs, it is poorly connected with the policy planning and the results are not adequately communicated to the policy makers. Hence, the quality, success and relevance of foresight is likely to be dependent on how well it serves the policy process

in terms of its timing, scope and substance. Van der Steen & van Twist have identified three dimensions to policy making that all need to be considered when infusing foresight into it. These are policy making as a process of politics, as an organizational process and producing and digesting data and knowledge. (Van der Steen & Van Twist 2012, 478.)

Van der Steen & van Twist stress the importance of *connective foresight* that fits in the needs of public policy making. Connective foresight is designed to answer the institutional and political cues and can have positive effects to the policies when applied properly. They have distinguished five possible outcomes and connective functions of foresight to the political and organizational use and processes. In the political context, foresight can contribute to (1) winning political battles, (2) solving or resolving present-day political issues, (3) putting issues on the political agenda, (4) indicating new political issues and (5) identifying potential political risks. From the organizational perspective, foresight can (1) falsify or amend existing policy theories, (2) provide new theories for existing and emerging policy issues, (3) provide useful arguments for policy advisers and political decision makers, (4) encourage reflection on current organizational path and (5) reframe exciting policy theory. (Van der Steen & Van Twist 2012, 482–484.)

A quality foresight process can contribute to one or more of these outcomes. Van der Steen & van Twist have built their suggestions for an evaluation framework based on the outline of the possible outcomes. They argue that when evaluating the impact of foresight the assessment should consider how well the design of foresight project is connected to the policy issue in question, address the unintended positive or negative outcomes of the project, monitor the outcomes after the foresight project and study the networks of the futures researchers among the policy makers. (Van der Steen & van Twist 2012, 485.)

While Van der Steen & van Twist succeeded in describing potential outcomes of foresight in the public policy making, they failed to formulate a clear and credible evaluation framework. Their proposals do not form a complete evaluation framework, but rather contain preliminary perspectives. Another weakness is in the application of the approach. The article is based on conceptual thinking and it has not been tested in real cases. It would be interesting to apply it in an evaluation of a policy foresight process.

Blue Marble Evaluation

The Blue Marble evaluation approach provides a broader and deeper perspective for evaluating the outcomes and impacts of change initiatives. It is developed by a renowned evaluation professional Michael Quinn Patton (2019a; 2019b). The approach offers a comprehensive way to evaluate transformation and systemic changes. Thus, it also offers useful perspectives for evaluating futures work and foresight.

The Blue Marble is a symbol that refers to the whole earth system. Patton argues that the evaluation discipline has been blind to the global perspective and focused too much on evaluating individual projects or initiatives. Therefore, Patton emphasizes the importance of incorporating the global and earth perspective in change initiatives and their evaluation. It is essential since societal change is complex and systemic by its nature, and the transformation initiatives rarely limit to the sector or national boundaries. Combining the global and local perspectives are at the center of the approach. Thus, the evaluation approaches and methods must consider the complexity of the challenges and address global sustainability in the evaluation practices. (Patton 2019b, 304.)

The Blue Marble evaluation approach is strongly principle-based. The principles guide the situation analysis, design of interventions and evaluation efforts. Patton introduces four overarching principles that guide the general process of evaluation. These are (1) the global thinking principle, (2) anthropocene as context

principle, (3) transformative engagement principle and (4) integration principle. These principles aim at approaching the evaluation holistically and systemically, and they are implemented through twelve operating principles. The operating principles are transboundary engagement, time being of the essence, world savvy, transformation fidelity, glocal, yin-yan, skin in the game, transformation alignment, cross-silos, bricolage methods, theory of transformation and evaluation as intervention principle. (Patton 2019a.)

Applying the principles-based approach to evaluation is the strength of the Blue Marble evaluation approach. Blue Marble evaluation aims to combine a global and local perspective, which is increasingly important in a volatile and uncertain world. In a context of uncertainty and complex problems, best practices and simple manuals are no longer useful tools for evaluation. Therefore, principles can provide more useful guidelines for evaluation. The same applies to the evaluation of futures work and foresight. The futures studies and foresight explore phenomena that are complex and systemic such as megatrends and weak signals. Thus, the outcomes and impact of foresight must be addressed holistically.

The futures orientation poses also a challenge to the evaluation approaches and methods. Looking at past and achieved outcomes is not enough. The evaluation must consider the future effects of the initiatives and projects. The Blue Marble evaluation approach is set to do that. As Patton emphasizes, it "looks backwards (what has been) to inform the future (what might be) based on the present trajectory (what is happening now)" (Patton 2019b, 306). Thus, the role of evaluation and evaluators should be to inform the future, not just assess the past events.

Comparison of the Evaluation Approaches

The impact evaluation framework of policy foresight and the Blue Marble evaluation provide two distinct approaches to assessing the outcomes and impacts of futures studies, foresight and futures work. I have summarized the key differences of the approaches in the following table 1. The table illustrates the differences between the approaches in relation to the evaluation context, focus, scope, question, method and intended user as well as perspectives to foresight. The impact evaluation of policy foresight is suitable for a more specific evaluation need, whereas the Blue Marble evaluation can be applied to broader and systemic phenomena.

Table 1. *Comparison of the two evaluation approaches.*

Evaluation approach	Impact evaluation of policy foresight	Blue Marble evaluation
Perspectives of foresight and futures studies	Connecting futures studies and foresight to political and institutional cues	Transforming systems and creating sustainable futures
Intended users of the foresight and futures knowledge	Policy makers, officials, bureaucrats	Change agents and other actors driving transformation
Evaluation context	Governmental and organizational policy planning and decision making	The Earth system
Evaluation focus	Evaluating the connectivity of foresight to public policy making	Evaluating global sustainability, equity and transformation
Evaluation scope	Local level; municipality, nation state	Global level; beyond nation states
Evaluation question	What is the impact of foresight in policy making?	How evaluation can support the transformation towards sustainable futures?

Evaluation method	Examining the outcomes of foresight project in political and organizational domain	Using the four overarching principles and 12 operating principle
Intended users of the evaluation	Policy makers, officials, futures researchers	Everyone involved with global transformation initiatives
Maturity of the evaluation approach	Conceptual approach, not tested	Extensively tested approach

Conclusions

The evaluation of future oriented work is never easy and simple. Futures studies and foresight are almost always aimed at something that does not exist or is emerging. Thus, futures studies challenge the traditional evaluation settings and methods, and call for innovative ways to value outcomes and impact that may not exist yet. The two approaches studied in this essay showcase examples on how to apply evaluative thinking in the context of futures research.

The futures studies and evaluation field can learn from each other. The role of a futurist is to look forward and anticipate possible, probable and preferable futures. The evaluator, on the other hand, examines the past events and gives value to them. As Patton states “although futurists and evaluators employ different methods, they share similar aims. Both aspire to contribute to social betterment.” (Patton 2019b, 296.) That is a fruitful starting point for the future collaboration of these two disciplines.

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KEKO1 Kestävän kehityksen integrointi ja hallinta
Integrating the Principles of Sustainable Development

KEKO9001 course 'Implementing the principles of sustainable development' forms the backbone of the Sustainable Development Studies Minor. The goal of the course is to develop collective expertise and problem-solving ability in issues related to sustainable development. To achieve the goals of sustainable development people must agree on important priorities. This is a challenge, as both the aims and the means to pursue them change depending on the spatial scale, the time perspective – and depending on whom you ask. To get experience of such dialogue, students work in multi-disciplinary teams. Each team is assigned a theme that they will explore throughout the year. In 2022–2023, the themes were Charity and Development Aid, Ecological Compensations, Non-homemade meals and Algae.

During the year, each team writes four essays: ecological, social, economic and cultural sustainability transformation analysis of the topic. For each paper, the team needs to self-organize, agree on a more specific question or a problem, define what they mean with sustainability in this context, divide and carry out research and writing tasks, and to integrate their work into a coherent whole, all within a month.

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Of the 16 papers produced by the KEKO teams, a high-standard essay of our International team with the team topic Charity and development aid regarding social sustainability in various development cooperation projects (grade 5) and a topical essay of the Ecological compensations team regarding a critical examination of compensations from different sustainability perspectives (grade 4½) ended up being selected. The first essay is written in English, the second in Finnish. The members of the Charity and Development aid team were **Hossain Md Zakir, Aino Kivinen, Lila Laakso, Lola Leblond, Megan Maher, Burgert Maree, Maksim Pasynkov, Dzmitry Paturemski, Ann Jyothis Raj** and **Thilini Seneviratne**. The members of the Ecological Compensations team were **Matilda Hyytiäinen, Anne Jackson, Essi Lappi, Essi Narva, Kristiina Peltoniemi, Linnea Piililä, Veera Rauhala, Emmi Somero, Oskar Strauss** and **Sonja Yli-Kurki**. Papers are introduced by the responsible teacher, Senior Research Fellow, Adjunct Professor **Sari Puustinen**.

The essay "**Achieving Social Sustainability through a Futures-focus on Individual Agency and Social Capital**" examines the nature of social sustainability and the conditions for its realization in projects classified as development aid and charity (DAC). The starting point of the work is the idea of the definitional multidimensionality of social sustainability. Different perspectives of social sustainability are presented by comparing Maslow's Hierarchy of needs, Nussbaum's Central Human Capabilities model and Boström's substantive and procedural aspects of social sustainability. In addition, the work emphasizes the importance of democracy, individual agency and social capital in achieving social sustainability. The strength of the essay is both the presentation of the different theories and perspectives of social sustainability, which have been consistently chosen, and their successful connection to real-world practical examples. An example is the failed aid projects for Rohingya refugees in refugee camps in Bangladesh. Instead of trying to strengthen the refugees' own agency and livelihoods with aid programs, the focus was on short-term first aid and new dependencies on

external aid were created. As a positive example of a successful development aid project, the activities of the Grameen Bank of Bangladesh are described, where by microlending women's activities, it was possible to reduce poverty by increasing social capital and strengthening individual agency and capability.

The value of the essay is enhanced by the fact that the presented concepts are brought together in the conclusions with the help of a visual model. The model illustrates the interrelationships of social capital, individual agency and development aid/charity in striving for the preferred future where the goals of social sustainability are achieved.

In the essay "**Compensation markets – Compensation market as part of the fight against climate change**" compensation markets are examined as a means of mitigating climate change. The essay was chosen for this publication because it describes carbon footprint compensation practices in a general but also critical way. In addition, the essay describes societal and individual expectations of compensation. The authors include both factual information and their own reflection in their work.

Both companies and individuals are interested in the use of compensation as support in their efforts to move towards carbon neutrality. At a quick glance, compensation seems like a concrete action that could be used to achieve visible results even with relatively little effort. Today, carbon footprint compensation is used in a wide variety of activities related to sustainable development, including development aid projects. The essay states that, however, the compensation market in its current form is a contradictory field of activity. The market does not work efficiently, and it also includes various threats of abuse and scams. With the help of compensation, it is also not possible to cancel an activity that has already been carried out, i.e. it mainly aims to compensate for emissions that have already been caused. The primary starting point should be that no emissions are caused in the first place.

The difficult traceability and assessment of the real climate effects of the compensation market is also perceived as a problem. Several companies based entirely on fraud have been found in the industry. Compensation projects could be more effective than they are now if they were implemented more transparently. For example, the use of different international standards could be recommended to get a more accurate picture of the achieved compensation.

The authors state that the importance of the compensation market should not be overemphasized in the debate on combating climate change. The role of compensations should rather be understood more as a support measure when moving to carbon-neutral operations, and not treated as the main means of achieving carbon neutrality or combating climate change. The essay also ponders the question of whether compensation really has a positive effect on the climate crisis, or whether it only serves as a means of alleviating consumers' conscience and as a justification to consume more.

Achieving Social Sustainability through a Futures-focus on Individual Agency and Social Capital

Writers in alphabetical order:

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Aino Kivinen, Master's Program in Educational Sciences
Lila Laakso, Bachelor's Program in Geography
Lola Leblond, Bachelor's Program in Law
Megan Maher, Master's Program in Food Development
Burgert Maree, Master's Program in Futures Studies
Maksim Pasynkov, Master's Program in Education and Learning
Dzmitry Paturemski, Master's Program in Food Development
Ann Jyothis Raj, Master's Program in Education and Learning
Thilini Seneviratne, Master's Program in Futures Studies

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Abstract

This essay explores various theoretical frameworks to examine Social Sustainability. Social sustainability is defined through numerous interrelated components: individual agency, social capital, human rights, and capabilities. The connection between these components is determined by the nature of social sustainability as a complex phenomenon. Furthermore, the essay briefly explores how the dynamics and pluralistic aspects of social sustainability are link with the development aid and charity sector, through the framework of individual agency and social capital. The authors use the preferred future as a unifying premise to emphasize the links between Maslow's hierarchy of needs, Martha Nussbaum's Central Human Capabilities and Boström's substantive and procedural aspects of social sustainability. Finally presenting the claim that a preferred future is sustainable, for which social sustainability is a critical factor.

Key words: sustainable development, social sustainability, social capital, individual agency, development aid and charity, human rights and capabilities, preferred future, capabilities approach.

Introduction

Social sustainability is one of the four dimensions of sustainable development along with ecological, economic, and cultural sustainability. It is a complex concept that is dynamic and thus it is difficult to define. In examining what social sustainability refers to, Boström (2012) notes that "The proliferation of various frameworks – and not one hegemonic theory – is constructive because sustainable development is enormously complex. Pluralism is preferable to a single common approach" (p. 5). Consequently, this essay reflects on the dynamic and pluralistic aspects of social sustainability through the specific framework of individual agency and social capital and proceeds to briefly explore their relationships with the development aid and charity sector. At the same time however, the essay's premise is predominantly based on the four universal principles covering social sustainability: human well-being, equity, democratic government, and democratic civil society (Magis & Shinn, 2008).

According to Gough (2017), social sustainability refers to the levels of human well-being and its distribution among people. The concern of the distribution of well-being between people involves the pursuit of equity and justice (Gough, 2017). As Gough (2017) has expressed aptly, the pursuit of well-being and social justice is inadequate if it is done at the expense of the future generations. Similarly, Stayzk et al. (2016) argue that sustainability is best understood as intergenerational social equity, which clearly emphasises the intertemporal aspect that is also evident in the most popular definition of sustainable development – Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland, 1987). Hence, when taking the future generations into account, the notion of intergenerational equity is central. Additionally, in aiming towards a future of social sustainability, the impact of both historical trends/events and current practices must be acknowledged and a vision for the future also needs to be developed.

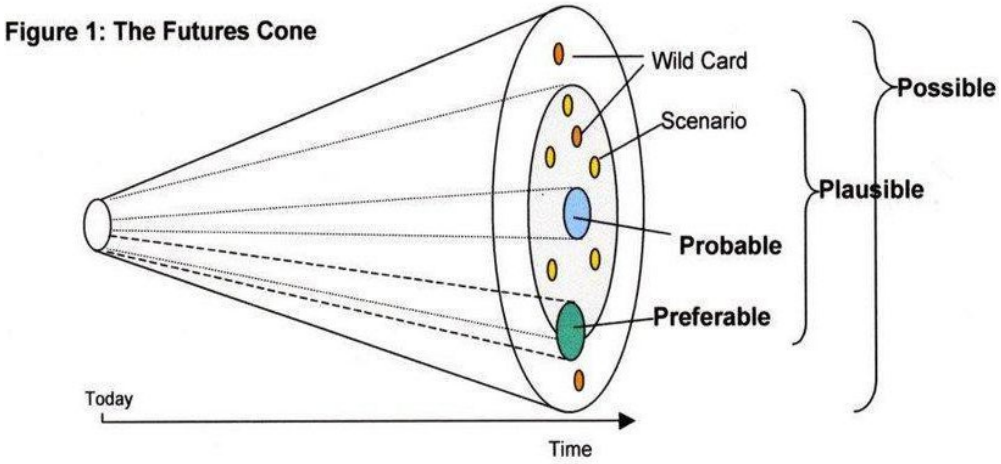

Figure 3. *The cone of plausibility (adapted from Taylor, 1993; image retrieved from http://thinkingfutures.net/)*

Historical trends and the decisions made in the past have brought us to the present, the decisions we make in the present will determine the kind of future we will have. Eleanora Masini (1982) said that "visions make it possible to create a future that is different from the present although its seeds are in the present" (p. 7). Within the field of futures studies, the Cone of Plausibility[2] (Figure 1) is used to indicate the relationship and the difference between numerous 'types' of futures. These futures are respectively called possible, plausible, probable, and preferable futures (Gidley, 2017). The extrapolation of the current status quo is referred to as the probable or 'used' future. This essay makes the claim that the preferred future is *reformed* Social Sustainability, but the current status quo needs to be challenged in order to reach this preferred future or we will end up with a probable or 'used' future by default. A preferred future is a sustainable future, for which social sustainability is a critical factor.

When theorising social sustainability, it is essential to discuss the substantive and procedural goals of sustainability. The distinction between the substantive and the procedural aspects is a way to separate two

[2] The cone of plausibility was originally developed by Charles Taylor in 1988 for the extensive use in scenario planning and then later refined (Dhami et al., 2022).

dimensions of social sustainability (Boström, 2012). The substantive refers to the actual goals of sustainability, whereas the procedural reflects the means that can serve to reach these goals. Substantive goals include basic needs (such as food, housing, and income); justice along the gender, race, class and ethnicity dimensions; equality of rights, access to social infrastructure; and opportunity to learn and self-development (Boström, 2012). Procedural goals, on the other hand, includes access to information, participation and decision-making, accountable governance, and empowerment for taking part in the processes (Boström, 2012). Accordingly, the theoretical framework of this essay is informed by these goals as well as the concepts of social capital, individual agency, and capability. The relationships between these factors are further considered from the perspective of the Development Aid and Charity Sector. Essentially, the thematic framework for the essay is as illustrated in Figure 2. A more nuanced conceptual diagram is presented as a conclusion to the discussions (in the following sections) about these relationships and its link to social sustainability.

According to the Capability Approach[3], introduced originally by Amartya Sen in the 1980s and developed afterwards by Martha Nussbaum, among others, well-being means the ability to live life in a meaningful way (Korhonen et al., 2017; Robeyns, 2005, p. 103). "The capability approach purports that freedom to achieve well-being is a matter of what people are able to do and to be, and thus the kind of life they are effectively able to lead." (Robeyns & Byskov, 2021, n.a). According to the framework, institutions should create possibilities for the individuals to use their agency in their lives, which, on the other hand, is relevant when aiming at well-being and meaningful life (Korhonen et al., 2017).

Figure 4. *A visual conceptualization of the essay's theoretical framework.*

One way to theorise the steps to the well-being of an individual is the hierarchy of needs by Abraham Maslow. Maslow's hierarchy of needs is a psychological theory that reflects the five categories of human needs that people need to fulfil in order to achieve well-being (West, 2022). The five categories of needs in Maslow's theory are (1) physiological needs, (2) safety, (3) love and belonging, (4) esteem, and (5) self-actualization

[3] "The capability approach is a theoretical framework that entails two normative claims: first, the claim that the freedom to achieve well-being is of primary moral importance and, second, that well-being should be understood in terms of people's capabilities and functionings. Capabilities are the doings and beings that people can achieve if they so choose – their opportunity to do or be such things as being well-nourished, getting married, being educated, and travelling; functionings are capabilities that have been realized. Whether someone can convert a set of means – resources and public goods – into a functioning (i.e., whether she has a particular capability) crucially depends on certain personal, sociopolitical, and environmental conditions, which, in the capability literature, are called 'conversion factors.' "(Robeyns & Byskov, 2021)

(Hopper, 2020)[4]. As West (2022) further explains, according to Maslow, fulfilment and well-being in life is a result of being able to meet the needs in all the five categories above. In addition, the needs are organised in a hierarchy, starting from the bottom from the concrete physiological needs until the final more abstract needs of self-actualization on the top pyramid. These needs overlap and are further extended in the Central Human Capabilities listed by Nussbaum (See Appendix A). Although Sen himself was not a proponent of such a list because he believed that human capabilities are dynamic and "the selection of capabilities is the task of the democratic process." (Robeyns, 2005, p.106). Nussbaum argues for the commitment to such a list in order to have any legitimate traction with justice and human rights (Nussbaum, 2008).

This essay claims that for a preferred future, Maslow's hierarchy of needs would be fulfilled, Martha Nussbaum's Central Human Capabilities would be embraced and appropriately promoted, and Boström's substantive and procedural aspects of social sustainability would be embedded within societies and related systems. A preferred future is a sustainable future, for which social sustainability is a critical factor.

Democracy, Individual Agency, and Capability

There is a growing awakening and emphasis on a democratised future across the world. In a recent online seminar on World Futures Day by the Copenhagen Institute for Futures Studies (CIFS), esteemed panellists from various organisations shared their vision for "Democratising the Future" (Copenhagen Institute for Futures Studies, 2022).[5] The word "agency" was frequently mentioned to describe a preferred future imagined by the panellists. The discussions emphasised that both individual and collective agency is critical for the preferred future. The importance for all, but especially the youth to belong, to be heard, to help shape their own futures, was deemed of utmost importance.

Social sustainability is linked to democracy in a complex manner. In Dewey's (1939) explanation of how democracy should and can be revitalised, he states that "we have had the habit of thinking of democracy as a kind of political mechanism that will work as long as citizens are reasonably faithful in performing political duties" (Dewey, 1939:1); it implies a default state-of-mind with no active engagement in the formation and maintenance of democracy and democratic processes. In a preferred future, deliberate decisions that examine and acknowledge present conditions must be made through a democratic process. Active and meaningful engagement in the democratic process is possible through empowered individuals and collectives. Dewey also supports the view that democracy is an evolving phenomenon, and, since the world and people in it are constantly changing, the democracy that had been created before needs to change and evolve with us. Without individual agency, it is impossible to allow for such evolution.

According to Dewey (1939), democracy is intrinsically linked to the creation of a humane experience with everyone's participation and contribution. Here the Capabilities Approach is a useful framework to discuss the links between democracy, individual agency, and capabilities. Capabilities can be referred to as real or substantive freedoms as they denote the freedoms that have been cleared of any potential obstacles, in contrast to mere formal rights and freedoms. Robeyns (2005) links an individual's contribution and participation, or

[4] The physiological needs in Maslow's theory include the most concrete basic needs such as food, water, shelter and sleep. Safety needs, on the other hand, refer for example to personal security, employment and health. Love and belonging include needs that are related to friendship, family and sense of connection, whereas esteem refers to self-esteem, recognition and freedom, for instance. The fifth and final need called self-actualization stands broadly for the feeling that we are reaching our potential. (Hopper, 2020; West, 2022).

[5] The Copenhagen Institute for Futures Studies (CIFS) is an independent, non-profit think tank based in Denmark.

“achieved functionings”, to a set of capabilities of that person. Capabilities give people the right to choose how they want to use their individual agency. Individual agency is a vast system of its own, the defining of which is beyond the scope of the essay. However, it is relevant to point out that agency has been theorised as ‘will’ but also ‘action’ or ‘choice’ (Campbell, 2009; Emirbayer & Mische, 1998), it is an ongoing debate with diverse points of view. In this essay agency denotes individual action, choice or will. Agency is concerned with the individual's freedom to choose and bring about the things that they value (Robeyn, 2005). Furthermore, individual agency can be considered as achievements in individual well-being combined with freedom to achieve particular outcomes (Robeyns, 2005). This view can be directly seen as an aspect of social sustainability, as social equity, defined as “fairness in the distribution of resources, particularly for those most in need” (Cuthill, 2010, p. 368) and is considered a core concept in many social sustainability frameworks (Cuthill, 2010; Jabareen, 2008; Murphy, 2012). Besides that, Nussbaum (2007) states that, being provided with central capabilities, people can become “able to function in a variety of areas of central importance” (Nussbaum, 2007, p. 21), which can be translated into Robeyn’s (2005) concept of agency.

Considering the distinction between substantive and procedural dimensions of social sustainability, most human capabilities defined by Nussbaum (2007): bodily health, bodily integrity, emotions, correspond to the substantive aspect. Boström (2012) argues that procedural and substantive aspects of social sustainability often overlap and reinforce one another. Therefore, addressing substantive issues can increase individual decision-making ability, involvement, and participation (Boström, 2012). In addition to that, Vizard et al., (2011) state that the capability approach reinforces the fulfilment of human rights and their codification in international legislation.

The importance as well as the complexity of human capabilities and the process of enhancing individual agency can be demonstrated with the following example concerning the access to nutritious food: Webber & Dollahite (2008), in a study of low-income households in the United States, showed that people are aware of the impact of nutrition on health and are willing to buy more fruit and vegetables. In addition to that, interviewees in the study acknowledge the importance of buying from local producers instead of big agricultural corporations with questionable business practices, which allows an assumption about their readiness to engage in environmentally, socially, and ecologically more sustainable practices in food consumption. However, low-income households face several issues that hinder them from purchasing fresh produce from small-scale sellers, including financial limitations and geographically restricted access to marketplaces. One can assume that, if the social and economic barriers to such central human rights of access to healthy and affordable food were addressed, people would become more proactive stakeholders and leverage their agency because a basic need is secured. As a result, not only a substantive goal of health and nutrition could be achieved, but there could also be a certain movement towards the procedural goals of sustainability. It must be noted, however, that substantive changes must not be seen as merely providing financial help because the issue of unequal access to food, for example, involves various barriers such as food prices and income, quality and quantity of items, lack of available time for shopping, lack of transportation and distanced marketplaces, etc. (Wolfson et al., 2019) – and they require changes in multiple structures and institutions, which can be addressed as or within the context of procedural goals.

At the same time, due to the feedback loops between procedural and substantive aspects of social sustainability, enhancing individual agency through the capability approach can be strongly constrained by established practices, policies, and norms suppressing individual agency of the more vulnerable communities/individuals. The same example of the food consumption and food market, now viewed from the perspective of a vendor in the research by Pilgeram, (2012), shows that the market of small-scale agricultural produce, while

providing an alternative for the environmental issues and social injustices associated with agricultural corporations, is predominantly represented by white, heteronormative dyads. Pilgeram in her study argues that the inequity that people of other races, genders, and sexual orientations might meet at a particular US local food market, is reinforced by two aspects - the hegemonic view of sustainable farmers as white, straight, cis couples, and the second one is the policy of the particular food market in space allocation indirectly pushing the few non-white sellers to the periphery of the market both literally and figuratively (Pilgeram, 2012). In this case, one can argue that procedural goals should align with or precede provision of human capabilities.

Another key point of social sustainability is social capital. Social capital can be defined in many ways, but the idea is that it forms a tight net of relationships that holds societies together; it includes relationships between people in communities and interactions with networks and cultures (Bhuiyan & Evers, 2005). Individual agency and social capital are in a strong relationship together, and their reciprocal effect is complex. On one hand, people might develop social capital to compensate for the limited individual capabilities, as it happens, for instance, in low-income households actively engaging in personal relationships and networking (Webber & Dollahite, 2008). On the other hand, Fukuyama (2000) argues that it is difficult to build good social capital without developing individual agency. He states that it is hard to make social capital a main factor in conversations about social sustainability because it is natural for humans and individuals to divide people into friends and “enemies”. Social capital wants to make sure everybody in communities are included but human nature wants to help friends and not “enemies”. This further emphasises the role of individual agency within communities even if the social capital is dysfunctional at any given time or within any given context.

Social Capital and Individual Agency

For the scope of this essay, social capital will be addressed and distinguished for the purposes due to its significance to individual agency. It will also address the influence social capital can have on the development aid or charity that a community may receive or provide. In addition, it will discuss how the accumulation of social capital connects with the preferred future.

Like social sustainability, there is no definite and overreaching agreed theory of social capital, but rather a variety of separate theories that focus on the various sources and unique effects of social capital. Social capital was defined by the author Lyda Hanifan (1916) as "concrete assets [that] count for most in people's daily lives: mainly goodwill, fellowship, sympathy, and social interaction among the individuals and families who constitute a social unit” (p. 130). Here Hanifan was credited with the introduction of the concept of social capital with reference to rural school community and educational clubs and community involvement as a means of developing ‘social capital’. The most well-known contributions to the identification and theorization of social capital are from Pierre Bourdieu (1986), James Coleman (1988), and Robert Putnam (1993). Social capital as a concept has immense potential for emphasising the importance of social factors as well as the advantages of procedural and substantive action. It has the potential to clarify and reframe social and environmental issues beyond the profit motive and to refocus attention on human rights and well-being, and the significance of an engaged and empowered society. It can assist in reversing the problems caused by rampant individualism and its attendant competition, greed, and exploitation (Claridge, 2019). It contributes to reversing the under-socialised view that humans are overly rational and self-interested, and largely unaffected by social factors (Claridge, 2019).

Social capital has been developed in various ways by researchers and developers, concentrating on different ways to emphasize individual actions in networking or social processes. As Canadian researchers Chris Ling and Ann Dale (2013) asked in their paper: “What is uncertain is the relative importance of individual versus

social capacity – and to what extent social capacity is greater (or lesser?) than the sum of its parts" (Ling & Dale, 2013, p. 2). Bourdieu, for example, sees social capital as a benefit that accrues primarily to individuals as a result of their participation in a set of social relationships (Bhuiyan & Evers, 2005). For individuals who invest in it and/or have access to it, social capital serves as a social facility and a foundation for individual agency (Adler & Kwon, 2002). From the capabilities perspective, we can also see the stress on individual action. Nussbaum (2007) refers to affiliation as one of the central human capacities. In the definition, a lot of focus is placed on the individual's actions, including "being able to live with and towards others" and "having the social bases of self-respect and non-humiliation" (Nussbaum, 2007, p. 23).

On the other hand, other authors believe that social capital is an attribute of community. According to Putnam (1993), social capital is based on networks. Networks of engagement and reciprocity are built on trust and shared values, allowing for mutually beneficial cooperation. Social networks generate "collective value" and encourage people to help one another through reciprocity norms. Scholars at the World Bank are credited with coining the term "linked social capital" to describe relationships between people or institutions at various levels of the societal power hierarchy. Linking social capital differs from bridging social capital in that power imbalances between partners are an intentional component of the relationship. While bridging social capital fosters horizontal trust between dissimilar groups, linking social capital entails traditional patron/client or mentor/mentee relationships (Grootaert, 1998; The World Bank, 1998). Linking social capital entails developing social relationships with those in positions of authority that can be used to gain access to resources or power. Many indirect community benefits of linking social capital are frequently overlooked in the literature. For example, connecting government officials with people who provide knowledge and skills to perform their jobs. Linking social capital is demonstrably important for well-being, particularly in poor countries and communities where bankers routinely charge usurious interest rates, cops are corrupt, and teachers fail to show up for work. It provides economic opportunities to those from less powerful or excluded groups. To have a strong social capital, there must be a balance between the different types, rather than just linking to one type of capital but lacking others. According to Onyx et al. (2007), communities with higher levels of all forms of social capital are better able to mobilize in the face of adversity and are less likely to have negative outcomes.

In a preferred future, social capital would be enhanced within a community to the extent that it enables the development of individual agency toward Nussbaum's (2007) capabilities approach. This would enhance diverse capabilities that would improve the 'freedoms' of members of that community to live a meaningful life leading to improved equity and equality. Social capital would accomplish this by fostering the procedural and substantive aspects of social sustainability. There is mounting empirical evidence that social capital makes a significant contribution to long-term development.

Social sustainability necessitates a shift away from a narrow focus on economic and individual interests and toward a more holistic approach that considers the environment, society, and future generations. There must be a shift toward considering the full range of costs and benefits over generations, rather than fiscal years and election cycles. Besides the government another key actor in terms of achieving procedural goals is the development aid and charity (DAC) sector. Given the networks, funding, and other resources in this sector, it has a substantial impact on communities' agency and social capital, with both planned and unplanned outcomes. In a preferred future, social capital would be enhanced within a community to the extent that it enables the development of individual agency toward Nussbaum's (2007) capabilities approach. This would enhance diverse capabilities that would improve the 'freedoms' of members of that community to live a meaningful life leading to improved equity and equality. Social capital would accomplish this by fostering the procedural and substantive aspects of social sustainability. There is mounting empirical evidence that social capital makes a significant contribution to long-term development.

Charity and Social Capital

Having discussed the various approaches to defining and building social capital, a correlation between social capital (or a certain level of it) and charity needs to be discussed. As Putnam (1993) points out, an important feature of social capital is that it is both productive and compatible with the common good. Thus, the nature of social capital prevents it from becoming private property. Fukuyama (1995) defined social capital as "the ability of people to work together for common purposes in groups and organizations" (p. 10). Both definitions are quite close to the nature of charity as well as to the goals of charity organisations. In modern society, individual donations are certainly a very important and well-recognized phenomenon. As the latest World Giving Index 2022 published by The Charity Aid Foundation (CAF) shows, individual donations have risen and have reached a record high: 35 percent of people donated to charity during 2021 (Heslop, 2022). Therefore, it is likely that systematic charity is related to social capital and eventually social sustainability. Charity is thus also linked to individual agency from the perspective of the donor.

In a peer-reviewed journal, a research group from China published an article, which examined charity and social capital in crowdfunding platforms for medical needs (Ba et al., 2022). As a result, this group finds that "a charity can contribute more to the fundraising and participation performances of a medical crowdfunding project than an individual fundraiser" (p. 6). Research shows that charities have built up social capital over time, which is based on a broad network and strong trust (2022).

The Role of Development Aid and Charity in Social Sustainability

The complexity of social sustainability and its components is well established – what then is the link between DAC and what Magis & Shinn (2009) call the "four universal principles covering social sustainability: human well-being, equity, democratic government, and democratic civil society"? This section attempts to redefine the role of DAC, specifically in enabling and aligning with democratic spaces and movements (social capital) and individual agency towards social sustainability.

Development Aid and Democracy

Although governments provide and ensure fair elections, there are still factors posing some serious challenges to democracy: poverty, inequality, discrimination, unemployment among others. More precisely, "exclusions and discriminations impede the participation that is needed to generate the effective demand for change in the political arena that would then address those exclusions" (Farrington, 2012, p. 16). Nevertheless, overcoming this democratic deficit includes the need to break vicious cycles of poverty and inequity. Governments, non-governmental organisations, and other actors in the DAC have a crucial role to play in breaking these cycles. For this essay, the focus is on the role of DAC, which includes non-governmental organisations, charities, and aid agencies.

According to, non-governmental organisations in the democratic transition are not credible enough to represent the interests of the poor. Secondly, political interests are determined by the clientele for the power struggles of politicians rather than as citizens with rights. This consequently creates a void between the governors and the governed. Finally, Pearce (2004) offers the following conclusion: social movements have a crucial role to play in the expansion of rights. Consequently, a civil society should be established, that is to say "a space for the development and articulation of opinion through associational life about the values and priorities that should underpin a given society" (p. 20). In other words, all citizens must be able to bring about

change appropriate to their lived experience. Social activists consequently must contribute to the refining of this civil society so that it can be closer to the ideal of direct democracy. They must themselves be democratic because collective action needs democracy and democratic deficits must be challenged by collective action. If they succeed, the model of direct democracy will be more compatible with representation and pluralities.

The preferred future indicated in this essay requires deliberate decisions to move away from the current status quo and curtail the 'business as usual' approach. In critiquing the specific role of DAC, post-development authors do not set any alternatives. In fact, Frediani (2010) argues that "overcoming processes of subordination is not about 'development alternatives', but about 'alternatives to development' through supporting local grass-roots organisations" (p. 174) or community-based organisations or civil society at large. However, the threat of continuing the status quo and maintaining 'business as usual' does not disappear with the sub-contracting or transitioning of development imperatives to local communities. A way forward is offered by the capabilities approach to agency and freedom, which is the process aspect of development, and encompasses the substantive and procedural goals. The following sections discuss the cases of the Rohingya Refugee crisis to expound on the issues with DAC and the Grameen Bank as an example of an alternative approach.

Rohingya Refugees

In August 2017, armed attacks, massive scale violence, and serious human rights violations forced thousands of Rohingya to flee their homes in Myanmar's Rakhine State. Many walked for days through jungles and undertook dangerous sea journeys across the Bay of Bengal to reach safety in Bangladesh. As of July 2022, the World Health Organisation estimates over 925,000 Rohingya are living in Cox's Bazar in Bangladesh. The United Nations has described the Rohingya as "the most persecuted minority in the world" (UNHCR, 2022). There are many national and international organisations working within the 38 Rohingya camps, which are mainly funded by different development aid organisations (Gorlick, 2019). These organisations are focused on immediate emergency measures such as shelter, food relief, water and sanitation and a few education camps for the refugee children. Programs focusing on livelihoods or skill-building are missing or focused on low-impact projects like home-gardens (Concern Worldwide, 2022). They remain isolated from the rest of the world, are completely dependent on aid and charity and they remain nationless. There are limited or no options for productive work or self-employment. Moreover, the Government of Bangladesh is itself struggling with limited resources for its own people and has raised concerns about the rapid growth of the Rohingya population in Cox's Bazar camps with an average of 35,000 new births registered every year (Rahman, 2022). The world's largest refugee camp is facing a protracted humanitarian crisis.

This is a complex situation with several dimensions and components. However, the development model in Rohingya camp is not a long-term solution. There is little opportunity for the refugees to reduce dependence on aid, to reduce poverty or to improve their own well-being. The host communities are also facing threats to their resilience, resource-base and social cohesion. Given such a scenario, one wonders about the scope of future available to the refugees, host communities and their children. What capabilities do refugees have to enhance their own agency and fight for their rights and well-being? Or will they remain forever dependent on aid and the mercy of charity? This is a question to be asked of any of the several refugee camps and the 27 million refugees across the world (UNHCR, 2022).

If social sustainability is a cornerstone of sustainability, then development aid and charity must seriously consider it as a parameter for meaningful impact. Multiple threats to social sustainability can be averted by focusing on empowering the refugees as individuals and a collective. Steering their collective agency towards a future that is improving on intergenerational equity is critical for the host communities as well as the refugees.

In addition to the aid and charity needed to keep refugees alive, projects should include skill-building, counselling, employment, higher education, and other projects that can cater to any of the substantive goals indicated by Boström (2012). A truly innovative approach would be to empower them to fight poverty and enhance their capability to achieve well-being freedom.

The Grameen Bank of Bangladesh

One of the key deterrents to meaningful engagement with community and society is poverty. Poverty does not just mean lack of money; multidimensional poverty is lack of rights and equality (OHCHR, n.d.). Reducing poverty is the single best way to increase individual agency and capability as well as social capital. An example is the impact of the Grameen Bank of Bangladesh, a microfinance organisation and community development bank that gives microcredit to the impoverished, especially women, without requiring collateral. The Nobel Prize-winning bank's objective is to promote financial independence among the poor. The bank's approach is unique because the small loans are guaranteed by members of the borrower's community; pressure within the group encourages borrowers to pay back the loans in a timely manner. "The group-lending model fosters a powerful social network that produces social capital by engaging borrowers in weekly group meetings" (Grameen Research, Inc., n.d.). It is an example of how individual capability is bolstered by social capital – a group of women will borrow from the bank and be responsible for each other's loan repayment.

An Alternative to Business-as-usual

Another dimension is the individual agency and capability of a single person – Professor Muhammad Yunus, who recognised a complex problem, and used his own money to make small loans that addressed the basic needs of the poor. His action in 1983 propelled the possibility of thousands of other women to form groups and improve their own well-being. The microloans were used for anything from sanitation infrastructure to starting a small business/enterprise. All of which enabled the most impoverished families to take a step forward towards increased capability and social capital. Increased capability can enable communities to participate meaningfully in the development of their own communities, as illustrated in Figure 3. If we could imagine a similar scenario for the Rohingya refugee camp, the likelihood of each family rising out of poverty and powerlessness is greater. As Robeyn & Byskov (2021, n.a.) explains, "Capabilities have also been referred to as real or substantive freedoms as they denote the freedoms that have been cleared of any potential obstacles, in contrast to mere formal rights and freedoms." An individual's capability to improve their own and their family's well-being is detrimental for the preferred future discussed in this essay.

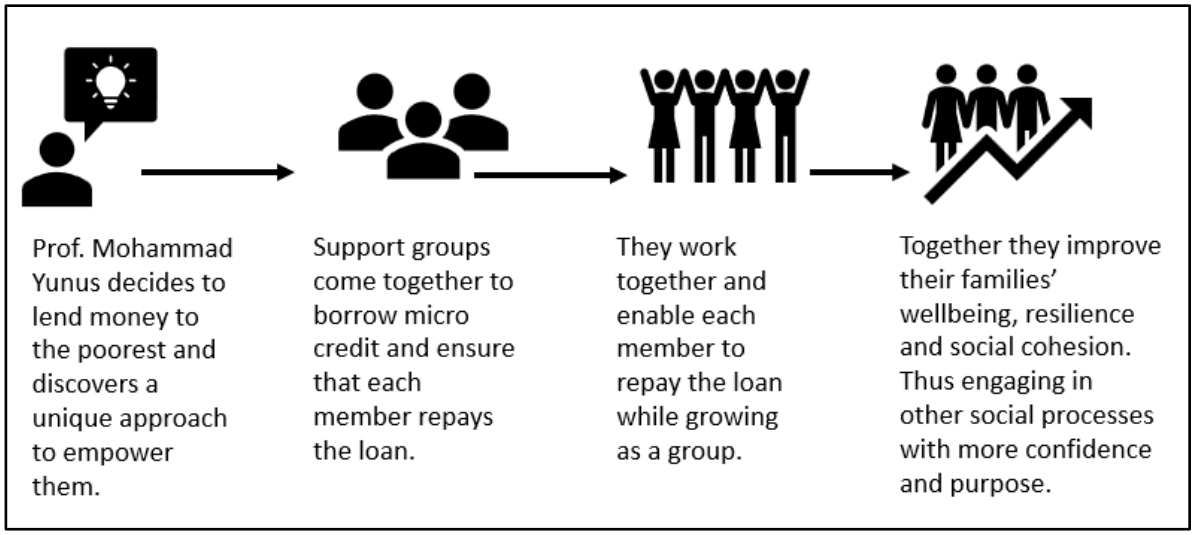

Figure 5. From individual to collective agency.

The criticism for DAC's approach in emergencies or long-term development essentially centres on how well the local context is understood and subsequent meaningful engagement. It is the difference between going into a community to 'fix a problem' that was framed 'elsewhere' versus identifying and solving the issues with the community. A practical alternative to 'business as usual' and 'tried and failed' development programs is the Sustainable Livelihoods Framework (SLF). It was first conceptualised by Chambers & Conway in the 1990s, where they found that "capabilities, equity and sustainability combine in the concept of sustainable livelihoods" (Chambers & Conway, 1991, p. 9). All of which are ends and means for social sustainability. A working definition of SLF is as follows (Chambers & Conway, 1991):

> "A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a living is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term." (p. 10)

Natarajan et al. (2022) reformulate the original SLF and narrow assets to financial and physical and add two further aspects: 'relational power' (class, gender, ethnicity, caste, and other material power relations) and 'climate and environment context/relations' (local-level climate and environmental contextual factors). In the context of the Rohingya crisis, both relational power and climate and environment contexts/relations need to be considered to the best extent possible, from the perspective of the host communities as well as the refugees.

Conclusion

As established, social sustainability does not have a single hegemonic definition. It is one dimension of sustainability or sustainable development, which is an enormously complex framework. Together with economic and environmental sustainability, social sustainability is critical for poverty-reduction and social cohesion as well as community resilience, and vice versa. Consequently, and despite the risk of oversimplification of core theories and complex realities, this essay's futures-focused framework of social sustainability remains open to several emerging pathways and possibilities. As established, three core elements or components of such a future are individual agency and capability, social capital and a reformed development aid or charity. Each has a role and lever to push for social sustainability embedded within the idea of creative democracy (Dewey, 1939).

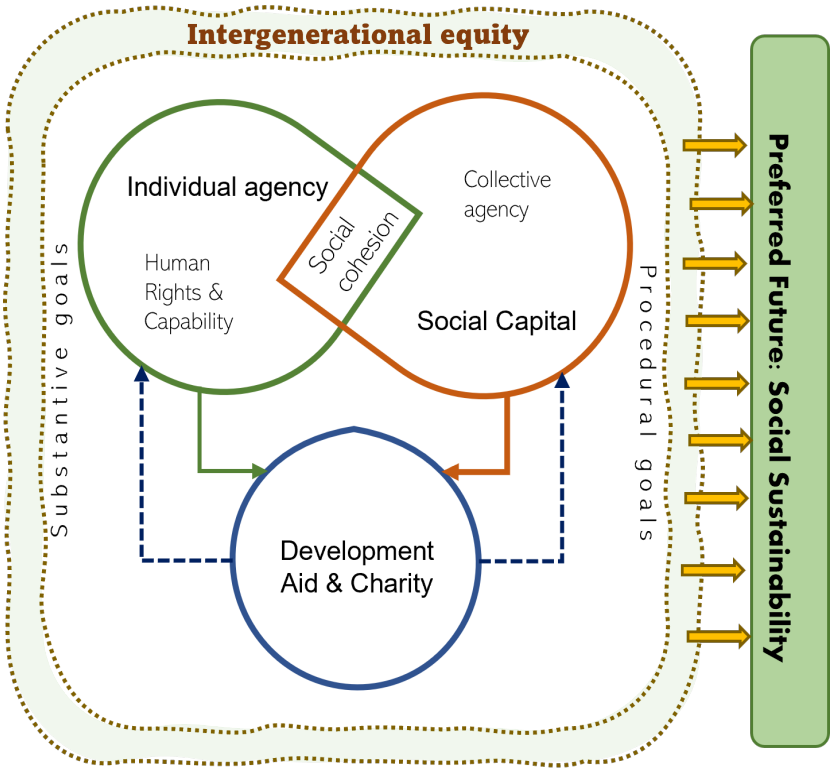

***Figure 6**. Visual conceptualisation of the dynamic links that can allow the emergence of social sustainability.*

The complex links between these elements are demonstrated in Figure 4: all action and decisions needed to move forward from current status quo must be based on the overarching premise of intergenerational equity, which is expounded upon by substantive and procedural goals. These goals are the imperative of individuals, families, communities, and the larger entities that units of society engage with. The role of DAC is to enhance and align with individual agency and social capital. Individuals and social capital must in turn engage/negotiate with DAC within these mentioned frameworks, to produce the outcomes that will lead to social sustainability and eventually overall sustainability. This diagram assumes that governance systems are following democratic processes. Individuals can shape society – but societies encourage certain types of motive for action. The steering of that action towards social sustainability must be informed by free choice and based on scientific facts, sound reasoning and a hope for the collective future because "the task of democracy is forever that of

creation of a freer and more humane experience in which all share and to which all contribute." (Dewey, 1939, p. 4). However, in imagining and theorising such a future, the human collective will remain uncertain of the outcomes of today's decisions and indecisions. As aptly stated by Chambers & Conway, (1992) three decades ago and which remains most relevant in 2022:

> "In almost every domain of human life, change is accelerating... conventional or normal concepts, values, methods, and behaviour prevalent in professions are liable to lag further and further behind… future conditions [will] become harder and harder to predict. In this flux and future uncertainty, we can expect that change will continue to accelerate, that much professionalism will continue to be behind the times, and that we will continue to be out of date and wrong in our anticipation of the future". (p. 1)

This should, however, not be a deterrent but rather an encouragement to do the best we are able to, today. The preferred future of future generations may very well depend on it. As demonstrated in this essay, several experts, researchers, and thinkers have offered diverse avenues to consider while the global and local collectives work towards a sustainable future.

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Appendices

A. The Central Human Capabilities

From 'Human Rights and Human Capabilities' by Martha Nussbaum (Nussbaum, 2007)

1. ***Life***. Being able to live to the end of a human life of normal length; not dying prematurely, or before one's life is so reduced as to be not worth living.

2. ***Bodily Health***. Being able to have good health, including reproductive health; to be adequately nourished; to have adequate shelter.

3. ***Bodily Integrity***. Being able to move freely from place to place; to be secure against violent assault, including sexual assault and domestic violence; having opportunities for sexual satisfaction and for choice in matters of reproduction.

4. ***Senses, Imagination, and Thought***. Being able to use the senses, to imagine, think, and to reason—and to do these things in a "truly human" way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection with experiencing and producing works and events of one's own choice, religious, literary, musical, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise. Being able to have pleasurable experiences and to avoid non-beneficial pain.

5. ***Emotions***. Being able to have attachments to things and people outside ourselves; to love those who love and care for us, to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger. Not having one's emotional development blighted by fear and anxiety. (Supporting this capability means supporting forms of human association that can be shown to be crucial in their development.)

6. ***Practical Reason***. Being able to form a conception of the good and to engage in critical reflection about the planning of one's life. (This entails protection for the liberty of conscience and religious observance.)

7. Affiliation.

   A. Being able to live with and toward others, to recognize and show concern for other human beings, to engage in various forms of social interaction; to be able to imagine the situation of another. (Protecting this capability means protecting institutions that constitute and nourish such forms of affiliation, and also protecting the freedom of assembly and political speech.)

   B. Having the social bases of self-respect and non-humiliation; being able to be treated as a dignified being whose worth is equal to that of others. This entails provisions of non-discrimination on the basis of race, sex, sexual orientation, ethnicity, caste, religion, national origin.

8. ***Other Species***. Being able to live with concern for and in relation to animals, plants, and the world of nature.

9. ***Play***. Being able to laugh, to play, to enjoy recreational activities.

10. Control over One's Environment.

    *A. **Political**. Being able to participate effectively in political choices that govern one's life, having the right of political participation and protections of free speech and association.*

    *B. **Material**. Being able to hold property (both land and movable goods) and having property rights on an equal basis with others; having the right to seek employment on an equal basis with others; having the freedom from unwarranted search and seizure. In work, being able to work as a human being, exercising practical reason and entering into meaningful relationships of mutual recognition with other workers*

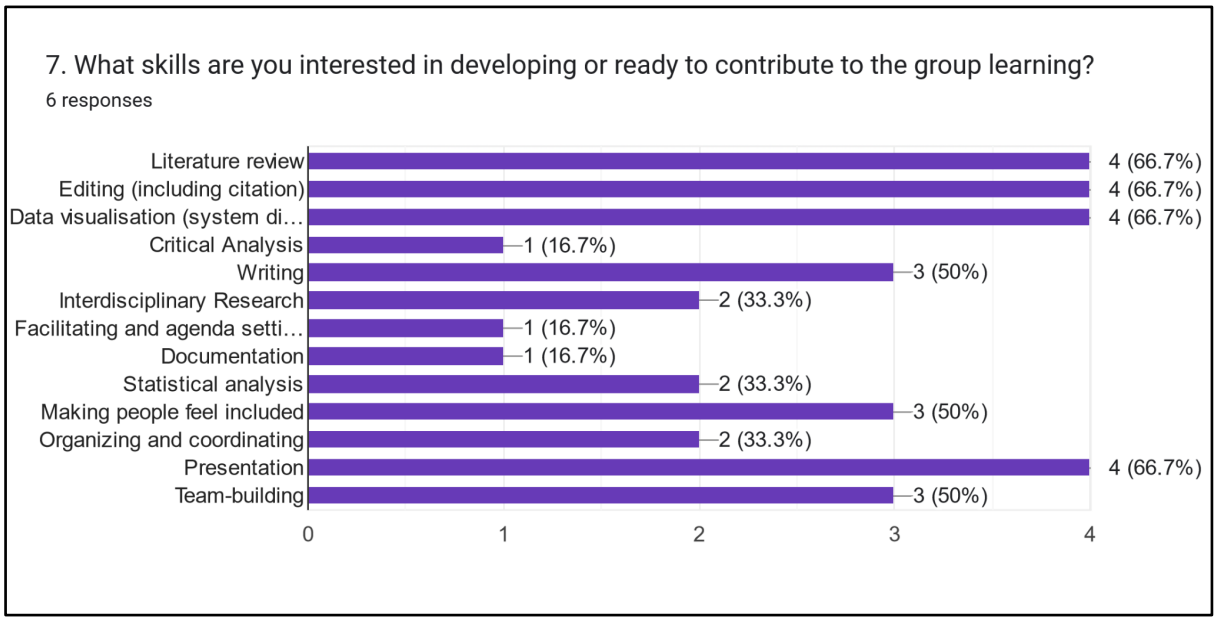
    .

B. Criteria used for designing the essay discussion and writing process

For the purpose of the Minor as well as for the outcome expected in this essay, we discussed and identified the following as learning outcomes, which also served a purpose as the criteria that informed our process:

1. Gain a better understanding of sustainability: aspects/dimensions of sustainability, complexity, methods, current status, etc.
2. Explore practical application of sustainability and related knowledge: analysis, policy influence, methodology, decision-making, problem-solving etc
3. Team building, teamwork, team learning (overcoming the English language)
4. Connect team member Major subject knowledge with Minor

We also considered the following:



(This is the result of a survey answered by the group members and endorsed through discussions)

The essay writing process, including research, discussion and writing were based on the above. Our own criteria for the essay includes the achievement of the learning outcomes listed above as well as the following: Quality of collaborative/co-operative learning, meaningful individual and collective contributions, academic writing*, critical thinking/analysis*, understanding of social sustainability dimensions*, and avoiding other pitfalls of collaborative/cooperative learning.

Kompensaatiomarkkinat – Kompensointimarkkina osana ilmastonmuutoksen torjuntaa

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Abstrakti

Tässä työssä perehdytään kompensaatiomarkkinoiden tarkasteluun ilmastonmuutosta torjuvana ja mitigoivana keinona. Sekä yrityksiä että yksityishenkilöitä on jo pitkään kiinnostanut kompensaation käyttö tukena näiden pyrkiessä siirtymään kohti hiilineutraaliutta; kompensaatio tuntuu taloudelliseen kestävyyteen liittyvältä konkreettiselta toimelta, jonka avulla voitaisiin saavuttaa näkyviä tuloksia jopa suhteellisen pienellä vaivalla. Kompensaatiota käytetäänkin tänä päivänä monenlaisissa kestävään kehitykseen liittyvissä toimissa. Tässä esseessä keskitytään erityisesti hiilijalanjäljen kompensointiin.

Kompensaatiomarkkinat ovat kuitenkin nykymuodossaan ristiriitainen toimintakenttä. Ne eivät toimi tehokkaasti, ja niihin sisältyy lisäksi erilaisia väärinkäyttön ja huijausyritysten uhkia. Kompensaation avulla ei myöskään saada tehtyä tekemättömäksi, vaikka sen avulla voidaankin toisinaan vaikuttaa taloudelliseen kestävyyteen tiettyjen puitteiden rajoissa. Kompensaatioprojektit saattavat olla sitä hyödyllisempiä, mitä läpinäkyvämpiä ne ovat; esimerkiksi erilaisten kansainvälisten standardien käyttö saattaa hyvinkin olla suositeltavaa tarkemman kuvan saamiseksi saavutetusta kompensaatiosta.

Kompensaatiomarkkinoiden merkitystä ei pitäisi ylikorostaa keskustelussa ilmastonmuutoksen vastustamisesta. Niiden rooli tulisi pikemminkin ymmärtää enemmänkin tukitoimeksi hiilineutraaliin toimintaan siirryttäessä, eikä käsitellä niitä pääasiallisena keinona hiilineutraalisuuden saavuttamiseksi tai ilmastomuutoksen torjumiseksi.

Johdanto

Ilmastokatastrofi on yksi suurimmista ihmisen aiheuttamista maailmanlaajuisista kriiseistä. Ilmastonmuutoksen pysäyttäminen tai sen vaikutusten minimointi on ihmiskunnan vastuulla. Mutta kenellä on asiasta suurin vastuu, poliittisilla päättäjillä, talouseliitillä vai yksityishenkilöillä? Mitä näin ison mittakaavan ongelmassa yksityishenkilö voi edes tehdä? Eräs yksilöitäkin koskettava vaikutuskeino on aiheutettujen ilmastohaittojen kompensointi ostamalla niin sanottuja päästöyksiköitä päästökompensaatiomarkkinoilta. Näin on myös tehty: vuonna 2018 globaalisti hyvitettiin 100 miljoonan tonnin edestä hiilidioksidipäästöjä (Landström 2020).

Suomen ympäristöministeriön mukaan hiilidioksidipäästöjen vapaaehtoisen kompensoinnin suosio on kasvanut viime vuosina (ym.fi). Kotimaiset vapaaehtoiseen kompensaatioon suuntautuneet kompensaatiomarkkinat ovat merkittävässä kasvussa. Palveluiden kysyntää ovat lisänneet yritysten ja muiden organisaatioiden asettamat hiilineutraaliustavoitteet sekä kuluttajien huoli ilmastonmuutoksesta.

Tässä esseessä tarkastelemme sitä, mitä hiilikompensaatio on, ja millaiset hiilikompensaatiomarkkinat käytännössä ovat. Ensin määrittelemme päästöjen kompensaation yleisesti, minkä jälkeen keskitymme hiilikompensaatioon. Tämän jälkeen siirrymme tarkastelemaan kompensaatiomarkkinoita keskittyen Compensate-säätiön ja Zalandon toimintaan. Valitsimme suomalaisen Compensate-säätiön ja saksalaisen Zalandon

tarkastelun kohteiksi, koska ne avaavat mielenkiintoisella tavalla kompensaatiomarkkinoiden toimintaa erilaisista lähtökohdista käsin. Lopuksi pohdimme kompensaation ongelmia, sääntelyä ja läpinäkyvyyttä. Esseellä pyrimme vastaamaan kysymykseen siitä, onko kompensoimisella oikeasti positiivista vaikutusta ilmastokriisiin, vai toimiiko se vain kuluttajien omantunnontuskan lievittämisen keinona ja oikeutuksena kuluttaa lisää.

Päästöjen kompensaatiosta

Yleisesti päästöjen kompensoinnilla tarkoitetaan sitä, että tiettyyn päästömäärään liittyvä ilmastohaitta kumotaan vähentämällä tai sitomalla kompensoitavia kasvihuonekaasupäästöjä vastaava määrä jossain muualla. Kompensaation seurauksena globaalien nettopäästöjen ei siis tulisi kasvaa. Tyypillisesti kompensaation kohteena ovat kompensoijan omat päästöt. (Vapaaehtoisten päästökompensaatioiden sääntely 2021, 13.)

Päästökauppa on yksi tapa mitätöidä päästöjä. Päästökauppa on kauppaa, jonka piiriin kuuluvat yritykset, organisaatiot ja laitokset tarvitsevat toiminnastaan aiheutuvia päästöjä vastaavan määrän päästöoikeuksia, joilla ne voivat käydä kauppaa. (ilmastokauppa.com) Suomessa CO2esto ostaa oikeuksia pois EU:n päästökaupasta, jolloin ne ovat pois energiantuotannon ja teollisuuden sallitusta päästökiintiöstä (Landström 2020).

CO2-päästöleikkuripalvelun kautta voi ostaa päästöoikeuksia pois EU:n päästökaupan kiintiöstä ja siten mitätöidä aiheuttamaa hiilijalanjälkeä (CO2esto.com). Lisäksi yksityishenkilöt voivat mitätöidä tai niin sanotusti hyvittää aiheuttamiaan päästöjä lahjoittamalla varoja esimerkiksi ympäristöjärjestöjen toimintaan tai ikimetsien suojeluun sekä soiden ennallistamiseen. Tässä esseessä kuitenkin keskitymme virallisempaan päästökompensaatioon: hiilikompensaatioon.

Hiilikompensaatio

Hiilikompensaatio on kasvihuonepäästöjen hyvittämistä erilaisilla hiilensidontaa lisäävillä toimilla, tai yleisesti päästöjen vähentämistä. Hiilikompensaatioille on olemassa järjestelmä: kansainvälinen hiilikauppa. Lisäksi on olemassa kuluttajille tai yrityksille suunnattuja vapaaehtoisia hiilikompensaatiojärjestelmiä. (Pekkonen ym. 2020, 14.) Vapaaehtoisessa hiilikompensaatiossa yksityinen kuluttaja tai yritys ostaa kolmannelta osapuolelta palvelua, joka sitoo tai vähentää kuluttajan tai yrityksen toiminnasta syntyneitä päästöjä vastaavan määrän hiiltä aktiivisten toimenpiteiden avulla jossain muualla (hiilikompensaatio.fi).

Konkreettisesti yksilön tai yrityksen tekemä hiilikompensaatio tarkoittaa päästöyksikköjen ostamista jonkin palveluntarjoajan kautta (Landström 2020). Hiilikompensaation edellytyksenä on, että kompensaatiotoimien avulla saavutettu päästövähennys ei olisi toteutunut ilman hyvitysyksiköiden ostoa (hiilikompensaatio.fi). Ostettavissa olevia päästöyksiköitä tuotetaan esimerkiksi rakentamalla uusiutuvaa energiaa, suojelemalla metsiä tai metsittämällä uusia alueita. Usein nämä päästökompensaatio-projektit tapahtuvat kehittyvissä maissa. Projektit sertifioidaan kolmannen osapuolen tekemillä tarkastuksilla, erilaisten standardien mukaan, ja tuotetut päästövähennykset lasketaan standardin määrittämällä menetelmillä. Yleisimpiä käytössä olevia standardeja, joita käytetään vapaaehtoisiin kompensaatioihin, ovat Verified Carbon Standard (VCS), Gold Standard ja Clean Development Mechanism (CDM). Päästökompensaatio-projektissa tuotetut päästövähennykset tarkastetaan, jonka jälkeen ne numeroidaan päästöyksiköiksi ja lisätään rekisteriin, jossa niiden omistuksesta pidetään kirjaa. Kun yksikkö myydään kompensointiin, se poistetaan rekisteristä. (Landström 2020.)

Mitä on taloudellinen kestävyys?

Kun pyritään löytämään tietoa taloudellisen kestävyyden määritelmästä, ei esimerkiksi hakukoneista löydy vain yhtä yksinkertaista vastausta tai mallia, vaan määritelmiä löytyy lukuisia. Seuraavassa kappaleessa tullaan avaamaan erilaisia näkökulmia taloudelliseen kestävyyteen. Näitä ovat muun muassa irtikytkentä, donitsimalli ja yritysten vastuullisuusraportointi.

Taloudellinen kestävyys jakaa mielipiteitä – ja varsinkin poliittisessa keskustelussa mielipiteitä on laidasta laitaan – jyrkästä suhtautumisesta löysempään linjaan. Ympäristöministeriö (2023) kirjoittaa sivuillaan taloudellisesta kestävyydestä sekä siitä, miten talouspoliittisen suuntauksen ollessa linjassa kestävien tavoitteiden kanssa taloudellinen kasvu on tasapainoista ja sisällöltään laadullista. Tämän toteutuessa myös sosiaalinen kestävyys toteutuisi: kun talous on kestävällä pohjalla, pystytään paremmin reagoimaan erilaisiin yhteiskunnallisiinkin haasteisiin. Tämä ympäristöministeriön määritelmä kuitenkin liittyy enemmän kestävyyteen pysyvyyden merkityksessä kuin ympäristön kuormittavuuteen yhdistyneeseen kestävyyden käsitteeseen.

Taloudellisen toiminnan ympäristövaikutukset ovat kestävän kehityksen keskeinen osa-alue. Yritysten on minimoitava haitalliset ympäristövaikutukset ja tarjottava sidosryhmilleen ratkaisuja, jotka auttavat asiakkaita vähentämään tarpeetonta energiankulutusta ja resurssien kulutusta. Tämä on yhä tärkeämpää yrityksille, jotka haluavat luoda pitkän aikavälin arvoa, ja se on siten myös osa kannattavaa liiketoimintaa. (Kestävä kehitys 2023)

Toinen taloudellisen kestävyyden ulottuvuus on sosiaalinen vastuu. Yhteiskunnalla on tärkeä rooli kestävän talouskehityksen edistämisessä, ja kotitalouksien kulutusvalinnoilla on tässä merkittävä rooli. Kestävän talouden merkitys näkyy kuluttajien käyttäytymisessä ja valinnoissa, sillä tavat, joilla elämme, liikumme, syömme sekä ostamme tavaroita ja palveluita vaikuttavat merkittävästi ympäristöömme. (Kestävä kehitys 2023)

Hallinnointi on myös yksi taloudellisen kestävyyden keskeinen ulottuvuus. Ympäristöön liittyvät, sosiaaliset ja hallinnolliset tekijät eli ESG-raportointi on yhä tärkeämpää yrityksille pitkän aikavälin arvon luomiseksi. Maailman talousfoorumi on käynnistänyt Stakeholder Capitalism Metrics -aloitteen, jonka tavoitteena on edistää johtavien yritysten ESG:n julkistamiskäytäntöjä sekä edistää kestävän kehityksen raportoinnin systemaattista integrointia. (Chen 2023.)

Euroopan tilinpäätösraportoinnin neuvoa-antava ryhmä (EFRAG) on saanut tehtäväkseen luoda yksityiskohtaiset kestävän kehityksen raportointistandardit (ESRS) EU:ssa toimiville yrityksille. Näitä vaatimuksia sovelletaan vaiheittain erilaisille yrityksille, joista ensimmäisten tulisi alkaa noudattaa niitä vuoden 2024 alusta alkaen. ESRS-luonnoksilla olisi merkittävä vaikutus yritysten julkaisemiin kestävän kehityksen ja erityisesti taloudelliseen kestävyyteen liittyviin tietoihin, koska ne määrittelevät tarkasti, mitä tietoja yritysten tulee raportoida. ESRS-raportointia sovellettaisiin kaikkiin EU:n suuriin ja useimpiin listattuihin yrityksiin sekä muihin EU:n ulkopuolisiin yrityksiin, joiden liikevaihto EU:ssa on yli 150 miljoonaa euroa. (EFRAG 2022)

Yksi taloudellisen kestävyyden ulottuvuus on myös ’irtikytkentä’ (*decoupling*). Artikkelissa Vaden ym. (2019) käsitellään kyseistä aihetta. Irtikytkennän ideana on erottaa taloudellinen kasvu ympäristön kuormituksen kasvusta. Artikkelin kirjoittajat selittävät suhteellisen irtikytkennän ja absoluuttisen irtikytkennän erot. Suhteellinen irtikytkentä tarkoittaa, että ympäristökuorma pysyy samana tai kasvaa hitaammin, kun talous kasvaa. Absoluuttinen irtikytkentä puolestaan viittaa tilanteeseen, jossa ympäristökuorma pienenee, vaikka talous kasvaa tai pysyy kooltaan samana.

Donitsimalli (Doughnut economics) on yksi ehdotus taloudellisesta mallista, joka pyrkii takaamaan kaikkien ihmisten tarpeiden täyttymisen samalla varmistaen, että maapallon ekologiset rajat eivät ylity. Malli koostuu

kahdesta renkaasta: sosiaalisesta perustasta ja ekologisesta katosta. Sosiaalinen perusta varmistaa, että kukaan ei jää pulaan elintärkeistä tarpeista, kun taas ekologinen katto rajoittaa ihmiskunnan toimintaa niin, että se ei ylitä planeettamme elämää ylläpitäviä rajoja. Donitsimalli on osa Doughnut Economics -konseptia, joka tarjoaa taloudellisen ajattelutavan, joka sopii paremmin nykypäivän taloudellisen kestävyyden haasteisiin. Kate Raworth julkaisi donitsikäsitteen Oxfamin raportissa vuonna 2012, ja se sai nopeasti kansainvälistä huomiota. (Doughnut Economics 2023)

Yhteenvetona voidaan siis todeta, että taloudellinen kestävyys on moniulotteinen käsite, joka sisältää monia eri osa-alueita. Näitä ovat muun muassa kestävä taloudellinen kasvu, tehokas luonnonvarojen käyttö, vastuullinen sijoittaminen ja yritystoiminta sekä sosiaalinen vastuu. On kuitenkin siis vielä matkaa siihen, että tälle käsitteelle löytyy yhtenäinen määritelmä.

Kompensaatiomarkkinat

Hiilikompensaatiomarkkinat

Vapaaehtoinen hiilikompensaatio on viime vuosien aikana kasvattanut suosiotaan huomattavasti. Vuonna 2021 markkinoiden suuruudeksi on arvioitu noin sata miljoonaa CO2-tonnia vuodessa. Tämä on noin kaksi kertaa Suomen vuosipäästöjen verran. (Finnwatch 2021, 8.) Markkinoiden koko nelinkertaistui välillä 2020–2021, ja niiden arvon odotetaan nousevan kymmeniin miljardeihin vuoteen 2030 mennessä (bcg.com). Uusiutuvan energian ja metsähankkeiden lisäksi tarjolla on muun muassa jätteenkäsittelyä ja kotitalouksien energiatehokkuutta parantavia ohjelmia, teollisuuskaasujen talteenottoa sekä liikenteen päästövähennyksiä. Uusina ratkaisuina valikoimaan on tullut maatalouden ja merikasvien hiilensidonta sekä hiilen poistaminen ilmasta teknologian avulla. Uusiutuvan energian odotetaan jäävän vaihtoehdoista pois sitä mukaa, kun siitä tulee itsenäisesti kilpailukykyistä markkinoilla. (Finnwatch 2021, 8.)

Yrityksille vapaaehtoisessa hiilikompensaatiossa on usein kyse itse asetettujen ilmastotavoitteiden saavuttamisesta (Seyni ym. 2019). Kuluttajat saattavat puolestaan ostaa kompensaatiota lisäpalveluna ostoksen yhteydessä. Esimerkiksi Finnair tarjoaa mahdollisuutta kompensoida lentomatkan aiheuttamat päästöt lisäämällä uusiutuvan polttoaineen osuutta tai lahjoittamalla yrityksen valitsemiin hyvityshankkeisiin (finnair.com). Lisäksi kuluttajille on tarjolla palveluita oman elämäntavan hiilijalanjäljen laskentaan ja hyvittämiseen. Esimerkkinä tällaisesta palvelusta on säätiömuotoinen Compensate, johon syvennytään lisää seuraavassa luvussa.

Yksi motiivi yritysten ostamalle hiilikompensoinnille on liiketoimintaympäristön aiheuttama paine. Tällainen kuormitus voi sisältää regulatiivisia kannustimia tai paineita toimia jonkin alan normien mukaisesti. Tavoitteena voi olla myös yrityksen sidosryhmien edun tavoittelu ja taloudellisen aseman parantaminen. (Haque & Ntim 2020, 526.) Päästöjen kompensointi voi toimia myös taktisena markkinointikeinona. Yritykset saattavat ostaa hiilikompensaatiota voidakseen markkinoida itseään tai tuotteitaan hiilineutraaleina tai jopa päästöttöminä (hs.fi 1.2.2023). Kuluttajien motiiveihin kompensoida päästöjään kuuluvat muun muassa moraalinen vastuuntunto, vapaaehtoisen hyvän teon aiheuttama mielihyvä sekä sosiaalisen yhteisön asettama esimerkki (Schwirplies & Ziegler 2016, 746).

Compensate-säätiö

Yksi esimerkki kompensaatiomarkkinoiden palveluista on suomalainen, voittoa tavoittelematon Compensate-säätiö. Entinen kansanedustaja Antero Vartia perusti Compensate-säätiön vuonna 2019. (Compensate Foundation s.a.) Compensaten arvoja ovat esimerkiksi tiukat kriteerit kompensaatioprojektien valinnassa, ylikompensointi sekä kompensaatioprojektien vaikutusten ulottuminen myös muualle kuin vain ilmastolle (Our mission… s.a.): kompensaatiohankkeissa on tärkeää, että vaikutukset esimerkiksi ihmisoikeuksille sekä biodiversiteetille ovat myös nettopositiivisia (Compensate: Project Criteria and Evaluation 2020).

Compensate tarjoaa kompensointipalveluita sekä yrityksille että yksityishenkilöille. Tämän lisäksi palveluita voivat käyttää esimerkiksi yliopistot sekä erilaiset voittoa tavoittelemattomat järjestöt. (Compensate Foundation s.a.) Kompensaatioon käytetyillä rahoilla Compensate ostaa päästövähennysyksiköitä eli hiilikrediittejä. Hiilikrediittien avulla rahoitetaan hankkeita, joiden tarkoituksena on poistaa hiilidioksidia ilmakehästä tai estää sen pääsy ilmakehään. (Kompensointi on keino kantaa vastuuta… s.a.)

Kompensaatiomarkkinoilla yksi hiilikrediitti vastaa yleisesti ottaen yhtä tonnia eli tuhatta kiloa poistettuja tai vältettyjä hiilidioksidipäästöjä. Kompensaatioprojektit sisältävät kuitenkin paljon epävarmuuksia, joten Compensate ei luota siihen, että yksi hiilikrediitti olisi täysin yhden hiilidioksiditonnin arvoinen. (Sustainability statement 2022.) Tämän vuoksi Compensate toteuttaa ylikompensointia, eli se ostaa enemmän hiilikrediittejä kuin teoriassa olisi tarpeen. Compensaten ylikompensointikerroin määräytyy projektien arviointiprosessin jälkeen suoritettavan hankepisteytyksen mukaan. (Kaskeala 2020.)

Compensatella on kompensointiprojekteja lähes kaikissa maanosissa (Raising the bar on sustainability s.a.). Yksi niistä on suometsäprojekti Indonesian Borneossa, jonka tavoitteena on suojella turvemaita sekä alueella eläviä orankeja. Projekti auttaa myös työllistämään paikallisia ihmisiä ja tarjoaa heille oikeudenmukaista palkkaa. (Project: Rimba Raya Biodiversity Reserve s.a.) Toisessa projektissa Perun San Martinissa pyritään elvyttämään metsäkadosta kärsiviä maa-alueita kahvi- ja kaakaopavun peltometsäviljelyn avulla (Project: Jubilacion Segura Agroforestry s.a.) Näiden lisäksi Compensatella on käynnissä metsitys- sekä biohiiliprojekteja (Raising the bar on sustainability s.a.). Compensaten kriteereinä projektien valinnassa ovat ilmastovaikutusten luotettavuus, luonnon monimuotoisuuden lisääminen sekä paikallisten yhteisöjen hyvinvoinnin edistäminen. Näiden kriteerien lisäksi projektien tulee olla sertifioituja esimerkiksi Gold Standardilla tai Verified Carbon Standardilla. Projektin valitsemisen jälkeen Compensate seuraa sen toteutumista ja arvioi sen tarvittaessa uudelleen. (Project Criteria s.a..) Vuodesta 2020 lähtien vain 10 % tarkastelluista projekteista on täyttänyt Compensaten asettamat tiukat kriteerit ja päätynyt säätiön hankeportfolioon (Kaskeala 2020).

Vuonna 2020 Antero Vartia oli vähällä saada syytteen Compensaten toiminnasta, sillä poliisi epäili rahankeräysrikosta. Poliisin mukaan kompensaatiomaksut ovat vastikkeettomia, joten ne tarvitsevat rahankeräysluvan, jollaista Compensatella ei ollut. (Oikarinen 2020.) Rahankeräyslakia kuitenkin muutettiin vuonna 2021 siten, että vapaaehtoiset päästökompensaatiot eivät enää vaadi rahankeräyslupaa (Vapaaehtoinen päästökompensaatio helpottuu… 2021). Tämä johti siihen, että Vartian syyte rahankeräysrikoksesta peruutettiin vuonna 2022 (Teittinen 2022).

Finnwatchin vuonna 2021 tekemän selvityksen mukaan Compensate on niin sanotun lisäisyyden, ajoituksen sekä kaksoislaskennan välttämisen osalta ansioitunut kotimainen kompensaatiopalvelu (Finnwatch 2021, 80). Lisäisyydellä tarkoitetaan sitä, että kompensaatioprojekti ei sisälly lainsäädännön edellyttämiin toimiin ja että sitä ei olisi voitu toteuttaa ilman kompensaatiosta saatua rahallista tukea (Finnwatch 2021, 14). Ajoituksesta Compensate sai hyvän arvion, sillä myytävät hiilikrediitit ovat syntyneet ja ne on todennettu ennen, kuin ne päätyvät kompensaatiokäyttöön. Compensate välttää kaksoislaskentaa siten, että se hyödyntää kansainvälisiä projekteja. (Finnwatch 2021, 60.) Näiden projektien sisältö ei liity Suomen omiin ilmastotavoitteisiin,

joita muutenkin kuuluisi tavoitella (Finnwatch 2021, 19). Raportissa kerrotaan myös, että Compensaten asiantuntijapaneelissa on paljon ilmasto- ja metsäalan ammattilaisia. Paneelissa ei kuitenkaan ole ihmisoikeuksien asiantuntijaa, vaikka projekteilta vaaditaan, että ihmisoikeusrikkomuksia ei tapahdu. (Finnwatch 2021, 60.) Muita puutteita Compensatella on raportin mukaan esimerkiksi ilmastovaikutusten pysyvyydessä, valvonnassa ja toiminnan läpinäkyvyydessä sekä mitattavuudessa (Finnwatch 2021, 80, 17). Compensatella on siis vielä hiottavaa toiminnassaan.

Zalando

Berliinissä vuonna 2008 perustettu Zalando on 14 vuoden aikana laajentanut toimintaansa 25 Euroopan maahan, ja se on nykyisin yksi suurimmista vaatteita myyvistä verkkokaupoista. Liiketoiminnasta on tapana kuitenkin aiheutua nettopäästöjä, esimerkiksi tuotteiden toimituksiin sekä muuhunkin toimintaan liittyen.

Zalando on tiedostanut oman asiakaskuntansa arvot ja panostaa selvästi vastuullisen liiketoiminnan teeman näkyvyyteen monien kanaviensa kautta. Tästä ovat esimerkkeinä muun muassa metsityshankkeisiin ja kestävyystavoitteisiin liittyvät videot YouTubessa sekä omilla sivuillaan julkaistu Sustainability Progress Report, joka ilmestyi ensi kertaa vuonna 2021. Kyseisessä raportissa Zalando erittelee itselleen asettamia kestävyystavoitteita, kuten sen, että vuoteen 2023 mennessä noin 25 prosenttia myyntituloista tulisi niin kutsutuista vastuullisemmista valinnoista. Lisäksi raportissa mainitaan Zalandon tähtäävän nettopositiivisuuteen, eli siihen, että liiketoiminnasta seuraisi ympäristölle myönteisiä vaikutuksia (vrt. kokonaisheikentymättömyys). Raportissa mainitaan myös lupaus kompensoida päästöt, joita ei voida vähentää yrityksen omassa toiminnassa. (Zalando 2022, 7–8, 50). Näiden tavoitteiden tulkinnassa tulee kuitenkin huomata se, että usein termeihin, kuten vastuullisuus, ei liity selkeitä määrittelyjä, jolloin tavoitteet saattavat jäädä ympäripyöreiksi ja kuluttajalle konkreettiselta sisällöltään tuntemattomiksi.

Toimintansa ympäristövaikutuksiin Zalando pyrkii vaikuttamaan valinnoillaan sekä kompensaatiotoimillaan. Esimerkki tällaisista valinnoista on se, että yritys on sitoutunut tieteeseen pohjautuviin SBT-tavoitteisiin (science-based targets); näiden standardien mukaisesti he aikovat valita yhteistyökumppaninsakin vuoteen 2023 mennessä (Zalando Partner Portal). Kompensaatiotoimista sen sijaan esimerkkeinä ovat erilaiset metsityshankkeet (Zalando, 2021). Asiakkailla on ostosten yhteydessä mahdollisuus kattaa 25 sentin lisämaksulla paketoinnista, toimituksesta sekä mahdollisesta palautuksesta koituvat hiilidioksidipäästöt sekä Zalandon työntekijöille kustannettavat julkisen liikenteen liput.

Olennaisesti liiketoimintaan liittyen tällaiset toimet eivät toki ole yritykselle ilmaisia. Varsinaisia taloudellisia lukuja Zalandon kompensaatiotoimien kustannuksista ei vaikuttanut julkisesta netin tarjonnasta löytyvän, mutta oletettavaa on, että kustannushyötylaskelmat on tehty ainakin yrityksen sisäisesti. Kustannusten voisi odottaa vertautuvan esimerkiksi markkinointikuluihin, joiden kautta yritys hyötyy näkyvyydestä, positiivisista assosiaatioista sekä brändin tunnettuudesta, jotka taas johtavat suurentuneeseen myyntiin. Etenkin julkisesti listattuna yhtiönä Zalando oletettavasti hyötyy myös parempien ESG-luokitusten kautta. Tämä luokitus liittyy vastuulliseen sijoittamiseen, ja paremman luokituksen avulla voi olla helpompi saada esimerkiksi lisää sijoittajia tai lainavaroja. Luokitukseensa liittyen Zalando vastaa vuosittain myös CDP-kyselyyn, jonka avulla investoijat voivat ottaa huomioon yritysten ympäristölliset, sosiaaliset ja hallinnolliset (ESG) tekijät sijoituspäätöksiä tehdessään (CDP Climate Change Questionnaire, 2022).

Kompensaatiomarkkinoiden ongelmat

Kompensaatiomarkkinoiden sääntelemättömyys

Vaikka niin yritykset, julkinen sektori kuin yksityishenkilötkin ovat alkaneet hyödyntämään vapaaehtoisia kompensaatiopalveluita ja markkinat ovat kasvaneet merkittävästi, ei toimintaa juurikaan säännellä Suomessa tai kansainvälisesti. Suomessa on ollut jopa epäselvyyttä siitä, lasketaanko kompensaatiopalvelut rahankeräykseksi vai palveluiden kaupaksi. (Vapaaehtoisten päästökompensaatioiden sääntely 2021, 11, 24.) Esimerkkinä tästä on aiemmin esitelty Compensate-säätiö, jonka perustaja Antero Vartia oli saada syytteen rahankeräysrikoksesta. Rahankeräyslakia onkin uudistettu vuonna 2021, ja nykyisellään vapaaehtoiset kompensaatiopalvelut ovat rajattuja rahankeräyslain ulkopuolelle, mikä selkeyttää vapaaehtoisten kompensaatiopalveluiden asemaa markkinoilla suhteessa lainsäädäntöön (Sisäministeriö 2021). Suomessa osaa sääntelyyn liittyvistä ongelmista on jo siis pyritty ratkaisemaan, mutta silti useita kysymyksiä on vielä täysin ratkomatta. Kun mukaan tuodaan kansainvälinen taso, on sääntelyssä vielä laajempia puutteita. Voidaankin pohtia, voivatko markkinat, joilla ei ole yleistä sääntelyä, olla kuluttajan näkökulmasta luotettavia. Luovatko vapaaehtoiset kompensaatiomarkkinat uuden markkinaraon yrityksille tehdä voittoa viherpesulla? Yritysten tai muiden toimijoiden ostamat hiiliyksiköt ovat aineettomia, eikä palvelun ostajalla ole yleensä käytännössä keinoja tarkistaa, ovatko kompensaatiorahat käytetty siihen tarkoitukseen, johon niiden on luvattu menevän.

Kompensaatiomarkkinoilta puuttuvat myös kaikille asetetut, samanlaiset standardit, ja alalla käytettävät standardit perustuvatkin yksityisten toimijoiden laatimiin kokonaisuuksiin, joita ovat esimerkiksi Gold Standard ja Verified Carbon Standard. (Vapaaehtoisten päästökompensaatioiden sääntely 2021, 31.) *The Guardianin* uutisen (2023) mukaan riippumaton tutkijaryhmä on tutkimuksissaan huomannut, että ison kompensaatiopalveluita tarjoavan yrityksen, Verran, myymistä hiiliyksiköistä (carbon credits) jopa 94 prosentilla ei ole ollut mitään vaikutuksia ympäristölle. Verra on kiistänyt täysin kyseisen tutkimuksen tuloksen vedoten tutkimuksen tehneiden ulkoisten tutkijaryhmien käyttämiin metodeihin, joiden Verra ei katso olevan soveltuvia. Erimielisyyksiä Verran ja ulkopuolisten tutkijaryhmien välillä on myös löytynyt sen suhteen, kuinka huono metsien kunto on alun pitäen edes mahdollisesti ollut. Ulkopuoliset tutkijaryhmien tutkimuksen mukaan Verra on liioitellut jopa 400 % sitä uhkaa, joka metsiin kohdistuu. Palvelun ostajan voi olla työlästä, tai jopa lähes mahdotonta, seurata jokaisen vapaaehtoisen kompensaatiopalveluntarjoajan käyttämiä standardeja sekä ymmärtää niiden laskentatapoja ja sitä, miten eri mittaukset suoritetaan kussakin standardissa. Jos tilannetta verrattaisiin yritysmaailmaan, esimerkiksi pääomantarjoajalle voisi vastaavassa tilanteessa olla lähes mahdotonta kohdentaa pääomaansa tehokkaasti jokaisen yrityksen soveltaessa omia tilinpäätösstandardejaan. Pörssilistattujen yhtiöiden piirissä on esimerkiksi käytössä riippumattoman tahon kehittämät IFRS-standardit, jotka takaavat sen, että sijoittajan on mahdollista vertailla tilinpäätöstietoja keskenään ja nähdä tarkemmin se, miten sijoitettu pääoma on tehnyt tuottoa.

Jos kompensaatiomarkkinoiden sääntelyä tarkastellaan Suomen ulkopuolella, ei esimerkiksi Yhdysvalloilla ole myöskään kansallisen tason sääntelyä tai ohjeistuksia vapaaehtoisille kompensaatioille (Franki 2022, 182). Franki (2022, ibid.) toteaa, että ilman kompensaatiomarkkinoiden sääntelyä ei eri toimijoilla ole selkeää tietoa siitä, mikä lasketaan luotettavaksi hyvitykseksi. Ongelmat ovat samankaltaisia myös Suomen markkinoilla ilman sääntelyä, sillä yritysten ja yksityisten kuluttajien voi olla vaikeaa vertailla eri kompensaatiopalveluita tarjoavia yrityksiä keskenään tai arvioida palvelun laatua (Vapaaehtoisten päästökompensaatioiden sääntely 2021, 11–12). Ilman sääntelyä ovat mukaan tulleet myös ulkopuoliset kolmannen osapuolen varmennuspalvelut, joten palveluiden ostaja joutuu tutkimaan ja arvioimaan itse, onko ostettujen palveluiden kohdalla käytetty kriteeristö hyvä- vai huonolaatuinen (Franki 2021, 183).

Franki (2021, 214) esittää, että vapaaehtoisille kompensaatiomarkkinoille olisi tultava keskitetty sääntely, jotta hiilikompensaatiosta (*carbon offset*) voisi tulla ikinä luotettava keino osana laajempaa suunnitelmaa ilmastonmuutoksen estämiseksi. Vahvempi sääntely voisi estää markkinoilla pelaamisen sekä kasvattaa toiminnan läpinäkyvyyttä ja luotettavuutta. Ympäristöministeriö julkaisussaan toteaa kuitenkin, että vielä tällä hetkellä ei voitaisi säätää pakottavaa kansallista lainsäädäntöä vapaaehtoisille kompensaatiomarkkinoille esimerkiksi elinkeino- ja sopimusvapauden vuoksi. Euroopan Unioni onkin kehittelemässä viherpesuun liittyviä lainsäädäntöehdotuksia, jotka saattavat vaikuttaa kompensaatiomarkkinoiden kehitykseen. Kuitenkin esimerkiksi informaatio-ohjauksen keinot, jossa yritykset vapaaehtoisesti suostuisivat noudattamaan tiettyjä valtionhallinnolta tulevia kriteereitä, voisivat toimia ratkaisuna. (Vapaaehtoisten päästökompensaatioiden sääntely 2021, 114–115.) Koontina voidaan kuitenkin sanoa, että markkinoita, joilla myydään aineetonta omaisuutta, jonka laatua ei puolestaan palvelun ostaja pääse todentamaan juuri millään keinoilla, on säänneltävä keinolla tai toisella pitkässä juoksussa. Sääntelyllä ja yhteisillä pelisäännöillä voitaisiin ennaltaehkäistä ja korjata esimerkiksi aiemmin esitellyn Verran kaltaisia tapauksia, joissa suurin osa ostetuista hiiliyksiköistä oli tutkimusten mukaan täysin hyödyttömiä.

Kompensaatiomarkkinoiden luotettavuus

Kuten aiemmin mainittu, kompensointipalveluiden ostajilla ei ole kunnollisia keinoja tarkistaa, ovatko kompensointiin sijoitetut rahat menneet luvattuun tarkoitukseen. Yhtiöt saattavat käyttää myös monitulkintaisia myyntilauseita, joiden todenperäisyyttä kuluttajien on hyvin vaikea selvittää. Esimerkiksi, jos yritykset mainostavat leikanneensa hiilidioksidipäästöjään 20 prosentilla, kuluttajan on lähes mahdotonta selvittää, pitääkö tämä paikkansa. (Polonsky & Garma 2008, 3) Sama pätee kompensointipalveluihin.

Herää siis kysymys siitä, ovatko kompensoitihankkeet täysin läpinäkyviä. Tapahtuuko luvattu kompensointi, ja onko siitä oikeastaan hyötyä? Ikävä esimerkki korruptoituneesta toiminnasta on aiemmin mainittu iso kompensaatioita tarjoava palvelu, Verra. Suuri ongelma on piillyt siinä, että vastuu on jätetty palvelun ostajan kontolle. Kun näin menetellään, tukeutuvat sekä kompensaatiopalveluita tarjoavat että ostavat yritykset kuluttajien tietämykseen. Tämä antaa mahdollisuuksia harhaanjohtamiseen. Kyseistä tapausta tutkinut ryhmä sai selville, että Verran 29:stä hiilikredittejä tarjoavista projekteista 21 projektia eivät luoneet minkäänlaista hyötyä ilmastolle. Suurin osa projekteista keskittyi metsien hävittämisen ehkäisemiseen. Verra oli kuitenkin ennustuksessaan liioitellut metsäkadon uhkaa. Tutkijat totesivat, etteivät he voineet luottaa Verran ennustuksiin niiden ollessa “ylipessimistisiä”. (The Guardian, 2023)

Tutkijoiden mukaan haasteena hiilikompensaatiossa ei ole hiilivarastojen laskeminen, vaan tulevaisuuden luotettava ennustaminen. Barbara Haya, Berkeley Carbon Trading -projektin johtaja, toteaa The Guardianin haastattelussa, että 20 vuoden uransa jälkeen hänen mielestään tarvitaan vaihtoehtoisia menetelmiä, sillä hiilikompensaatiomarkkinat ovat rikkinäisiä. (The Guardian, 2023) Toista mieltä on kuitenkin aiemmin esitelty Compensate -säätiö. Säätiön vaikuttavuusjohtaja, Niklas Kaskeala, toteaa blogipostauksessaan, että koko ajan kasvavat hiilikompensaatiomarkkinat ovat hänen mielestään kriittinen työkalu ilmastokriisin päihittämisessä. Compensate ottaa kantaa Verran tapaukseen ja kertoo tiedostaneensa markkinoiden ongelmallisuuden. Yhdistyksen päämääränä on kuitenkin uudistaa markkinoita yhä luotettavampaan suuntaan. (Kaskeala, 2023.)

Voidaan siis todeta, että valitettavasti kompensaatiomarkkinat eivät ole vielä täysin läpinäkyviä. Niin kauan kuin ne pysyvät säätelemättöminä, huijaamiselle on tilaa. Maailmalta löytyy hyviä esimerkkejä rehellisestä toiminnasta, kuten Compensate-säätiö, mutta valitettavasti myös petollisia tapauksia löytyy. Nykymarkkinatilanne ei ole tarpeeksi tehokas.

Johtopäätökset

Aitoa kompensointia vai omatunnon parantamista?

Teollisen vallankumouksen ja elintason nousun mukana tulleen ilmastonmuutoksen myötä on pyritty moniin erilaisiin torjuntatoimenpiteisiin, kuten päästöjen kompensointiin (Kokkonen 2022). Päästöjen kompensointi on helposti markkinoitava tapa taistella ilmastonmuutosta vastaan. Toisaalta, kuten tässä esseessäkin pohditaan, sen toimivuus ja tehokkuus käytännössä ovat kyseenalaistettuja. Kompensaation idea on helppo määritellä ja selostaa myös jokapäiväiselle kuluttajalle, jonka ei tarvitse sen enempää paneutua asiaan perehtymiseen. Tämä tekee kompensaatiomarkkinoista helposti lähestyttäviä, vaikka henkilö ei olisikaan ilmastoasiantuntija, eivätkä kompensaation määritelmä tai toiminnan sisältö usein edes nosta lisäkysymyksiä. Konsepti kuulostaa olevan niinkin yksinkertainen, että ostetun tuotteen tai palvelun yhteydessä ostetaan samalla palvelu, joka ilmastoteoilla – kuten vaikkapa puiden istuttamisella – korvaa tuotteen aiheuttama ilmastopäästöt. Nopeasti ajateltuna tämä kuulostaa nettopäästöjen tasaukselta ja päästöjen välittömältä korvaukselta, mutta valitettavasti asia ei usein kuitenkaan ole niin yksinkertainen. Kuten esseessä on jo aiemmin käsitelty, päästömarkkinoilla ei ole vielä selkeitä viitekehyksiä tai suuntauksia; markkinat pikemminkin käsittävät usein toisistaan riippumattomia yksityisten alojen hankkeita, mikä tekee tulosten tutkimisesta vaikeampaa.

Tässä luvussa. mainitaan kompensaation tehokkuudesta tehdystä tutkimuksesta, joka kertoo, että tutkituista kompensaatiohankkeista 94 % on hyödyttömiä ilmastovaikutuksiltaan. Lisäksi siinä puhutaan metsien tilan liioittelusta ja siitä, miten on melkein mahdotonta saada selville, mitkä kompensaatiopalvelut ovat oikeasti toimivia ja sellaisia, joiden sanaan voi luottaa. Tämä esimerkki viittaa siihen suuntaan, että kompensaatiomarkkinoiden tuomat vaikutukset eivät välttämättä ole riittäviä toimia ilmastonmuutoksen hillitsemiseen, jonka kuitenkin mainostetaan olevan niiden tärkein tehtävä. Esseemme ei kuitenkaan täysin hylkää kompensaatiota, vaan pikemminkin osoittaa epäkohtia. Tällä hetkellä kompensaatio ei välttämättä ole tehokas keino ilmastokriisin helpottamiseksi, mutta edellä mainitut asiat, kuten läpinäkyvyyden ja säätelemättömyyden parantamisella, voitaisiin saada parempia tuloksia päästökompensaatiotoimissa.

Vapaaehtoinen päästökauppa saa kuluttajalle sen mielikuvan, että hän on aidosti mukana taistelussa ilmastonmuutosta vastaan, vaikka tulokset eivät näytäkään varteenotettavia vaikutuksia. Tämä indikoi sitä, että tällä hetkellä päästökauppa on kuluttajan tapa saada hyvä omatunto ja ikään kuin puhdistaa kätensä haitallisista ilmastoteoista. Tämänkaltainen henkinen ‘viherpesu’ voi johtaa arvaamattomiin seurauksiin, mikäli selviää, että suoritetut kompensoivat toimet eivät olekaan automaattisesti hyödyllisiä. Esimerkiksi brändin maine saattaa kärsiä pahastikin mahdollisen vilpin tullessa ilmi. Tämän ohella myös ympäristöteot ja väitteet, joita yritykset julkaisevat, menettävät merkittävyyttään mahdollisen vilpin tultua esille, eikä yritysten ympäristötekoihin enää luoteta tai uskota (Asikainen 2022).

Tästä herääkin kysymys, kuinka paljon on kestävää kompensoida? On vaikea hahmottaa, kuinka paljon pitäisi aidosti kompensoida mitäkin tuotetta kohden, jotta saataisiin täydellinen tasapaino; välillä se on jopa mahdotonta. Kuitenkin, kuten Landström (2020) toteaa, päästöjen kompensointi on kuitenkin usein parempi tapa toimia, kuin päästöjen tuottaminen ilman kompensointia. Landström jatkaa kertomalla, miten kompensaatiomarkkinoihin investoimalla yksilöt ja yhteisöt voivat yllyttää toisiaan toimimaan ja siirtymään kohti vihreämpää ja kestävämpää taloutta, vaikka täydellisen ratkaisun löytyminen saattaisikin kestää. Hän kuitenkin toteaa myös, että tärkeämpää kuin kompensointi on itse päästöjen vähentäminen. “Nyrkkisäännöksi sopii: vähennä päästöistäsi mitä voit, kompensoi mitä voit” (ks. Landberg 2020).

Millaisia kompensaatiomarkkinoiden tulisi olla, jotta ne toimisivat?

Kuten aiemmin olemme mainineet, kompensaatiomarkkinat eivät ole täysin toimivia markkinoita. Niitä piinaavat mm. sääntelemättömyys ja luotettavuusongelmat. Ongelmat johtavat siihen, että markkinat eivät toimi mahdollisimman tehokkaasti, ja niiden todellinen ympäristövaikutus jää luvattua heikommaksi. Huoli on noussut myös siitä, että jos kompensaatiomarkkinoita hyväksikäytetään omien päästöjen vähentämisen sijasta, se voi heikentää kasvihuonekaasuja vähentävien toimien kehitystä ja käyttöönottoa yrityksissä (VCMI Provisional claims code of practice 2022, 12). Tässä osiossa keskitymme erityisesti siihen, mitä toimia vaadittaisiin, jotta saataisiin ratkaistua juuri nämä edellä mainitut ongelmat sääntelemättömyydessä ja luotettavuudessa.

Steer ja Hanson nostavat World Resource Instituten artikkelissaan (2021) esille tavan lähestyä kompensaatiomarkkinoiden positiivista tulosta hiiliyksikköjen kysynnän ja tarjonnan kautta. Artikkelin mukaan kysyntä ei saa muodostua yritysten omasta haluttomuudesta tehdä ilmastotoimia toiminnassaan jo ennen kompensaatiomarkkinoiden hyödyntämistä, ja yritysten tulisi ensisijaisesti tehdä omasta toiminnastaan ja toimitusketjuistaan ympäristöystävällisiä. Tarjonnasta nostetaan esille se, että tarjonnan on oltava ympäristöllisesti ja sosiaalisesti kestävää sekä olla standardien mukaista toiminnan eheyden säilyttämiseksi. (Steer & Hanson 2021).

Standardit olisivat tärkeitä myös siksi, että sitä kautta markkinoille saataisiin yhteiset termit, joita kaikki käyttäisivät. Tällä hetkellä yritykset käyttävät monitulkintaisia ja harhaanjohtavia sanoja, kuten ‘vastuullinen’, ‘ilmastoystävällinen’ ja ‘vihreä’, joille ei ole mitään todistetta niiden todellisesta vaikutuksesta ilmastoon. (Asikainen 2022). Tämä taas vähentää ihmisten luottoa yrityksiin ja eri ympäristötoimiin. Selkeä termistö siis auttaisi lisäämään ihmisten luottamusta kompensaatiomarkkinoihin.

Samaa ajatusta siitä, että yritysten tulisi ensisijaisesti muuttaa omaa toimintaansa kohti tavoitetta pysyä 1,5 °C lämpötilan nousussa ennen kompensaatiomarkkinoita, ajaa Voluntary Carbon Markets Integrity Initiative (VCMI). VCMI:n tavoite on luoda vapaaehtoisille kompensaatiomarkkinoille läpinäkyvyyttä ja luottamusta luomalla ohjeistuksen, joka koskisi kompensaatiomarkkinoita (vcmintegrity.org). VCMI pyrkii luomaan juuri niitä puuttuvia ohjeita ja standardeja, joita kompensaatiomarkkinoille tarvittaisiin yllä kuvatun sääntelyongelman ratkaisuksi. Tällainen ohjeistus myös takaisi markkinoille luotettavuutta, kun yritykset ja kuluttajat voisivat selkeästi saada tietoa markkinoiden toimintaperiaatteista ja standardeista.

Onko kompensaatiomarkkinoilla oikeasti niin paljon mahdollisuuksia kuin ajatellaan?

Kuten aiemmassa kohdassa nostettiin esille, kompensaatiomarkkinoilla on uhka siitä, että yritykset saattavat yrittää hyväksikäyttää kompensaatiota välttyäkseen ympäristötoimilta omassa toiminnassaan. Kompensaation kun tulisi muutenkin olla viimeinen vaihtoehto ilmastotoimissa oman toiminnan kehittämisen ja muuttamisen jälkeen. Kompensaatiomarkkinoiden ympärillä on myös paljon puhetta sen todellisesta toimivuudesta ja viherpesusta. Kuten aiemmin esseessä esille nostetusta Verran tapauksesta käy ilmi, markkinoilla todella tapahtuu huijausyrityksiä, joita sääntelemättömyys mahdollistaa. Tällaiset yritykset puolestaan lisäävät entistä enemmän markkinoiden luotettavuusongelmia.

Kompensaatiomarkkinat voivat kuitenkin toimia kannustimena yrityksille investoida ilmastonmuutosta lieventäviin toimiin. Markkinat voivat myös toimia eräänlaisena siirtymävaiheena kohti kehitystä hiilineutraaliuteen ja auttaa luomaan ja rahoittamaan kestävän kehityksen projekteja. (Streck 2021, 368–369). Kompensaatio myös itsessään on ilmastotoimi, jolla pyritään hidastamaan ja lieventämään ilmastonmuutosta sekä sen negatiivisia seurauksia, ja markkinat tehokkaasti toimiessaan lisäävät kompensaation määrää.

Kompensaatiomarkkinat ovat siis ainakin nykyisessä muodossaan ristiriitainen toimintakenttä. Ne pyrkivät tukemaan ihmisiä ja yrityksiä siirtymässä kohti hiilineutraaliutta näennäisen pienellä vaivalla, mutta toisaalta

markkinat eivät toimi tehokkaasti ja niihin sisältyy väärinkäyttön ja huijausyritysten uhka. Kompensaation avulla ei myöskään saada tehtyä tekemättömäksi; esimerkiksi joltakin alueilta osittain kadonnutta biodiversiteettiä ei saa enää takaisin. Tämän vuoksi kompensaatiomarkkinoiden merkitystä ei pitäisi ylikorostaa keskustelussa ilmastonmuutoksen vastustamisesta, vaan niiden rooli tulisi ymmärtää olevan enemmän tukitoimi hiilineutraaliin toimintaan siirryttäessä; eikä suinkaan pääasiallinen keino sen saavuttamiseksi.

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TUTU1 Tulevaisuusajattelu ja skenaariot

TUTU1 Tulevaisuusajattelu ja skenaariot (5 op) -opintojakso tarjoaa perustietoa tulevaisuusajattelusta ja ennakoivasta asenteesta. Opintojaksolla tutustutaan tulevaisuudentutkimuksen keskeisiin käsitteisiin ja tulevaisuusajatteluun. Lisäksi opetellaan skenaariotyöskentelyä. Opintojakson suoritettuaan opiskelija tunnistaa ja osaa nimetä oppiaineen keskeiset toimijat, tulevaisuudentutkimuksen keskeiset kansalliset ja kansainväliset yhteisöt ja hyödyntää niiden tuottamaan materiaalia kurssin tulevaisuustyöskentelyssä. Opiskelija ymmärtää tulevaisuustiedon luonteen ja sen, miten tulevaisuudesta saadaan tietoa. Harjoitustyön hyväksytysti suoritettuaan opiskelija osaa soveltaa skenaarioajattelua ja tulevaisuustaulukkomenetelmää tulevaisuuden vaihtoehtojen hahmottamiseen ja pystyy arvioimaan kehitystrendejä.

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Tampereen yliopiston monialaisen ryhmän opiskelijat **Essi Alakopsa**, **Sara Lehtoranta**, **Aapo Reinikka**, **Katri Viljo** ja **Otto Wallenius** tarttuivat kevätlukukaudella 2023 ajankohtaiseen teemaan, tekoälyyn. Laaja kielimalli Chat GPT nousi paitsi otsikoihin, myös opiskelijoiden kiinnostuksen kohteeksi. Myös muut tekoälyä, koneoppista ja algoritmeja hyödyntävät teknologiat ja sovelluskohteet näyttävät tarjoavan tulevaisuuden kannalta merkittävän muutosmahdollisuuden. Opiskelijaryhmä päätyi tarkastelemaan työssään tekoälyä terveydenhoidon kontekstissa. ”Tekoälyn käyttö terveydenhuollossa 2040” -työssä toteutui tulevaisuustyölle tyypillinen prosessi, jossa lopputulokseen päädyttiin iteratiivisesti, tarkentaen ja palaten tarvittaessa aiempiin vaiheisiin. Tulevaisuustyö esittelee hyvin jäsentyneesti ja tiiviissä muodossa taustan, prosessin ja toimintaympäristöä relevantteja lähteitä hyödyntäen. Työssä esitetään useita keskenään erilaisia tulevaisuuskuvia, ja näistä kolmeen on kytketty monipuolisesti ja elävästi kuvatut skenaariot. Skenaariotarinoiden osana on oivaltavia henkilötarinoita ja aikajanoja sekä tutkimuskirjallisuutta. Työ on tehty haastavasta aiheesta, ja se onnistuu avaamaan kiinnostavia mahdollisia maailmoja tulevaisuustaulukkoon perustuvan skenaarioprosessin avulla.

Työn on arvioinut Tulevaisuudentutkimuksen Verkostoakatemian opettaja Tampereen yliopistossa, lehtori **Markus Pöllänen**.

Turun avoimen yliopiston ryhmän **Jarkko Kangas**, **Paula Lehtimäki**, **Reeta Palomäki**, **Hilma Ruokolainen** ja **Meeri Väänänen** skenaarioraportissa ’Mitä muuta metsät ovat kuin puuta? Suomen metsien käyttö vuonna 2050’ toimintaympäristön analyysi on toteutettu huolellisesti lähdeaineistoon nojaten, ja se kantaa hedelmää skenaarioissa. Kehityskulkujen pohdinnassa on onnistuttu hyödyntämään sekä todellisuuden epävarmuutta että systeemistä ajattelutapaa. Skenaarioissa taustatyö kantaa hedelmää. Skenaariot ovat keskenään erilaisia, mutta kussakin skenaariossa toimintaympäristön potentiaaliset kehityskulut ovat myös sisäisesti jännitteisiä ja vivahteikkaita. Skenaariot antavat paljon pohdintapintaa raportin kuvitteelliselle tilaajalle.

Työn on arvioinut Tulevaisuudentutkimuksen Verkostoakatemian opettaja Turun avoimessa yliopistossa **Kati Lehtiö**.

Tekoälyn käyttö terveydenhuollossa 2040

Essi Alakopsa, Sara Lehtoranta, Aapo Reinikka, Katri Viljo & Otto Wallenius
Tampereen yliopisto

Tiivistelmä

Työelämän näkökulmasta tekoälyn käyttö on alkanut leviämään entistä laajemmalle alueelle, mitä sitä on ennen käytetty. Suurta kehitystä on tapahtunut etenkin terveydenhuollon piirissä, jossa digitalisoituminen on nopeaa. Samalla tekoälyn käyttö on tullut jäädäkseen. Sosiaali- ja terveysalalla työvoimapula on yksi alan suurimmista haasteita ja tekoäly voi olla siihen yhdenlainen ratkaisu. Kaikki eivät kuitenkaan ole myötämielisiä tekoälyä kohtaan, koska kokevat teknologian kylmänä ja etäisenä artefaktina. Näin ollen myös tulevaisuudessa terveydenhuollon tulisi olla jokaiselle miellyttävä palvelu erilaisine vaihtoehtoineen.

Hyödynnämme raportissamme morfologista skenaariotyöskentelyä eli tulevaisuustaulukkomenetelmää sekä PESTE-analyysia rakentaessamme erilaisia skenaarioita. Seitsemästä tulevaisuuskuvasta valitsimme kolme toisistaan poikkeavaa kehityskulkua, joista muodostimme kaksi dystooppista (julkinen ja yksityinen) ja yhden utooppisen skenaariotarinan: Ei mitään neuvoteltavaa, Kadotettu yksityisyys & Kymmenen minuutin vastaanotto.

Skenaariotyöskentelyn seurauksena esille nousi vahvasti valinnanvapauden menettäminen ja etenkin eettiset kysymykset yksityisyydensuojasta sekä datan keräämisestä. Toisaalta huomasimme myös tekoälyn positiiviset vaikutukset diagnosoimisen näkökulmasta varsinkin, jos potilas ei itse pysty kommunikoimaan selkeästi syystä tai toisesta.

Johdanto

Sosiaali- ja terveysalalle on keskimääräistä toimialaa vaikeampi rekrytoida työntekijöitä (Työ- ja elinkeinoministeriö, 2020, 59). Alalla on puhuttukin jo pitkään työvoimapulasta. Sosiaali- ja terveyspalveluiden järjestäminen tulevaisuudessa hankaloituu varsinkin pienemmissä muuttotappiokunnissa. Kaikilla, joilla on asuinkunta Suomessa, on kuitenkin oikeus kaikkiin julkisen terveydenhuollon palveluihin (Perustuslaki 6 §, laki potilaan asemasta ja oikeuksista 3 §) ja väestön ikääntyessä tarvitaan uusia menetelmiä terveydenhuollon toimivuuden varmistamiseen.

Covid-19-pandemia pakotti myös sote-palvelut teknologiseen muutokseen, joka johti digiloikkaan mahdollisesti jopa ajateltua aikaisemmin. Samalla, kun digitalisaatio helpottaa ainakin näennäisesti sote-alan ammattilaisten arkea, ”…digitaaliset teknologiat muuttavat kliinisiä hoitopolkuja, organisaatioiden toimintatapoja, potilaan ja ammattihenkilöiden vuorovaikutusta sekä edellyttävät uudenlaista osaamista…” (Ikonen & Reponen, 2021). Onkin siis huomioitava kokonaisuus, jossa turvallisuus ja toimintavarmuus ovat sekä henkilöstön että potilaiden kannalta välttämättömiä (Ikonen & Reponen, 2021).

Tässä raportissa tavoitteena on tarkastella potilaan näkökulmasta tekoälyn käyttöä terveydenhuollossa vuonna 2040 kolmen eri skenaarion kautta. Tarkastelemme alueena Suomea ja sijainnin vaikutusta tasa-arvoisen terveydenhoidon saamiseen. Näkökulmana on terveydenhuollon asiakas. Aikajänteeksi valikoitui 17 vuotta tulevaisuuteen sekä kurssille muodostuneen tavan vuoksi että siksi, että terveydenhuolto digitalisoituu

nopeasti ja siitä aiheutuvien kehityspolkujen ennakointi vain 17 vuoden päähän tarjoaa jo lukuisia eri vaihtoehtoja. Yleislääkärit ovat korkeasti koulutettuja ja hyväpalkkaisia, joten olisikin tärkeää priorisoida yleislääkärin työaikaa mahdollisimman tehokkaasti. Pohdimme myös tulevaisuutta, jossa tekoäly korvaa lääkärin työn kokonaan esimerkiksi diagnostiikan tai kliinisen päätöksenteon osalta. Näin ollen tutkimuskysymykseksemme muotoutui:

Millaista tekoälyn käyttö terveydenhuollossa on potilaan näkökulmasta vuonna 2040?

Raportti etenee seuraavasti: järjestyksessä toisessa pääluvussa johdannon jälkeen käydään läpi terveydenhuollon nykytilaa sekä avataan raportin keskeisimmät käsitteet. Keskeisimmiksi käsitteiksi valikoituivat terveydenhuolto, yleislääkäri, teknologia sekä tekoäly.

Kolmannessa pääluvussa esitellään raportin tekemisessä käytetyt metodit. Tätä raporttia on työstetty muun muassa tulevaisuustaulukkoa ja PESTE-kehystä hyödyntämällä. Tulevaisuustaulukolla tarkoitetaan taulukkomuotoon laadittua valitulle aiheelle olennaisten muuttujien ja niiden arvojen kartoittamista (Rubin, 2004b). PESTE-kehys puolestaan liittyy valitun aiheen toimintaympäristöanalyysiin: laaditaan taulukkomuotoinen kategorisointi aiheeseen liittyvistä muutoksista. Lyhennys PESTE käsittää muutosten erilaiset luonteet: poliittiset, taloudelliset, sosiaaliset, teknologiset ja ekologiset (Dufva, 2022, s. 107–109).

Neljännessä pääluvussa käsitellään tulevaisuustaulukkoa. Kaikki taulukon kuusi muuttujaa avataan omissa alaluvuissaan. Tulevaisuustaulukkoa seuraavat siitä muodostetut tulevaisuuskuvat omassa pääluvussaan. Tulevaisuuskuvia syntyi seitsemän, joista kolmesta muodostettiin skenaariot. Skenaariot esitellään omassa, raportin toiseksi viimeisessä, pääluvussaan. Skenaarioissa terveydenhuoltoa tarkastellaan lapsiperheen näkökulmasta. Raportti päätetään skenaarioita seuraavaan johtopäätökset-lukuun, jossa vastataan tutkimuskysymykseen ja reflektoidaan skenaariotyöskentelyä.

Toimintaympäristön analyysi & käsitteet

Tässä pääluvussa käsittelemme aiheemme toimintaympäristöä nykytilan kontekstissa sekä tärkeimmät käsitteet. Toimintaympäristön analyysissä keskeiseksi nousee teknologian kehittyminen sekä terveydenhuollon taloudellinen tila. Raportin kannalta keskeisimmiksi käsitteiksi valikoituivat yleislääkäri, teknologia sekä tekoäly. Nykytila-analyysi sekä käsitteet näkyvät tulevaisuustaulukon muuttujissa neljännessä pääluvussa.

Toimintaympäristön nykytila-analyysi

Teknologinen kehittyminen ja digitalisaatio ovat kehityksessä ja kasvussa koko maailmassa, myös Suomessa. Lääkäriliiton (2016) tekemän tutkimuksen mukaan enemmistö suomalaisista on melko vakuuttunut digitalisaation myönteisistä vaikutuksista terveydenhuoltoon tulevaisuudessa. Kaksi kolmasosaa on sitä mieltä, että digitalisaatio parantaa palvelujen saavutettavuutta ja lähes yhtä suuri osuus uskoo sen alentavan kustannuksia. Terveyskeskusten johtavista lääkäreistä lähes kaikki pitävät digitalisaatiota terveyspalveluissa hyvänä asiana.

Digitalisaation myötämielisyys yhdistettynä jatkuvaan teknologian kehittymiseen mahdollistavat terveystiedon räjähdysmäisen kasvun ja mahdollisuudet hyödyntää sitä potilaiden hoidossa. Parhaimmillaan digitali-

saation odotetaan automatisoivan hoidon tarpeen arviointia ja tehostavan hoitoprosesseja. Terveydenhuollossa vahvistuu ihmisten itsenäinen rooli terveyden edistämisessä ja ylläpitämisessä sekä sairauksien ehkäisyssä. Terveydenhuollolle omahoidon lisääntyminen on mahdollisuus parantaa kustannustehokkuutta, kun kallista ammattilaisresurssia voidaan kohdentaa vaativimpiin tehtäviin.

Taloustilanteeseen ja terveydenhuollon resurssointiin tuovat helpotusta edellä mainitut seikat, mutta myös kansantaloudella on merkittävä rooli terveyspalveluiden tuottamisessa. Suomen terveydenhuollon menot ovat tällä hetkellä noin 32 % bruttokansantuotteesta, joka on EU:n keskitasoa (Sosiaali- ja terveysministeriö, 2020). Julkisen terveydenhuollon tila on laskussa ja sitä on kritisoitu esimerkiksi sote- ja hyvinvointialueuudistusten myötä.

Tällä hetkellä 35 % suomalaisista on työterveyshuollon piirissä ja 24 % on vakuutettu vapaaehtoisella sairauskuluvakuutuksella. Olettamuksella, että kaikki täysi-ikäiset sairauskuluvakuutetut ovat myös työterveyshuollon piirissä saadaan, että 43 % suomalaisista on joko työterveyshuollon piirissä tai sairauskuluvakuutettuja. Toisin sanoen lähes puolet suomalaisista ovat äänestäneet lompakoillaan nopeamman ja paremman hoidon puolesta (Kauppalehti, 2022).

Trendi yksityisen terveydenhuollon puolesta on myös kasvussa, mutta perinteiset yhteiskunnallisia arvoja ajavat puolueet eivät ole ajamassa julkista terveydenhuoltoa alas, pikemminkin päinvastoin (SDP, 2023). Terveydenhuollon rahoitusmalli tulevaisuudessa riippuu myös siis pitkälti poliittisista päätöksistä sekä ihmisten omista valinnoista.

Terveydenhuolto

Yleislääketiedettä kutsutaan "perusterveydenhuolloksi", mutta kliinisinä lääketieteen tieteenaloina ne ovat terveydenhuoltojärjestelmien tukipilari kaikilla tasoilla, ja ne ovat vaikuttaneet kaikkiin terveysparametreihin viime vuosisadalta, ellei jopa ihmiskunnan historian alusta lähtien. Perhelääketiede on ensisijainen ja pysyvä näkökohta terveydenhuollon alalla, ja se on ensimmäinen ja viimeinen vastuualue ihmisen hoidon kaikilla osa-alueilla (Göktaş, 2022). Maailmanlaajuinen terveydenhuolto on siirtymässä sairauksiin keskittymisestä kohti kokonaisvaltaista terveyttä, potilaskeskeistä, digitaalista lähestymistapaa hyvinvointiin. Jotta tulevaisuuden lääkäri pysyisi viimeisimmän kehityksen mukana, hänellä on enemmän aikaa uusien digitaalisten lähestymistapojen oppimiseen ja omaksumiseen (Herzhoff, 2022).

Yleislääkäri

Yleislääkäri on erikoislääkäri, joka on koulutettu työskentelemään terveydenhuoltojärjestelmän etulinjassa ja ryhtymään ensimmäisiin toimiin potilaiden terveysongelmien hoitamiseksi. Yleislääkäri huolehtii yhteiskunnan yksilöistä riippumatta potilaan sairauden tyypistä tai muista henkilökohtaisista ja sosiaalisista ominaisuuksista ja järjestää terveydenhuoltojärjestelmän käytettävissä olevat resurssit potilaiden parhaaksi. Yleislääkäri toimii itsenäisten yksilöiden kanssa ennaltaehkäisyn, diagnosoinnin, parantamisen, hoidon ja palliation aloilla käyttäen ja yhdistäen biolääketieteen, lääketieteellisen psykologian ja lääketieteellisen sosiologian tieteitä (Olesen ym. 2000).

Teknologia

Teknologia on sellaisten esineiden tuotantoa, jotka parantavat ihmisen kykyjä tai antavat ihmisille mahdollisuuden suorittaa tehtäviä, joita he eivät muuten voisi tehdä. Siihen kuuluvat laitteistot, tuotannontekijät ja ohjelmistot sekä tietämys eli tekniikka, jota tarvitaan auton ajamiseen tai pankkitilin käyttämiseen (Grübler, 1998). Lääketieteen kontekstissa tietokonesimulaatioteknologian, tekoälyn ja muiden teknologioiden kehittymisen myötä syntyy monia uusia lääketieteellisiä menetelmiä ja lääkinnällisiä laitteita ja tiloja. Lääketieteellisten prosessien muutokset reaalimaailmassa seuraavat teknologista kehitystä (Mengting ym. 2022).

Tekoäly

Lääketieteen näkökulmasta tekoäly on nousevassa oleva teknologian osa-alue, jota käytetään tällä hetkellä pääsääntöisesti apuna kuvantamisen diagnostiikassa. Siitä on kuitenkin potentiaalia monella muullakin lääketieteen alueella, jossa ollaan tekemisissä suurien tietomäärien kanssa. (Zellner ym., 2022) Yleisesti tekoälyllä tarkoitetaan laitetta tai ohjelmistoa, jotka prosessoivat informaatiota ja vuorovaikuttavat ympäröivän maailman kanssa ikään kuin elävät olennot (Zellner ym., 2022; Chary ym., 2020). Tekoäly eli AI (Artificial Intelligence) kuvailtiin ensin John McCarthyn toimesta tieteen ja tekniikan muovaamaksi älykkääksi laitteeksi, josta on muovautunut tämän päivän tekoäly yhdistäen tietokoneiden ja teknologian käytön älykkääksi toiminnaksi ja kriittiseksi ajatteluksi, jota voi verrata ihmisen toimintaan ja ajatteluun (Amisha ym., 2019).

Metodit

Tässä pääluvussa käsittelemme raportin luomisessa käyttämiämme metodeja. Määrittelemme myös muutaman perususkomuksen. Käytetyt metodit avataan käsitteiden tasolla ja niiden käyttöä on kuvattu tarkemmin niitä käsittelevissä luvuissa.

Tulevaisuustaulukkomenetelmä

Raportissa hyödynnämme morfologista skenaariotyöskentelyä eli tulevaisuustaulukkomenetelmää (Lätti ym., 2022). Menetelmän avulla luomme erilaisia tulevaisuusskenaarioita PESTE-analyysikehikkoa hyödyntäen. Sen avulla pystyimme jäsentämään kattavasti aiheeseemme liittyviä näkökulmia, kuten Dufva (2022) on artikkelissaankin huomioinut. Skenaariotyöskentely alkoi siis aiheen, tavoitteen sekä tutkimuskysymysten laatimisella. Näiden lähtökohtien pohjalta lähdimme keräämään tietoa ja tarkentamaan tutkimuskysymystämme.

Toimintaympäristön tarkastelu ja PESTE

Toimintaympäristön tarkastelulla pyrimme löytämään aiheemme kannalta keskeisiä tapahtumia ja riippuvuussuhteita. Näiden muuttujien tunnistamiseen käytimme Lätin ja kumppaneiden (2022) PESTE-analyysia. Rakensimme näiden muuttujien ja PESTE-luokkien avulla taulukon. Taulukon muuttujat jaoimme megatrendiksi, trendiksi, epävarmuustekijäksi, heikoiksi signaaliksi tai villiksi kortiksi. Aiheeseen liittyvät tunnistetut muutostekijät sijoitimme poliittisiin (P), ekonomisiin (E), sosiaalisiin (S), teknologisiin (T) tai ekologisiin (E) tekijöihin. Emme niinkään etsineet esimerkiksi poliittista muutostekijää, vaan ennemmin tunnistimme esimerkiksi aiheeseen sopivan megatrendin ja sovitimme sen PESTE-luokitteluun. Pyrimme täyttämään PESTE-analyysin eri

osa-alueet mahdollisimman kattavasti, koska PESTE-luokittelun tarkoituksena on saada mahdollisimman monipuolinen näkökulma tutkitusta aiheesta (Lätti ym. 2022).

Perususkomukset

Perususkomuksilla tarkoitetaan sellaista asiaintilaa, jota pidetään itsestään selvänä, eikä sitä kyseenalaisteta. Tämän raportin yhteydessä pidämme todennäköisenä, etteivät tunnistamamme perususkomukset tule muuttumaan vuoteen 2040 mennessä. Tunnistimme perususkomuksia neljä: suomalainen yhteiskuntajärjestys on pääpiirteissään samanlainen vuonna 2040 kuin vuonna 2023; terveydenhuoltojärjestelmä on edelleen olemassa vuonna 2040; teknologia jatkaa kehittymistään, ja väestörakenne, huoltosuhde sekä väestökasvuennuste pysyvät ennakoidun mukaisena (väestö ikääntyy).

Tulevaisuuskuvat ja skenaariot

Tulevaisuustaulukon rakentamiseen käytimme toimintaympäristö analyysin tuloksia. PESTE-taulukko antoi osviittaa tärkeistä tulevaisuuteen vaikuttavista tekijöistä, jolloin pystyimme helpommin valitsemaan muuttujia tulevaisuustaulukkoon. Muuttujien tunnistamisen jälkeen valitsimme noin kolme erilaista arvoa jokaiselle muuttujalle. Lätin ja kumppaneiden (2022) mukaisesti muuttujien arvot valittiin toisiaan pois sulkeviksi, jotta tulevaisuuskuvista saataisiin mahdollisimman erinäköisiä ja mielekkäitä. Tulevaisuuskuvien muodostuksessa pyrimme hyödyntämään jokaista muuttujan arvoa vähintään kerran.

Skenaariot pohjautuvat näihin tulevaisuuskuviin (Lätti ym. 2022). Skenaarioissa pyrimme kuvaamaan tulevaisuuskuvat mielekkäästi ja uskottavasti. Skenaariot eivät kuitenkaan, muodostuneet kerralla vaan olivat useamman iteraation tulosta tulevaisuuskuvien ja skenaarioiden välillä. Skenaariot päätimme luoda kuviteltujen henkilöiden kautta. Koimme aiheemme sopivaksi tällaiselle kuvituksella ja skenaariot olisi näin helpompi sisäistää (Lätti ym. 2022). Johtopäätöksissä olemme vielä analysoineet skenaarioiden todennäköisyyksiä.

Tulevaisuustaulukko

Johdanto ja tulevaisuustaulukko

Tulevaisuustaulukkoon sijoitimme kuusi eri muuttujaa: terveydenhuollon rahoitusmalli, terveydenhuollon tavoite/päätehtävä, päätöksenteko ja vastuu, yksilön luottamus, teknologian kehitys sekä sijainnin merkitys palveluiden laatuun. Muuttujamme sijoittuvat PESTEV-kehikkoon: ihmiset (P, poliittinen muuttuja), terveydenhuollon rahoitusmalli (E, taloudellinen), eriarvoistuminen (S, sosiaalinen), teknologian kehitys (T, teknologia), sijainti (E, ekologinen) ja tavoite/päätehtävä (V, arvot). PESTEV-kehikon avulla varmistetaan eri näkökulmien sisällyttäminen tulevaisuuskuviin. (Dufva 2022, 107–108.)

Kaikille muuttujille on määritelty kolme arvoa, paitsi sijainnin merkitykselle, jolla on arvoja neljä. Tulevaisuustaulukon muuttujien avulla ja niitä yhdistelemällä pystytään luomaan erinäköisiä skenaarioita, joskaan skenaariot eivät ole koskaan kaikenkattavia. Muuttujiksi valikoituivat tarkastelun kannalta oleellisimmat muuttujat. Seuraavissa alaluvuissa esitellään muuttujat ja niiden arvot tarkemmin. Viidennessä luvussa muuttujien ja tulevaisuustaulukon avulla on muodostettu tulevaisuuskuvia.

Tekoälyn käyttö terveydenhuollossa potilaan näkökulmasta 2040

Muuttujat	Arvo A	Arvo B	Arvo C	Arvo D
Terveydenhuollon rahoitusmalli	Julkinen	Yksityinen	Hybridi	
Terveydenhuollon päätehtävä	Hyvinvoinnin ja terveyden ylläpito	Taloudellinen tuotto	Tutkimustyö / lääketieteellinen edistyminen	
Terveydenhoitoon liittyvä päätöksen-teko	Tekoälyllä päätök-sentekoauktoriteetti koko hoitoproses-sista	Ihmislääkärillä lopullinen päätöksenteko	Päätöksenteon pääpaino ja vastuu yksilöllä	
Yksilön luottamus tekoälyn käyttöön terveydenhuollossa	Yksilö ei luota tekoälyyn ja vastustaa sitä	Yksilö luottaa teko-älyyn ja suhtautuu siihen myötämieli-sesti	Passiivinen suhtautuminen tekoälyyn	
Teknologian kehitys	Teknologian vahva kehittyminen	Teknologian hidas kehittyminen	Nykytrendin mukainen kasvu	
Terveydenhuollon palveluiden sijainnin merkitys palveluiden laatuun	Samat resurssit kaikkialla	Huomattavasti eriarvoiset alueet (resurssien keskitty-minen tietyille alueille)	Lievää eriarvoisuutta	Kasvava eriarvoisuus

Kuvio 1. *Tulevaisuustaulukko.*

Muuttuja: Terveydenhuollon rahoitusmalli

Tässä yhteydessä rahoitusmallilla tarkoitetaan sitä tapaa, jolla terveydenhuollon rahoitus on järjestetty kussakin vaihtoehtoisessa tulevaisuudentilassa. Arvoiksi valikoituivat julkinen, yksityinen ja hybridi. Julkisella rahoitusmallilla tarkoitetaan tässä raportissa tilannetta, jossa kaikki terveydenhuollon palvelut ovat pääosin julkisen sektorin rahoittamia. Julkisen puolen käytettävissä olevat varat kerätään muun muassa verotuksella ja erilaisilla maksuilla.

Yksityisen rahoitusmallin tilanteessa kukin yksilö vastaa itse terveydenhuollostaan ja terveydenhuollon palveluiden hankkimisesta yksityisiltä toimijoilta. Tässä rahoitusmallissa ei tunnisteta julkista sektoria terveydenhuollon toimijana, ei siis ole olemassa perustasoa, joka olisi taattu kaikille.

Hybridiksi nimetyllä rahoitusmallilla tarkoitetaan tässä raportissa tilannetta, jossa julkinen sektori järjestää julkisin varoin niin sanotun perustason terveydenhuollon kaikille. Nopeampaa, kattavampaa ja laadukkaammaksi koettua terveydenhuoltoa yksilöt voivat ostaa yksityisen sektorin toimijoilta omakustanteisesti.

Muuttuja: Terveydenhuollon päätehtävä

Päätehtäväksi nimetyllä muuttujalla tarkoitetaan tässä raportissa terveydenhuollon järjestämisen syytä järjestäjän näkökulmasta. Tämän muuttujan arvoiksi valikoituivat hyvinvoinnin- ja terveyden ylläpito, taloudellinen tuotto sekä tutkimustyö ja lääketieteellinen edistyminen.

Hyvinvoinnin- ja terveyden ylläpitämisen arvossa fokus on ihmisten pitäminen terveinä ja työkuntoisina. Tässä arvossa ei ole järjestäjänkään näkökulmasta toista motivaattoria. Taloudellinen tuotto arvona tarkoittaa

sitä, että järjestäjän näkökulmasta terveydenhuoltoa ylläpidetään taloudellisen tuoton saamiseksi. Terveydenhuollon palveluita tarjotaan niin, että toiminta on taloudellisesti tuottavaa järjestäjälle, lääkäri tekee työtään tuottaakseen työnantajalleen voittoa. Tutkimustyö ja lääketieteellinen edistyminen arvona sisältää ajatuksen siitä, että sen lisäksi, että terveydenhuolto on järjestetty säilyttämään ihmisten työkunto, on sen tarkoitus myös tarjota puitteet lääketieteelliselle tutkimustyölle.

Muuttuja: Terveydenhoitoon liittyvä päätöksenteko

Päätöksenteolla kuvataan hoitoprosessin aikana tapahtuvien päätösten vastuutahoja. Tekoälyn ollessa vastuussa hoitoprosessista on tekoäly päättävä elin, joka tekee diagnoosit ja määrää mahdolliset hoitokeinot. Ihmislääkärin lopullisessa päätöksenteossa, tekoäly voi olla mukana prosessissa ja diagnoosin tekemisessä, mutta varsinaiset tulokset ja hoitokeinot määrittelee ihmislääkäri. Yksilön ollessa vastuussa, on yksilöllä korostunut vastuu seurata omaa hyvinvointiaan sekä jakaa siitä tietoa hoitoon pääsyn edellytykseksi. Varsinaiset diagnoosit ja hoitokeinot määrittelee kuitenkin terveydenhuollon ammattilainen.

Muuttuja: Yksilön luottamus tekoälyn käyttöön terveydenhuollossa

Yksilöiden luottamus muuttujana tarkoittaa tässä raportissa yleistä suhtautumista tekoälyn käyttöön terveydenhuollossa. Muuttujassa on yhdistetty poliittiset päätökset sekä kansalaisten yleinen mielipide, jälkimmäisen näkyessä käytännössä edellisessä. Arvoiksi valikoituivat vastustaminen, myötämielisyys sekä passiivisuus.

Vastustamisella tarkoitetaan aktiivista vastustamista, jossa tekoälyn osallisuus terveydenhuollossa pyritään pitämään olemattomana tai mahdollisimman pienenä. Asiaan liittyy vahvoja tunteita ja mielipiteitä, tekoälyn käyttö on kynnyskysymys ja se on tiukasti säänneltyä. Myötämielisyydellä tarkoitetaan hyväksyvää ja siten edistävää näkemystä tekoälyn käytöstä. Tekoälyn käyttämiseen kannustetaan, siihen suhtaudutaan hyväksyvästi ja tekoälyn kehittämiseen allokoidaan varoja sekä resursseja.

Passiivisuudella tarkoitetaan eräänlaista vastustamisen ja myötämielisyyden välimuotoa: aihe ei herätä tunteita, vaan se nähdään luonnollisena osana terveydenhuoltoa. Toisaalta siihen ei myöskään suhtauduta erityisellä innolla, eikä tekoälyn kehittämiseen käytetä huomattavaa määrää resursseja.

Muuttuja: Teknologian kehitys

Teknologian kehitys -muuttujalla tarkoitetaan sitä, millainen arvo teknologialla on kussakin tulevaisuuskuvassa: onko kehitys ensisijaista, käytetäänkö siihen paljon resursseja? Arvoiksi valikoituivat teknologian vahva kehittyminen, hidas kehittyminen ja nykytrendin mukainen kehitys. Vahvan kehittymisen arvossa teknologian kehitykseen allokoidaan paljon resursseja, kehitys on tavallaan kilpailua. Hitaan kehittymisen arvossa teknologiaa kehitetään tarpeen mukaan, ei niinkään innovatiivisesti kuin nopean kehittymisen arvossa. Nykytrendin mukaista kehittymistä kuvaa yhä kiihtyvä tahti, joka ei kuitenkaan ole niin drastinen kuin nopean kehittymisen arvossa.

Muuttuja: Terveydenhuollon palveluiden sijainnin merkitys palveluiden laatuun

Sijaintiin liittyvässä muuttujassa on kyse siitä, kuinka terveydenhuolto asettuu maantieteellisesti. Pohjimmiltaan kyse on siitä, ovatko terveydenhuollon saavutettavuus ja saatavuus yhteydessä väestön sijoittumiseen. Saavutettavuudella tarkoitetaan matkaa terveyspalveluihin ja saatavuudella tarkoitetaan palveluiden saamista esimerkiksi terveyskeskuksessa (STN IMPRO 2018). Sijaintimuuttujassa on yhdistetty sekä saavutettavuus

että saatavuus. Arvoiksi valikoituivat samat resurssit kaikkialla, huomattavasti eriarvoiset rakenteet, lievää eriarvoisuutta sekä kasvavaa eriarvoisuus.

Samat resurssit kaikkialla -arvo pitää sisällään ajatuksen siitä, että maantieteellisestä sijainnista riippumatta terveydenhuolto on saatavissa koko laajuudeltaan. Jonotusajat ovat pääpiirteittäin samat kautta maan. Huomattavasti eriarvoiset rakenteet -arvo on kiinteässä riippuvuussuhteessa väestön sijoittumisen kanssa. Terveydenhuollon koko laajuus on saavutettavissa niillä maantieteellisillä alueilla, joilla on suurin väestömäärä. Mitä vähemmän väestöä alueella on, sitä niukempi on myös terveydenhuollon palveluiden tarjonta kyseisellä alueella, joka johtaa siihen, että harvaan asutuilta alueilta on maantieteellisesti pitkä matka edes perustason terveydenhuollon palveluihin. Arvot ”lievää eriarvoisuutta” ja ”kasvava eriarvoisuus” viittaavat kumpikin maantieteellisen eriarvoisuuden olemassaoloon. Lievää eriarvoisuutta -arvo viittaa staattiseen tilanteeseen, jossa terveydenhuollon palvelut ovat saavutettavissa, mutta laajimmat palvelut sijoittuvat suuriin väestökeskittymiin. Perustaso on tarjolla myös haja-asutusalueilla. Kasvava eriarvoisuus -arvo on luonteeltaan dynaamisempi alueellisen eriarvoisuuden koko ajan kasvaessa tulevaisuuskuvassa.

Tulevaisuuskuvat

Muuttujat	Arvo A	Arvo B	Arvo C	Arvo D
Terveydenhuollon rahoitusmalli	Julkinen	Yksityinen	Hybridi	
Terveydenhuollon päätehtävä	Hyvinvoinnin ja terveyden ylläpito	Taloudellinen tuotto	Tutkimustyö / lääketieteellinen edistyminen	
Terveydenhoitoon liittyvä päätöksenteko	Tekoälyllä päätöksenteko-auktoriteetti koko hoitoprosessista	Ihmislääkärillä lopullinen päätöksenteko	Päätöksenteon pääpaino ja vastuu yksilöllä	
Yksilön luottamus tekoälyn käyttöön terveydenhuollossa	Yksilö ei luota tekoälyyn ja vastustaa sitä	Yksilö luottaa tekoälyyn ja suhtautuu siihen myötämielisesti	Passiivinen suhtautuminen tekoälyyn	
Teknologian kehitys	Teknologian vahva kehittyminen	Teknologian hidas kehittyminen	Nykytrendin mukainen kasvu	
Terveydenhuollon palveluiden sijainnin merkitys palveluiden laatuun	Samat resurssit kaikkialla	Huomattavasti eriarvoiset alueet (resurssien keskittyminen tietyille alueille)	Lievää eriarvoisuutta	Kasvava eriarvoisuus

Kuvio 2. *Tulevaisuuskuvat*

Ilmaista rahaa kaikille
Pelastusrengas sen ostaneille
Tuttu ja turvallinen
Samassa uppoavassa veneessä
Skenaario: Ei mitään neuvoteltavaa
Skenaario: Kadotettu yksityisyys
Skenaario: 10 minuutin vastaanotto

Lähdimme muodostamaan tulevaisuuskuvia dystopian, business as usual (BAU) eli nykytilan jatkumon ja utopian kautta, terveydenhuollon palveluiden käyttäjän näkökulmasta. Rubinin (2004c) mukaan yleiskielessä utopialla tarkoitetaan asioiden haave- tai ihannetilaa. Tulevaisuudentutkimuksessa termillä on lisämerkitys: ”Utopia-ajattelulla tarkoitetaan sitä, että tulevaisuudesta pyritään tietoisesti rakentamaan erilaista ja parempaa kuin mitä nykyisyys on.” (Rubin, 2004c). Dystopian Rubin (2004a) tiivistää Bellin määritelmän pohjalta mahdollisessa tulevaisuudessa olevaksi kuvitteelliseksi paikaksi, jossa asiat ovat huonommalla tolalla kuin nykyhetkellä.

Määrittelimme hyvän terveydenhuollon saavutettavuuden, palveluiden laadun ja valinnanvapauden summaksi. Esimerkiksi resursseja ei pidetty hyvän terveydenhuollon määrittelijänä, vaan yhtenä sen mahdollistajana. Hyvän terveydenhuollon kokonaiskuva taas osoittaa tulevaisuuskuvan suunnan nykyhetkeen verrattuna, joten kärjistäen voimme päätyä esimerkiksi joko utopiaan tai dystopiaan rahoitusmallista ja terveydenhuollon tavoitteesta riippuen.

Tulevaisuuskuvien lopputuloksista tunnistimme dystopian, utopian ja business as usual-tulevaisuudet. Rahoitusmallia pidimme yhtenä pääarvona tulevaisuuskuvien jaottelulle. Muut arvot määräytyivät pitkälti tutkittavan tulevaisuuskuvan saavuttamiseksi. Tulevaisuuskuvia muodostui seitsemän, joista kolmesta muodostimme skenaariot. Alla on lueteltu tulevaisuustaulukkoon kuvatut tulevaisuuskuvat sekä skenaariot:

- (Dystopia julkinen) Samassa uppoavassa veneessä
- (Dystopia yksityinen) Pelastusrengas sen ostaneille
- (BAU) Tuttu ja turvallinen
- (Utopia julkinen) Ilmaista rahaa kaikille *ja muita ideoita, jotka pelastavat maailman*
- Skenaario 1: Ei mitään neuvoteltavaa
- Skenaario 2: Kadotettu yksityisyys
- Skenaario 3: Kymmenen minuutin vastaanotto

Skenaariotarinat

Johdanto skenaarioihin

Skenaarioilla pyritään luomaan kuvauksia mahdollisesta tulevaisuudesta. Skenaario perustuu kerättyyn tutkimusaineistoon ja niitä luotaessa pyritään ottamaan huomioon skenaarioon johtavassa kehityskulussa tapahtuva muutokset niin, että kehityskulku on muutakin kuin vain historiallisen kehityskulun jatkumoa. (Lätti ym. 2022, 314–315.)

Päätimme kirjoittaa skenaariotarinat kolmesta tulevaisuuskuvasta: kahdesta erilaisesta dystopiasta sekä yhdestä utopiasta. Nämä kolme valikoituivat sillä perusteella, että ne eroavat suhteellisen radikaalisti nykytilasta ja siten todennäköisesti herättävät enemmän ajatuksia kuin BAU-polkua seuraava skenaario. Skenaariot ovat luonteeltaan tutkivia ja jokaisessa eritellään, kuinka tähän asioiden tilaan on päädytty.

Skenaariotarinat kerrotaan terveydenhuollon asiakkaan näkökulmasta, sillä tästä jokaisella ryhmämme jäsenellä on omakohtaista kokemusta. Skenaariot avataan lapsiperheen näkökulmasta, jotta niihin saadaan skenaarioiden henkilöiden rooleista eri elementtejä. Skenaarioissa esiintyy tamperelainen perhe, joka muodostuu vanhemmista Olavista, Einosta ja Oliviasta sekä heidän leikki-ikäisestä lapsestaan, Havusta. Perhemuotojen moninaistuessa halusimme myös skenaarioperheemme rakenteen olevan linjassa skenaarioiden kanssa, joten päädyimme perhemalliin, jossa lapsella on kolme samassa kodissa asuvaa tasavertaista vanhempaa.

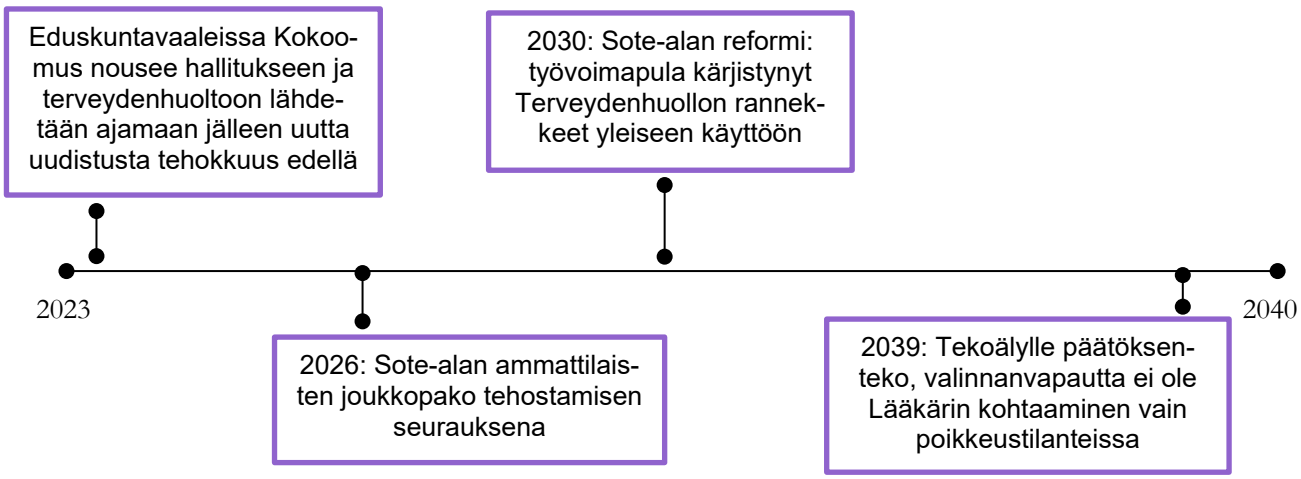
Dystopia: Ei mitään neuvoteltavaa

Vuonna 2040 Suomen terveydenhuolto on kriisissä. Viimeisen vuosikymmenen aikana terveydenhuollon niukat resurssivirrat ovat miltei tyrehtyneet. Tekoälyn piti turvata hoitoon pääsy ja vapauttaa lääkäreiden aikaa arvoa tuottavaan työhön. Julkinen terveydenhoito lanseerasi useampi vuosi takaperin tekoälypohjaisen rannekkeen. Vuonna 2039 diagnostiikka ja hoidon päätösvalta siirrettiin tekoälylle.

Havu on toista viikkoa kipeänä ja vanhemmat ovat päivittäin tavoitelleet hoitoon pääsyä. Olavi saa saman vastauksen viidenteen yhteydenottopyyntöönsä. Havun rannekkeen tulokset eivät anna syytä epäillä flunssaa vakavampaa sairautta, eikä vanhemmille anneta kunnollista mahdollisuutta kuvailla lapsen vointia. Automaattivastaus kirjoittaa reseptin vahvemmalle särkylääkkeelle ja käskee lasta lepäämään. Olavin sähköpostiin kilahtaa vielä varmistus Havun tallennetuista potilastiedoista. Iloisilla väreillä kuvitettu grafiikka näyttää, montako kertaa Havu on kuluvan vuoden aikana ollut kipeänä verrattuna omaan ikäluokkaansa. ”Hyväksytkö nämä käyttöehdot” -ikkuna tuntuu vanhemmista vieläkin huvittavalta, kun tekoälyn avustamaan hoitoon ei pääse ennen sen ruksaamista.

Eino hyväksyy tekoälyn diagnoosin mukisematta ja tyytyväisenä. Diagnoosi oli nopea ja mutkaton. Havun äitiä Oliviaa ja toista isää Olavia tilanne jää kuitenkin vaivaamaan. He pohdiskelevat, että kymmenen vuotta sitten näin nopeaa palvelua olisi saanut vain isolla rahalla, mutta päätösvalta oli kuitenkin heillä itsellään. Nykyään automaattisen diagnoosin saa muutamassa tunnissa ilman minkäänlaista lisälaskua, mutta käyttöehdot hylkäämällä he pääsisivät tapaamaan ihmislääkäriä, joskin hoito olisi tekoälyä hitaampaa. He kuitenkin uskovat, että ihminen pystyy intuitiivisesti huomaamaan jotain, mitä tekoäly ei. Terveysasema on nurkan takana, mutta sinne ei ole asiaa ennen tekoälyn hyväksyntää. Valinnanvapaus on näennäisesti vielä olemassa, riski hitaammasta hoitoon pääsystä seurauksineen kuitenkin huolestuttaa. Perhe asuu yhdessä Suomen isoimmista kaupungeista, Tampereella. Oliviaa ja Olavia mietityttää, mikä työllistää ne kaikki lääkärit täyspäiväisesti, kun edes Tampereella ei pääse tapaamaan lääkäriä.

Alkuasetelma skenaariossa ei viittaa dystopiaan. Skenaariossa lapsi on sairas, saa nopean diagnoosin ja todennäköisesti tehoavan lääkkeen. Laakasuon ja kumppaneiden (2022) tutkimuksen mukaan ihmiset eivät kuitenkaan luota robottien antamaan diagnoosiin. Hyvä hoito vaatii potilaiden ja lääkärien mielestä kasvotusten tapahtuvaa vuorovaikutusta (Lääkäriliitto 2016). Skenaariossa vanhempien on hankala luottaa tekoälyyn ja sen antamaan diagnoosiin, koska he eivät voit ilmaista omaa mielipidettään ja näkemyksiään. Vanhemmat jäävät kaipaamaan vuorovaikutusta, vaikka lääkärin kanssa lopputulos olisi todennäköisesti sama.



Dystopia: Kadotettu yksityisyys

Skenaario kertoo dystopiasta, jossa terveydenhuolto on täysin yksityistetty ja automatisoitu. Tekoälyllä on täysi vastuu hoitoprosessista. Yksityisyyden suojaa ja eettisiä kysymyksiä ei ole huomioitu riittävästi, ja tämän seurauksena perheen terveystiedot on levitetty ja myyty eteenpäin ilman heidän suostumustaan. Tarina käsittelee perheen yrityksiä suojata itseään ja yksityisyyttään tulevaisuudessa, kun heidän luottamuksensa terveydenhuollon ammattilaisiin ja teknologian kehittäjiin on murentunut.

Vuonna 2040 teknologian kehittyminen on saavuttanut uuden tason. Yksityinen terveydenhuolto on nyt täysin automatisoitu ja robotisoitu, tekoälyllä on päätösvalta hoitoprosessista. Robotisaatio tehostaa yritysten toimintaa ja tuottaa siten enemmän voittoa. Ihmiset saavat nopeasti ja tarkasti terveysmittauksia, mutta kaikki on muuttunut niin nopeasti, että eettiset kysymykset ovat jääneet huomiotta.

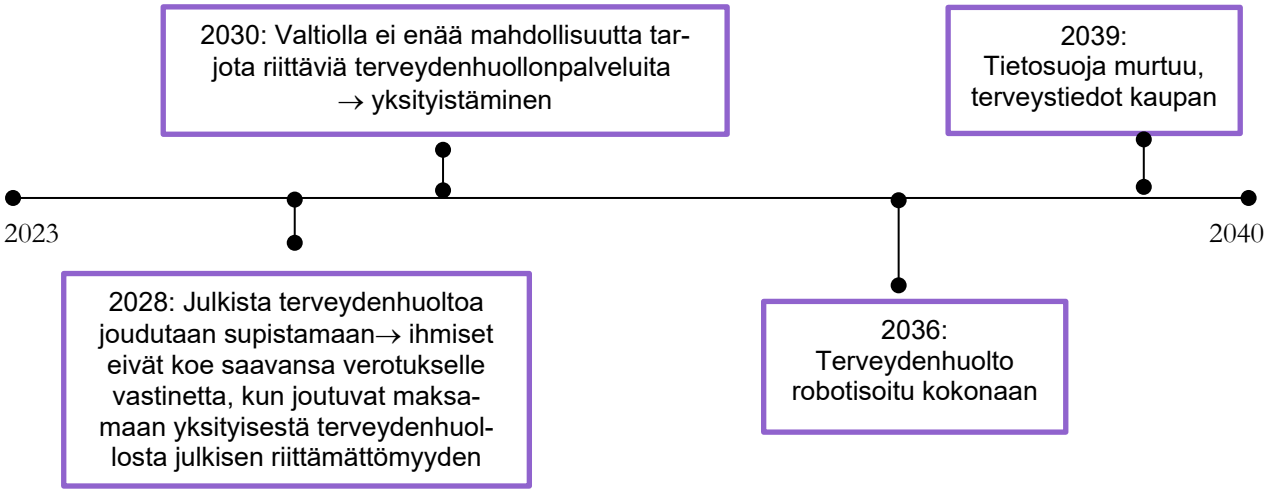
Tampereen Hiedanrannassa sijaitsevassa perheen kodissa vallitsi kylmä hiljaisuus. Olavi, Eino ja Olivia istuivat olohuoneessa tuijottaen seinää, joka oli täynnä tietokonenäyttöjä, joista he seurasivat terveydentilaansa ja siitä kerättyä dataa. Kamerat valvovat muun muassa perheen aktiivisuustasoa, lihasmassan määrää, ravintomääriä- ja aineita ja mahdollisia kehittyviä sairauksia. Mikäli perheenjäsenet söivät huonosti, näytöt kertoivat siitä heti ja heijastivat terveellisen ostoslistan näytölle. Tasaisin väliajoin näytölle ilmestyy muistutus tehdä lyhyt jumppa, jotta aktiivisuustaso pysyisi halutulla tasolla. Yhtäkkiä näytöt välkkyvät punaisena, ja ilmoittavat Havulla olevan tulehdustilan. Laite ilmoittaa, että Olavin on vietävä Havu varatulle ajalle 30 minuutin päästä, sillä Olavin kalenterissa oli tällöin 15 minuutin tauko töiden lomassa.

Kaikki oli pois heidän käsistään – heidän yksityisyytensä, valinnanvapautensa, terveystietonsa ja kaikki se, mitä he olivat pitäneet itsestään ja perheestään salassa. Se kaikki alkoi kymmenen vuotta sitten, kun yksityinen terveydenhuolto oli siirtynyt kokonaan robotisoituun muotoon. Tekoälyllä oli päätösvalta kaikista hoitoprosesseista, ja se näytti toimivan tehokkaasti. Lääkäreitä ja hoitohenkilökuntaa oli vähemmän, mikä tarkoitti alhaisempia kustannuksia ja nopeampaa hoitoaikaa. Monet olivat tyytyväisiä, koska heidän terveysongelmansa ratkaistiin nopeammin ja helpommin kuin koskaan ennen.

Mutta sitten alkoi tapahtua outoja asioita. Yksityisyys alkoi kadota, ja terveystiedot alkoivat levitä. Yritykset alkoivat ostaa ja myydä tietoja yksityisistä henkilöistä. Se oli vain bisnestä, mutta se tarkoitti myös sitä, että kaikki tiesivät kaiken toisistaan. Havun terveystiedot olivat mukana tässä kaikessa, vaikka hän oli vasta leikki-ikäinen. Hänen vanhempansa olivat raivoissaan ja peloissaan, koska he eivät tienneet, mitä seurauksia tästä kaikesta voisi olla. He yrittivät saada vastauksia, mutta kaikki tuntuivat pakoilevan vastuuta. Teknologia-alan asiantuntijat olivat vastuussa tekniikasta, mutta eivät halunneet vastata terveysongelmiin. Lääkärit olivat kadonneet, ja hoitoprosessi oli muuttunut täysin ihmisten hallitsemasta tekniikan hallitsemaksi. Kaikki tuntui olevan käsittämätöntä.

Olavi lähti viemään Havua tekoälyn itsenäisesti varaamalle vastaanottoajalle. Eino ja Olivia katselivat lapsensa, jonka tulevaisuus tuntui epävarmalta tässä dystopiassa, menoa. Onko Havulla edes mahdollisuutta itsenäiseen ja yksityiseen elämään? Vanhempien oli tehtävä jotain, mutta he eivät tienneet mitä.

Dystopia perustuu luoviin johtopäätöksiin, jotka perustuvat ryhmän valitsemien lääketieteen alan artikkeleihin. Tiwarin ym. (2022) mukaan jatkuvasti kasvava väestö asettaa julkisen terveydenhuoltojärjestelmän ja terveydenhuollon ammattilaiset koville. Niinpä sekä tutkimus- että teollisuusyhteisöt kokevat, että lääketieteellisten toimintojen automatisointiin tarkoitettujen tekoälyyn perustuvien välineiden ja tekniikoiden kysyntä kasvaa jatkuvasti. Wun ym. (2022) tutkimus toteaa, että viime vuosina tekoälyteknologia on edistynyt huomattavasti, ja sitä on vähitellen alettu soveltaa myös esimerkiksi lääketieteellisten kuvien käsittelyyn ja analysointiin.



Utopia: Kymmenen minuutin vastaanotto

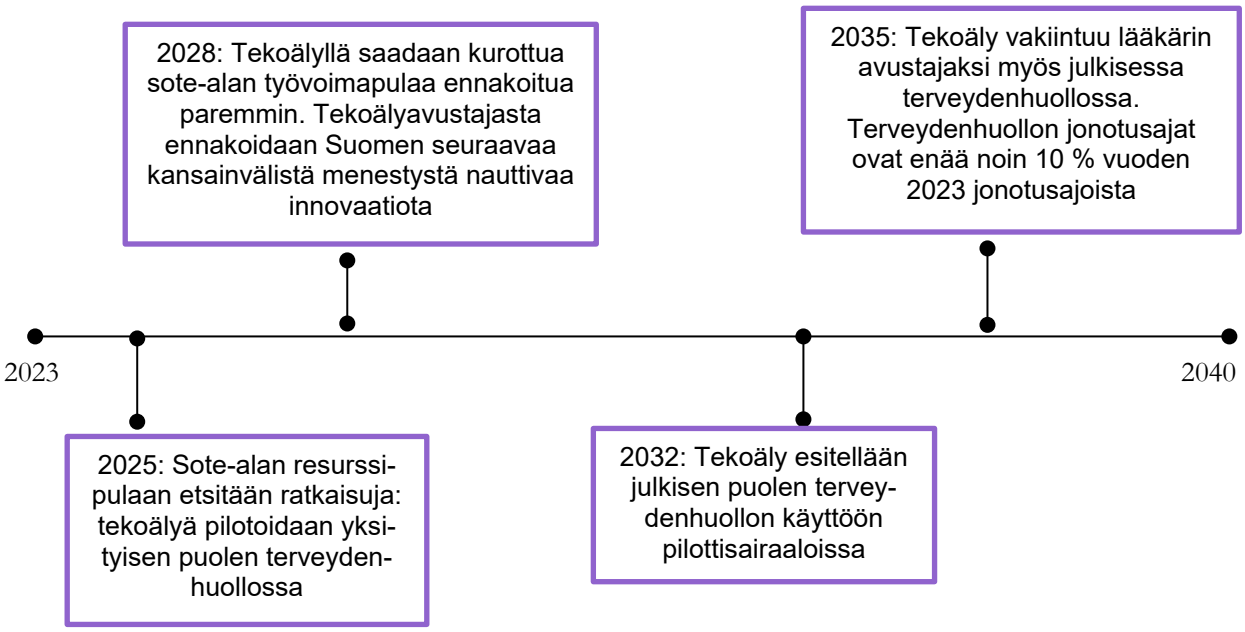
Utopiapohjaisessa skenaariossa nousee esille se, kuinka tekoälyn avulla lapsen, jolla ei ole samanlaista kykyä ilmaista itseään kuin aikuisella, diagnosoiminen on nopeampaa ja helpompaa. Tilanteessa korostuu myös mahdollisuus hengenvaaralliselle tilanteelle, joka voidaan selvittää nopeasti tekoälyn avulla. Samalla hoidosta ja diagnosoinnista saadaan muodostettua yksilöllistä.

Kymmenen minuutin vastaanotto -skenaariossa annetaan perheelle mahdollisuus myös valinnan mahdollisuuteen. Yhteiskunta ei oleta, että kaikki ovat myötämielisiä tekoälyä kohtaan vaan mahdollistavat myös tutun ja turvallisen hoidon mahdollisuuden pelkästään ihmisen kanssa.

Eräänä aamuna päiväkodista soitettiin Havun toiselle isälle Olaville, joka työskenteli kotoa käsin. Päiväkodin hoitaja oli huomannut aamun aikana, että Havulla ei ole kaikki hyvin ja alkanut epäilemään voimakasta allergista reaktiota tai jopa myrkytystä, sillä hoitajien tietojen mukaan Havu ei ollut syönyt sellaista ruoka-ainetta, jolle hän olisi allerginen. Olavi huolestui tilanteesta ja lähti hakemaan lastaan päiväkodista. Matkalla päiväkotiin hän ilmoitti tilanteesta työtovereilleen, miehelleen sekä Havun äidille. Samalla hän soitti lähimpään terveyskeskukseen Lielahden terveysasemalle, kuinka hänen tulisi toimia. Hoitaja kertoi epäilyksensä Olavin tiedossa olevien oireiden perusteella tilanteen olevan mahdollisesti vakava, mutta ei kriittinen. Häntä kehotettiin suuntaamaan lapsensa kanssa TAYS:iin, jossa Havu pääsisi nopeasti diagnosoitavaksi, jos perhe olisi myötämielinen tekoälyä kohtaan. Toisena vaihtoehtona olisi suunnata Olavin soittamalle terveysasemalle, jossa diagnosointi tulisi olemaan hitaampaa, sillä käytössä ei olisi tekoälyä diagnosoinnin apuna. Päätös oli Olaville helppo sekä kokonaisuutena koko perheelle – he menisivät TAYS:iin.

Sairaalaan päästyään Havu tunnistettiin nopeasti tekoälyn avulla ja ohjattiin vapaana olevaan tutkimushuoneeseen, jossa odotti lääkäri sekä pöytäkokoinen älyrobotti. Vastaanotto kesti yhteensä noin kymmenen minuuttia. Ensin lääkäri varmisti potilaan henkilöllisyyden sekä voinnin. Tämän jälkeen Havu istui isänsä sylissä robotin viereen, jolle Havu antoi sormensa. Minuutin aikana tekoälyrobotti oli ottanut Havulta verinäytteen sormesta, analysoinut sen ja todennut, mikä potilasta vaivaa. Tekoäly oli tunnistanut Havun verestä pähkinäallergiaan liittyviä merkkejä. Näin ollen hän sai täsmälääkkeenä kortisonia lääkäriltä ja robotti puolestaan ilmoitti reseptin olevan valmiina, kun perhe menee apteekkiin. Isä ja lapsi poistuivat vastaanotolta hyvillä mielin ja vastassa odotusaulassa heitä oli loppuperhe.

Edellä avattuun skenaarioon on päädytty Zellnerin ym. (2022) tutkimuksessa toteutetun tutkimuksen kautta, jossa tekoäly otettiin mukaan diagnosoimaan myrkyllisiä aineita ihmisen kehosta. Tutkimuksen tarkoituksena on ollut myös ajatella pidemmälle ja kehittää mahdollisesti onnistuneen tutkimuksen myötä verkkopohjainen sovellus, jonka avulla diagnosoiminen helpottuisi ja nopeutuisi. Edellä kuvatussa skenaariossa Zellnerin ym. (2022) ajatusta on sovellettu tilanteessa, jossa potilas ei osaa ilmaista itseään niin, että diagnoosin tekeminen onnistuisi pelkän puheen tai eleiden avulla. Skenaariossa ei myöskään diagnosoida myrkyllisen aineen olemassaoloa kehossa vaan ruoka-aineen, joka on varsin yleinen allergian aiheuttaja (Kukkonen ym., 2013). Tutkimuksen kautta kehitettävää sovellusta voitaisiin näin ollen käyttää myös muiden kehossa olevien oireiden aiheuttajien diagnosoimiseen.



Johtopäätökset

Tutkimuskysymyksemme oli ”*Millaista tekoälyn käyttö terveydenhuollossa on potilaan näkökulmasta vuonna 2040?*”. Kolmen skenaarion avulla hahmotimme terveydenhuollon palveluiden käyttämistä lapsiperheen näkökulmasta vuonna 2040. Skenaariossa ”Ei mitään neuvoteltavaa” korostuu yksilön valinnanvapauden merkityksen pieneneminen tekoälyn toimiessa portinvartijana terveyskeskukseen pääsemisen suhteen.

Skenaariossa ”Kadotettu yksityisyys” korostuu yksityisyydensuoja suhteessa yhä kasvavaan datan määrään sekä tekoälyn kehittämiseen käytetyt arvot. Skenaariossa yksityisyydensuoja on jäänyt voiton tavoittelemisen jalkoihin. Tekoäly vaatii tehokkaasti toimiakseen valtavan määrän tietoa, joka nostaakin esiin kysymykset yksilöiden yksityisyydensuojasta. Mihin asetetaan raja yksityisyydensuojan ja yhteisen hyvän välille, kun yhteisellä hyvällä ymmärretään kaikkien hyväksi tapahtuvaa tiedonkeruuta tekoälyn kehittämiseksi? Onko yksilöllä moraalinen oikeus kieltää tietojensa hyödyntäminen tekoälyn kehittämisessä?

Viimeisessä skenaariossa ”10 minuutin vastaanotto” tekoäly painottuu hyödyllisenä työkaluna varsinkin kommunikoimaan kykenemättömien yksilöiden kohdalla. Tekoälyllä voidaan kerätä sellaista silmin havaitsematonta tietoa, joka auttaa lääkäriä kartoittamaan potilaan tilaa. Kyseisessä skenaariossa huomioidaan myös

potilaan, tai tässä tapauksessa vanhemman, valinnanvapaus suhteessa tekoälyyn sekä toisaalta myös julkiseen ja yksityiseen terveydenhuoltoon.

Skenaariotyöskentelyn lomassa pohdittavaksi nousi kysymys siitä, millä eri tavoin tekoäly voisi korvata ihmisen työtehtäviä. Taloudellisista syistä johtoporras olisi valmis korvaamaan ihmislääkärit, mutta potilaat sekä lääkärit haluavat tekoälyn ja ihmisen välistä yhteistyötä. Esiin nousikin ihmisen niin sanottu kuudes aisti, joka tekoälyltä puuttuu. Olisiko se tarpeeksi relevantti peruste sille, että tulevaisuudessakin terveydenhuollossa saisi palvelua myös ihmiseltä eikä pelkästään robotilta?

Tekoälyn mahdollisuuksia on vaikea arvailla, vaikka samaan aikaan sen mahdollisuudet tuntuvat loputtomilta. Skenaariotarinat herättivät myös pohdintoja keille tekoälyä suunnataa. Tekoäly voisi olla hyödyllinen työkalu niille, jotka eivät itse pysty kommunikoimaan esim. Taaperot, vammautuneet, autismin kirjolla olevat. Toisaalta terveydenhuollon kriisi tarvitsee suurempaa muutosta, joten ei ole mahdoton ajatus tekoälyn laajamittaisesta hyödyntämisestä jokaisella terveydenhuollon osa-alueella. Potilaat ja lääkärit eivät kyselyn mukaan tunnu erityisemmin innostuvan aiemmin mainitusta terveydenhuollon muutoksesta, mutta eniten päätösvaltaa omaava johtoporras tuntui asiasta olevan erityisen innoissaan Lääkäriliitto (2016).

Pohdintaa herätti myös teknologian kehittymisen ja lainsäädännön tasapainoilu. Mahdollisuus, jossa potilaan näkökulmaa ei painoteta tekoälyn kehittämisessä. Tällaisessa mallissa yksilön perusoikeus yksityisyydensuojaan voi kärsiä niin sanotun yhteisen hyvän vuoksi.

Skenaariotyöskentelyllä pystyimme luomaan tutkittuun tietoon perustuvia mahdollisilta ja vähemmän mahdollisilta tuntuvia tarinoita. Nykytilanne ei luonut vahvaa usko terveydenhuollon tulevaisuuteen ja toivottavaa olisikin, että jotain tekoälyn kaltaista mullistavaa otettaisiin käyttöön.

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Mitä muuta metsät ovat kuin puuta? Suomen metsien käyttö vuonna 2050

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Tiivistelmä

Metsillä on suuri merkitys Suomen historiassa, nykyisyydessä ja todennäköisesti myös tulevaisuudessa. Metsät ovat olleet ja ovat edelleenkin Suomessa merkittävä vaurauden lähde ja keskeinen osa suomalaista identiteettiä. Kuitenkin etenevän ilmastonmuutoksen ja luontokadon myötä metsät näyttäytyvät myös hiilinieluina ja suojelukohteina. Tässä tulevaisuusraportissa tarkastellaan neljän skenaarion kautta, miten metsien käyttö Suomessa kehittyy, ja mitä muuta metsät ovat kuin puuta.

Tulevaisuusraportin fiktiivinen toimeksiantaja on Metsähallitus, ja siten tarkasteluun otetaan myös toimeksiantajan rooli metsien käytön muutoksessa. Metsähallituksen tehtävissä on kiinnostavaa ristiriitaisuutta, sillä sama virasto sekä tuottaa taloudellista arvoa Suomen valtiolle hakkuilla, että pyrkii hoitamaan ja suojelemaan metsiä. Raportin tavoite on tukea Metsähallituksen pitkän aikavälin strategiatyötä, jotta Metsähallitus pystyy tavoitteensa mukaisesti toteuttamaan luonnon arvon vastuullista kehittämistä yli sukupolvien.

Neljä vuoteen 2050 sijoittuvaa tulevaisuuskuvaa ja niihin johtavat skenaariotarinat on muodostettu tulevaisuustaulukkomenetelmällä eli morfologisen skenaariotyöskentelyn kautta. Skenaarioissa tarkastellaan systeemin muutosta, teknologiavetoista kehitystä, poliittisten ristiriitojen kärjistymistä sekä ilmastonmuutoksen ja luontokadon vähättelyä, ja näiden kehityskulkujen erilaisia vaikutuksia Suomen metsiin ja Metsähallituksen rooliin. Johtopäätöksenä esitetään, että metsät todellakin ovat muutakin kuin puuta, ja että tämä näkökulma kannattaa nostaa keskiöön myös Metsähallituksessa.

Johdanto

Millainen on yhteisen metsäomaisuutemme tulevaisuus maailmassa, jossa ilmastonmuutos ja luontokato ovat globaaleja megatrendejä (Dufva & Rekola, 2023), ja jota on juuri mullistanut villi kortti, koronaviruspandemia? Ilmaston lämpeneminen ja luontokato voivat edetessään muokata suomalaista metsää dramaattisesti. Samanaikaisesti pandemia-ajan rajoitukset saivat suomalaiset hakeutumaan ennennäkemättömän aktiivisesti juuri metsiin virkistäytymään.

Tulevaisuusraporttimme fiktiivinen toimeksiantaja on Metsähallitus, joka on vastuussa Suomen valtion omistamista metsäalueista. Metsähallitus (Metsähallitus, Tarkoitus ja arvot, n.d.) kuvaa verkkosivuillaan tehtäviään seuraavasti: Metsähallitus:

- luo arvoa valtion maista ja vesistä luonnon, ihmisten ja yhteiskunnan hyväksi.
- käyttää, hoitaa ja suojelee valtion maa- ja vesialueita kestävästi ja sovittaa yhteen erilaisia omistajan, sidosryhmien ja asiakkaiden odotuksia.
- varmistaa, että kaikilla on mahdollisuus nauttia luonnosta ja sen luomasta arvosta yli sukupolvien.

Valittu toimeksiantaja on erityisen mielenkiintoinen sen vuoksi, että Metsähallituksen tehtävissä ja toiminnassa on nykytilanteessa selvää keskinäistä ristiriitaisuutta. Sama virasto sekä tuottaa taloudellista arvoa Suomen valtiolle hakkuilla että pyrkii hoitamaan ja suojelemaan metsiä niin, että ne säilyisivät sukupolvelta toiselle.

Raporttimme tavoite on tukea Metsähallituksen pitkän aikavälin strategiatyötä. Jotta harjoitustyö saataisiin pidettyä annetussa mitassa, emme tässä raportissa kyseenalaista perususkomusta, että Metsähallituksen tehtävät säilyvät pääosin samoina. Haemme siis vastauksia siihen, kuinka Metsähallitus pystyisi tavoitteensa mukaisesti toteuttamaan luonnon arvon vastuullista kehittämistä yli sukupolvien (Metsähallitus, Tarkoitus ja arvot, n.d.). Onko sen mahdollista yhteensovittaa näennäisen yhteensopimattomat tehtävänsä johdonmukaiseksi ja vaikuttavaksi toiminnaksi?

Tutkimuskysymyksemme on: Millaista metsien käyttö on Suomessa vuonna 2050? Lisäksi kysymme, millainen on Metsähallituksen rooli silloin. Muodostamme Suomen metsien käytöstä vuonna 2050 neljä erilaista tulevaisuuskuvaa ja skenaariota, joissa tarkastelemme myös Metsähallituksen tehtäväkentän ja palvelujen muutoksia. Pyrimme ymmärtämään tutkimusaihettamme erityisesti seuraavien näkökulmien kautta:

- miten ympäristöpolitiikka vaikuttaa ilmastonmuutokseen ja ilmastonmuutos metsien tilaan.
- millaisia vaihtoehtoja on taloudellisen arvon tuottamiseen metsästä.
- miten erilaiset energiantuotannon ratkaisut vaikuttavat metsien käyttöön.
- miten ilmaston lämpenemisvauhti vaikuttaa teknologisten innovaatioiden tarpeeseen.
- miten ilmaston lämpeneminen vaikuttaa ihmisiin, muuttoliikkeeseen ja metsien virkistyskäyttöön, ja millaisia vaikutuksia näillä on suomalaisten metsäsuhteeseen.
- mikä muu kuin taloudellinen arvo voisi nousta merkittäväksi metsän käytössä.

Hyödynnämme raportissa tulevaisuustaulukkomenetelmää eli morfologista skenaariotyöskentelyä. Tulevaisuustaulukon muuttujat valitsimme PESTEV-analyysin avulla, jotta näkökulma saataisiin riittävän laajaksi. Mahdottomien tilaparien tunnistamisessa käytimme FAR-menetelmää. Kaikki skenaariot ovat tyypiltään eksploratiivisia eli tutkivia: niiden tarkoitus on selvittää, mitä Suomen metsille voi tapahtua ilmastonmuutoksen ja luontokadon kehityksen myötä.

Nykytilan analyysi

Nykytilan analyysissä käsittelemme metsien käyttöön liittyvää toimintaympäristöä kattavasti eri näkökulmista, PESTEV-analyysikehikkoa soveltaen. Otamme tarkasteluun metsien omistuksen ja taloudellisen arvon, ilmastonmuutoksen ja luontokadon, muutokset asenneilmapiirissä ja ympäristöpolitiikassa, sosiaalisten arvojen muutoksen sekä Metsähallituksen roolin. Teknologian kehitystä emme esittele tässä yhteydessä erikseen, vaan sen sijaan muiden aihealueiden yhteydessä, sillä sen vaikutukset kytkeytyvät useisiin käsittelemiimme muutosvoimiin hyvin kiinteästi.

Metsien omistus ja taloudellinen arvo

Suomen pinta-alasta 75 prosenttia on metsää. Yksityiset metsänomistajat omistavat metsämaasta 60 prosenttia ja valtio noin neljänneksen (Maa- ja metsätalousministeriö, Suomen metsävarat, n.d). Metsien taloudellinen arvo syntyy pääosin metsäteollisuuden tuotannosta, jonka arvo vuonna 2021 ylitti 18 miljardia euroa. Suomen tavaraviennistä metsäteollisuuden osuus oli noin 17 prosenttia. Metsäteollisuuden jalostusarvo on laskenut

koko 2000-luvun, kun painopaperien kysynnän laskiessa on siirrytty yhä enemmän matalakatteisempaan sellun ja kartongin valmistukseen. (Luonnonvarakeskus, Metsäteollisuuden tuotannon bruttoarvo ja jalostusarvo 1975–2021, n.d.)

Metsäteollisuuden puuhuolto perustuu suurelta osin yksityismetsänomistajien puunmyynteihin, sillä yli 80 prosenttia Suomessa toimivan metsäteollisuuden käyttämästä raaka-aineesta on 2010-luvulla korjattu kotimaisista yksityismetsistä (Luonnonvarakeskus, Hakkuukertymä ja puuston poistuma alueittain 2021, 2022). Metsähallituksen rooli puuhuollossa on silti merkittävä erityisesti Pohjois- ja Itä-Suomessa, missä valtion omistamat metsät pääosin sijaitsevat (Maa- ja metsätalousministeriö, Suomen metsävarat, n.d).

Metsät tarjoavat vientitulojen lisäksi muitakin taloudellisia hyötyjä, kuten bio- ja tuulienergiaa, marjoja ja sieniä sekä luontomatkailuun liittyviä hyötyjä. Esimerkiksi luonnonmarjoja- ja sieniä kerätään arviolta yli 100 miljoonan euron arvosta vuosittain. (Maa- ja metsätalousministeriö, Metsien taloudellinen merkitys, n.d.)

Etenevä ilmastonmuutos ja luontokato ovat saaneet liikkeelle muutosvoimia, joissa taloudellisen hyödyn ja luontoresurssien yhteyttä tarkastellaan uudella tavalla. Vihreällä siirtymällä tarkoitetaan sitä, että talouden ja sen kasvun on jatkossa perustuttava kestävälle luonnonvarojen käytölle. Tämä edellyttää vihreää teknologiaa, teollisuutta ja liikennettä. (Valtioneuvosto, 2023, 35.) Teknologian kehityksen lisäksi siirtymään tarvitaan politiikkatoimia ja ihmisten käyttäytymisen muutosta, joka näkyy esimerkiksi kuluttamisessa. Valtioneuvosto selvittää vihreän siirtymän investointitarpeita, mutta jo tämän selvitysprojektin väliraportissa todetaan, että puhtaan teknologian ratkaisut ovat osin jo osoittautuneet perinteistä vaihtoehtoa edullisemmaksi esimerkiksi Venäjän tilanteen vuoksi. Rahoitusmarkkinoilla on nähtävissä murros, jossa kestävyysnäkökohdat painottuvat, ja tämä kirittää vihreän siirtymän toteuttamiseksi tarvittavia innovaatioita. Hiilijalanjälkien lisäksi puhutaan hiilikädenjäljestä, jolla tarkoitetaan myönteisiä ilmastovaikutuksia. (Valtioneuvosto, 2022, 9–16.) Esimerkkinä hiilikädenjäljen kaupallisesta potentiaalista on ennallistava matkailu, jossa turisti osallistuu luonnon ennallistamiseen ja jättää kohteen parempaan kuntoon. (Valpas, 2022.) On todennäköistä, että vihreä siirtymä merkitsee muutoksia metsien taloudellisen arvon muodostumisessa.

Muutosvoimaa edustaa myös Partha Dasguptan Iso-Britannian hallitukselle tekemä raportti, jossa tarkastellaan yhteiskunta- ja talousjärjestelmämme luontokatoa kiihdyttäviä valuvikoja. Siinä ehdotetaan kymmentä muutospolkua, joiden kautta suunta voitaisiin kääntää. (Ympäristöministeriö, 2023, 8–9.) Myös Suomessa on käynnistynyt keskustelu siitä, että luonnon monimuotoisuudelle aiheutettuja haittavaikutuksia tulisi voida mitata ja hinnoitella. Tätä kautta yritysten toiminta ohjautuisi kestävän kehityksen mukaiselle uralle. (Ympäristöministeriö, 2023, 97–99.) Samalla globaali kilpailu luonnonvaroista kiihtyy, kun kulutus kasvaa ja luonnonvarat ehtyvät. Luonnonvarojen resurssitehokas käyttö ja uudet innovaatiot ovat niin globaalisti kuin Suomenkin näkökulmasta tärkeitä. (Valtioneuvosto, 2023, 82–83.)

Ilmastonmuutoksen ja luontokadon vaikutukset metsiimme

Metsien tulevaisuuteen vaikuttavista muutosvoimista ilmastonmuutos on keskeinen. Uusimpien ennustemallien mukaan tehokkailla maailmanlaajuisilla päästöjen rajoituksillakin Suomen keskilämpötila nousisi sadan vuoden aikavälillä noin kaksi astetta, josta jo noin puolet on toteutunut 1900-luvun lopulta tähän päivään mennessä (Ilmatieteenlaitos, 2022).

Ilmastonmuutos vaikuttaa metsiimme monin eri tavoin. Negatiivisia vaikutuksia ovat esimerkiksi tuholaispopulaatioiden lisääntyminen, routajaksojen lyhentymisen vuoksi lisääntyvät tuulituhot, lisääntyvät lumituhot sekä kuivuusjaksojen myötä kasvava metsäpalojen riski. (Suomen Ilmastopaneeli, 2022.) Toisaalta puuston nopeampi kasvu voisi sitoa ilmakehän hiiltä hiilinieluiksi, ja tämä näyttäytyy positiivisena vaikutuksena. Pelkästään Metsähallituksen talouskäytössä olevien metsien hiilinieluvaikutus on huomattava: vuosittain metsät

kasvavat 13,3 miljoonaa kuutiometriä ja puuta korjataan noin kuusi miljoonaa kuutiometriä. (Metsähallitus, Metsätalous ja ympäristö, n.d.)

Ilmastonmuutoksen vaikutuksiin ja hiilinielujen kehitykseen liittyy edelleen merkittäviä epävarmuuksia. Luonnonvarakeskus raportoi loppuvuonna 2022 metsien nettonielun yllättävästä pudotuksesta, joka oli seurausta alentuneesta puuston kasvusta ja korkeista hakkuumääristä (Luonnonvarakeskus, Suomen LULUCF-sektorin 2021–2025 velvoitteen toteutuminen, 2022). Metsillä on olennainen osa Suomen ilmastotavoitteiden saavuttamisessa, sillä metsät ovat maamme suurin hiilinielu. Keskeisenä uhkana nähdään, että hakkuut kehittyvät laskelmia suuremmiksi ja siten hiilinielut jäävät pienemmiksi. (Horne, Korhonen & Ruuskanen, 2021, 7.)

Luontokato tarkoittaa luonnon monimuotoisuuden vähenemistä eli kasvi- ja eläinlajien kantojen pienentymistä, vaikka lajit olisivatkin vielä elinvoimaisia. Lajeja voi myös uhanalaistua tai kuolla kokonaan. Vuonna 2019 Suomen metsälajeista uhanalaisiksi arvioitiin 9 prosenttia. (Hyvärinen, Juslén, Kemppainen, Uddström & Liukko, 2019.) Sekä ilmastonmuutos että lajistoa köyhdyttävät metsänhoitomenetelmät edistävät osaltaan luontokatoa.

Asenneilmapiirin ja ympäristöpolitiikan muutos

Suhtautuminen metsiemme talouskäyttöön on murroksessa. Metsien suojelua vaaditaan entistä ponnekkaammin, myös aktivismin keinoin. Esimerkiksi tammikuussa 2023 Metsähallitus joutui keskeyttämään hakkuut Aalistunturin alueella, jonne on esitetty perustettavaksi kansallispuisto. Elokapina-liike vaati Metsähallitusta luopumaan hakkuista, kunnes ympäristöministeriö on käsitellyt aluetta koskevat suojeluesitykset. (Saavalainen, 2022.)

Keskeisiä muutoksen ajureita ovat myös Suomen noin 620 000 yksityistä metsänomistajaa, joiden metsäomistukselleen asettamat tavoitteet heijastuvat metsätalouteen (Luonnonvarakeskus, 2019). Osa heistä on virkistys- ja suojelupainotteisia omistajia, jotka suhtautuvat kriittisesti avohakkuita, ojitusta ja muita tehometsänhoidon menetelmiä kohtaan. Yhä useampaa metsänomistajaa kiinnostaa metsien ennallistaminen ja yksityisten suojelualueiden perustaminen. (Virtanen, 2022.)

Joulukuussa 2022 hyväksytty Kansallinen metsästrategia 2035 heijastelee asenneilmapiirin muutosta. Strategiassa huomioidaan metsätaloudellisten seikkojen lisäksi metsien merkitys ilmastonmuutoksen ja luontokadon hillinnässä. Metsien ja puuraaka-aineen käyttöön sekä käytön hyväksyttävyyteen vaikuttavat tulevaisuudessa aiempaa voimakkaammin myös EU:n politiikkatoimet, joihin kuuluu strategisten suuntaviivojen lisäksi jäsenvaltioita sitovaa oikeudellista sääntelyä. (Maa- ja metsätalousministeriö, 2022.) Ylikansallinen sääntely ja kansallinen itsemääräämisoikeus voivatkin johtaa ristiriitoihin, mistä hyvä esimerkki on poliittinen vääntö Euroopan unionin luonnon ennallistamisasetusehdotuksesta (Keski-Heikkilä, 2022).

Kiinnostavaa Suomen metsien kannalta on myös se, että oikeustieteessä on 2000-luvulla syntynyt uusi luonnon oikeudet tunnustava suuntaus. Esimerkiksi Uudessa-Seelannissa ja Intiassa on vuonna 2017 myönnetty joelle oikeushenkilön asema, eli samat oikeudet kuin yrityksille. Myös Ecuadorin perustuslaki vuodelta 2008 edustaa uudenlaista oikeudellista ajattelua, sillä se tunnustaa luonnon juridisena yksikkönä. Luonnon oikeuksien edistämisen taustalta löytyy usein alkuperäiskansojen aktivismia, joka pohjaa näkemykseen luonnon ja ihmisen ykseydestä. (Kivipelto, 2018.)

Sosiaaliset ja arvoihin vaikuttavat muutosvoimat

Millaiset muutosvoimat vaikuttavat Suomessa asuvien ihmisten metsäsuhteisiin sekä halukkuuteen virkistäytyä valtion metsissä ja kansallispuistoissa? Näiden kysymysten yhteydessä on syytä huomioida, että metsän arvo muodostuu myös ihmisten mielissä.

Suomen väestö ikääntyy, mutta demograafista kehitystä tarkastellessa ei voi luottaa pelkkään väestöennusteeseen. Ilmastonmuutos voi edetessään tuoda Suomeen ison joukon ilmastopakolaisia jo lähivuosikymmeninä. Korkeimpien arvioiden mukaan jopa 200 miljoonaa ihmistä voi joutua jättämään kotinsa (Prokkola et al., 2021, 34–36). Väestön ikääntyminen kasvattaa myös painetta lisätä työperäistä maahanmuuttoa (Rönkä, 2023, 01:55).

Suomessa nykyisin asuvien ihmisten luontosuhteessa on nähtävillä kaksi täysin erisuuntaista trendiä. Yhtäältä kansallispuistojen käyntimäärät ovat viimeisen vuosikymmenen aikana noin kaksinkertaistuneet (Metsähallitus. Käyntimäärien kehitys, n.d.), ja koronarajoitusten aikana retkeilyalueille rynnistivät myös nuoret ja lapsiperheet (Metsähallitus, 2021). Toisaalta nuorempien sukupolvien nähdään vieraantuneen luonnosta (Polvinen, 2012, 9).

Kovaa vauhtia etenevällä ja elämän kaikkiin sfääreihin ulottuvalla digitalisaatiolla voi olla metsäsuhteisiin monenlaisia vaikutuksia. Esimerkiksi suomalainen trendi- ja ennakointitietopalvelu Futures Platform listaa laajalle levinneen internet-riippuvuuden mahdolliseksi 2030-luvun epidemiaksi. Koukuttavuutta voivat aiheuttaa erityisesti kehittyvät virtuaalisen ja lisätyn todellisuuden teknologiat. Futures Platform esittää myös, että datatalouden ja teknologiatrendien (esim. esineiden internetin) nopea kehittyminen aiheuttaa vastareaktioita kuten pelkoa yksityisyyden suojan menettämisestä. (Futures Platform: trendi- ja ennakointiedon alusta, n.d.)

Väestön ikääntyminen ja teknologioiden kehitys muokkaavat myös kulutuskäyttäytymistä. Trendexplorer mainitsee megatrendinä uudenlaisen konsumerismin, jossa korostuvat yksilöllisyys, “arjen luksus” ja terveelliset elämäntavat. Ennakoitavissa on, että varsinkin ikääntyvän väestön tarpeisiin luodaan päivittäistä elämää ja kokemuksellisuutta helpottavia työkaluja, jotka hämärtävät sukupolvien välisiä rajoja. Tällaisia voivat olla esimerkiksi virtuaalitodellisuudessa toimivat matkailu-, hyvinvointi- ja kuntoilusovellukset. (Trendexplorer: trendi- ja ennakointitiedon alusta, n.d.)

Terveellisten elämäntapojen megatrendin alla Trendexplorer ennakoi myös tulevia kehityssuuntia. Näitä ovat mielenterveyden merkityksen korostuminen, älysovellusten kehittyminen perinteisen terapian kilpailijaksi, etäterapiapalveluiden kehittyminen sekä huomion siirtyminen sairauksien hoidosta preventiiviseen ja yhä yksilöllisempään terveyden edistämiseen. (Trendexplorer: trendi- ja ennakointitiedon alusta, n.d.)

Mielenterveys onkin tulevina vuosikymmeninä mielenkiintoinen ja keskeisesti raporttimme teemoihin linkittyvä aihe. Jo nyt puhutaan nuorten mielenterveysongelmien lisääntymisestä, jonka taustasyitä on löydetty muun muassa ilmastonmuutoksesta sekä digitalisaatiosta (Kaltiala, 2020). Samanaikaisesti metsänluonnon moninaiset terveysvaikutukset on todistettu tieteellisesti (Kallunki, 2017).

Viimeisenä sosiaalisena ja arvoihin vaikuttavana muutosvoimana nostamme esiin hengellisyyden, jolla selvä yhteys ihmisen hyvinvointiin. Ihmisellä on taipumus hakea voimaa hengellisyydestä etenkin vaikeina aikoina. Sitra listaakin uskontojen ja ideologioiden merkityksen yhteiskunnassa nousevaksi trendiksi (Dufva & Rekola, 2023, 45). Vaikka isossa kuvassa maallistuminen on voimakkainta, on samanaikaisesti nähtävissä signaaleja uushenkisyyden voimakkaasta kasvusta etenkin nuorten naisten keskuudessa (Puurunen, 2019) sekä kasvavaa kiinnostusta esimerkiksi luontoyhteyttä korostavaan uusshamanismiin (Karhu, 2020).

Metsähallituksen rooli muutoksessa

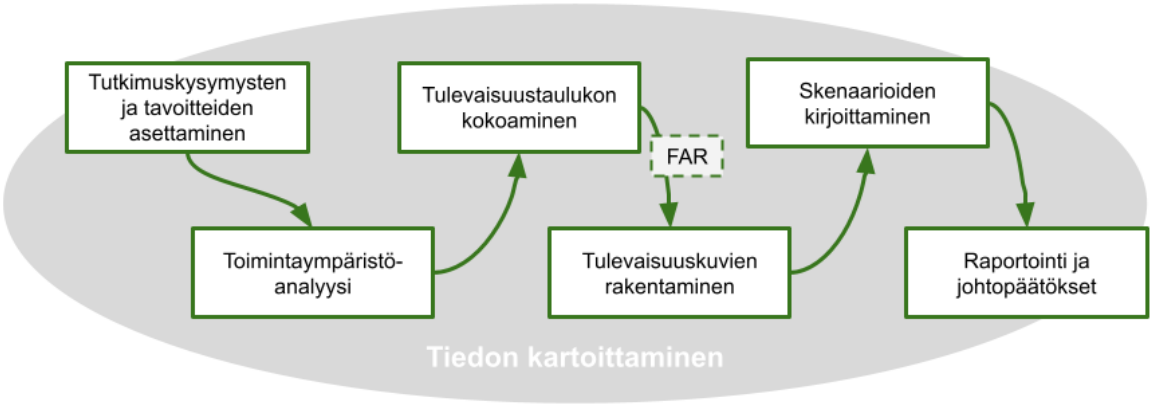
Valtio-omistaja määrittelee Metsähallituksen taloudellisen tuloksen, kestävän metsätalouden, puun saatavuuden, luonnon monimuotoisuuden, virkistyskäytön ja ilmastopolitiikan tavoitteet. Vuonna 2020 Metsähallitukselle asetettiin ensimmäistä kertaa hiilinielujen ja -varastojen kasvutavoite ja sen taloudellista tuottotavoitetta laskettiin vastaavasti (Valtioneuvosto, 2020).

Hakkuiden tarvetta metsissämme vähentää osaltaan teknologinen kehitys. Taloudellista arvoa syntyy yhä enemmän tuulivoimasta, jonka lisärakentaminen on keskeinen osa Suomen ilmastopolitiikkaa. Metsähallitus kehittää valtion maa- ja vesialueilla tuulivoimahankkeita, joista saadaan tuottoa maanvuokratuloina (Metsähallitus, Kasvatamme huomista – Ilmastoratkaisuja uusiutuvalla energialla, 2022.). Toisaalta teollisuusyritykset kehittävät uusia korkeamman arvonlisän materiaaleja ja tuotteita, joiden valmistus kuluttaa vähemmän puuta. Esimerkiksi Stora Enso valmistaa selluteollisuuden sivutuotteesta kovahiiltä akkujen anodimateriaaliksi (Mäkitalo, 2022).

Metsähallituksen tehtäväkentässä metsien suojelu ja virkistyskäyttö voivat saada uusia muotoja. Heikkona signaalina voidaan pitää ennallistavaa matkailua, joka pyrkii yhdistämään nämä molemmat. Siinä periaatteena on, että matkailun tulisi antaa alueelle enemmän, kuin mitä se ottaa, ja jättää se parempaan kuntoon verrattuna siihen, mitä se oli aiemmin. (Valpas, 2022.)

Tutkimusprosessi ja menetelmät

Rakensimme tässä työssä kuvattuja tulevaisuuskuvia ja skenaarioita morfologisella skenaariotyöskentelyllä eli tulevaisuustaulukkomenetelmällä. Skenaarioiden rakentamiseen kuuluu kuusi vaihetta, joista yksi on tulevaisuustaulukon rakentaminen. (Lätti, Malho, Rowley & Frilander, 2022, 318–319.) Tämän raportin tutkimusprosessi mukaili pitkälti tulevaisuustaulukkomenetelmää, joskin toimintaympäristöä koskevan tiedon kartuttaminen jatkui koko prosessin ajan (Kuva 1).



Kuva 1. *Tutkimusprosessi tulevaisuustaulukkomenetelmää mukaillen.*

Käytimme tulevaisuustaulukon luomisessa apuna aiemmin toteutettua toimintaympäristön analyysiä ja PESTEV-analyysiä. Toimintaympäristön analyysissä pyritään muodostamaan kokonaiskuva tutkittavasta asiasta, ja PESTE-menetelmä auttaa muodostamaan analyysistä mahdollisimman kattavan. PESTE onkin lyhenne sanoista *Political, Economic, Social, Technological* ja *Environmental.* (Dufva 2022, 105–108.) Näiden

viiden peruslinssin lisäksi hyödynsimme tässä raportissa PESTEn variaatiota PESTEVia, jossa otetaan tarkasteluun myös arvot (V eli *Values)*.

Tulevaisuustaulukolla voidaan määritellä potentiaalisten tulevaisuuksien monimuotoisuutta (Lätti et al., 2022, 324), ja monipuolisten muuttujien avulla keskenään erilaisten tulevaisuuskuvien muodostaminen voi olla helpompaa. Toimintaympäristön analyysin perusteella tulevaisuustaulukkoon valitut kahdeksan muuttujaa olivat seuraavat: ympäristöpolitiikan suunta, metsien taloudellinen arvo, metsien virkistyskäyttö, uusiutuva energiantuotanto, digitalisaatio/tekniset innovaatiot, ilmastonmuutos, metsien tila/luontokato ja arvot. Otimme siis mukaan ainakin yhden muuttujan jokaisesta PESTEV-analyysikehikon ulottuvuudesta. Valituille muuttujille määriteltiin erilaisia arvoja aiemman toimintaympäristön analyysin perusteella. (Liite 1: tulevaisuustaulukko.)

Muodostimme tulevaisuustaulukon avulla neljä erilaista tulevaisuuskuvaa, jotka sijoittuvat vuoteen 2050. Tulevaisuuskuvien muodostamisen lähtökohdaksi valittiin kaksi muuttujaa ja niiden arvon muutokset. Nämä muuttujat olivat ilmastonmuutos ja metsien tila suhteessa luontokatoon, sillä näillä on todennäköisesti suurin vaikutus metsien käyttöön ja Metsähallituksen tehtävien hoitamiseen. Tulevaisuuskuvien loogisuuden ja keskinäisen erilaisuuden varmistamiseksi hyödynsimme myös FAR-menetelmää, jonka avulla kokeilimme mahdottomien tilaparien tunnistamista muuttujiemme arvoista. Mahdottomia tilapareja on laadullisessa skenaariotyöskentelyssä kuitenkin suhteellisen vähän (Lätti et al., 2022, 327) ja niiden tunnistaminen tapahtui luonnostaan, joten emme hyödyntäneet FAR-menetelmää loppuun asti. Vertailimme tulevaisuuskuvia toisiinsa, jotta niistä saisimme niiden pohjalta rakennettua monipuoliset ja toisistaan erottuvat skenaariot.

Kirjoitimme skenaariot muodostamiemme tulevaisuuskuvien perusteella siten, että pyrimme hahmottamaan reittiä, jonka kautta tiettyyn tulevaisuuskuvaan voidaan päätyä. Sijoitimme aluksi aikajanalle keskeisiä tapahtumia, ja niiden avulla työstimme sitten skenaarioita tarkemmiksi. Skenaarioiden kirjoittamisessa hyödynsimme läpi työprosessimme jatkunutta tiedon kartuttamista, jotta tunnistamme trendit ja heikotkin signaalit saataisiin raporttiin mukaan.

”Hiilineutraalin maailman kukoistavat metsät” -skenaario on rakennettu utopian kaltaiseksi, toivotun tulevaisuuden kehitystarinaksi. Siinä tarkastelemme, miten ilmastonmuutos voitaisiin saada pysäytettyä 1,5 ℃:een, ja miten luonnon hyvinvointia kyettäisiin parantamaan. Skenaariomme sisältää onnistuneen systeemisen muutoksen. Sen sijaan *“Menetetyt metsät”* -skenaario on dystooppinen, eli se edustaa ei-toivottuja kehitysnäkymiä. Siinä keskitymme tutkimaan, mitä tapahtuu, jos ilmastonmuutoksen ja luontokadon vähättely tai jopa näiden ilmiöiden kieltäminen voimistuu.

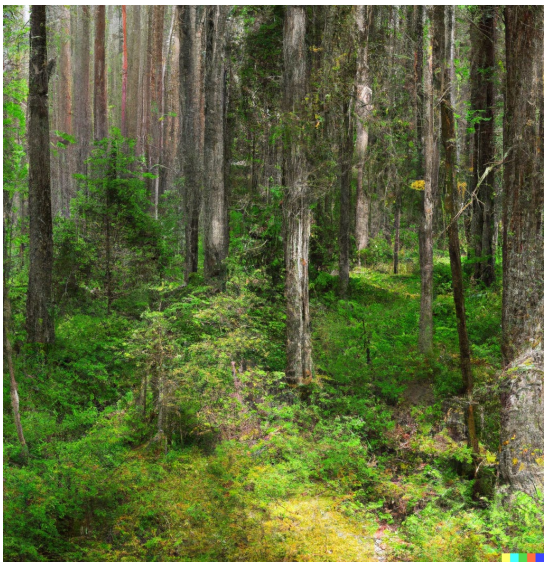
Näiden kahden ääripään väliin jäävien skenaarioiden muodostamisessa hyödynsimme BAU-näkökulmaa, eli tarkastelimme, miten tiettyjen nykyhetkessä näkyvien trendien jatkuminen ja kehittyminen voivat edetä (Lehtiö, 2023, Luentomateriaali). *”Teknologialla tuetut metsät”* -skenaariossa tutkimme, miten teknologian avulla voidaan hillitä ilmastonmuutosta tai pyrkiä sopeutumaan siihen. Skenaariossa tulevat kuitenkin esiin myös liiallisen teknologiauskon varjopuolet. *”Ristiriitojen riivaamat metsät”* -skenaariossa tarkastelemme, millaisia vaikutuksia epäjohdonmukaisella ympäristöpolitiikalla voi olla. Kumpikaan näistä skenaarioista ei ole selkeästi utopistinen tai dystooppinen, vaan niistä voi löytää sahaavaa muutosta sekä parempaan että huonompaan suuntaan.

Neljä skenaariota Suomen metsien käytöstä vuonna 2050

Seuraavaksi tarkastelemme neljää skenaariota Suomen metsien käytöstä vuonna 2050 (Kuva 2). Esittelemme jokaisen skenaarion vuoteen 2050 sijoittuvan tulevaisuuskuvan kautta, ja tämän jälkeen kuvaamme tulevaisuuskuvaan johtavan polun skenaariotarinan sekä aikajanan muodossa.

***Kuva 2**. Neljä tulevaisuuskuvaa.*

Hiilineutraalin maailman kukoistavat metsät



Vuonna 2050 ilmaston lämpeneminen on saatu pysäytettyä 1,5 asteeseen ylikansallisesti koordinoiduin toimin. Vihreän siirtymän onnistuminen mahdollistaa talouden, joka ei kuluta liikaa luonnon resursseja. Metsiä suojellaan paljon, ja sen rinnalla virkistyskäyttö on laajaa. On tapahtunut systeeminen muutos, jonka myötä ihmisen ja luonnon suhteen vastavuoroisuus ymmärretään ja huomioidaan kaikessa ihmisen toiminnassa. Suomalaisten suhde metsiin on elävä ja uusiutuva, ja metsien oikeudet tunnustetaan. Metsähallituksen asiantuntemus on globaalisti tunnustettua, ja merkittävää myös taloudellisen arvon tuottamisessa.

Skenaario 1:

Vuonna 2022 julkaistu IPCC:n raportti muodostuu käännekohdaksi, jonka jälkeen ilmastotoimet alkavat edetä. Yhdysvaltojen Inflation Reduction Act antaa yrityksille suunnan muokata liiketoimintaansa. EU herää siihen, että investoinnit voivat alkaa valua Yhdysvaltoihin, ja muutaman valtion jarrutuksesta huolimatta saa aikaan vielä hieman kunnianhimoisemman rahoituspaketin vihreän siirtymän tukemiseksi. Näiden suurten talousalueiden yhteisvaikutuksesta globaalit markkinat alkavat saada uutta suuntaa, ja Suomessakin vihreään siirtymään liittyvän tutkimuksen ja tuotekehityksen merkitys markkinoilla kasvaa.

Kiinassa tapahtuu ekokatastrofi, jossa tehtaan päästöt pilaavat suuren luonnonalueen hyvin näkyvällä tavalla. Kommunistinen puolue haluaa varmistella kannatustaan ja linjaa, että ekologisuus tulee jatkossa olemaan talouden painopistealue. Yhdysvalloissa vihreä siirtymä tuo uusia työpaikkoja ja virkistää vientiteollisuutta myös Kiinan suuntaan, ja republikaaniäänestäjätkin alkavat nähdä uuden politiikan tuloksellisuuden. Vaaleissa ilmastoehdokkaiden kannatus vahvistuu.

Harvaan asutussa Suomessa maatuulivoima on tärkeässä asemassa 2030-luvulle asti, mutta sitten muun muassa halpeneva merituulivoima ja fuusioenergia alkavat syrjäyttää sitä. Merkittävä tekijä ilmastonmuutoksen ehkäisyssä ovat hiilineutraalit energiantuotantoteknologiat. Selluteollisuuden merkityksen vähetessä siirrytään korkean jalostusarvon tuotteisiin ja metsien taloudellinen arvo syntyy enää vähäisessä määrin hakkuista. Puupohjaiset tekstiilikuidut ja edistyksellinen puurakentaminen sekä näihin liittyvä osaaminen muodostavat voimakkaasti kasvavan kasvava osuuden viennistä ja BKT:sta.

Suunnitelmallisella politiikalla metsien talouskäyttö rajataan yhtenäisille alueille, ja teknologia mahdollistaa hyödyn saamisen samalta alueelta sekä uusiutuvana energiana että puuraaka-aineena. Matkailuun ja virkistyskäyttöön tarkoitettujen metsien alueita voidaan laajentaa. Niitä on myös suurien kaupunkien alueilla. Metsässä oleilu ja retkeily on mahdollista kaikille, ja metsä pysyy luontevana ja keskeisenä osana arkielämää. Metsiä suojellaan lisää ja yhtenäisempinä alueina huomioiden tutkijoiden näkemykset eri luontotyypeistä ja koko maan kattavasta suojelualueiden verkostosta. Retkeilyä näissä suojelluissa metsissä rajataan.

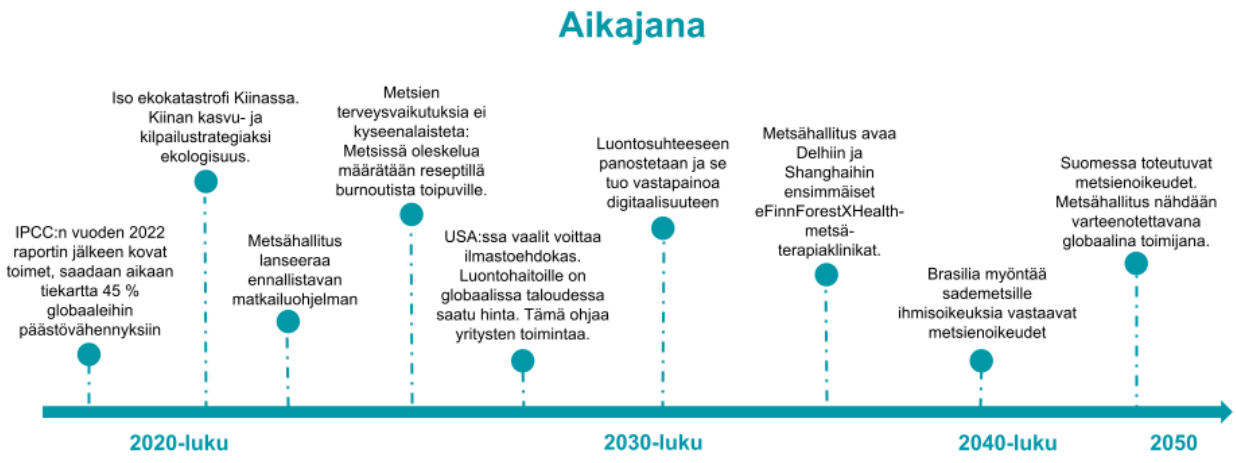
Ikääntyvä Suomi saa uusia asukkaita maahanmuuton kautta. Tulijoista suurin osa on maista, joissa ihmisten metsäsuhde poikkeaa kantasuomalaisista; metsää ei omisteta, joten sillä ei nähdä taloudellista arvoa, jokaisenoikeuksia ei tunneta ja metsää saatetaan jopa pelätä. Suomen Partiolaiset aloittaa yhteistyössä paikallisten suunnistusseurojen ja marttojen kanssa 2020-luvun lopulla hankkeen, jolla vahvistetaan uussuomalaisten ja muiden halukkaiden metsäsuhdetta ja -taitoja maksuttomilla kursseilla. 2030-luvulla suomalaiset koulut kyllästyvät digitalisaation mukanaan tuomiin haasteisiin, ja niistä monet ottavat ohjelmaansa metsäpäivät, jolloin opitaan ilman digilaitteita luontoympäristössä. Näiden muutosten seurauksena Suomessa asuvien luontosuhde ja hyvinvointi vahvistuvat.

2030-luvulla vuosien tutkimustyön tuloksena saatavilla on jo muutamia varteenotettavia malleja siihen, miten luontohaittojen aiheuttamista voidaan mitata. Tämän varaan voidaan rakentaa päästökaupan tapainen laajempi järjestelmä, jossa luonnon resurssien käyttö on globaalisti hinnoiteltu eikä taloudellisen voiton saaminen metsää hakkaamalla tai saastuttamalla ole enää mahdollista.

2040-luvulla luonnon ja ekosysteemien oikeudet tulevat osaksi kansainvälistä oikeutta. Brasilian sademetsien oikeusaseman vahvistaminen on käännekohta, jonka jälkeen useat luonnonkohteet maailmalla saavat oikeusaseman. Suomen luonnontilaiset metsät otetaan Unescon maailmanperintökohteeksi vuonna 2040, ja vuonna 2045 ne saavat myös oikeushenkilön aseman.

Tieteellinen näyttö metsien terveysvaikutuksista on karttunut vuosien ajan (Tyrväinen, Lanki, Sipilä & Komulainen, 2018), ja 2030-luvulla on jo tavallista, että lääkäri määrää reseptillä oleskelua ja retkeilyä metsässä esimerkiksi burnoutista toipuville. Samaan aikaan virtuaaliset kokemukset mahdollistava teknologia on kehittynyt nopeasti. Multisensorista teknologiaa kokeillaan myös virtuaalisten metsäkokemusten luomiseen. Terveys, hyvinvointi ja kestävät arvot voimistuvat kuluttamisen trendeinä, ja kulutus kehittyy kokonaisuudessaan kestävämpään suuntaan.

Metsähallitus avaa Delhiin ja Shanghaihin ensimmäiset eFinnForestXHealth-metsäterapiaklinikat vuonna 2035. Nämä kiireisten kaupunkilaisten terveyskeitaat osoittautuvat sekä taloudelliseksi että lääketieteelliseksi menestykseksi, ja Metsähallitus alkaa tuottaa toiminnalla Suomelle taloudellista arvoa. Samalla Suomen maabrändi metsien, hyvinvoinnin ja digitalisaation huippuosaajana vahvistuu. Metsähallitus niittää kansainvälistä mainetta, ja 2040-luvulla se avaa metsäterapiaklinikoiden tuloilla planetaarisen sosiaalisen vastuun ohjelman (enää ei puhuta kehitysyhteistyöstä), jossa virtuaalimetsien avulla metsäluontokokemuksia ja luontokasvatusta tarjotaan myös maailman köyhimpien maiden asukkaille. 2050-luvulle tultaessa Metsähallitus on globaalisti merkittävä metsien suojelija, metsäkasvattaja ja luontokokemusten mahdollistaja.



Teknologialla tuetut metsät

Vuonna 2050 ilmastonmuutoksen ja luontokadon vastaiset toimet ovat olleet kansallisesti vaikuttavia, mutta globaalisti riittämättömiä, sillä kaikki maat eivät ole sitoutuneet niihin. Suomen tilanne on siedettävä, sillä globaalissa pohjoisessa ilmaston lämpenemisen vaikutukset ovat toistaiseksi hallittavissa uuden teknologian ja toimivan infrastruktuurin ansiosta. Suomen metsät voivat kohtalaisesti, sillä iso osa sekä valtion että yksityisten omista metsistä on sidottu hiilinieluiksi. Kasvava kysyntä metsien virkistyskäyttöön tuo paineita yhä uusille teknologisille innovaatioille. Metsähallitus tasapainoilee keskenään ristiriitaisten tehtäviensä kanssa, mutta työ käy yhä vaikeammaksi.

Skenaario 2:

Hiilidioksidipäästöjä ei saada globaalisti hallintaan, vaan ne jatkuvat 2000-luvun alun tasolla. Ilmastokokouksissa tehdään päätöksiä, mutta käytännön toimet 2020-luvulla eivät ole riittävän nopeita ilmaston lämpenemisen pysäyttämiseksi. Vuoden 2029 lopulla ilmasto on lämmennyt 1,5 ℃, eikä lämpenemiskehitystä saada kokonaan pysäytettyä (Hartikainen, 2021).

Vuoden 2022 Suomen Ilmastopaneelin raportti Suomen hiilinielujen oletettua huonommasta tilasta laittaa vauhtia kansalliseen metsiensuojeluun. Päästöjen kompensointi kuuluu yhä useamman kansainvälisen yrityksen agendalle ja tarvetta täyttämään syntyy markkinaehtoisesti ylikansallisia hiilinielupörssejä, joilla myös yksityiset metsänomistajat voivat suojella metsiään korvausta vastaan. 2020-luvun puolivälissä käy selväksi, etteivät useat EU-jäsenmaat kykene omalta osaltaan täyttämään Fit for 55 -ohjelman tavoitteita hiilinielujen kasvattamiseksi 15 prosentilla vuoteen 2030 mennessä. Suuret EU-maat Saksa ja Ranska etunenässä lobbaavat Suomen ja Ruotsin metsien hiilinielujen kasvattamista edelleen, mikä aiheuttaa poliittisen kriisin blokkien välille. Pattitilanne ratkeaa, kun EU taipuu kompensoimaan metsien lisäsuojelusta Suomen kansantaloudelle aiheutuvat menetykset kahdeksan vuoden siirtymäajalla vuoteen 2034 saakka.

Metsien välineellinen merkitys ilmastonmuutoksen torjunnassa muokkaa suomalaisten metsäsuhdetta. Tuulivoimakapasiteetti maa-alueilla on nelinkertaistunut 2022–2032 ja jopa 300 metrin napakorkeuteen kohoavat tuulimyllyt ovat osa kansallismaisemaamme. Tuulivoimapuistot pirstovat metsiä ja kiistellyn lakimuutoksen jälkeen niitä voi poikkeusluvalla rakentaa myös luonnonpuistoihin. Metsien virkistyskäyttö rajataan vain luonnonpuistoihin ja erikseen määritellyille luonnonpuistojen ulkopuolisille metsäalueille. Tulenteko metsissä tulee luvanvaraiseksi. Hiilinielumarkkinoilla havaitaan hintapiikkejä, jotka lisäävät ulkomaisten sijoittajaryhmien spekulatiivista kiinnostusta suojeltavien metsien omistukseen.

EU-kompensaatiopaketin rahoituksesta vähintään puolet on suunnattava sellaisen ilmastonmuutosta hidastavan ja siihen sopeutumista edesauttavan teknologian kehittämiseen, josta myös muut EU-maat voivat hyötyä. Paketti toimii merkittävänä piristysruiskeena suomalaiselle greentech-sektorille, ja yliopistojen ja yritysten yhteistyönä kaupallistetaan muun muassa tekoälyratkaisuja metsäpalojen ennakointiin ja ehkäisyyn.

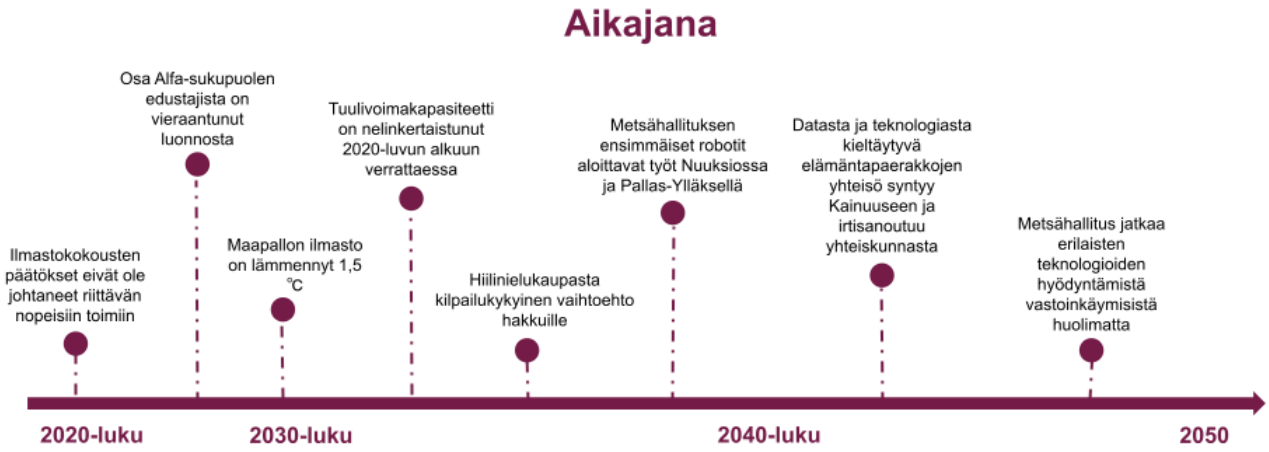
Osa EU-rahoituksesta ohjataan Metsähallituksen digitaalisten palveluiden yksikölle, jonka palvelukehityksen tärkeä painopistealue ovat multisensoriset immersiiviset virtuaaliset metsäkokemukset ja robotisaatio. Metsien ehtyessä ja luontokadon edetessä globaalisti Suomen kansallispuistoihin kohdistuu luontomatkailun kysyntäpaine, jota virtuaalikokemukset osaltaan purkavat. Varsinkin suurkaupungeissa asuvien keskuudessa virtuaalisista kansallispuistoretkistä tulee suosittuja. Niille, jotka edelleen haluavat matkustaa fyysisesti paikan

päälle, rakennetaan päästöttömiä kulkuyhteyksiä kansallispuistoihin. Monikieliset robotit opastavat vierailijoita toimimaan metsässä mahdollisimman vähän luontoa kuluttaen. Terveysteknologiayritykset haistavat rahan, jonka suomalaisen metsän terveysvaikutuksilla voi tuottaa. Suomalainen Oura lanseeraa vuonna 2028 viidennen sukupolven Green Universal Platinum -älysormuksen, jonka uutuusominaisuus suosittelee stressioireita havaitessaan metsäkylpyjä sekä mittaa metsässä vietettyä aikaa vertaillen sitä muuhun hyvinvointidataan.

Ikääntyvä Suomi saa uusia asukkaita maahanmuuton kautta. Tulijoista suurin osa on maista, joissa ihmisten metsäsuhde poikkeaa kantasuomalaisista; metsää ei omisteta, joten sillä ei nähdä taloudellista arvoa, jokaisenoikeuksia ei tunneta ja metsää saatetaan jopa pelätä. 2020-luvun lopulla todetaan myös osan Alfa-sukupolven edustajista olevan pahoin vieraantuneita luonnosta. Hätiin kutsutaan teknologia. Eräs menestynyt pelifirma kehittää sosiaalisen vastuun hengessä Metaversumiin Extreme Forest Survival Experience -pelimaailman, jossa pelaajat metsästävät kauriita ja peuroja, harjoittelevat tulentekoa, suunnistavat ja keräävät pisteitä tunnistamalla syötäväksi kelpaavia metsän antimia, mutta valitettavasti virtuaalimaailman opit eivät siirry todellisuuteen. Itse asiassa peli synnyttää uusia nettiriippuvaisia. Vuonna 2035 internetissä leviää viraalisti siilinjärveläisen Nocco-Ollin video, jossa hän kokeilee uimista oikeassa metsälammessa. Olli kastaa lammessa toisen jalkansa ja huutaa: “Ei pysty, liian kylmää!” Haptisen teknologian mahdollistama virtuaalinen uintikokemus on kuulemma moninkerroin miellyttävämpi.

Teknologian ja datatalouden kehitys ei ole kaikkien mieleen. 2040-luvun alkupuolella Suomeen syntyy elämäntapaerakoiden yhteisö, joka ostaa Kainuusta laajan metsäalueen, jolle se leiriytyy ja jossa se elää metsän antimista. Yhteisön jäsenet kieltäytyvät internetin käytöstä ja datansa luovuttamisesta ylikansallisille suuryrityksille. Valinta pakottaa heidät yhteiskunnan ulkopuolelle.

Metsähallitus investoi 2020- ja 2030-luvulla kalliisiin teknologisiin ratkaisuihin, joista osa osoittautuu toimiviksi, osa ei. Metsähallitukseen kohdistuu kritiikkiä, sillä osa suomalaista kokee, etteivät teknologiset ratkaisut ole tuottaneet hintaansa nähden riittäviä tuloksia luonnon, ihmisten ja yhteiskunnan hyväksi. 2050-luvulle tultaessa Metsähallitus tasapainoilee tehtäviensä kanssa teknologiaa hyödyntäen, mutta työ käy yhä vaikeammaksi, sillä teknologinen edelläkävijyys ja innovaatioiden kehittämistyö vie aikaa muulta työltä.



Ristiriitojen riivaamat metsät

Vuonna 2050 metsien tila on kriittinen. Ilmastonmuutosta ehkäisevistä toimista ei ole päästy kansainvälisesti yhteisymmärrykseen, ja ympäristöpolitiikka jakaa jyrkästi poliittista kenttää myös Suomessa. Metsän tutkijat, omistajat ja suojelijat ovat avoimessa ristiriidassa keskenään ja ääriliikkeet turvautuvat jopa ekoterrorismiin. Massiivinen ilmastopakolaisuus on todellisuutta. Globaali kilpailu luonnonvaroista on kireää, ja lisäpainetta metsien käyttöön luo yhä kasvava virkistyskäyttö. Myös Metsähallitus on ajautunut pahoihin sisäisiin ristiriitoihin, mikä heikentää sen kykyä sen tehtäviensä vaikuttavaan toteuttamiseen.

Skenaario 3:

2020-luvun ilmastokokouksissa ei päästä yhteisymmärrykseen ilmastonmuutosta pysäyttäviin toimiin sitoutumisesta. EU:n ilmastopolitiikka joutuu vaikeuksiin, kun muutama jäsenmaa irtisanoutuu Green Deal -politiikkaohjelmasta. Suomen metsissä kuivuuden ja uusien tuhohyönteisten aiheuttamat tuhot ovat joillakin alueilla jo selvästi nähtävissä.

Metsien yksityisomistajat, metsätutkijat, metsäyhtiöiden osakkeenomistajat ja luonnonsuojelijat ajautuvat suuriin ristiriitoihin. Osa teollisuudesta haluaa edelleen hakata puuta raaka-aineeksi, koska puupohjaisten kertakäyttötuotteiden kysyntä on taitavan viherbrändäyksen tuloksena globaalisti kasvanut. Maa-alaa tarvitaan myös uusiutuvan energian tuottamiseen. Ekosysteemien tutkijat toistelevat, että sekä luontokadon että hiilinielujen näkökulmasta metsiä tulisi suojella huomattavasti enemmän, kuin mitä ajateltiin vielä 20-luvun alussa. Yksityisomistajat korostavat omaisuuden suojaa, ja luonnonsuojelijat turvautuvat asioiden hitaasta etenemisestä tuskastuneina useilla alueilla kansalaistottelemattomuuden keinoihin. (King & Borrund, 2020.)

Metsät ja niiden käyttö tai suojelu ovat sisäpolitiikassa jatkuvasti merkittävä puolueita jakava kysymys. Kulloinkin vallassa kiinni olevat puolueet ohjaavat ympäristöpolitiikkaa aina omaan suuntaansa, mikä heikentää mahdollisuuksia pitkän aikavälin toimenpiteisiin. Julkisen talouden kestävyysvajetta ei saada oikaistua osin siksi, että vihreä siirtymä ei onnistu eikä uusia vihreään teknologiaan pohjaavia kasvuyrityksiä synny tarpeeksi. Valtion talousvaikeuksien vuoksi Metsähallituksellakin on kasvavaa painetta saada metsistä tuottoa. Ristiriidat heijastuvat Metsähallitukseen, kun eri näkökantoja edustavia työntekijöitä eroaa tehtävistään ja asiaa käsitellään laajasti julkisuudessa.

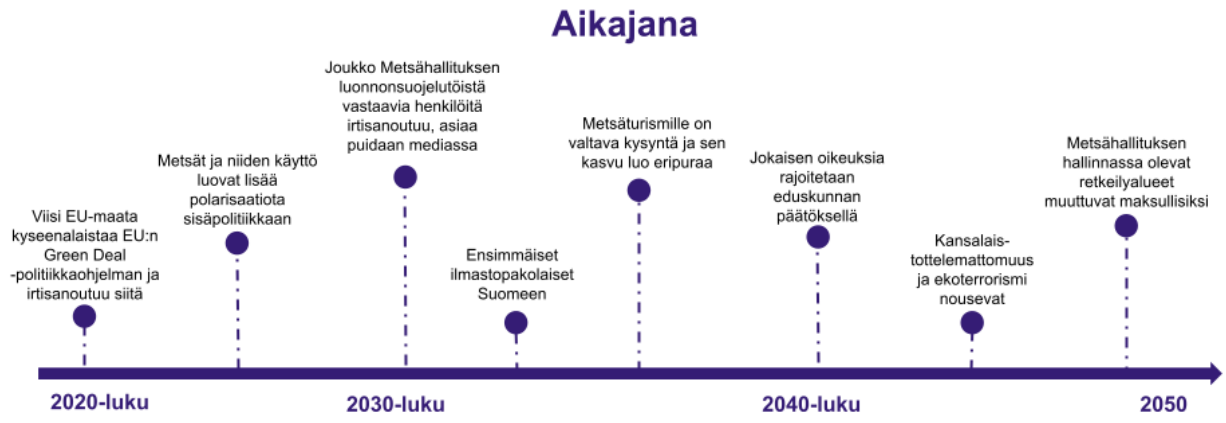
Ilmaston lämpenemisen konkreettiset vaikutukset näkyvät ympäri maailmaa, ja 2030-luvulla globaali ilmastopakolaisuus tulee todeksi. Suomeen ja muihin Pohjoismaihin hakeutuu ihmisiä globaalista etelästä, ja turvapaikanhakulainsäädäntö nousee myös EU-tasolla taas suureksi kiistakysymykseksi. Euroopan unionin suunnasta Suomeen ja Ruotsiin tulee painetta myös siksi, että unionin alueen yhä elinvoimaisimmat metsävyöhykkeet sijaitsevat täällä.

Kysyntää metsien virkistyskäytölle on yhä enemmän niin kotimaassa kuin unionin sisämarkkina-alueella, vaikka EU:n ulkopuolelta tulevien turistien määrää on jo jouduttu rajoittamaan. Yhteiskunnan polarisoitumisesta johtuva pahoinvoinnin lisääntyminen ja yliteknologisoituminen johtavat osaltaan siihen, että ihmiset haluavat vapaa-aikanaan rauhoittua luonnossa. Metsien virkistyskäyttö aiheuttaa eripuraa, sillä pienenevillä alueilla toisensa kohtaavilla ihmisillä on hyvin erilaisia tarpeita ja näkemyksiä siitä, mitä metsässä sopii tehdä. Eniten närää aiheuttavat huonosti metsäalueiden sääntöjä tuntevat ulkomaalaiset ja kotimaiset leiriytyjät, sähköavusteisilla muotivillitykseksi nousseilla kengurukengillä siellä täällä poukkoilevat kulkijat ja maastopyöräilään eroosiota aiheuttavat adrenalisti-endorfinistit.

2040-luvulla metsäalueiden hupeneminen on edennyt siinä määrin, että eduskunta rajaa jokaisenoikeuksia ja säätää Metsähallituksen retkeilyalueiden käytön maksulliseksi. Metsäluonnon tuhoaminen talouden nimissä kismittää tavallisia kansalaisia – jokaisenoikeuksien rajoittaminen on viimeinen pisara. Vuonna 2044 järjestetään suurmielenosoitus, joka kerää 500 000 henkeä retkeilemään eduskuntatalolta Metsähallituksen eteen Tikkurilaan, jonne innokkaimmat leiriytyvät viikoksi. Mielenosoittajien Keskuspuistosta lähettämä Trangia-live kerää miljoonapäisen tukijoukon tuoksuttelemaan älylaitteidensä ääreen suomalaista metsää ja fiilistelemään retkeilyn tunnelmaa.

Kun kansalaisten protestointi ei tuota toivottua tulosta, nostaa Suomessa päätään pieni, mutta keinoja kaihtamaton aktivistiryhmittymä ClimatAnon, joka on osa kansainvälistä ekoterrorismiliikehdintää. ClimatAnonin iskuissa tuhotaan useiden ilmastotoimia vastustavien poliitikkojen omaisuutta, ja mellakoissa vammautuu ihmisiä. Välikohtaukset vaikeuttavat maamme sisäisiä ristiriitoja entuudestaan. Ekoterrorismista syntyy tiukka poliittinen vääntö, jonka seurauksena poliisin määrärahoja lisätään vastaaviin tilanteisiin varautumiseksi. Suomen linja saa runsaasti kansainvälistä, joskaan ei kovin mairittelevaa, huomiota.

Metsähallituksella on suuria vaikeuksia selvitä tehtävistään. Sitä riepottelevat sekä sisäiset ristiriidat että poliittisen ohjauksen arvaamattomuus, ja myös kansalaisten suunnalta tuleva kasvava kritiikki. Metsähallitus ajautuu toistuvasti konflikteihin sekä luonnonsuojelijoiden että ekoterroristien kanssa, ja nämä konfliktit rapauttavat sen uskottavuutta etenkin metsien suojelutehtävän toteuttamisessa.



Menetetyt metsät

Vuonna 2050 ilmastonmuutos etenee peruuttamattomasti ja massiiviset luonnonkatastrofit ovat jatkuvia. Suomessakin metsiä on jäljellä vain vähän. Siirtymää uusiutumattomista uusiutuviin energialähteisiin ei ole onnistuttu tekemään. Taloudellista arvoa metsillä ei enää ole isommassa mittakaavassa, vaikka vähäiset metsät nähdään sinänsä arvokkaina. Merkittävä osa Suomen valtion ja yksityisten metsänomistajien maa-alueista on myyty kiinalaisille. Muuttoliike globaalista etelästä pohjoiseen on jatkuvaa. Metsähallitus on aidannut jäljellä olevat valtiolliset metsät ja valvoo niitä jatkuvasti. Teknologiasta etsitään kuumeisesti uusia ratkaisuja.

Skenaario 4:

2020-luvulla globaaleista ilmastotoimista ei päästä yksimielisyyteen. Yhdysvalloissa ilmastotoimia vastustavat voimat pääsevät valtaan, ja samassa imussa Aasian valtiot jättävät kunnianhimoiset ilmastotavoitteet pois agendaltaan. Myös Suomen politiikassa valtaa saavat puolueet, jotka jättävät nopeat ilmastotoimet taka-alalle. Vihreän siirtymän tutkimukseen ja tuotekehitykseen ei panosteta. Uusiutumattomien polttoaineiden käyttö jatkuu ja Suomen metsiä käytetään edelleen esimerkiksi maailmanlaajuisen verkkokaupan pakkausmateriaalien raaka-aineeksi.

2030-luvulla Suomen metsien tila romahtaa. Ilmastonmuutoksen eteneminen tuo Suomeenkin laajat metsäpalot ja ennennäkemättömän suuret tuholaisvahingot. Samaan aikaan globaali ilmastonmuutos etenee nopeasti ja kouriintuntuvasti, ja Suomen hupeneviin metsävaroihin alkaa kohdistua kasvavaa kansainvälistä kiinnostusta ja kysyntää.

Yksityiset metsänomistajat alkavat saada metsien ostotarjouksia kiinalaisilta teollisuus- ja teknologiayhtiöiltä. Suomen julkisen talouden kestävyysvaje on syventynyt, kun vihreän siirtymän taloudellinen potentiaali on jäänyt haaveeksi. Yhteiskunnan eriarvoistuminen näkyy jo hyvinvointivaltion rakenteiden rapautumisena, ja moni yksityinen metsänomistaja tarttuu kiinalaisten ostotarjoukseen ainoana vaihtoehtona. Metsäalueista merkittävä osa ehtii mennä ulkomaiseen omistukseen, ennen kuin valtio kieltää yksityisomistajilta metsän myynnin ulkomaalaisille. Uudet omistajat tekevät laajoja avohakkuita ja toisaalta lennättävät yritysten johtoa luontoelämyskohteisiin, joissa kalastetaan, metsästetään, ajetaan moottoriajoneuvoilla ja kerätään jäkälää matkamuistoksi.

Metsäalueiden väheneminen ja yksipuolistuminen johtaa siihen, että yhä harvemmalla suomalaisella on omaa kokemusta metsässä olemisesta tai metsässä toimimisesta. Shifting baseline -ilmiön mukaisesti uusi sukupolvi pitää normaalina metsien tilaa, joka oli edelliselle ennenkuulumaton. Yhteiskunnan eriarvoistuessa metsässä käymisestä tulee kallis hyödyke, johon vain harvoilla on varaa. Kansalaisliike vaatii, että vuotuinen kiintiöity tuntimäärä metsässä oleskelua pitäisi taata jokaiselle kansalaiselle. Tavoitetta pidetään epärealistisena julkisen talouden haasteiden vuoksi.

Luonnosta vieraantumiselle käänteisenä trendinä Suomessa saa jalansijaa uusshamanistinen liike, joka perustuu suomalaiseen muinaisuskoon. Uushenkisyyden voimakasta nousua selittää ihmisten suuri tarve löytää uutta merkitystä elämäänsä tuhon partaalla olevassa maailmassa. Liikkeen jäsenet vetäytyvät jäljellä oleviin yksityisten omistajien metsiin. Etenkin kiinalaiset metsänomistajat tekevät mielellään yhteistyötä liikkeen kanssa, sillä Kiinan hallinto näkee vallitsevaa yhteiskuntajärjestystä haastavassa liikkeessä mahdollisuuksia horjuttaa Suomen ja muiden EU-maiden yhteiskunnallista vakautta. Liike kannattaa universaaleja luonnonoi-

keuksia ja holistista ekologista ajattelua, jossa ihmistä ei nähdä luonnosta erillisenä osana. Liike saa ensimmäisen kansanedustajansa vuoden 2039 eduskuntavaaleissa, mutta varsinainen jytky koetaan vasta 2040-luvulla.

Ilmastonmuutoksen suunnan kääntämiseksi etsitään kiihkeästi pelastusta teknologiasta. Luontaisia hiilinieluja ei ole jäljellä riittävästi, jotta ilmakehän hiilidioksiksipitoisuus saataisiin laskuun. Suomi lähtee vuonna 2045 mukaan kansainväliseen hankkeeseen, jossa hiilidioksia sidotaan suoraan ilmakehästä (Direct Air Capture, DAC) “mekaanisten metsien” avulla ja pumpataan maanalaisiin varastoihin. Suomessa varastoiksi valikoituvat maankuoren basalttikerrostumat, joissa hiilidioksidi reagoi kemiallisesti muodostaen pysyviä karbonaatteja. Hanke ei onnistu toivotusti, sillä suomalaisen basaltin vähäinen huokoisuus hidastaa hiilen sitoutumista ja hiilivarastot vuotavat takaisin ilmakehään. Sitoutumista yritetään tehostaa öljynporauksesta tutulla kallion vesisärötyksellä, mutta siitä aiheutuvat mittavat ympäristöhaitat vesistöille herättävät laajaa vastustusta.

2040-luvun alussa Metsähallitus vapautetaan kokonaan tuloutustehtävästä, ja se keskittyy ainoastaan jäljellä olevien metsäalueiden suojeluun ja vartiointiin. Alueet joudutaan aitaamaan, ja niitä pyritään suojelemaan tuhoeläinparvilta erilaisin teknisin ratkaisuin. Metsähallitus tekee suuria investointeja valvontakameroihin ja palkkaa vartijoita, jotka häätävät metsissä luvatta oleskelevia. Laittomista siirtolaisista, paperittomista ja koditтomista syrjäytyneistä koostuvat yhteisöt piileksivät metsäalueilla valvontadroneja ja vartijoita harhautellen. Valvontatehtävät vievät Metsähallituksen resursseja yhä enemmän, mutta silti metsien suojelua ei pystytä toteuttamaan kyllin vaikuttavasti.

Johtopäätökset

Tässä tulevaisuusraportissa olemme skenaariotyöskentelyn kautta tutkineet, millaisena Suomen metsien käyttö näyttäytyy vuonna 2050. Lisäksi olemme tarkastelleet, mitä eri vaihtoehdot tarkoittavat Metsähallituksen tehtävien kannalta. Tässä päätösluvussa esitämme ensin keskeisimmät havaintomme näihin tutkimuskysymyksiin liittyen. Tämän jälkeen arvioimme tulevaisuustaulukkomenetelmän käyttömahdollisuuksia ja tulevaisuustyöryhmämme työskentelyprosessia. Lopuksi tuomme vielä esiin mahdollisia suuntia Suomen metsiä tarkastelevan tulevaisuustyön jatkamiselle.

Keskeisimmät tulokset

Tulevaisuusraporttimme metsien käytöstä vuonna 2050 tuo esiin, että vuodesta 2022 käsin voi avautua hyvin monenlaisia tulevaisuuksia Suomen metsille, suomalaisille ja Metsähallitukselle. Kaikkien skenaarioiden kautta tulee myös näkyviin, ettei Suomen metsien tulevaisuus ole yksin suomalaisten käsissä. Ilmastonmuutos ja luontokato ovat globaaleja megatrendejä, joiden hillitseminen vaatii yhteistyötä sekä kansallisella että kansainvälisellä tasolla.

“Hiilineutraalin maailman kukoistavat metsät” -skenaariossa toimivan kansainvälisen yhteistyön ja globaalin systeemin muutoksen kautta Suomen metsien hyvinvointia voidaan vaikuttavasti edistää. Tässä skenaariossa myös Metsähallitukselle avautuu uusia mahdollisuuksia ydintehtäviensä toteuttamiseen. Kun metsien suojelutehtävä otetaan vakavasti, voidaan metsien avulla luoda uudenlaista taloudellista arvoa esimerkiksi ennallistavan matkailun ja virtuaalisten metsäklinikoiden avulla. *“Teknologialla tuetut metsät”*-skenaario puolestaan tuo näkyviin, että menestyksekkäätkään teknologiset innovaatiot eivät riitä torjumaan ilmastonmuutosta ja luontokatoa, jos kansainvälinen yhteistyö ja metsien itseisarvon ymmärrys eivät kehity. Systeemisen ajattelun puute voi johtaa tilanteeseen, jossa lupaavien teknologisten ratkaisujen kerrannaisvaikutuksia ei huomioida.

“Ristiriitojen riivaamat metsät” -skenaario kiinnittää huomion siihen, millaiseen vaaraan poliittisten ristiriitojen kärjistyminen ja yhteiskunnallinen polarisaatio asettavat Suomen metsät. Myös Metsähallituksen kannattaa pyrkiä välttämään ristiriitojen kärjistymistä sellaisin tavoin, joita vuonna 2022 on nähty esimerkiksi Aalistunturin tapauksessa. Kuitenkin kaikkein suurimpana uhkana Suomen metsille näyttäytyy *“Menetetyt metsät”*-skenaariossa kuvattu kehitys, jossa ilmastonmuutosta ja luontokatoa väheksyvät yhteiskunnalliset vaikuttajat onnistuvat viivyttämään ympäristön suojelutoimia, kunnes on liian myöhäistä. Metsähallituksen taloudellisen tehtävän korostaminen ja hakkuiden jatkaminen johtavat tilanteeseen, jossa metsien laaja tuhoutuminen romahduttaa myös jäljelle jäävien vähäisten metsäalueiden arvon, sekä talouden että hyvinvoinnin kannalta tarkasteltuna.

Esitettyjen skenaarioiden pohjalta voidaan arvioida, että metsien suojelutehtävään keskittyminen kannattaa nostaa keskiöön Metsähallituksen tulevassa strategiatyössä, jotta metsät jatkossakin tarjoavat mahdollisuuksia luoda sekä taloudellista arvoa että hyvinvointiarvoa Suomelle. Erityisen tärkeää on tarkastella, mitä kaikkea muuta metsät voivat olla kuin puuta: hiilinieluja, virkistyspaikkoja, uudenlaisen liiketoiminnan ympäristöjä tai jopa oikeushenkilöitä. Suojelutehtävän ja tulostavoitteiden ei tarvitse olla ristiriidassa, jos metsien arvoa pystytään ymmärtämään ja hyödyntämään monipuolisemmin. Liiallisista hakkuista luopuminen näyttäytyy ensiarvoisen tärkeänä toimenpiteenä, jotta Suomen metsistä voivat nauttia myös tulevat sukupolvet.

Menetelmän ja prosessin arviointia

Tulevaisuustyöryhmämme kokemusten perusteella skenaariotyöskentely voi vaikuttavasti toteuttaa yhtä tulevaisuuksien tutkimuksen keskeistä tehtävää eli rikkoa ajatusta yhdestä ainoasta tulevaisuudesta (Masini, 1993, 8–9). Vaihtoehtoisten tulevaisuuksien tarkastelu tuo esiin myös toimijuuden mahdollisuuksia, sillä eri vaihtoehdot kytkeytyvät aina ihmisten toimintaan. Toisaalta omassa tulevaisuusraportissamme tulee näkyviin myös se, ettei ihminen ole ainoa toimija maapallolla.

Tulevaisuustaulukkomenetelmä tarjoaa monipuolisia mahdollisuuksia skenaarioiden luomiseen, ja tämä on ehdottomasti menetelmän vahvuus. Muuttujien ja arvojen valintaan kannattaa kiinnittää huomiota, sillä niiden kautta muotoutuvat sekä mahdollisuudet että rajat niiden pohjalta luoduille skenaarioille. Kattava nykytilanteen analyysi on luonnollisestikin perusedellytys soveltuvien muuttujien ja arvojen tunnistamiselle. PESTEV-analyysi toimii nykytilan analysoinnissa varsin hyvin, sillä sen avulla voidaan varmistaa erilaisten muutosvoimien huomioiminen. Toisaalta PESTEV-analyysin laaja-alaisuus voi muodostua haasteeksi tutkimuksellisen fokuksen säilyttämiselle.

Tulevaisuustyöryhmämme työskentelyssä tuli esiin, että nykytilanteen analyysille olisi ollut hyödyllistä saada enemmän aikaa. Myös useampien tutkimusmenetelmien, kuten esimerkiksi haastattelujen, käyttö olisi voinut tarjota meille syvempää ymmärrystä aiheestamme. Toisaalta aiheestamme oli erittäin runsaasti tietoa saatavilla, ja näin ollen kohtasimme myös rajaamisen haasteita. Muuttujien ja arvojen valintaprosessi oli haastava, koska nykytilanteen analyysissa tunnistimme niin monia muutosvoimia, jotka vaikuttavat Suomen metsiin. Kuitenkin onnistuimme luomaan valintojemme pohjalta neljä skenaariota, joissa kuvataan kiinnostavia, realistisia ja huomionarvoisia kehityskulkuja. Uskomme, että Metsähallitukselle ja muille metsien tulevaisuudesta kiinnostuneille tahoille skenaariomme voivat avata mahdollisuuksia sen pohtimiseen, mitä muuta metsät ovat kuin puuta.

Suuntia tulevalle tutkimukselle

Suomen metsien käyttöä tarkastelevassa tulevaisuudentutkimuksessa olisi hyödyllistä tarkastella tarkemmin aiheen erilaisia ulottuvuuksia, joita tässä tulevaisuusraportissa on voitu esitellä vain rajallisesti. Esimerkiksi luontomatkailuun, ympäristöaktivismiin, uudenlaiseen metsätalouteen ja suomalaisten metsäsuhteeseen liittyen voisi tehdä tutkimusta, jossa skenaariotyöskentelyn avulla keskityttäisiin nimenomaan näihin aiheisiin. Myös eri toimeksiantajien tilaukset voisivat suunnata metsiin liittyvää skenaariotyöskentelyä kiinnostaviin ja merkityksellisiin suuntiin.

Suomen metsien nykyisyys ja myös tulevaisuus kiinnostavat monia eri tahoja yhteiskunnassamme. Siten tulevaisuudentutkimuksessa kannattaa ehdottomasti suunnata tutkimuksellinen katse metsiin, ja myös tulevassa tutkimuksessa etsiä erilaisia mahdollisuuksia Suomen metsien käytön tarkasteluun. Metsillä on suuri merkitys Suomen historiassa, nykyisyydessä ja todennäköisesti myös tulevaisuudessa. Metsät ovat olleet ja ovat edelleenkin Suomessa merkittävä vaurauden lähde ja keskeinen osa suomalaista identiteettiä. Kuitenkin etenevän ilmastonmuutoksen ja luontokadon myötä metsät näyttäytyvät myös hiilinieluina ja suojelukohteina. Siten on tärkeää etsiä vastauksia siihen, miten metsien käyttö Suomessa kehittyy, ja mitä muuta metsät ovat kuin puuta.

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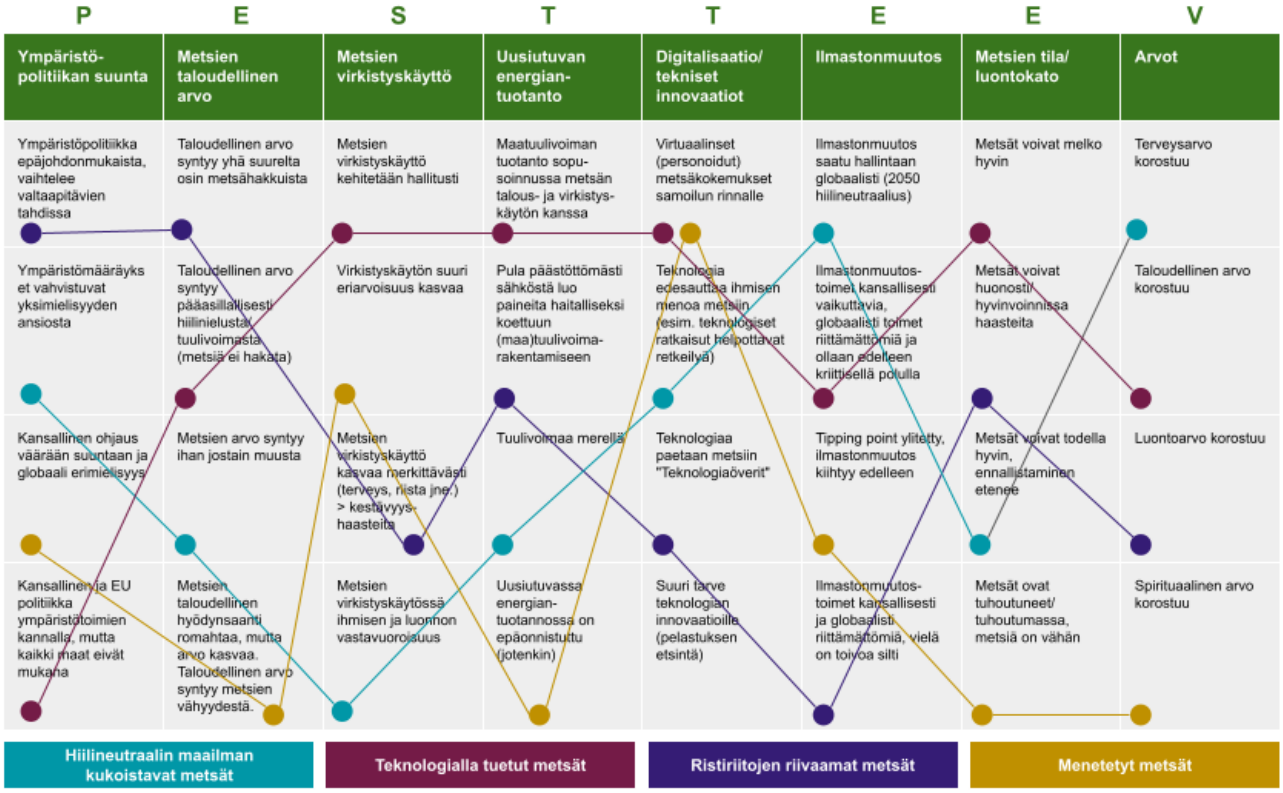

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