

# International students' experiences and perceptions of the therapeutic values of everyday green-blue spaces during the COVID-19 pandemic in the Netherlands

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# International students' experiences and perceptions of the therapeutic values of everyday green-blue spaces during the COVID-19 pandemic in the Netherlands

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## Abstract

The COVID-19 pandemic has brought to light the significant role that readily accessible natural space holds in restoring our everyday lives. In this research, the benefits of nearby nature to the sense of well-being in physical, mental and social levels were highly valued by 15 international students in a relatively green setting in the Netherlands. Through the semi-structured interviews and the narrative interviews, students admitted that it contributed the most to their mental well-being. However, they noticed that exercising in nature allowed their emotions to manifest physically, and as regards the social well-being, students remarked that increasing nature interaction compensated for a lack of social interaction. Concerning the underlying framework, this research primarily uses the therapeutic landscapes framework to explore international students' interactions in green and blue environments, paying attention to the four dimensions of therapeutic characteristics, namely material, social, symbolic (spiritual), to analyze how everyday practices in nature can be used as a coping mechanism during a chaotic period and the resettlement process. In this analysis of the therapeutic values of natural landscapes for the participants, four key themes are identified; a place for multi-sensory experiences, a safe and healthy environment to undertake daily activities, a setting for non-European students to gain a sense of belonging based on their place-related memories, and a space to connect with the spiritual self. Moreover, the results demonstrated that green space has a significant impact on physical and mental well-being, while blue space facilitates students' mental and social well-being. Overall, this article implies that individual perceived and interpreted the therapeutic qualities differently, resulting in diverse experiences of therapeutic landscapes.

Keywords: Therapeutic landscapes, Everyday green-blue space, International students, Well-being, Therapeutic characteristics

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## I. Introduction

The unprecedented COVID-19 pandemic has caused changes in the way we live, the time we stay indoors and how we can socialise. This respiratory syndrome coronavirus 2 (SARS-CoV-2) first emerged in December 2019 in Wuhan, China and rapidly spread through the rest of the world. In January 2020, WHO has declared the novel coronavirus outbreak a Public Health Emergency of International Concern and later in March, WHO assessed it as a pandemic (WHO, 2020). With its high transmissibility and the evidence of human-to-human transmission, restrictions have been announced by each government for the sake of flattening the curve and shielding people from the infection. However, based on the confirmed cases and national conditions, the strictness of lockdown and policy responses are varied. Compared to other European countries, the stringency level of the Netherlands was quite soft (Hale, et al., 2021); shelter-in-place order was suggested but not mandatory (Stricter measures to control coronavirus, 2020) and there were no restrictions in regard to domestic travel (FAQs about tourism in the Netherlands and COVID-19 measures, 2020). But as stay-at-home and social distancing has proven to be impactful measurements to curb transmission (Marroquín et al., 2020), people comply with these new norms and reduce face-to-face interaction. However, distancing has led to adverse mental health problems in the general population (Marroquín et al., 2020).

In the past decades, it is ascertained that psychological issues are associated with epidemics. People who quarantined during SARS felt distressed (Hawryluck et al., 2004), and Lau et al. (2006) found that in Hongkong, out of 818 respondents, around 62%-73% felt horrified, apprehensive and helpless; during the outbreak of Ebola, mental disorders were expected and mental health intervention warrant consideration (Shultz et al., 2015); likewise, Jeong et al.'s (2016) study of the MERS highlights the effective intervention on anxiety and anger in order to avoid chronic problems. Similarly, in the past few months, several studies have discussed how COVID-19 takes a toll on emotional well-being. Chinese researchers pinpointed the increased anxiety, depression and stress that COVID-19 brings (Cao et al., 2020; Wang et al., 2020). Besides, a study among 500 participants in the United States also revealed greater health anxiety, financial worry, and loneliness and stressed the importance of simultaneous psychological interventions (Tull et al., 2020). In addition, news regarding the surge in demand for psychological counselling brought into focus. An administrator of a Disaster Distress Helpline said the service increased 338% in March (Madani, 2020) and the Trimbos Institute for Mental Health (2020) demonstrates that one-third of the Dutch population have encountered adverse mental health issues. Even though fear, worry, and stress are normal reaction when

we encounter real threats (WHO, 2020), maintaining well-being is essential and increase nature exposure is one of the most effective and feasible ways during crises (Pouso et al., 2020; Karl et al., 2020).

As green spaces enable social distancing which indirectly contained further spread of the contagious disease and meanwhile offer possibilities for social interaction (Venter et al., 2020), an upsurge in access to nature areas during COVID-19 is noticed (Google, 2020). Studies have confirmed the buffering, restorative and psychological effects of green spaces (Van den Berg et al., 2010; Xie et al., 2020; Pouso et al., 2020) and their value in promoting well-being. On the one hand, natural environments facilitate physical activities that significantly determines mental health (Gascon et al., 2015; Samuelsson et al., 2020). On the other hand, accessibility to outdoor areas (green-blue spaces) and nature views have a high correlation with lower symptoms of depression and anxiety and exert a positive influence on well-being (Daniela et al., 2020; Pouso et al., 2020). However, due to the disparate access to parks and green spaces (Pouso et al., 2020; Slater et al., 2020), interaction with nature can be manifold. Home gardening is one of the easiest ways to directly connect with nature, which is blooming worldwide. An American seed company stated that “they sold more seed than any time in its 144-year history in March” (Christopher & Tom, 2020) and in the UK, the sales of plants were increased by 35% compared to 2019 (Mead, 2020). The benefits of exposure to natural environments are miscellaneous and it helps achieve the balance of well-being in various forms.

The most extant studies reiterated how urban nature (mostly green spaces) favourably affected human well-being (Gascon et al., 2015; Gascon et al., 2017; White et al., 2017) and during the COVID-19, quantitative researches underscored the greater public awareness and urgent need of urban green spaces and of great importance to reappraising the sustainable planning (Kleinschroth & Kowarik, 2020; Rodgers, 2020; Rousseau & Deschacht, 2020; Venter et al., 2020). However, qualitative research was relatively scarce and discussions on specific populations, such as international students, was insufficient. Therefore, this research is based in Wageningen, the Netherlands, and aims to investigate international students’ experiences and perceptions of everyday green-blue spaces, as well as how therapeutic characteristics affect their physical, mental and social well-being, incorporating narrative interviews and semi-structured interviews in both sit-down and walk-along formats. Moreover, guided by the therapeutic landscapes framework, this paper evaluates the therapeutic effects of green and blue environment from four dimensions: material, social, symbolic (spiritual), and further analyzes how subjective experiences and different cultural backgrounds influence health-place dynamics. Also, underpins the therapeutic values that green-blue areas bring to the general public, specifically, students in this context in times of crisis.



## 1.1 Preliminary problem statement

The prior studies mainly focused on the mental effects of urban residents, patients and the elderly whereas a growing number of students are experiencing psychological issues as a result of public health emergencies that yet to be addressed (Castillo & Schwartz, 2013; Cao et al., 2020; Storrie et al., 2010). According to studies, young adults aged 15 to 24 have higher levels of stress, anxiety, and depression, and are less likely to seek support (Milligan & Bingley, 2007; Wang et al., 2020), let alone international students (Gascon et al., 2015; Gascon et al., 2017). Although Wageningen University (2020) has conducted a survey in regard to international student well-being, no more than 20% of the respondents were international. Thereby, as a Chinese student who went through COVID-19 on my own in the Netherlands, I came to realization that landscapes serve as therapeutic resources in daily life. As such, I aspire to target the same demographic group (non-Dutch students) to enhance the understanding of how students from multiple social contexts interact with the Dutch landscapes and how the similarities and differences affect health and well-being.

In addition, a substantial amount of studies mainly exemplified urban green spaces in reviewing the beneficial impacts of nature intervention on mental well-being and physical activities while to date, fewer studies have considered natural environments from a micro-scale perspective. A growing body of research (e.g., Bell et al., 2018; Bignante, 2015) has begun to confirm that health-enhancing spaces are no longer restricted to large-scale and conventional sites, but instead, more ordinary, mundane sites have the potential to project the therapeutic effects, such as indoor greeneries, community gardens, or streams in the residential areas. Therefore, this study applies both green and blue environments in a more inclusive level to natural-appearing elements or nearby nature in everyday contexts. Besides, blue spaces have similar stress-reducing effects (Völker & Kistemann, 2011) but not yet sufficiently acknowledge and it is worth discussing. Accordingly, this study will conduct in a spectrum of the rural green environments and take blue spaces into account as researchers considered that it has stronger beneficial influences on health and well-being than views of green spaces (Pouso et al., 2020; Ulrich, 1981). Moreover, a European Union funded project, BlueHealth (2020) has provided an insight into the impact that blue spaces have on people's well-being and encourages wellness by accessing good quality blue spaces. Thus, with more research shining a light on the health-promoting effect of blue spaces, it will attract more attention in the future.

## 1.2 Scientific objectives and research questions

This research's emphasis can be described in three respects. Firstly, investigating international students' encounters with everyday green-blue spaces in Wageningen, the Netherlands, and how these experiences affect their sense of well-being during the extraordinary circumstances of the COVID-19 pandemic. Secondly, what therapeutic qualities drew them to undertake daily activities in natural landscapes, and how does it vary from one individual to the next based on subjective perceptions and different cultural and social contexts. Lastly, since people experience greeneries and aquatic environments in different ways, the researcher aspired to analyze how an individual experienced and evaluated the healing effects of green environments and water bodies, respectively. To better understand how the health-promoting effects of natural landscapes reflect on international students' physical, mental and social well-being as well as to address the main research question *How has the use of green-blue spaces in the Netherlands influenced international students' well-being during the COVID-19 pandemic?* Three sub-questions are proposed:

1. *How has spending time in green-blue spaces impacted international students' perception of their physical, mental and social well-being?*
2. *What do international students value about the characteristics of therapeutic landscapes from the material, social and symbolic (spiritual) dimensions and how they experience them from everyday practices?*
3. *Are there differences in impacts on well-being between green and blue spaces?*

### 1.3 Outline of the structure

The thesis is organized into five chapters. The research is introduced in the first chapter, which explains why it is worth investigating. Besides, based on the previous studies, the knowledge gap and research objectives are outlined, and thereby conceived the research questions. Guided by a literature review, the therapeutic landscapes framework is established in the theoretical framework chapter. Starting with a definition of terms, four therapeutic characteristics and two main themes that relevant to the research are presented. In the methodology chapter, the introduction of the research area and population is firstly provided, followed by the implementation of methods used in the data collection and analysis process. It concluded by analyzing the research quality and reflecting on my role. In the results and discussion chapter, four categories of findings are presented and from which, compare my results with the previous study. The discussion shows how some outcomes serve as continuous support whereas others bridge the knowledge gaps and bring new insights into the field. The closing chapter summarizes and uses the results to answer the main research question and three sub-questions, along with a general discussion. This paper ends by noting the research limitations and providing suggestions for future research.

## II. Theoretical Framework

This research is built on the theoretical concept of 'therapeutic landscapes' (Gesler, 1992) and adopted the notion of 'therapeutic mobilities' (Gatrell, 2013) to gain a deeper insight into the role of green and blue space as therapeutic landscapes. The chapter will begin by defining four key terms; 'green space', 'blue space', and the related terms of 'health' and 'well-being', in order to provide an overview with the domain of investigation. Followed by a brief review of the evolving meaning and application of the concept of therapeutic landscapes and how it relates to human well-being. In terms of the COVID-19 circumstances and target community, international students, the analysis will emphasise the everyday contexts (e.g., neighbourhood green and blue settings or indoor environments) and how landscapes affect the participants therapeutically as migrants. Lastly, the concept of therapeutic mobilities (Gatrell, 2013) will be utilised, as researchers (e.g., Doughty, 2013; Pitt, 2014) has shown that therapeutic landscapes are not a static environment, but are engaged with through movement, and that movement itself can play an important role in producing a sense of healing.

## 2.1 Definition of terms

Four terminologies are defined in the following paragraphs. Throughout the entire report, 'green space' and 'green environment', 'green setting', 'green area', 'greenery', 'vegetation' are used interchangeably and 'blue space' are replaceable with 'aquatic environment', 'water body', 'waterside area'.

### 2.1.1 Defining green space

Previous studies have mostly referred to green space as urban green space. But this research, in taking a therapeutic landscapes approach, understands green spaces from a more diverse and elusive spectrum, encompassing such spaces as "small garden plots and potted patio plants to vast urban parks, forests" (Finlay et al., 2015, p. 99). This broad definition is supported by recent findings which demonstrated both outdoor green spaces use and indoor green views contributed to positive mental outcomes during times of crisis (Soga et al., 2020).

Thus, this research extends the most common meaning of urban green spaces, which tend to be limited to outdoor areas with significant amounts of vegetation, which is associated with natural elements (Beatley, 2012; Taylor & Hochuli, 2017) and existed mainly as semi-natural areas (Jim & Chen, 2003). Beyond that, it has been considered as urban vegetation, including forests, wilderness areas, trees, parks, allotments or cemeteries (Bastian et al., 2012) as well as land uses that can be divided into recreational or undeveloped areas. By the same token, green spaces in rural settings can be interpreted as "woodlands or forests, farmland or arable land, meadow or grassland, mountains, moorland or heathland, country parks" (Bluehealth, 2020), and these landscapes are easily spotted in the study area.

Private green space has received little attention in the broader literature on green space and health but is an important facet of life quality and living environment (Coolen & Meesters, 2012), it also has similar beneficial impacts as public green space (Farahani et al., 2018). For the aims of this study, private green space refers to a private domestic garden or indoor plant. Cameron et al. (2012) defined the private domestic garden as "the area adjacent to a private dwelling, which itself is either privately owned or rented" and the general public can not access it. Previous studies have documented gardening-related health benefits, it is not only one of the few pastimes associated with promoting greater physical activities but also with the ability to interact with nature (Cameron et al., 2012). However, as most of the international students live in student dorms, gardening was less likely to be possible. Instead, the study takes cultivating indoor plants into account.

### 2.1.2 Defining blue space

In contrast to green space, blue space is less familiar and previous research have interpreted this term variously. Generally, blue space signifies all visible surface waters in space and has traditionally been integral to the development of spas, baths and other healing water spaces across different cultures and settings (Foley, 2016). In this paper, this aesthetic landscape will be divided into two categories; urban and rural inland blue space. As the study area, Wageningen is not situated along the coast, hence the coastal blue space would not pertain to the investigation.

Grellier et al. (2017) defined blue space as natural or man-made outdoor aquatic areas which feature water significantly and are open to humans in proximity. In view of 'blue', the associations with oceans, seas, lakes, rivers and other bodies of water were being established (Foley & Kistemann, 2015). Rural inland blue spaces can be discovered easily in Wageningen, which include "ponds, streams, lakes, rural rivers and wetlands", while "fountains, urban rivers or canals, swimming pools" (Bluehealth, 2020) can be viewed as urban inland blue spaces are less noticed in town.

### 2.1.3 Defining human health and well-being

The term 'health' and 'well-being' are commonly attached to each other, they are not completely equivalent but affiliated and inseparable. The World Health Organisation (WHO)'s definition of health is most broadly acknowledged, which defined it as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 2006). However, this definition has been met with many critiques due to its absoluteness and strictness. With the rising prevalence of chronic diseases worldwide, illness-free living is becoming more improbable, and we are less likely to attain this optimal health status. Thus, the previous definition does not conform to the social environment and adaptation is needed. In the 1986 Ottawa Charter, health was regarded as "a resource for everyday life, not the objective of living" (WHO, 1986), and in an international health conference in the Netherlands in 2011, a broader yet more functionalistic definition was proposed, which define health as "the ability to adapt and self manage" (Huber, et al., 2011). From my perspective, health is an ability to cope with the environment and life circumstances, and satisfy our own needs in physical, mental and social aspects. Furthermore, positive health is often a foundation for well-being.

In comparison to health, well-being has different connotations and varies among individuals, groups and cultures (WHO, n.d.), it is a complex measurable subjective state and there is no universally 'approved' definition (Völker & Kistemann, 2011). Generally speaking, human well-being is an integrated, multifaceted, and multifunctional concept (Alatartseva & Barysheva, 2015), refers to positive rather than

neutral characteristics, and “enable individuals and organisations to thrive and flourish” (Cambridge Wellbeing, n.d.). In other words, “the state of being comfortable, healthy, or happy”, as defined by the Oxford English Dictionary. Furthermore, there are two approaches to measuring well-being: objective well-being and subjective well-being. Objective well-being, also known as eudaimonic or psychological well-being, relates to material and meaning, how to live a fulfilling life while subjective well-being, also described as hedonic well-being, is determined by how people experience and pursue happiness in life (Ryan & Deci, 2001). Through the lens of the subjective domain, this research underlines how students perceive physical, mental and social well-being when conducting activities or simply being present in green areas or water environments. Upon students’ interpretations, the understanding of how therapeutic qualities in nature contribute to their life satisfaction as well as how encounters enhance their sense of well-being is reached.

## 2.2 Therapeutic landscapes

The ‘therapeutic landscapes’ is a geographic metaphorical concept proposed by Gesler (1992) to reflect on the interaction between health and space. More specifically, he described a place that has “an enduring reputation for achieving physical, mental, and spiritual healing’ (Gesler, 1993). Simply put, it is a natural or built environment in which people can experience and perceive a sense of healing, and the different therapeutic components have the potential to influence human well-being.

### 2.2.1 The development of therapeutic landscapes

Therapeutic landscapes as a framework for evaluating the dynamics between place and well-being has grown in popularity over the last three decades, and the application has become more widespread. Initially, the therapeutic landscape was conceptualized as a space that conducive to health and supports recovery from illness (Gesler, 1992, 1996). Likewise, Williams (1999, 2002, 2010) and Palka (1999) regarded as a place that maintains and promotes health and wellness, as well as improving the quality of life.

Following the review of Doughty’s (2018) and Williams’s (2010) classifications of therapeutic landscapes research, from my perspective, it can be mainly concluded into two categories: traditional physical healing sites and everyday landscapes. The initial emphasis is primarily on historical sites, constructed and natural environments, and healing effects are derived from symbolic meanings and restorative experiences. For instance, the religious shrine at Lourdes (Gesler, 1996), the pristine wilderness, Denali National Park in Alaska (Palka, 1999), the yoga centres in India and France (Hoyez, 2007), and the holy wells across Ireland (Foley, 2011).

Furthermore, non-conventional and ordinary sites have recently gained more recognition for their therapeutic quality. For examples, restorative qualities in home spaces (Williams, 2002), the well-being of the older adults are improved in the communal gardens (Milligan et al., 2004) and the marginalized women feel social inclusion by engaging in activities in local parks (Plane & Klodawsky, 2013). These everyday landscapes, on the other hand, not only play an important role in contributing therapeutic experiences but simultaneously, their non-therapeutic potential is revealed. Milligan and Bingley (2007) examined why some young adults regarded visiting woodland as a coping strategy for stress relief, while others associated it with their childhood experiences and influenced by media which results in the thought of a 'scary place'. Besides, Sperling and Decker (2017) have looked at the differences in men and women's landscapes experiences. In natural environments, women are afraid of being attacked while men feel more free to roam around. Moreover, with the examples of migrants provided by Gastaldo et al. (2004), this category also implied that therapeutic landscapes go beyond the physical environment. In the migration process, mental landscapes can evoke memories and places of home.

Generally speaking, environmental, social, cultural, and individual factors can affect the development of therapeutic landscapes in which it can be both therapeutic and harmful. Based on the value and meaning individuals provided and experiences they have, therapeutic space is thus "individualized, everyday, dispersed, unbounded and complexly constructed." (Gastaldo et al., 2004)

### 2.2.2 Green-blue space for well-being

A subset of the therapeutic landscapes literature has focused on what can be broadly termed 'natural environments'. These studies have examined the relationship between engagements with green nature in various forms (e.g., gardens, woodlands, and wilderness areas) and experiences of health and healing (Milligan et al., 2004; Milligan & Bingley, 2007; Palka, 1999). More recently, the literature has also shed light on the role of 'blue spaces' in promoting well-being. Traditionally, healing power can be found in green-blue space, specifically either medicinal herbs or water in the countryside. As an essential part that offers therapeutic experiences, green-blue space maintains health, enhances a sense of well-being and improves the quality of later life (Finlay et al., 2015). A spate of studies has seen water bodies as a starting point in the healing process (Gesler, 1992; Williams, 1998) and a place for miscellaneous physical activity where therapeutic benefits can be perceived (Foley & Kistemann, 2015). In the canal environment, it provides a sense of rejuvenation and has a stress-busting effect (Vaeztavakoli et al., 2018). In an urban city – Stockholm, green space as a component of the therapeutic landscape plays an important role in



improving air quality and mitigating air pollution, which effectively prevents some health problems (Bolund & Hunhammar, 1999). With better health conditions, the state of well-being is easier to achieve.

Despite the fact that both green and blue environments could promote health and well-being and provide healing effects, Völker and Kistemann's (2015) research compare health effects and therapeutic use between these two environments through four different dimensions. In the experience space dimension, blue space holds a greater possibility for contemplative experiences due to its vastness; in the symbolic space dimension, blue space in their study, the Rhine river embodies a more profound emotional connection and has a stronger identity than urban green space; in the social space dimension, green and blue space engaged individuals in different manners, blue spaces provided a more vibrant social atmosphere while green spaces are ideal for interaction within the friends circle; in the activity space dimension, green space plays a more prominent role in physical activity promoting where activities are more vigorous and intense compare to walking – a core part of the movement in blue space.

Healing can be both physical and psychological and “occurs along a symbolic pathway of words, feelings, values, expectations, beliefs, and the like which connect events and forms with affective and physiological processes” (Kleinman, 1973). Therefore, therapeutic significances of green-blue space can come in many shapes, associated with subjective perception and interpretation as well as their wider societal contexts.

### 2.2.3 The four dimensions of therapeutic landscapes, and the influence of culture

In order to understand the role of social and cultural backgrounds in students therapeutic encounters with Dutch landscapes, this research makes use of the four dimensions (material, social, symbolic, spiritual) of therapeutic qualities that were proposed by Gesler (1992) and further articulated by Bell et al. (2018). Among these core dimensions, the symbolic aspect is underlined because it is closely linked to the socio-cultural level, and cultural influences are thought to shape the relationship between health and place, as well as whether or not the place can be considered as therapeutic (Wilson, 2003). Within the international student population, individuals' subjective experiences, upbringing, and cultural beliefs vary considerably from one another.

In terms of material dimensions, therapeutic landscapes are considered as ‘palettes of place’, implying that not only does the commonly referred ‘green’ and ‘blue’ settings can produce healing effects, but different colours, such as white space, which featured snow and ice in Minneapolis (Finlay, 2018) and Iceland (Brooke & Williams, 2020), and yellow space, indicating the dessert area in China (Wang et al.,

2018) have the potential to act therapeutically. Besides, this study aims to take the multi-sensory facet into account because nature interaction is beyond visual experiences and healing energies can be awakened by engaging the five senses. For instance, the sound of blue spaces, such as streams and fountains, is the most powerful natural sound to block noise from road traffic (Jeon et al., 2010). Subsequently, social dimensions illustrate that it provides a space for therapeutic assemblages and stresses the significance of therapeutic elements in the context of healthcare sites. Furthermore, therapeutic landscapes encourage people to get involved with their spirituality and pursue healing in a wider sense. Additionally, the affective experience is a process of human-place interaction in which strongly impacted by social and cultural norms, anticipation and previous experiences (Edensor, 2012). As a consequence, cross-cultural discrepancies between European and non-European students are likely to lead to differing views on which characteristics have a significant impact on their therapeutic experiences.

Previous research (Bignante, 2015; Wilson, 2003) has pointed out the need to further discuss the relationship between place and well-being among individuals living in different cultural backgrounds because the culturally specific aspects can affect the relationship. Sampson and Gifford (2010) confirmed that during the resettlement, youth with refugee backgrounds have developed an attachment to the place where aesthetic qualities have met, such as trees, flowers and other green spaces. Consequently, the restoring relationship has been fulfilled. However, concerning how landscapes therapeutically affect the special population/minorities in the displacement, resettlement and rehabilitation process, attention had only been paid to first nations immigrant (Wilson, 2003), indigenous group (Madge, 1998; Williams & Guilmette, 2001) and refugee community (Biglin, 2020) while attention on international students migration is also noteworthy but remains absent. Therefore, this research outlines how varying emotions, ideas and experiences infiltrate students' perceptions of therapeutic landscapes under the divergences of personal value.

#### 2.2.4 Therapeutic mobilities

Therapeutic landscapes bring attention to the relationship between health, well-being and spatial settings. However, there is a dearth of research discussed the value of movement itself add to well-being until a new concept, therapeutic mobilities is coined. It discussed how therapeutic qualities in everyday movements contributes to well-being (Gatrell, 2013) and utilized to understand therapeutic spaces from the mobile perspective (Doughty, 2013). Building on this notion, this research analyzes how daily movements; cycling or walking to the grocery or roaming in neighbourhood green and blue settings bring therapeutic effects to international students.

The benefits of therapeutic mobilities present socially and individually. In order to confirm mobilities can be therapeutic, Gatrell (2013) took walking as an example to manifest its beneficial impacts from three dimensions; activity, sociality and context. Among children, schools in New Zealand (Mitchell et al., 2007) and the US (TenBrink et al., 2009) have put 'walking school bus' into practice. This intervention not only ensuring physical activity but also increasing active school commuting. Another example such as walking campaign in less affluent communities is given (Fitzsimons et al., 2008; Pretty et al., 2005). Residents responded that mood has significantly enhanced and physical activity has ameliorated. Regarding sociality, walking confers a sense of well-being in two scenarios. On the one hand, walking in green and blue environments offers a possibility for social interaction, which could strengthen the community bonds (Finlay et al., 2015). Especially under the COVID-19 circumstances, the indoor gathering is suggested to be minimized, walking together is seen as a relatively safe way to maintain social contact because social distancing can be ensured in open spaces. This shared movement facilitates the creation of mobile therapeutic spaces where enable individuals to have restorative experiences and pursue a sense of well-being (Doughty, 2013). On the other hand, solitary walking allows us to reflect and ponder, which conducive to problem-solving. Additionally, the walking context, it refers to walkability, in other words, how environmental factors associated with walking experiences.

Building on the therapeutic landscapes framework, this paper investigates how everyday green and blue space can perform a therapeutic role for international students experiencing the COVID-19 pandemic in the Netherlands. In such an environment, different material, social and symbol (spiritual) characteristics could induce healing effects in which participants could perceive a sense of physical, mental and social well-being. Furthermore, by applying the therapeutic mobilities concept, a holistic understanding of how space contributes therapeutically from both the static and mobile aspects is gained.

### III. Methodology

This chapter will outline a qualitative research design from which data concerning international students' perceptions and experiences of how nature influences their well-being and therapeutic characteristics of everyday green-blue space was gathered. To begin with the study area and population, it provides readers with an overview of the research setting. The researcher will then demonstrate data collection practice by incorporating the chosen methods, which include the semi-structured interview in the formats of sit-down and walk-along, as well as narrative interview. The data will be further analyzed via the use of coding, and the 19 inductive codes produced from 15 interviewees will eventually be categorized into four themes for presenting the results. In addition, the performance of this research will be discussed through the analysis of generalizability, validity and reliability, and lastly, the researcher will describe her position in this study, which occur in both an advantage and a disadvantage.

### 3.1 Study area and population

In this research, Wageningen, a Dutch town in the province of Gelderland, central Netherlands was chosen to be the study area for three reasons. Firstly, Wageningen itself is endowed by a large area of nature; community gardens, forests, woodlands, country parks and wilderness areas are easily accessed by either walking or cycling. This proximity embodies the value of green-blue space even more due to stay at home as much as possible was recommended during the lockdown. Secondly, Wageningen University and Research (2019) has a total of 2.889 international students from various continents in the academic year 2019/2020. This diverse composition becomes a facilitating factor for the researcher to reach out to target audiences in which a more valid and reliable result is achieved. Lastly, in terms of the data provided by the National Institute for Public Health and Environment (2020), it shows that the number of cases per 100.000 inhabitants was 84.7 in the Netherlands during the first peak of the COVID-19 outbreak; from April 1<sup>st</sup> to April 14<sup>th</sup>, while in Wageningen, it was 55.5. With that being said, relatively low confirmed cases would have the possibility to alleviate students' uneasiness and fear from the virus and cultivate more positive well-being in some way. Furthermore, in regard to the study population, every type of international (non-Dutch) students; who obtained a Bachelor, Master or Doctoral degree at Wageningen University and Research and was staying in the Netherlands from March to June could be taken into account.

### 3.2 Methods

Qualitative interviewing is an underlying method of gaining in-depth knowledge about participants' interior experiences and meanwhile, providing informants with an opportunity to interpret their perceptions and emotions (Weiss, 1995). Among all different forms of interview, this research mainly adopted semi-structured interview in both sedentary and walking format and along with a few narrative interviews to establish the understanding of international students' experiences in green-blue space in Wageningen and their perceptions of well-being regarding the exposure to nature. By steering conversations, an interview guide (see Appendix 1) was formulated and utilized as a measuring instrument during the process (Boeije, 2009).

#### 3.2.1 Semi-structured interview

As the means of collecting data, the semi-structured interview is considered as the most frequently used qualitative interviewing format (DiCicco-Bloom & Crabtree, 2006) and it is easy to implement (Wengraf, 2001). Regarding the research topic, it is suitable for analyzing respondents' perceptions and opinions in relation to complex and sensitive matters (Barriball & While, 1994). Although the nature of

this study is neither complex nor too sensitive, interviewees were asked to reminisce about their health and well-being, and life in general during the first lockdown which could trigger emotional sensitivity. With thorough preparation, a list of predetermined open-ended questions was structured (DiCicco-Bloom & Crabtree, 2006), which encouraged respondents to share as much comprehensive information as desired. Besides, for the sake of enabling the researcher to probe for more follow-up questions according to participants' responses (Turner, 2010), developing a rapport is required (DiCicco-Bloom & Crabtree, 2006).

### 3.2.2 Walk-along interview

In addition to the conventional sit-down interviews, six walk-along interviews were performed, in which students took the lead in a walk around their familiar green and blue neighbourhoods while conversing along the way. Walking interviews yield richer place-specific data than sedentary conversations because interacting with the place allows students to detail their experiences, emotions and thoughts (Carpiano, 2009; Kusenbach, 2003). Exposure to the physical environment also increased multi-sensory stimulation (Adams & Guy, 2007) and participants were better recognized the importance of daily nature to their health and well-being (Evans & Jones, 2011) as well as value the therapeutic landscapes' characteristics. Furthermore, it helps the researcher to further the understanding of how the amount of green-blue space impacts foreign students' quality of life and how the everyday landscapes practices serve to address the lack of social contact and physical activities. Lastly, the walking interviews provided an opportunity to notice participants' habitual connections with the environment (Kusenbach, 2003), such as smelling the flowers, picking up the leaves, and taking pictures of the sceneries.

### 3.2.3 Narrative interview

The narrative interview is the other method in qualitative research which stories themselves are seen as raw data (Bleakley, 2005). This approach aims to provide participants with an opportunity to narrate their experiences while active listening and open questioning are requested from the researcher (Kartch, 2017). In this study, the researcher initiated the narrative with an open-ended question; *Tell me about your experiences with green-blue space*. Often time when narrators referred to experiences with nature in Wageningen, they associated the contact with forest/water bodies in the past and their feelings in such areas without the coming questions being elicited. In this scenario, the researcher involved storytelling as a listener and facilitator and let the narrator steer the conversation instead of taking the lead (Kartch, 2017). Lastly, by choosing narrative interview, this study has developed a deeper understanding of international students' situation and how their personal experiences influenced environmental identity because "narratives provide us with access to identity and personality" (Lieblich et al., 1998).

### 3.2.4 Interview guide

An Interview guide serves as an integral part of a qualitative study in which a string of questions is developed to lead conversation towards the research subject (Krauss et al., 2009). In order to address the purpose of the study (Barriball & While, 1994) and yield abundant data from interviews, questions are comprised of two levels; main themes and follow-up questions (Kallio et al., 2016).” Therefore, this semi-structured interview guide was made up of 15 open-ended questions and one close-ended question from five topics, excluded the introduction and closing sector. The conversation began with a lively tone and an opening question as regards the current state of participants’ health and well-being, leading them to the first topic – health and well-being. All these questions were interrelated and in compliance with the main research questions and theoretical framework (example question from each topic are outlined in the table below). Directed by the interview guide, the answers manifested their stories about green-blue space in Wageningen and feelings of nature experiences. Ethical concerns have been taken into account while formulating questions.

Topic	Example question
Health and well-being	What’s health and well-being means to you?
Experiences in green-blue spaces	Could you describe your feelings when visiting this place and how your emotions have changed?
Characteristics of therapeutic landscape	What are the main reasons for you to visit this place (or nature in general)?
Place attachment	What do you think the place you grew up shaped your relationship with place/space?
Therapeutic mobilities	What would you choose to move from one place to another and what do you benefit from the movement?

Table one: example questions that correspond to five interview topics

### 3.3 Data collection

In qualitative research, the term ‘sample’ is commonly used and participants are intentionally selected based on the needs of the study because each ‘unit’ carries a lot of significance of the research (Coyne, 1997; Boeije, 2009). As this research aims to investigate international students’ experience in green-blue areas in Wageningen during COVID-19, a purposive sample was chosen from a defined research population mentioned in the first section of this chapter. In order to recruit 15 interview participants, two methods were employed in the process; direct contact via Whatsapp, Facebook and Instagram inside the researcher’s network and snowball sampling in which participants were forwarded by previous interviewees. Networking strategy is known as a convenient and efficient way to sample

participants who were subsequently approached (Boeije, 2009). Additionally, all interviewers perceived more or less the objective of this study before the interview and considered themselves had interaction with green-blue spaces to some degree.

Regarding the time frame for data collection, from October 20<sup>th</sup> to November 28<sup>th</sup>, 2020, 15 international students from 11 countries; China, Indonesia, India, Mexico, Surinam, Mozambique, Ghana, Spain, Italy, England and America have participated in the research. In total, 14 interviews were conducted individually which enable students to dive deeply into social and personal issues (DiCicco-Bloom & Crabtree, 2006) and the other two respondents preferred to be interviewed at the same time. Interviews were carried out in Cantonese, Chinese and English in various locations in Wageningen. Ideally speaking, the chosen environment should be the best possible to manifest study itself where a researcher can learn most about the subject (Boeije, 2009), which in this case is participants' regular route in green-blue areas. However, a few social and personal factors hinder the process that eventually resulted in only six interviews were taken place in the optimal setting, four interviews were in a home setting as it is considered more comfortable for participants (Gagnon, 2015), four were inside campus buildings; Lumen and Leeuwenborch and the other one via Microsoft Team. Interviewer as a listener actively engaged in their storytelling and guided the conversation if necessary, the lengths were varied between 21 minutes 25 seconds to 57 minutes 53 seconds. Lastly, all recordings were permitted by participants and each of them expressed their support to this research. It was pleasant to notice participants' enthusiasm for the topic and their willingness to share stories with green-blue spaces in the past months. The majority of them found it meaningful and seen it as a great chance to reflect the relationship with nature and space, to rewind the feeling and to appreciate the proximity to nature which facilitates their well-being, especially during the lockdown. Moreover, a few of them stated that this interview reminds them to be more mindful when having contact with nature in the coming days.

In addition, the same interview guide was applied in every interview to ensure consistency and structure except for two interviews, an additional close-ended question; *"Do you think green-blue areas affect you even more during this time?"* have been asked but none of the 19 codes was generated from it. Furthermore, 16 questions were asked in order theoretically. However, some questions might be left out to avoid repetition when interviewees were talkative and already covered the answer within the course of narratives.



### 3.4 Data analysis

In the qualitative analysis, “data are sorted, named, categorized and connected”, and interpretation is involved in all these activities (Boeije, 2009). The analysis aims to “make sense out of the data” (Merriam & Tisdell, 2015) and the process comprises of two primary activities, namely segmenting and reassembling. All the raw data were generated from 14 recorded interviews and permissions were given by all participants which could be used for further analysis. Interviews were first fully transformed into analysable documents and pseudonyms was applied (see Appendix 2 for an example transcription). Overall, 11 out of 14 interviews were transcribed manually and the other three were completed through a software program – Otter, and proofreading was followed. Before the coding procedure, the researcher skimmed through interview transcripts and highlighted recurring words and ideas that were related to and embodied the research questions.

In order to turn the raw data into meaningful findings, coding, as the most significant tool is presented (Boeije, 2009). Charmaz (2006) defined coding as “categorizing segments of data with a short name that simultaneously summarizes and accounts for each piece of data.” With the aim of dividing data into fragments and generate corresponding codes, which is “a label that depicts the core topic of a segment” (Boeije, 2009), interview transcripts have been reviewed again under scrutiny. In total, the coding scheme contained 19 inductive codes and was derived from 14 interviews (see Appendix 3). Subsequently, 19 codes were categorized into four themes. These categories should be representative and able to reflect the main findings of the research (Creswell & Creswell, 2017). When it comes to the final phase of the analysis, interpretation takes place which is expounded on the data (Creswell & Creswell, 2017) and looked at from a theoretical perspective for the purpose of answering the research questions (Boeije, 2009). These four themes will be unfolded and further delineate in the next chapter.

### 3.5 Quality of the research

Boeije (2009) and Creswell (2014) both considered validity and reliability as two indicators for the accuracy and the quality of the qualitative research and have utilized to assess the credibility of the results.

External validity, also known as generalizability, refers to whether or not the results can be extended to other contexts, settings or groups (Boeije, 2009; Noble & Smith, 2015; Bryman, 2016). To put it differently, if the research is externally valid, the findings can be generalized to all the international students in WUR or the circumstances in the pre-COVID-19 season. However, in the setting of nearly 3,000 international students, the number of students who took part in the interviews were relatively small. Therefore, only a limited range of perspective and experiences have been reflected in this study. On the

other hand, by the time of sample selection, the length of participants' stay in Wageningen was not taken into consideration and the self-perceived well-being and nature connectedness were not measured beforehand. Because in the later stage of the analysis, the researcher found out the span of the stay affected experiences and the well-being status impacted students' emotions and feelings in the green-blue space.

Internal validity reflects on the accuracy with which data is described and interpreted (Noble & Smith, 2015). In this study, the researcher holds the position of an insider, namely an international student; to build a rapport, I have outlined my personal feelings in the interaction because we shared similar experiences during the pandemic. However, this active intervention may have induced biases and influenced participants' perspective, resulting in findings that do not accurately represent the data. To enhance credibility, researchers should minimize the use of probing words and share their experiences afterwards.

Reliability refers to "the consistency of the measures", which means once the adopted methods are appropriate and trustworthy, identical or comparable outcomes are being expected (Boeije, 2009; Noble & Smith, 2015). While the same interview guide was applied in all 14 interviews, with the exception of two interviews where one close-ended question was posed, the interview format varied from sit-down and walk-along. Moreover, the tone in which the researcher prompted the questions differed between acquaintances and people who were unfamiliar with. Therefore, maintaining the interview format and remain neutral tone in interviewing has the potential to improve reliability.

### 3.6 Positionality

Reflecting on my position in the research context, I realized that my identity had influenced the interview process. As a Chinese researcher who has been in Wageningen since the outbreak began, I fit completely in the demographic of the research population and thus served as an insider when interviewing other international students. This positionality resulted in both an advantage and a constraint. On the one hand, the identification helped me acknowledge and understand the challenges that international students encountered, and made it easier to identify commonalities and be emotionally attentive to the narrator. Besides, since eight of the interviewees were friends of mine, it was easier to establish trusting relationships from which richer data could be gathered. However, on the other hand, the results may be less objective. Because growing up in a neighbourhood where having access to grassland and an arboretum has impacted my relationship with nature profoundly and thus during the conversation, I gave responses to participants' stories with emotions and perhaps unintentionally, leading the conversation in the direction I expected.

## IV. Results and Discussion

This chapter will present four main categories of findings and highlight how they add support to prior literature while also providing new insights into the therapeutic landscapes research. To begin with individual relationship with nature; how one's educational background, childhood experiences, and upbringing environment shaped the affiliation. Subsequently, emphasize that a dose of nature serves as a vital health source in this stressful circumstance; the discourse of how everyday practices in the green and blue environments affect students' well-being will unfold in three aspects; physical, mental, and social, with the influence on mental well-being is the most profound. Moreover, individuals have associated the therapeutic attributes of landscapes with characteristics from material, social and symbolic (spiritual) dimension, with the symbolic features being mostly reflected by non-EU students. Lastly, the results of the students' perceptions of the green and blue areas will be shown. Although the preference of green or blue is fairly subjective, the findings are intriguing because a number of interviewees believe these two settings are inextricably intertwined.

## 4.1 Individual relationship with nature

Due to the diversity of the interviewees' constitution, the variance among individual's relationships with nature arise. Previous studies have proven that those who spent more time in nature as a child or grew up in a family that valued nature reported a higher sense of nature connectedness than those who were relatively less attached to nature, such as bringing up in a densely populated urban area or raising in a less green vicinity (Tam, 2013; Windhorst & Williams, 2015). The data collected in this study validated this result as well as implied that the bond with nature is fostered in a number of ways.

Among the 15 participants, seven students grew up with access to nature (in both urban and rural settings), while the rest discovered and became fond of this way of living during vacations to the mountains/nature areas, Erasmus Exchange Program, bachelor studies, working and their stay in Wageningen. The participants richly exemplified relationship with place has a direct impact on self-identity that they realized themselves as a mountain person or have a sense of belonging in the ocean after migrating to urban areas, and affect residence decision, where they are inclined to dwell in a more natural area in the coming days.

*"Like hills, to listen to this night insects, it was only the moment when everything changed, when I migrated to Delhi...I realized the difference...it's not close to nature. So I think like as a kid, subconsciously it was planted in me, the relationship with the mountain, that I am a mountain person." (Indian-Nepali, non-binary)*

*"I never realized how much I miss nature until I left England. So I think I really crave that. When I started travelling...I discover that I like the mountain, hiking, being in that nature, the silence, the clarity of your thoughts you get. So I said I'll never go back to London for that reason." (British, female)*

The philosopher Friedrich Engels once said, "Each of us is a particle of nature. We belong to Nature." The majority of participants' interpretations correspond to this saying, in which a sense of belonging to nature appears to every individual in spite of growing up in different cultural and social contexts, either urban or rural environments, western or eastern societies; for instance, a student from Ghana reflected on his upbringing and said, *"I didn't grow up in the nature area but it was something I wish I had"* (Ghanaian, male), a woman from Spain pondered after moving out from Barcelona, *"I discovered another way of living...with much more nature around and I really like that feeling"* (Spanish, female). However, there were some inconsistencies, such as one respondent who noted that Wageningen is relatively rural and that she would prefer to reside in a city with a larger population, despite the fact that she might encounter the deficiency of nature interaction.

Moreover, previous research has demonstrated that an individual's relationship with nature and the amount of time spent in nature are correlated. In other words, people who are more nature connected tend to spend more time in natural places (Nisbet et al., 2009; Tam, 2013), and this direct interaction has a positive impact on pro-environmental attitudes and behaviours (Hartig et al., 2001; Lawrence, 2012; Martin et al., 2020). After living in Wageningen for two years, an interviewee genuinely expressed her appreciation of students' attitude towards nature and the environment, *"that people recycle, they actually care about the impact of the planet and I have never seen that to this extent anywhere else"* (British, female). With the fact that Wageningen, the 'city of life science', has accessible and expansive natural landscapes, students can come into contact with nature even if it is unintentional, and because the university is renowned for its agricultural and forestry programs, students become more connected and drawn to nature, and subconsciously aware of environmental issues. This finding reinforces the idea that the surrounding environment has an influence on students' relationships with nature and facilitates them to undertake sustainable practices, for instance, consuming 'green' produce and reducing their plastic use.

Unlike adopting different scales as a measurement of the individuals' feeling about nature in previous research (e.g., Mayer & Frantz, 2004), students' responses in the interviews were based on their subjective experiences, confirming that certain people had a greater desire for nature connectedness than others (Tam, 2013). The findings also lend support to Kellert and Wilson's (1993) term 'biophilia hypothesis', which described human's innate tendency to establish connections with nature from an evolutionary perspective as our ancestors made living in the natural environment as well as human-nature relationship is shaped by educational and cultural background, and experiences (Kellert, 2003).

## 4.2 Interaction with nature and well-being outcomes

Nature is uniquely compatible with human inclinations, such a setting may deliver restorative experiences and enable us to carry out a variety of activities readily (Kaplan, 1983). Thereby, the two main findings in this section will come in a sequence that expounds on respondents' experiences and feelings of the increased engagement with nearby nature and how the interaction facilitates their physical, mental and social well-being.

### 4.2.1 The use of green-blue space under a global crisis

By means of the data from the Google Community Mobility report (Google, 2020) and the empirical evidence supported by Derks et al.'s (2020) research in Bonn, Germany and Venter et al.'s (2020) investigation in Oslo, Norway, the growth of recreational activities in forests and city parks, or broadly, green space is progressively recognised. Subsequently, the other findings during COVID-19 suggested that the frequency of visit to nearby nature (indoor and outdoor green) would help mitigate mental health issues and deliver higher levels of life satisfaction and subjective happiness (Soga et al., 2020). As indicated earlier, residents still gained permission to roam around freely due to moderate rules imposed by the Dutch government. Nevertheless, compared to a large-scale city that potentially faced with inadequate green space, interviewees showed gratefulness in response to the experience of living in a place where a large amount of greenery converged. By analyzing interview fragments, although participants did not directly discuss their mental health condition before and after a stroll in these areas, their emotions certainly implied the necessity of getting access to natural areas in this extraordinary time. These findings are compatible with the previous results and the importance of highly accessible vegetation has been reinforced.

*“During the quarantine, I’m so grateful for nature and living here. Even though we were in lockdown, you can still see people. In comparison to people in the big city, they are really locked in right. I was super grateful for everything around us.” (British, female)*

*“It’s really good during corona times to be here, you can still go out. Imagine I’m in Amsterdam... it might be very depressed. Everything closed and if there’s a park, everyone is in that park and you still need to keep the distance. Here is really spacious and can enjoy nature.” (Italian, female)*

However, research by Martin et al. (2020) as well as Richardson and Hamlin (2021) attested that the green environment of a neighbourhood is not necessarily beneficial to an individual's health and subjective well-being. The researchers interpreted the quantitative data through the lens of a distinction between existence and use of green space. Consequently, living close to nature does not imply noticing and interacting with nature, and this interactive behaviour becomes a decisive factor. In comparison to

research conducted earlier, none of the interview questions in this study discussed the frequency of nature contact in the pre-COVID-19 season and the midst of the pandemic, nor did they recognize the means of contacting nature, such as incidental contact and intentional contact. Therefore, the findings leave it unanswered if participants' positive emotions were boosted by the surrounding green via incidental contact or if they were related to the times of green areas visits.

#### 4.2.2 Physical well-being

The global outbreak is a reminder for us to take care of our physical health because having a strong immune system is of great importance to defending against the virus. However, regular physical exercises could be interrupted since gyms and sporting venues were remain closed and group classes were suspended. To maintain physically active, as it is the determining factor of stay healthy (Pretty, 2004), adopting physical activities in natural areas is an option, particularly green exercise produces substantial impacts on the sense of well-being (Pretty et al., 2003; Pretty et al., 2005). Fortunately, students here in Wageningen have the privilege of returning to nature and physical well-being mainly manifested from two aspects; feeling good physically from undertaking exercises and experiencing emotions physically induced by movement.

For the sake of preventing congregation in the workplace, working from home or working remotely has advocated by the government. This new norm, however, directly led to an inactive, sedentary lifestyle and screen time was soaring owing to all arranged online meetings and classes. Therefore, physical activities appeared to be more urgent under this circumstance. Most of the participants felt thankful and resonated with the same feeling that nearby nature provided a space for them to exercise in which their physical well-being was able to achieve. They cherished the time to step out of the room, took a break from the screen and kept the body active even more. Interviewees shared the experiences of practising Acroyoga in a patch of nature or along the water bodies, swimming in the Rhine river, running around the fields behind campus, cycling around the town or going for a long walk in the Hoge Veluwe area. After outdoor activities, they can immediately feel that muscles are activating, blood circulation is boosting and in general, the body is functioning better.

*"At first I was cycling very often, every evening. Like at least I'll cycle past Hoevenstein or maybe go to the hill there. Basically for me to exercise and see if I can lose some weights." (Ghanaian, male)*

*"I feel good because my leggings are stretching. Cause you can not really do many sports right now so at least it's an open space in which you can either sometimes go for a run or walk in the woodlands." (British, female)*

In addition to perceiving a sense of physical well-being directly from moving the body or sweating from exercises, the perception is also derived from emotions of our physical experiences. Because our body and mind are inextricably connected, the sensations we experience will be embodied by our body. Sugiyama et al. (2008) concluded the significance of the quality of natural environments in which the researcher could relate in this study. Healthy green and blue environment can nourish our body and the energy we gleaned could reflect physically. A participant indicated that when stretching her arms, she heard the cracking sound around her joints and in her back, and felt lighter physically and a sense of letting go. Analogously, therapeutic landscapes allow the other fellow to understand physical well-being on a more spiritual level.

*“I feel really light like I was not carrying everything that comes with being myself I think, all those tasks that I had to do, everything I would just leave it somewhere else. I would just be with me and my body and my spirit. I feel really light, carrying my body and dragging it across the grass you know.” (Indian-Nepali, non-binary)*

Another girl spoke about how physical activities make her feel good about herself, feel more confident with her body, and hence gain a sense of accomplishment. In the area encompassed by natural elements, we toss out the toxic energy, release the tension and feel more connected to our body, our soul which able us to observe the transition physically.

*“I’m being healthier like I’m really getting my exercises... I look fitter, I look better. I think I kinda got like abs this summer... Also, you feel like you’ve done a good job at something, so you feel better about yourself.” (British, female)*

As the extant research only evaluated the effect of green exercise on self-esteem and mood (Pretty et al., 2005; Pretty et al., 2007; Barton & Pretty, 2010) and verified natural green and blue environment bestowed health benefits (Pretty, 2004), the present study brings new insight into this field; physical well-being also manifests on physical sensations. Prior literature oftentimes omits how our body responds to absorbing therapeutic energies, and thereby future research should pay more attention to how our body experiences emotions being amidst nature. In short, this research confirmed that physical well-being is somewhat internal and external and physical activity gives ourselves, our body and our mind room to breathe by all means.

#### 4.2.3 Mental well-being

There is substantial evidence of nature’s beneficial effects on mental well-being (e.g., Hurly & Walker, 2019; Meredith, et al., 2020). Compared to physical and social well-being, more participants acknowledged the significance of the mental aspect. Concluding from their experiences, this section will



be composed of three layers and will discuss how they gauge the mental benefits of getting involved in natural environments.

### *Refreshed and inspired*

Given the fact that everyday nature is accessible in Wageningen, albeit participants do not visit intentionally, they could build connections accidentally and hence able to engage with nature on a daily basis. Amid the COVID-19, several participants realized the value of unplugging from technology and harnessing the benefits to take a respite in nearby natural areas. A Mexican student reflected on her walk around the campus in between studies and said, *“I’m kinda disconnected from the world...it takes some space from this technological connection” (Mexican, female)*. Besides, a few students also described a sense of relaxation and freshness, *“my brain is fresher” (British, female)*, *“it relaxes my nerves and muscles” (Indian-Nepali, non-binary)*, *“I feel like something has left me” (Ghanaian, male)*, *“all my problems go away” (Spanish, female)*, *“I’m more prepared to restart” (Mexican, female)*. Their experiences demonstrated that investing time in nature would help tossing out the stresses from the newly online education setting, as well as negative energies from reading dreadful corona news and noticing the rapidly changing number of confirmed cases. They regained momentum or simply felt like lifting the weight from their shoulders, leaving everything behind, and empowering their bodies and minds to unwind. According to a couple of researchers (Capaldi et al., 2014; De Vries et al., 2011; Nisbet et al., 2011; Ulrich et al., 1991), being exposed or engaging in physical exercises in natural environments could boost vitality and enable emotions to transfer towards a more positive state. Likewise, a Mozambique student admitted that on the days when she was least productive, the beneficial effects of nature become more pronounced. She felt at ease as a result of her visits to green areas and didn’t have a feeling of it’s such a waste of time.

Moreover, a few participants noticed that the positive impacts of being present in open spaces go beyond the feeling of renewal; natural elements have evoked their inspiration and creativity to some extent as well. Albert Einstein once said, “look deep into nature and then you will understand everything better.” This sentiment is also echoed by students’ experiences because natural environments not only create rooms for our physical bodies but simultaneously, tranquillity and peacefulness enable us to expand and deepen our minds.

*“When you are in your room full of walls, you are kinda in a box. So when you go out in nature, with the breeze and all, it just clears your mind and makes me feel very good.” (Surinamese, female)*

*“I think what I get from the green area is also creativity besides relaxing. Because look at the air you thought in a different way. When you are in a silent place, far away from your own setting, it makes you change a little bit of the idea.” (Mexican, female)*

Except physically interacting with nature, an Indonesian student shared her vision experiences of booking a pond view room in Leeuwenborch or opting for a window seat in the Forum library. She illustrated that when her mind got stuck, nature sceneries often time facilitate her to come up with new ideas and inspirations. In addition, while discussing therapeutic mobilities, Gatrell (2013) documented a few writers who commented about “walking generating a rhythm of thought”. This remark is evident among a few participants that they identified the movement per se as a thought-provoking activity, either during walking or cycling.

*“In the middle of the journey, when I have already seen some part of nature, it can also ease my mind. Sometimes some new thoughts are being generated.” (Indonesian, male)*

Lastly, a Chinese student delivered a unique outlook on how natural elements have driven her creative performance. As part of her permaculture course, she was asked to grow plants from seeds and documented their daily changes. Rather than buying seeds from the store, she was inspired by a stay-at-home lifestyle and intended to regenerate seeds from tomato and avocado in which she had a chance to somewhat live a self-sufficient life. She expressed the pure happiness she found in nurturing plants, *“the process of witnessing plants growth and change is so enlightened and peaceful” (Chinese, female)*. The indoor greenery in this sense prompted her to explore a new way of living and her desire to feel competent and achievement have been satisfied by the opportunity for self-sufficiency that granted by natural environments (Clayton & Myers, 2015).

In concluding, participants’ experiences reiterate the restorative impacts that nature exerts on human mental well-being, accentuated by feelings of refreshment and inspiration during nature walks, viewing natural scenes (vegetations and water bodies) through the window and the transition process. It also provides insight into how therapeutic landscapes might be developed in an everyday setting.

#### *Achieve mindfulness*

Comparing to the restorative effects presented above, the mindful perception has received less attention with regards to how nature contributes to mental well-being. However, a number of studies (Howell et al., 2011; Schutte & Malouff, 2018) have looked into the reciprocal relationship between nature connectedness and mindfulness, which has been shared by a few students. In other words, mindfulness supports individuals to feel more connected to nature, and a stronger sense of nature interaction can help achieve mindfulness.

Mindfulness is described as “being attentive to and aware of what is taking place in the present” (Brown & Ryan, 2003). Based on the participants’ responses, mindful awareness can be fostered through

multiple means, including meditation, simply being in nature, and transitioning by walking or cycling. A student from Ghana said he would go to a park behind his room, where there is a pond surrounded by greenery, and meditated alone for an hour or more. He regarded meditation as a pathway to get in touch with himself. Previous research has associated restoration with meditation, which is thought to be a mechanism that induces peace and allows the mind to restore its cognitive abilities (Kaplan, 2001). I assume that practising meditation in nature facilitates the process because of the serene physical environments. In a similar vein, an Indonesian student reflected on his previous nature experiences and said, *“I can like reflecting and inventing myself... I realized that I am part of the universe...I will absorb the good energies from nature and be more present”* (Indonesian, male). The quote encapsulates a thought that immersing ourselves in nature could not only reinforce the relationship with it as well as the connection with ourselves but also allows us to evaluate our role in a broader context. In addition, a few students have noticed that while cycling or walking, their meditative awareness is enhanced.

*“If my head is overloaded, I wanna walk because it then helps me relaxed and focused and almost meditate. I go through my thoughts and... try to talk with myself.”* (British, female)

*“When I’m walking I would say I’m more focus on the certain things. I would have a long string of thoughts. And I also aware of the surroundings.”* (Indian, female)

Though some participants preferred cycling and admitted that it was a contemplative experience, walking encourages students to cultivate mindfulness more easily and effectively. In general, both activities are slower than driving or riding a motorcycle, but they allow us to be more conscious of our surroundings, absorb the atmosphere and be fully present. Walking, in particular, enables us to pay less attention to the traffic and ease our mind, and the sidewalk is somewhat more isolated which we could appreciate and interact with the world around us, as well as observe seasonal changes in flowers and plants.

In conclusion, students’ mindful awareness can be enhanced from three perspectives and their experiences are consistent with earlier findings that mindfulness promotes a deeper nature connectedness, contributes to a sense of peace (Nisbet et al., 2019) and is conducive to positive self-nature experiences (Unsworth et al., 2016). Especially during unsettling times, we need to turn to nature and experience mindfulness as an opportunity to rewire our connection with the natural world.

#### *Relish the solitude*

Admittedly, characters vary from individuals; introvert or extrovert corresponds to different interpretations of perceiving beneficial effects of green-blue space. In comparison to some students who gravitated by the gregarious atmosphere affording in the wilderness (see section 4.2.4 ‘social well-being’),

a few participants expressed enjoyment of solitary experiences in nature. They were not aiming for interaction with others, but were inclined to a moment of peaceful loneliness and were looking for a place where allow them to be completely alone. As stated by Leary and his colleagues (2003), spending time in solitude occasionally increases overall happiness and mental well-being, and conducive to escape or respite from undesired social contact. Participants' reactions were in concurrence with this previous finding.

*"I'm not going to the forest to socialize. I'm going for my own peace. So I avoid people if I see them."* (Surinamese, female)

*"Sometimes feeling a bit socially pressured, even at home... I'm gonna enjoy the me-time...go to a park and just lay down on my own, read a book with music, or with nothing just like laying down with my eyes closed."* (Mozambican, female)

Students who lived with several housemates sometimes felt obliged to socialize and those who lived by themselves felt overwhelmed with the time spent scrolling and engaging with news from COVID-19. A Spanish girl said, *"I was almost every day checking the number of infected cases around the world"* (Spanish, female) which many participants were able to resonate with this mental state at the beginning of the pandemic. We all need time to process a torrent of news, and as international students who have been away from their families also need to keep an eye on the situation in their home country. Therefore, spending me-time in outdoor settings was seen as a breath of fresh air and a chance to getaway in a time of volatility. Furthermore, two other students indicated that the silent and tranquil ambience in the wild encouraged them to cultivate a clear channel for effortless activities, reflecting and communicating with their heart profoundly.

*"It makes me feel more relaxed and reflective because there is no one around usually and only fields and animals."* (Italian, female)

*"The quietness in the nature area really attracts me. It's very pure, a place that you can completely be with yourself and enjoy the me-time. Although lockdown did reduce social interaction, at the same time, interaction with yourself is boosting. It can somehow offset the loss."* (Chinese, female)

Indeed, being alone allows time to ponder personal issues and concerns (Leary et al., 2003) and likewise, Johansson et al. (2011) found that the revitalisation has been boosted to a larger extent and the restorative effect would be optimal while walking alone in the forest. Nature is, in sum, a setting where we could experience alienation in a stressful time and open up an opportunity for a deeper understanding of ourselves.

Lastly, Leary et al. (2003) proposed the particular factors that lead some individuals to pursue and embrace solitude should be addressed in future studies. On the one hand, according to Staats and Hartig

(2004), the answer could be safety. They argued that companion facilitates restoration by ensuring safety, but that when safety is guaranteed, the individual has a greater ability to recover when being alone. On the other hands, the findings presented above revealed that people are more eager to seek inner peace when they feel overwhelmed and dispirited. While both of these answers are valid, previous studies have been less considered how nature encourages people to experience solitude. Thereby, future research practices may look at whether other factors influence people's willingness to spend time alone in nature.

#### 4.2.4 Social well-being

The Coronavirus unquestionably increased the alone time and impacts on well-being have existed in varying degrees. For those living in a student house, it might be an opportunity to boost housemate relationship whereas, for people who live alone, a sense of community might be absent in which well-being is likely to be more challenging. As such, finding an alternative means to maintain interpersonal bonds is indispensable because "a need to belong is a fundamental human motivation" (Baumeister & Leary, 1995). In the midst of this global event, seeking interaction in nature can be one of the most powerful ways to satisfy the need for connectedness. Some participants enjoyed solitude in the wild as it could deepen the connection with their mind, body and motherland while others noticed that either spending time with nature or socializing with friends in nature would fulfil their social well-being. In the following paragraphs, these two findings will be expanded.

As all non-essential stores (including restaurants) were closed in the Netherlands from April to June, people could not go to a mall or dined out, and therefore leisure activities were, to some extent, monotonous. However, the constraints did prompt people to notice everyday nature where they can develop social connections with animals and vegetations. A few respondents were gratified because they were able to stop by and look at the cows, horses and sheep which they rarely experienced back home. Two of them mentioned that after greening up the personal living spaces, they felt the bond with plants for the first time and realized that it was possible to establish social contact with other living beings. They were pleased not to be alone and having a companion in a confined room. The other two participants felt socially connected via standing by the window and wandering around the arboretum respectively.

*"Everyone was walking individually, we don't talk to each other but it's just you see people and that's a bit better." (Surinamese, female)*

Although both circumstances did not entail participants communicating with others, a sense of belonging was perceived by the liveliness emanated from passersby and through observing other individual activities. This is also in consonance with the findings by Carr et al. (1992) that social inclusion can be expressed in

observing and immersing ourselves in a vibrant atmosphere. Moreover, the current research provides further evidence of the relationship between social connectedness, nature contact and well-being examined by Cartwright et al. (2018). The researcher confirmed that the detrimental effects caused by lack of social interaction can be mitigated by exposure to surrounding nature. To put it differently, contact with nature can become a substitute for the lack of social connectedness and consequently, fulfil the belongingness needs and social well-being. An interviewee highlighted how her social well-being was satisfied by spending some time in a nearby grassland, either reading or simply noticing everything around her.

*“The lockdown did cut down my time to socialize with friends. Therefore, contact with nature became more necessary as it can compensate for my lack of social activities. I do feel like at some points, it strengthens my communication with others, perhaps because we all share the same place, Mother Nature and we have this universal language.” (Chinese, female)*

Clearly, the regularity of social gathering has been drastically decreased with the advent of the implementation of social distancing and restrictions on household visits. Therefore, in order to ease loneliness and build interpersonal and social bonds, online gathering has become a prevailing practice. Besides, if a group of comrades live close to each other, hang around in open spaces would be a preference since face-to-face communication is more authentic, meanwhile, distancing is guaranteed. The results of this research have demonstrated that green-blue spaces offer opportunities for interaction between friends, strangers and like-minded people during the pandemic. Most of the participants noted that natural areas could function as a meeting point, especially enabling them to meet with others who are not live in the same student house. They arranged a barbeque or a picnic, danced and practised yoga with friends or simply enjoyed the sun and had a coffee break catchup in between intense online courses.

*“We always meet in these green areas and then we would have coffee or something and we also keep some kind of distance. So we make use of these green areas as a way of socializing with people.” (Mexican, female)*

*“We’ve been to the Rhine for a few times just to meet with a big group and we have picnics and barbeque.” (Indian, female)*

Furthermore, two respondents shared their unexpected experiences while spending time by themselves in nature. One of the Chinese girls talked about how blue space serves as a social area in which she can make contact with the local community. During her weekend getaway to the beach, a Dutch couple came for chitchat and started speaking Dutch. But due to the language barrier, the conversation was not able to go deeper. However, she could feel the connection through their geniality from the body language, the

amiable tone and the facial expression. The other girl, as a birdwatching enthusiast, told a story of her solo trip to a wetland in the northwestern part of the Netherlands.

*“I love bird watching with friends so it does facilitate my social well-being, we can enjoy nature together. Also, I went alone once and bumped into an old couple. They are more professional than I am and have this spotting scope you know. But since my lens is not long enough and I didn’t want to go home empty-handed, so I borrowed it from them and we discussed the species for a while. They are friendly and easy to talk with, I honestly didn’t expect to have this kind of social interaction before I went.” (Chinese, female)*

There is a paucity of study discussing how natural area exerts positive effects to social well-being, and my findings broaden prior research (e.g., Maas et al. 2009) to both green and blue spaces could provide interaction opportunities for individuals from various ethnic groups and all walks of life. Amidst the worldwide crisis, turning to nature not merely ameliorate loneliness, but also an occasion to create social interaction.

### 4.3 Individual perception of landscapes' therapeutic value

The previous section outlined international students' well-being were obtained in physical, mental and social aspects. However, which elements in nature give wings to well-being and make everyday sites health-enabling remain unclear. The following paragraphs will unravel how characteristics from material, social, symbolic (spiritual) dimension contribute to the development of everyday health-enhancing landscapes. Besides, with these elements in natural environments that have therapeutic qualities, international students could maintain and enhance well-being from everyday practices.

#### 4.3.1 Material

Some participants found that the encounters with therapeutic landscapes activated their senses which enable them to experience the healing effects. Together with the natural and wild soundscapes, the colour that nature wears, the smell of fresh air and the touch of nature, students reflected that these features enrich their nature experiences and add a lot of value to their well-being.

Numerous types of nature sounds have been noted by participants, including birds chirping, leaves rustling and light wind breeze in green spaces, water flowing and frog croaking in blue spaces, and cow mooing while passing through farmland. Previous studies have shown that natural sounds, most commonly birdsongs aid to restorative perception, stress and mood recovery, and physiological health (Alvarsson et al. 2010; Benfield et al. 2014; Ratcliffe et al. 2013). Although earlier findings have also pinpointed that bird singing could be viewed as either pleasant sound or unpleasant noise due to bird species and personal connection to nature, all participants in this research have positively reported the sounds of nature. Therefore, the discussion of the range of bird sounds is not taken into account. Interviewees associated nature sounds with calming, relaxing and soothing, and a number of participants even valued the sound of silence because it empowers them to be more presented and feel more connected to Mother Nature.

*"I'm passionate about bird-watching. Whenever I hear birds chirping, it makes me feel relaxed, it's like lift a burden off my shoulder." (Chinese, female)*

*"You are connected with the Earth and if you go to the green area like you can be with your bike you don't see any cars and people and buildings." (Spanish, female)*

Besides, those who are not used to living in a green setting before arriving in Wageningen are more conscious and mindful of sounds. A Mexican girl tenderly commenting on the enjoyment of birds chirping, in which this sense of novelty draws her to nature. Additionally, because of the nearby construction sound



and inadequate soundproofing in her room, she felt restless sometimes and thus seeking an environment where she could perceive restorativeness is desperately needed.

*“Because I’m from Mexico, it’s not that accessible to go to a green area. And I discover that I really enjoy hearing the birds singing. The birds chirping, the leaf and the wind. The sounds I think! It’s soothing.” (Mexican, female)*

The term ‘palettes of place’ has been increasingly used to examine how various colours of the therapeutic landscape influence individual’s perception and experience. Aside from the pristine green and blue space, white space has also been discussed (Finlay, 2018; Brooke & Williams, 2020). Unlike previous research focused on large-scale and meso-scale settings such as destinations and open areas, participants discussed colour landscape from a micro-scale – home environment. Cox et al. (2017) found that vegetation cover is rate as one of the most essential features in relation to positive mental health among several characteristics of neighbourhood nature. This statement is bolstered by a participant who beheld that the density of trees appears to be one of the most appealing characteristics in nature, she remarked, *“the more trees the better” (Surinamese, female)*. Besides, as indoor natural environments are the easiest accessible nature for most people, two participants explicitly described how their well-being was enhanced by arranging and taking care of indoor greenery. Due to the global outbreak, the flower industry has been hit drastically and sadly, millions of tulips need to be destroyed. Thereby, a student decided to support the business with other friends and bought bunches of tulips directly from flower growers and at the same time, she also benefits from the presence of an assemblage of colours. By the same token, the other respondent has up to 30 potted plants in his place and he feels vigorous with the fact that surrounded by green. The diversity of flowers and plants implies a riot of colours and undoubtedly, this can brighten the living environment, lighten up the mood and in general promote healthy living.

*“I bought lots of flowers to ease my depression, the more colourful the better because when I saw them, I felt passionate...I know at least something is alive in my confined place except for myself made me felt happier and I was not alone, I had their company.” (Chinese, female)*

*“Making sure I have lots of plants because I feel like that’s, this colour green I guess it helps me with my well-being a lot.” (Indian-Nepali, non-binary)*

According to the review by Franco et al. (2017), it is certain that olfactory sensory profoundly influences our emotion, behaviour, and cognition. However, there is no substantial proof yet. As indicated by numerous students, the smell of fresh and clean air can lift their mood, particularly because the time spent indoors has skyrocketed in recent months. Consequently, the need to get a breath of fresh air is more prominent since it would increase the amount of oxygen in our brain and allow us to function better. Some of them said that they felt free, free to breathe and metaphorically, a bird flying out of the cage. In

a nutshell, the freshness of air serves as an initial incentive for some respondents to go out and immerse themselves in green-blue spaces.

*“It was nice to get in some fresh air because you were in your house whole day, not necessarily have a good ventilation.” (Indian, female)*

*“Especially I’m in my room, I feel isolated. But when I’m in nature, there are a lot of things to see. I love the fresh air as well.” (Indonesian, male)*

Touch plays a crucial part in creating bonds but the importance of tactile sensation has often been neglected in human-nature interaction (Franco, Shanahan, & Fuller, 2017). When referring to experiencing touch in nature experiences, earlier literature has provided evidence of physical interaction with animals is accounted for positive psychological and physiological effects (Barker et al., 2003; Beetz et al., 2012; Vormbrock & Grossberg, 1988). But to date, how nature touch from the non-animal context could contribute to well-being has remained elusive. Fortunately, a few participants reminisced their tactile experience with grass and wind during contact with green space and mobility. Thereby, this result is possible to fill the knowledge gap in this domain. Two students expressed their tenderness of walking barefoot on grass, lying and rolling in the grass. This physical sensation results in relaxation and they felt more grounded and connected to the Earth. Two other fellows described the pleasure of stepping on soil, and how their emotion has changes attribute to the texture of the ground.

*“I like walking on top of the leaves when they down on the ground, I like walking on top of them. I like the pathway without cement, the ground itself it’s already nice to walk on it, it’s softer.” (Mexican, female)*

In addition, an interviewee pointed out that the sense of touch could also be stimulated while moving from one place to another on a daily basis. Not only her physical well-being was improved in the cycling process, but the wind on her face was conducive to clear the mind and conceive new ideas. This outcome reiterated the finding by Gatrell (2013) that therapeutic qualities are embedded in movement per se.

*“It does give me a sense of healing, it does. It’s because of the wind, I like the wind. When you bike, it’s cold and especially at the night, it’s really comforting, it emptied my mind, it’s really comforting me.” (Surinamese, female)*

The present findings are corresponding with existing evidence that exposure to the natural environment could provide human beings with multi-sensory experiences (Soga & Gaston, 2020) in which well-being is boosted. Evidently, nature experiences are beyond the visual pathway as reported by a Spanish student, *“With my music or just listening to the birds, I feel free and I could breathe again, fresh air and I feel more connected to this world” (Spanish, female)*. Similarly, the therapeutic effect exerted

during the movement has also been increasingly recognized. A Chinese fellow illustrates that the cycling process stimulates her senses and delivers physical and mental healing; the sight and sound loosen her tight muscle and empty her mind, *“I really like the cycling process, especially a good ambience would facilitate my journey even more... I love looking around, mushroom and birds always distracted me” (Chinese, female)*. Due to the fact that the sound, touch and smell could evoke an appealing and healing journey in natural landscapes, the future investigation should reflect more on non-visual stimuli as it is under-explored. Moreover, this study mostly manifests positive outcomes of sensory experiences and the researcher reckons that participants will have distinct sensory perceptions if the research is performed in different seasons and settings; because with the contrasting time spent between indoor and outdoor in the time of COVID-19, human senses might be more sensitive while in nature.

#### 4.3.2 Social

In a space where social well-being is perceived by interpersonal interaction, a number of female participants of this study reflected that a sense of security is a necessary prerequisite for achieving therapeutic experience. When the interviewer asked about the characteristic that motivated them to visit a natural area, a girl from Mozambique reacted surely and promptly to ‘perception of safety’. In contrast to the previous experiences in her home country, she valued the time alone in a safe and healthy greenfield and affectionately shared the connection with landscapes. She appreciated that safety issue could leave behind whilst spending pastime in open spaces either in the dark or early in the morning; simply put on the headphones, lay down on the grass and relish nature come naturally and is part of her daily routine.

*“I think I always feel very grateful when I go out in The Netherlands because this is something that I'm not used to do alone back home... I really enjoyed the green in the Netherlands and...I associate the green with like, okay, it's safe, it's pure, it's the smell of nature...and I'm not gonna have someone trying to arrest me.” (Mozambican, female)*

Undoubtedly, without feeling at ease in a social and physical environment, it is unwise to undertake activities alone in an outdoor setting even if the place has not been abandoned. When reminiscing a park near her workplace back home, she said,

*“Nice parks in Mozambique it's like you're going to be assaulted. So if you go for a walk in a place that there is no one, you're gonna for sure have any problems ” (Mozambican, female)*

This is in consonance with Valentine’s (1989) previous statement that women could feel more defenceless when engaging in leisure activities in public deserted (green-blue) space such as parks, woodland, canals and rivers. The research by Finlay et al. (2015) also demonstrated that several elderly women felt

vulnerable to crime while exercising alone. Likewise, an investigation by Giles and Oncescu (2020) revealed the downside of single women' involvement in leisure activities during COVID-19. Due to the change of activity patterns, solo leisure pursuits is more pervasive and used as a substitute for group activities in order to curb the spread of the virus. However, this increasing solitude time leads to an enhancement of fear and women safety have been challenged. Besides, the dread of violence also associated with the way public space is accessed, occupied and managed (Valentine, 1989). Moreover, the researcher speculated that a feeling of safety is tied up with the socio-environmental condition of participants' country of origin and embodied identities. The other two girls from Spain and Mexico echoed the same feeling and expressed their commendation of the community safe and reckon that it will be one of the things they miss when leaving Wageningen.

*“For girls, you can walk safely at 2 a.m. outside and no one will do anything. Here is super safe, I really like that.” (Spanish, female)*

*“I can go cycling wherever I want and whenever I want. It's safe and it's easy to do it. So I think that's the most thing I will miss.” (Mexican, female)*

This result assured that a sense of safety is determined by social circumstances as the statement of this study contradicts another study carried out in the same period. Consequently, in order to establish therapeutic relationships with green-blue spaces, safety, as a noteworthy social and economic factor should not be overlooked.

### 4.3.3 Symbolic

In the literature that employed the concept of therapeutic landscapes over these two decades, the symbolic dimension has been less considered but viewing from this perspective, Wilson (2003) stated that the places enable us to heal and connect with our spiritual selves. Taking the occasion to interview 15 international students consisting of 11 nationalities, the findings zoom in on the socio-cultural level to assess how students interpret their self-encounters with everyday nature from various perspectives based on the culture they are embedded in and how they use memories to connect Dutch landscapes to places of home. Earlier studies (Conradson, 2005; Edensor, 2012; Gesler, 2003; Wilson, 2003) have also shown that a range of experiences and symbolic meaning of therapeutic landscapes derives from individuals' subjective relationship with nature, different patterns of engagement and interpretation, and a wider socio-environmental context.

As a migrant community, international students need to mediate the construction of Dutch landscapes in light of the cross-cultural differences. Despite the fact that natural landscapes are a common

home of mankind, the diverse category yields a wide array of impressions and perceptions among people from different cultures and social settings, yet it all contributes to a sense of well-being. An Indonesian student exemplified that growing up in a rural area, he associates nature with arable land or paddy fields as (South) East Asia is a predominantly agrarian society. However, the green setting in Wageningen takes on a different shape, resembling more of a recreation area where people can socialize and engage in various activities.

*“My parents have these fields where we can grow lots of fruits and vegetables. my place I can tell it’s rural but it’s not as green as here in Wageningen. Here you can easily find parks and can sit there easily.” (Indonesian, male)*

Similarly, a student raised in Eastern Himalaya think of landscapes as a sacred source which no one is entitled to interfere with; the whole community shares the same indigenous values and maintain the holy spirit. Because of the relationship he shared with a place, it took him a while to adjust to the Dutch landscapes at the beginning of the resettlement. Moreover, a student from London described a park near her home as a pleasant place to sit and interact with others, but added, *“it’s just grassland and there isn’t even a tree” (British, female)*. Comparably, she appreciates nature in Wageningen since it is more spacious, open and diverse. On the other hand, a few students from relatively pristine and abundant natural resource areas viewed nature as a wide place that shaped itself, but when they arrived in the Netherlands, they discovered it to be manicured. While the relational image of landscapes is formed differently, these spaces play a health-enhancing role.

#### *Personalized place-related memories*

In the migration process, a few participants created “personalized places-related memories” based on prior experiences and life events. These ‘mind’ places, in other words, mental landscapes instil in them a sense of belonging and as a therapeutic coping mechanism to adapt to the new living environment (Gastaldo et al., 2004). While integrating into the Dutch society, four non-European students experienced emotional attachment in a certain place or a land in Wageningen, these places evoke memories and minds and appear to connect their everyday living with places at home.

According to Franceschelli (2020), cross-border migration poses a challenge to individual identity and social relations. Because of the contrasting social and cultural background, non-European students are more likely to spend longer in creating a bond and seeking their own sense of place in the various realms of the new society than European students. For instance, a woodland nearby a Chinese woman dwelling has become her healing place because spending time and strolling in the woods is a home-related activity

and it delivers a feeling of home. As stated in the research, a regular visit to nature as a child can potentially influence an individual's desire to explore similar settings on their own when they grow up (Thompson et al., 2008). Therefore, even though she visits the forest alone out of her original environment, this piece of land that evokes memories has held a special place in her heart in the process of adjusting to the expat life in the Netherlands.

*"I live in an area surrounded by woods and my family always go there during the weekend. When I'm here in Wageningen, I also want to spend some time alone in the woods." (Chinese, female)*

Similarly, a married student from Ghana studies here alone and expressed sentimentally and nostalgically when looking outside the window and seeing parents riding cargo bikes and carrying their children passing by. While this scenario may seem ordinary for other students, it gives meaning to him as it contains memories of his family time.

*"This bike when you have kids in the front fascinates me, I really like seeing it. You know, those kids insides remind me of my son." (Ghanaian, male)*

Another student came across Nepali herbs while roaming around the city during the first few months. He was surprised but also relieved to discover that these herbaceous plants could thrive outside of his home country. These familiar home-related medicinal herbs bring him a sense of belonging, allowing him to create and share the relationship with landscapes in Wageningen. Likewise, an Indian woman said that when she looked out her window in Wageningen, she saw trees that looked similar to those back home. As a result, this window view can serve as a reminiscence of home, and thus a connection to place has been established.

These four students' experiences embodied that meaning-making to a therapeutic landscape is a subjective process. A place that carries personalized memories of their original setting would not only influence their decisions to visit a particular area because it contains the therapeutic value but would also favour their relationship with nature. (Windhorst & Williams, 2015). In addition to the plant species and sceneries detailed above, Biglin (2020) targeted her research on the refugee community in the UK, concluding that the sensory stimuli, specifically familiar smells and scents, can trigger memories in an urban allotment. I believe it would be interesting to examine if other materials, such as soundscapes, can elicit memories and contribute to the development of a relationship with a place in the future.

## *Spirituality*

In addition to the physical and symbolic relationships with lands, three students also perceive the spiritual connection and customarily, it has been affected by culture. One participant from Himalaya articulated his profound spiritual relationship with water because of his upbringing and cultural beliefs.

*“I grew up with a lot of falling water bodies, rivers and stuff like that. Like you can hear the river flowing right down there from the place where we are located. So the river is like life, we also worship the river back home. I really related to the whole spiritual aspect of the river...I believe that I embody a lot that what rivers are.” (Indian-Nepali, non-binary)*

The community believes that water is sacred, and picnic along the riverside is a ritual for those who live in the mountain; they go with families during the harvest seasons and schools also take children out for a picnic on Children’s Day. As water is an essential component of emotional attachment to a place (Völker & Kistemann, 2015), he also likes to spend some time in the Rhine river in Wageningen with a couple of friends where he could connect with his spiritual self. Therefore, water as a spiritual surface supported his well-being, embodied his landscape experiences and influenced his identity.

*“The energies that I feel from these water bodies really aligns with the energy that I feel within me, my soul...It always flowing, on the goes, spontaneous, and that’s exactly me.” (Indian-Nepali, non-binary)*

A respondent from Mozambique, a less stable society associated green areas with hazardous places on account of her previous experiences. However, the safety and serenity in Wageningen bring her comfort and thus she interpreted it oppositely.

*“Green area it’s just not what I’m used to. So what appeals to me the most is like this feeling that leads me home, leads me to peace.” (Mozambican, female)*

In spite of the fact that she grew up in close proximity to the ocean, where subconsciously, blue spaces signify safe and calm, the healing power she discerned from greenery in the Dutch context aligns with the sacred connection she shared with the ocean. In brief, regardless of the pattern, she communicates with her spirituality when feeling safe in natural landscapes. Moreover, spirituality is also derived and involved in the plant growth process. One of the participants felt a strong connection to plant energies and believed that nurturing plants resemble taking time to nourish her soul. She personified flowers as her buddies and revelled in their company. The other student attributes the plant spirit to his culture as numerous offerings in both indigenous Hinduism and Buddhism are plant-based, and preserving a relationship with plants is considered a sacred practice.

Summarizing participants’ experiences, this study highlighted that the relation between individuals and natural landscapes is a multifaceted phenomenon, and the perceptions of therapeutic space are

shaped by their own cultural identity as well as cognitive experiences and motivations. Besides, some data reported here also concurs with Fredrickson and Anderson's (1999) statement of immersed ourselves in the wilderness could foster spiritual inspiration. In terms of cross-cultural experiences, Brown and Bell (2007) argued that whether nature is for health promotion in non-Western contexts. A few Asian students exemplified their experiences from home, confirming that nature is indeed presented as a 'space for health' that facilitates their physical and mental well-being. This research highlighted non-western students' therapeutic experiences in western settings, and future exploration of western participants in a non-western environment is recommended since it is currently understated (Bignante, 2015).



## 4.4 The different therapeutic qualities of green and blue environments

When referring to nature, previous studies generally did not explicitly address whether different types of natural environments grant different benefits and emotional feelings to participants. Therefore in this study, one interview question focuses primarily on students' interpretations of these two settings – greeneries and water bodies. Six participants elucidated that nature is a holistic and interconnected entity that greenness and blueness are inextricably related and deliver the same impacts. They used 'a river in the middle of the mountain' and 'a lake or a pond encompassed by grassland and trees' to exemplify their arguments. One of the Indonesian students pondering and said, *"I can't differentiate the feeling of green and blue space. But both of them give me some relax thing, like a sense of healings"* (Indonesian, female). This quote is in line with the findings of Ulrich et al. (1991), who confirmed that there were no substantial variations between these two natural settings. However, the researchers did delineate that the water setting is in a continuously flowing form while the forest environment appears to be static. In this regard, several participants supported that these subtle differences and the respective unique characters indeed provide a sense of healing and support their well-being in slightly different ways. Their experiences and perceptions will be further analyzed in the following paragraphs.

### 4.4.1 The static of green

Green space, in contrast to blue space, is depicted on a greater scale and is somewhat more miscellaneous, with the envisioned images varying between woodlands, grasslands or simply roadside vegetation. As a consequence, different varieties of green space provide a wide range of perception and therapeutic values are revealed by various means.

According to one of the commonalities participants noticed, the tranquil environment serves for solitude activities or socializing with a couple of close friends. Some respondents revealed that especially in the wake of the unprecedented crisis, peaceful space for solitude is necessary in order to sustain their mental well-being (see section 4.2.3 'relish the solitude'). Meanwhile, the serenity of the landscape ease us, and being surrounded by more natural elements, such as trees, bushes, flowers and grass, makes it easier to form a bond with nature.

*"I also like walking in the woods. It is more tranquil, quiet, feel closer to nature and you accompany by trees and bushes."* (Chinese, female)

Unlike the majority of students that perceived the calming effect of walking in the forest, one student from India shared his opposing feeling. He remarked, *"the woods over here in the Netherlands, I feel it a little dark. You know it's a little kind of cold and evil kind of places I felt"* (Indian-Nepali, non-binary). This

impression is also held by a couple of British young adults in Milligan and Bingley's (2007) study. It is considered that this negative perception might be influenced by the types of woodland, childhood experiences, media or myth. However, he later clarified that he found this landscape specifically fascinating in autumn because of the colour of the leaves and a season of mushroom hunting. To put it in another way, the perception changes with seasons. In addition, the other participant expressed a feeling of seclusion while walking in the wood, which I conjectured was attributed to the dense canopy of trees and leaves.

The other benefit that participants reaped is that the green environment encourages them to undertake more physical activities, which is also confirmed by several researchers (Taylor et al., 1998; De Vries et al., 2011).

*"The green space itself is being one of the attractions. I mean if you are only cycling but in the city and not surrounded by green spaces or blue, it won't help that much." (Indonesian, male)*

Despite the fact that their preferences for cycling, walking and running are varied, some might regard cycling *"is a bit more stressful because I need to follow the rules"* (Indian, female) or *"cycling is often when I'm last minute"* (Mozambique, female) while others perceived *"it's quite healing when cycling around"* (Chinese, female) or *"When I don't need to rush, I can just bike freely and pondering"* (Surinamese, female), they all agreed that movement itself contributes to both their physical and mental well-being. While exercising in green spaces, we emphasize more on the activity itself (Völker & Kistemann, 2015), which enables students to forget about things that drained their energies and allows them to slow down the pace of life. One of the students shared her biking experience, *"When I passed through small neighbourhoods, I was paying attention to the garden, how much they take care of the plants, it gives me a moment of peace"* (Spanish, female). In this cycling process, the vegetation aids in the cleansing of her mind, and the fact that people actually take time to nourish their plants reminded her to also attend to herself in order to feel revitalized.

Considering students' perspective vary between walking on promenades surrounded by roadside green and wandering in the forest, as well as between seasons, green space in this sense is more widespread and extensive. In short, students perceived that peaceful surroundings and physical exercises have therapeutic effects on them. Besides, it is interesting to realize that students' impressions and experiences in greenery are similar to participants in Völker & Kistemann's (2015) German study.

#### 4.4.2 The dynamic of blue

The attention on characteristics of blue spaces that contribute to human well-being have been less drawn and although Wageningen does not dominate by blue spaces, there are streams, the Rhine river and lakes where students have documented therapeutic effects. Contrary to greenery, the types of blue spaces are more homogeneous in Wageningen.

The initial reason for participants to visit a waterside area is that it enables more social interaction to take place, whether with friends, strangers or animals such as ducks and swans. Particularly during quarantine, individual activities soared and some people aimed to soak up the lively atmosphere in blue space as it is a place that well-suited for individuals to participate (Völker & Kistemann, 2015). Besides, it is worth noting that two studies (Thomas, 2015; Völker & Kistemann, 2015) identified blue space from a broader spectrum that included the sky. In this respect, the feelings of vastness described by the two students are well-explained.

*“Riverside provides me with a sense of openness which I like more, you have more social interaction and activities, it’s just more joyful. You can pick up the seashells, you can enjoy the sunset and I also get positive effects from the abundant sunlight.” (Chinese, female)*

As claimed by participants, sitting in an open space without any construction creates more room in their minds to ponder and water as a therapeutic element increases their mental concentration and clarity. In addition, one participant reported that watching ducks paddle makes him feel relaxed and calmed, and reminds him to slow down his life.

*“That kind of relaxation feeling in the water bodies help forget everything I did not find it in my room, or in my kitchen or even at a park over there.” (Indian-Nepali, non-binary)*

Aside from developing contemplative practices from the atmosphere of openness, a couple of participants recognized the acoustic characteristic as the other factor that brings mindfulness. In comparison to various forms of soundscapes in natural green areas, water sounds play a dominant role in blue spaces which is soothing and may help mitigating stresses.

*“When I close to a water body, I think the sound that makes by the water it’s super calming for me.” (Mexican, female)*

However, previous research regarding the auditory aspect of water has mostly reflected on how it enhances living conditions (Yang & Kang, 2005; Pheasant et al., 2008) and urban soundscapes (Jeon et al., 2010) as it effectively masking traffic and industrial noises in the urban environment (You et al., 2010) and studies on the beneficial effects on well-being are limited. Therefore, future work should shed light on

whether different natural sounds (e.g. bird chirps vs. water sounds) elicit different moods and feelings. Because a bird watching lover in the present study noted that the combination of birds chirping and water flowing is more relaxing.

Furthermore, cultural background and attachment to certain creatures also impact the inclination to spend time near the water. Two students have profound connections with the sea, river and waterfall because of the environment they brought up. As such, water, this entity has emotional significance for them (see section 4.3.3 'symbol').

*"I'm from a country that not so much green spaces or safe green spaces and we do have a lot of blue spaces, so with a lot of seas. And for me, it's easier to make the connection between sea relaxation than walking in the forest for relaxation." (Mozambique, female)*

Whereas the other two students have a fondness for the riverside in Wageningen, as well as canals and beaches in other Dutch cities because these elements are deficient in their home countries. They are used to greenfield and when arrived, they aim to seek out novel experiences and passionate about exploring new things. Three students indicated specifically that they enjoy visiting the pond in front of the Forum because of the presence of swans. By witnessing their growth during the first lockdown, they realized they had developed an emotional bond.

In the water environment, students' well-being derives from social engagement, water sounds and emotional connection. Although Völker and Kistemann (2015) suggested that blue spaces stimulate physical activities, only one of the 15 participants stressed that swimming makes him feel alive and practising yoga headstand makes him feel fulfilled because the reflection allows him to look at the water body upside down. As a result of these findings, I presume that the preferences for visiting natural environments change over time depending on the season. Moreover, previous studies have mostly focused on large-scale blue while the present research provides an insight into how inland blue support human well-being.

## V. Conclusion

Evidently, people of all ages, including young adults (e.g., Dzhambov et al., 2018; Milligan & Bingley, 2007) and the elderly (e.g., Finlay et al., 2015; Milligan et al., 2004; ) have perceived the therapeutic value of natural environments, and the current study expands the scope to include international students as this relatively vulnerable population is likely to have a more profound understanding of the therapeutic encounters. In the context of therapeutic landscapes, the results were conceived in a wider sense which confirmed that everyday places, such as a home setting can be seen as a therapeutic space. This concluding chapter will summarize how physical, mental and social engagement in nature contribute to international students' well-being, as well as therapeutic landscapes characteristics and the contrast between green and blue environments. In order to address the main research question, three sub-questions will be reflected first.

***RQ 1: How has spending time in green-blue spaces impacted international students' perception of their physical, mental and social well-being?***

Previous research (e.g., Meredith et al., 2020; Stigsdotter et al., 2010; Tester-Jones et al., 2020) showed that nature yields numerous mental benefits, along with stress reduction, relaxation, and mood-lifting, which has become one of the primary reasons for people to visit natural environments. However, through analyzing students' responses, the researcher noticed that the intention of exposing in green-blue spaces during COVID-19 goes far beyond seeking mental comfort.

As regards physical well-being, green and blue settings provide places to conduct activities, including walking, cycling, running, practising yoga and swimming. Nature exercises not only encourage students to move and stretch while sports centres were closed but also serve as a way to detox their bodies, which has received less attention. Our bodies are able to embody emotions physically as a result of the positive energies we take in, which makes us feel lighter and more confident. In terms of mental well-being, students expressed feeling energetic, peaceful and pure happiness, as well as experiencing their inspiration ignited by viewing nature scenes and nurturing indoor plants. In addition, the tranquillity and quietness facilitate several students to seek out and savour the solitude. This experience enables them to become more self-aware and grounded. Lastly, the spacious green and blue environments allow students to communicate with friends and strangers in person while maintaining social distance. Moreover, a few of them highlighted that the growing nature interaction buffering the impact of lack of social connectedness and thus also fulfil their social well-being.

Undoubtedly, students' preferences for exposure to nature are certainly diverse, and this study confirmed that nature can satisfy multiple perspectives on well-being by providing a space for physical activities, peaceful moments, creativity, solitude time and social engagement. Furthermore, my findings support what Richardson and Hamlin (2021) proposed, namely that in this uncertain time, human well-being is dependent on nature.

***RQ 2: What do international students value about the characteristics of therapeutic landscapes from the material, social and symbol (spiritual) dimensions and how they experience them from everyday practices?***

The study adopted Bell et al.'s (2018) four dimensions; material, social, symbol (spiritual) to deepen the understanding of international students' therapeutic encounters and come to the realization that landscapes can be therapeutic or non-therapeutic. Among these, the latter two are intertwined and thus answer together.

In the material dimension, Grahn and Stigsdotter (2010) noticed that the sense of sight is of great importance when exposing to green spaces. However, the findings expand the scope of sensory engagement to include non-visual senses such as sound, smell and touch. As regards vision, students focused more on the micro-scale – the home setting, and illustrated the colours of indoor greenery that were conducive to their well-being. Aside from the well-known benefits of birdsongs, students also heard sounds from trees, wind, flowing water, frog croaking and cow mooing in the soundscapes. Besides, due to the lack of ventilation in the room, the smell of fresh and clean air becomes much more valuable in this season. In addition, the results of tactile sensation bridge the knowledge gap in nature touch from the non-animal perspective (Franco et al., 2017). Participants shared their experiences of walking barefoot and lying in the grass, as well as feeling the breeze on their faces during the movement.

In terms of the social attribute, three female students highlighted that safety is a factor that would significantly affect their healing experiences. A Mozambican compared the healthy green spaces in the Netherlands to those in her home country and realized that without feeling safe, she would not favour green environments as therapeutic spaces. Building on Milligan's (2007) findings, this study provides additional evidence that landscapes are greatly bound up with socio-cultural contexts and can be both restorative and hazardous for those who experience them. Williams (1999) also acknowledged that gendered specificity may impact the therapeutic potential of landscapes. Furthermore, it is interesting to notice that Staats and Hartig (2004) found that when security is not an issue in the natural environment,

being alone has greater restoration than having a companion. Based on several female students' experiences of spending time alone in Dutch nature (see RQ 1 mental well-being), I can affirm that a sense of safety is an essential premise for healing practice.

With respect to symbol values, various characteristics, such as personal cultural context, subjective experiences and cultural beliefs appear to have a substantial impact on perceptions of therapeutic landscapes. Among all the participants, non-Western students were more inclined to associate their experiences in Dutch landscapes with their mental landscapes, where they have an emotional attachment and invoke place-related memories. I supposed that students with non-European backgrounds require more effort to integrate into a European or, more precisely, a Dutch setting due to the distance. As such, as migrants, having places with home-related elements in new environments can provide emotional sustenance, making them feel closer to home and safer. Additionally, their spiritual relation to spaces was also shaped by their identity, cultural practices, and personal bonding to plants and water. The data reported in this dimension provided continual support of Conradson's (2005) and Gastaldo et al.'s (2004) studies that individuals' relation to landscapes are varied and intricate and thus portray a different relational image of landscapes.

Summed up briefly, students value that lush nature could satisfy sensory experiences, provide safe and healthy places for healing, induce memories of home, and allow them to connect with their spiritual selves. The study corroborated that a place that becomes therapeutic is attributed to the individual's interaction and perception.

### ***RQ 3: Are there differences in impacts on well-being between green and blue spaces?***

Generally speaking, both environments hold therapeutic value and are health-promoting. A few students noted that they were unable to discern the emotions between green and blue setting because nature, as an entity, emitting healing power. This idea was also raised in Bell et al.'s (2018) research, which claimed that therapeutic materialities are interconnected. The concept of 'palettes of place' can be interpreted in a broader context, involving the interaction of various colours, such as browns, greys, whites, greens and blues.

Whereas based on their respective characteristics, some participants discussed the nuance of these two spaces. The quiet and serenity of green space, particularly woodland, facilitate students' contemplative experiences, which also confirmed by Van Herzele and Wiedemann (2003). Besides, since Wageningen abounds with greenness, embodied mobilities such as walking and cycling may be considered

therapeutic experiences. Both exercises maintain students' physical well-being, and when they are not in a rush, the activity itself is a pathway to clear their minds, reinforcing Gatrell's (2013) research that "the rhythm of the movement has therapeutic qualities". Even though different types of green spaces shaped experiences in multiple respects, generally, they have more significant impacts on physical and mental well-being.

While in blue space, the openness allows more social interaction to take place, and when we view 'blue space' in a wider picture (Thomas, 2015), the sea and the sky seems to blend into each other, creating an infinite space for our bodies and minds to heal. Compared to soundscapes in green areas, water sound is more monotone but it provides an opportunity to reflect and ponder. Additionally, two students from India and Mozambique who brought up in water environments have a deeper emotional attachment to the blue setting, which they perceived benefits on a more spiritual level. Overall, this research concluded that blue spaces promote students' mental and social well-being.

***Main Research Question: How has the use of green-blue spaces in the Netherlands influenced international students' well-being during the COVID-19 pandemic?***

The current COVID-19 health crisis has thrown the world into turmoil and has taken a toll on human well-being on multiple levels. However, fortunately, akin to substantial research conducted during this period, the present study consolidates the significance of the proximity to greenery and expands understanding of the therapeutic value of everyday nature in the midst of the global crisis.

Being in the natural environment can fuel ourselves with the highest quality of nourishment from various perspectives; apart from physical activities, students highlighted the embodiment of physical emotions; concerning mental well-being, students emphasised the enjoyment of seeking solitude experiences and noticed that inspiration could derive from nature interactions; moreover, social connectedness in nature not only rebuilds and revives human relationships but also deepens the relationship with ourselves. Besides, student appreciated therapeutic characteristics differently depending on their individual experiences and perceptions, cultural contexts and values; such as multi-sensory engagement, a sense of safety and a few non-European students revealed that healing occurs as a result of emotional attachment to certain places in Wageningen. Also, the spiritual connection to landscapes is closely related to the upbringing environment. Lastly, students' responses demonstrated that green spaces benefit more for their physical and mental well-being whereas blue environments have a more beneficial impact on their mental and social well-being.



It is reassuring to notice that this global crisis has deepened students' or the general public's gratitude for the value of green and blue environments, as well as raised awareness of the effectiveness and efficiency of nature prescriptions for health and well-being.

## 5.1 Limitations and Recommendations

Although the results seem to be positive, the research design is not impeccable and similar to every study, limitations emerged. Therefore, the following paragraphs will first comment on three constraints before providing some recommendations for future research.

First and foremost, there are three explanations of why this research could not be generalized. It was conducted at an extraordinary time, amid the pandemic, and only asked participants to share their stories during the first lockdown (from spring to early summer). Besides, this thesis project is focused solely on the Dutch setting, more particularly, a relative suburb area with a large tract of green and blue natural landscapes. Moreover, participants were purposefully selected in the recruitment process, namely, they enjoyed visiting the green and blue environment and having contact with nature is part of their routine. Secondly, more walk-along interviews were planned at the beginning and interviewees were supposed to take the researcher to their routine route. However, the weather conditions remained unstable, with substantial rain and strong wind which reducing the voice recordings' quality and eventually, over half of the conversations were only able to carry indoors. Lastly, two interviews were not conducted in English, therefore translation from Chinese and Cantonese to English need to be addressed. Although I attempted to preserve the responses as naturally as possible and not to overinterpret the data, less accuracy and vividness might occur as some idioms and proverbs are difficult to translate.

Therefore, a few recommendations are performed to improve future investigation. Firstly, a longitudinal study is worth considering because multi-sensory experiences and preferences for visiting green and blue spaces vary seasonally. For instances, people will engage in more activities in the aquatic settings in the summer as sunlight is more abundant and blue spaces have effect of mitigating temperature during the summer months (Völker & Kistemann, 2013), while leaves change colour in the autumn, which might attract people to visit green areas more. Next to that, adopting mixed methods besides in-depth interviews is suggested, such as focus groups and a quantitative questionnaire. On the one hand, the variations between participants of different cultural backgrounds would be more readily apparent. On the other hand, a quantitative questionnaire can be used to reach a wider audience and sample candidates that have a lower affinity with nature because Aspy and Proeve (2017) concluded that social connectedness is more significantly associated with well-being than nature connectedness among

undergraduate students in Australia. In this way, we can examine if nature exposure only facilitates a certain group of people's well-being, or if those with a weaker relation to nature determine significant benefits of their social well-being. Furthermore, living in more natural environments has a higher buffering capacity to counteract the effects of adverse events and circumstances, and contributes to positive well-being (Ottoosson & Grahn, 2008; Wells & Evans, 2003). Hence, a comparative analysis (e.g., green vs. less green area) will be more convincing that everyday nature is in an urgent need during this season.

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## Appendix 1: Interview Guide

### Topic 1: Introduction

- Introduction of the interviewer
- Research is for the graduation thesis - International students' experiences of green-blue spaces and their perceptions of well-being during COVID-19 in the Netherlands
- Ensuring that the participation is voluntary and anonymous
- Asking permission for recording and transcribing the interview
- Purpose of the interview
- Duration of the interview (+- 1 hour)

#### *Opening questions:*

- How would you characterise your health and well-being at this moment?

### Topic 2: Health and well-being

- How do you feel during the first lockdown? Life in general (ex. Being away from family and staying in the Netherlands by yourself)
- (Suboptimal) → In which way do you think you can improve your health and well-being?  
(Optimal) → Why do you think you feel good?
- Can I ask what's health and well-being means to you?

Keywords: evaluation; physical, mental and social well-being; loneliness; homesickness; depressing; companion

### Topic 3: Experiences in green-blue spaces

- (Let's talk about your experience in nature) Could you tell me about your experience with nature? (ex. Cycle around Wageningen, walk along the Rhine...)
- Could you describe your feelings when visiting this place and how your emotions have changed?
- Do you think green-blue areas affect you even more during this time?
- (Let's be more specific) Which one appeal to you more, green areas or places with water? How do they affect you differently?

Keywords: calm; serenity; vastness; healing effect

#### **Topic 4: Characteristics of therapeutic landscape**

- What are the main reasons for you to visit this place (or nature in general)? (which characteristics appeal to/motivate you?)
- What did you benefit the most from green-blue space?
- How does it facilitate your physical, mental and social well-being?

Keywords: well-being/health resource; spiritual needs; social space; physical activity

#### **Topic 5: Place attachment**

- What do you think the place you grew up shape your relationship with place/space? Is the experience in Wageningen different from where you grew up?
- What do you think of Wageningen? Do you feel attached to a certain place or is there a special emotional connection?
- Where or what would you miss most after moving away from Wageningen?

Keywords: symbolic effect; restoration relationship

#### **Topic 6: Therapeutic mobilities**

- What would you choose to move from one place to another and what do you benefit from the movement?
- Did your attention shift in the transition process?
- How do you feel in the movement?

Keywords: walkability; physical activity; social interaction; reflect and ponder; refresh/invigorated

#### **Topic 7: Closing the interview**

- Thanking the interviewee

*Closing questions:*

- Do you have any other stories to share?



## Appendix 2: A transcription sample

Co: So let's begin with a reflection. How would you characterize your health and well-being atm?

I: I see myself has been healthy in general, I think I eat healthily, I do pay attention to my nutrition, my boyfriend is a bit of a health freak cause he used to study food technology. He always like, babe you don't have enough protein in that milk or you don't have enough carbs or something. But it takes lots of efforts to put everything on one plate.

Co: Are you vegetarian?

I: Yes more or less. Sometimes I do go to have dinner in my friends' houses and if there's a chicken rib, I'll eat it but I never buy it myself.

Co: But is it only because of the environment or you just not get used to eating meat?

I: Because of the environment but also I have a feeling of guilt sometimes when I eat meat. When I was doing my research in Mexico, they made a lot of like beef. I would eat them and they are really good but then I feel guilty, what about this cow, is having in my body right now. I don't know, it just bothers me sometimes. But in terms of sports, I do exercises, but mostly in the summer, generally, I would say my health is like 7.5/10.

Co: That's not too bad haha but how did you feel during the first lockdown, from March to June?

I: I was doing my research in Mexico, so I have to fly back. I flew back at the end of March during a strict lockdown. When it started, I didn't really know how to function during my day cause lots of things you do, you go to campus, you see people and, so was difficult to adapt. But a month in, I started to cycle indoor cause my boyfriend has a kinda indoor bicycle. But to go out to adjust, I hate this. The first few days I was just like really bitchy for no reasons but then I adapt to it and now it's also fine for home exercises.

Co: I can imagine, also because your research been interrupted in some ways so you had to fly back.

I: I managed, I managed to finish everything before flying back!

Co: But how was your social life, did you meet your friends?

I: I saw some friends when coming back. The closest is 4 I would say, but the rest, not so much. I wanted to be more cautious, but then around May time, June, we really relaxed. So I was also one of those people who going to parties, like a smaller party, 15-20 people, still a lot though haha.

Co: But except for cycling indoor, did you ever think of you could do other things to make yourself feel better?

I: I did miss the gym for a while because I wanted to use the equipment a lot.

Co: So you are also quite active haha. Did you back these few months?

I: Oh, I got so used to living without it that I have all these videos of how to do exercises household stuff. Then I got used to doing it at home so much cause in the summer, I don't mind it that much. So now I do exercises on a Yoga mat.

Co: For me, the opposite haha, I'm quite active in summer while in winter, I sort of lose the motivation. So in wrapping up this topic, can you define what health and well-being mean to you?

I: I would say it's eating well as eating enough of various foods. Being conscious of what you eat impact the environment. Being aware of the environment as being somewhat in touch with nature, to a lesser extent, if you live in the city, you maybe can't do that as much. You just maybe be able to go to the parks for a while, like know how plants work. And mental health.

Co: Let's talk about your experience in nature in general during corona times.

I: I think the path we are taking now it's like the third mini park area. This is a little extended to it and there is a field behind it, I really love animals. Sometimes during the day, I said 6 o'clock but I realized it's dark already. When I was leaving I was like what, how is it dark, and then I was like winter. But when it was light here, you could see the animals, there's sheep and lambs in the front.

Co: OMG, really?

I: You never know?

Co: No haha. So this is also one of the main reasons that you love to take this path?

I: Yeah, cause you passed through a few playgrounds, you see people and nice houses. I love to take that route; they really have all these vegetations. They have like a sheep opposite and if you go left, there's goats and horses. There's a forest behind this huge field. If you go left in the forest, you have really nice houses in nature, you see people walking around with the horses sometimes.

Co: Yeah, seeing people with the horses is such a novel experience for me since back home, I grew up in a city, so. Also, owning a horse represents noble. But like how often you would go for a walk in this path.

I: So until September when I started my internship, twice or three times a week. Not always the same path but more or less. Sometimes I'll cycle up so be at the end of this path, just parked my bicycle and walk through the old random buildings and forests. Also towards, do you know where Droevendaal is?

Co: Yes!

I: So my friends live there. I walked from there behind towards Bennekom or from there towards Wageningen-Hoog.

Co: Could you describe your feelings about walking along these areas you mentioned.

I: I feel really peaceful. In general, it's a super simple word, but I feel happy because I can stop by and look at the animals. I'm a huge picture taker. Even though I walked this path for a hundred times. I still take pictures every time of the sun or the buildings. And if you go towards there, I mean now is dark so you can't see this. But you can pet them, you could touch them.

Co: Aww and how did you notice that your emotions have changed?

I: I think when I was walking from my house, you see the building, at first my mindset was still like I have to write my thesis or I have to work or something. And then you look at people's dogs, see people's houses, children, you kinda distract yourself of where you could relax. And by the time I reached here, I see all the greenery, just make me feel calmer. The leaves and berry sometimes, people planting in that little garden.

Co: Oh, they have a community garden here?

I: Yes yes, we can cross here.

Co: Did you grow any plants in this community garden?

I: No no because I think you have to pay for it. **We have plants in our house.**

Co: Let's be more specific, if you could choose, do you prefer greenery or a place with water although in Wageningen, the blue area is not that accessible compared to green.

I: Green space for sure! I'm not too drawn into the water thing, like water activities. I used to be scared of deep water, just doesn't make that much in my day.

Co: But do you feel differently when walking around here compared to along the water?

I: **I think green setting, you have less people and it's more open. Like because the green setting has somewhat infinite if it makes sense, when you are walking just endless greenery almost. While water setting, the river is kinda limited right and there are more people. So for me, is also about how many people there are and how you can relax.**

Co: Let's talk about characteristics. Which characteristics appeal to you more?

I: **The path, it's not paved, it's not stable, you can just place your feet and see what they fall.** And also this **vegetation exercising**, I read not that much about plants, so sometimes I stop and hear people saying, that makes me aware more about plants if I asked them, hey what are these plants. You have **interaction with things around you right, the wind blows, the sun shines in certain ways on the plants surround you.** Sometimes the horse, one of the fields was scalping when I passed. They were so exciting; they were running across the field. So I was there for 10 minutes and after 10 minutes they came towards me. I think they wanted foods. But I was like I'm sorry, I don't have anything. **It's very much about the interaction while in blue space, it's kinda away, which the sound it's like a thing of nature but it's more regular.**

Co: What do you think you benefit the most from these areas, either physical, mental or social well-being?

I: **Mental and physical. I already feel so much calmer.** Before I was hurry ah I didn't do that much today, I only like work for half a day and then procrastinating, and cleaning, I'm so stupid on Monday, I have things to do. But now I'm like it's okay, I have time. I can make dinner and I continue working. And I also feel like my body relaxes it, I don't feel aside. And sometimes I find myself when I'm walking and I just **rip my arms, my body clicks and I think my backs just lighter and letting go.** Maybe I'm going crazy haha.

Co: Not at all. I feel the same way haha. Changing the environment helps. But did you also see this open area as a social space?

I: Yes! I forgot about it already haha alright. Because at the beginning we didn't meet indoor for the first two months when I came back. So definitely was a regular thing. The roundabout which I sent you in the message, we met up there. There are 4 friends I meet on a regular basis. So I would definitely send the screenshot and that's where we meet and leave our bike. In the social space, bring coffee and enjoy the sun.

Co: But I do hope that after this pandemic, people will feel closer to nature because of spending more time in the open space. Let's talk about place attachment. Wow, there are lots of stars tonight although with this light pollution, you can still see quite clearly. What do you think the place you grew up shapes your relationship with space?

I: **I'm from London, so a big city. Even though I live on the outskirts, it's all residential. So if we have a park, it's just a field.** Like just a field, nothing on it, there's not even a tree.

Co: No? So it's just grassland?

I: It's just a grassland. I would say maybe half of the kilometres of grassland and people call it a park. And across from it, you would see a mental hospital which is great, you would see an actual hospital. So it's not really relaxing but you would still call it a park and go and sit there. And I never realized how much I miss nature until I left England. So I think I really crave that. When I started travelling, you try various things and like you and I discover that I like the mountain, hiking, being in that nature, the silence, the clarity of your thoughts you get. So I said I'll never go back to London for that reason.

Co: No?

I: Because it just not enough space.

Co: So you are not planning to go back anytime soon?

I: No haha.

Co: Did your parents visit you?

I: Yes, they love it!

Co: But don't you think there's a huge gap especially from a metropolitan to this tiny town, you would not get used to in the first place right?

I: Ah, I lived in a smaller town before so before that it was a shock, but then I saw it as a huge convenience. You saved so much time, you don't have to commute right, probably the same for you. I could just get up and go to work, it's not like half an hour planning, being squeezed like a sardine.

Co: I don't know, but for me, I also miss taking the metro and I can reach everywhere, it's quite handy. But here yeah, I can easily reach everywhere as well, by bike haha.

I: Yeah, did you cycle before you came here?

Co: I did, I used to be in the cycling association in my freshman year back in my Bachelor.

I: Oh wow, that's cool.

Co: And the park you mentioned, although it's solely grassland, is it so packed?

I: Yeah, people go there in the summer. If you actually do want to go somewhere to walk in a nicer area, you would have to drive outside of London. And the drive is about 40 minutes. And then you have a hill and less people and there's nature.

Co: But you also went outside London when you are little?

I: Not that much because you have to go there with your parents and they would not let you go alone. So I didn't see that much of nature.

Co: Sounds like you love Wageningen a lot, what do you think of this town in general?

I: I love it! I don't want to move! I'm so happy here. It's just the perfect balance. The people, the attitude towards nature and environment is so important for me. That people recycle, they actually care about the impact of the planet and I have never seen that to this extent anywhere else. Did you?

Co: No no. But not even back in the UK?

I: People think that they do a lot because they recycle. But they, everyone has so much takeaway. And then they collect all these boxed, plastics folks.

Co: Yeah and at the end, you perhaps would not know where they end up. Like after resorting. I don't know for me; I like this town because it's close to nature but also not too exciting to live haha. But did you feel attached to a certain place?

I: I lived in Ede for the first two months and then moved to Wageningen. I feel quite attached to this area and Droevendaal, all my friends live there pretty much. So I walked a lot in that area, so just I know the houses behind Droevendaal by heart. And all the trees, the parks. Do you know where you are just for the future in case you want to come back and see the animals? Do you know where we are just look around, just so you can navigate yourself? You have goats here and sometimes you have ponies on the left. And you go straight you have the forest and kinda entrance of the Veluwe, the nature park.

Co: Ah yes, I'm planning to go there sometime soon with a couple of friends.

I: Although you said that you love the town and don't want to move, but there's still a possibility to move away one day. What do you think you will miss the most?

I: One day I have to move away because I can't work remotely forever. But I would miss the student atmosphere. I would miss how people are so conscious and understanding of the environment and they are really aware of the world issue. I think quite often when I was doing my bachelor in England, I had to explain to people, please try to minimize your plastic use or reuse something. And here it's just implied. Like people will tell you if you are not doing something right. I like that. My friend was like why you are buying new stuff, why you are buying a new vest, they wouldn't see your new vest top because it's under your sweater and I was like true, I could not buy more you are right. And I like that. And even Too Good To Go, you know it?

Co: Yeah, I know it.

I: We used that as well in my house. It's just all these things, how people are connected with the environment around them, the ecosystem, just humanity.

Co: Yeah, how people aware of food waste and. I also get a huge impact from my best Dutch friend, she's like a zero-waste enthusiast.

I: Take her to China haha.

Co: OMG, it's highly needed. The last topic is about therapeutic mobilities. What would you normally choose to move from one place to the other?

I: Bicycle always. Apart from cycling indoors when the weather is not permitted, I mean two months at the indoor space. I cycle outdoors as well, with my boyfriend, we have race bikes. So we cycle to Utrecht, to his mother and back.

Co: Cycled to Utrecht?

I: Yes!

Co: How long it takes?

I: I think it's about 55 km in return. So I have like cycling shorts and bandage and stuff. We went to De Groote Peel, which is a national park area, it was pretty nice but we cycled 80km a day and I was dying.

Co: OMG, I experienced the same back in the cycling club. I'm so done after a whole day haha.

I: You enjoyed it. But when you sit down, you realized how it impacts you.

Co: I can't move at all haha. But do you prefer walking sometimes as well?

I: If I want to clear my head, yes, if my head is overloaded, I wanna walk because it then helps me relaxed and focused and almost meditate. I go through my thoughts and I was like hey why do I worry, why do I feel tension then just like trying to talk with myself.

Co: Love it. The self-reflection is just gold. Journaling.

I: You do that too?

Co: Yeah, I do journaling. So what do you think you benefit the most from cycling?

I: I think I'm being healthier, like I'm really getting my exercises. Sometimes you have a craving, you want to eat pizza, I try to cycle before. So then ok I did exercise, it's compensated. I look fitter, I look better. I think I kinda got like abs this summer, after Mexican carbs I needed that haha. Also, you feel like you've done a good job at something, so you feel better about yourself. I think everyone has that exercise right?

Co: I love bread. So back in Chile, I and my Japanese friend would walk for like almost an hour just for a nice bakery. So last question, how do you feel when moving from one place to another?

I: I definitely feel more connected with myself. Because the time you focused on your study or work, you get them to start and that's your life. But then you like oh I remember, I need to move my arms not just sitting there, like immediately I want to stretch my arms haha. You are more connected with yourself; you reflect like we said earlier. I do get new ideas sometimes when I'm stuck with something. It's like to take a two-hour break, go for a walk, meet with your friends and then your brain is fresher. It's also nice to feel the cold sometimes. Even now maybe you feel like your face it's a little bit chilliness.

Co: Yeah, but at least your body feel warmer. And yes, that's the end of the interview. Do you any remarks, comments and what else do you want to share?

I: I think it's super nice to talk about, think of this topic because it's something that I haven't done for a while. During the quarantine, I'm so grateful for nature and living here. Even though we were in lockdown, but you can still see people. In comparison to people in the big city, they are really locked in right. I was super grateful for everything around us. I love collecting leaves. And I think you are super friendly and outgoing and nice to speak to.

## Appendix 3: Coding scheme and definition per code

Code	Definition
Nature engraved in every human heart	The commonalities we shared – despite the fact of growing up in different cultures and context, we yearn for nature contact
Appreciation of the proximity	Focuses on students' experiences and gratitude of accessible green-blue areas in Wageningen
Stay physically active	Nature provides a space for students to undertake activities in which physical well-being is cultivated
Relax the mind and feel peaceful	Concerns nature facilitates mental well-being
Mindfulness	Concerns mental well-being to a deeper level, which is fully present and engaged at the moment
Feeling refreshed and get inspired	Concerns spending time in green-blue spaces improve mental well-being
Outdoor socializing area	Nature becomes a space for social contact in which individuals' social well-being is achieved
Openness and fresh air	Relates to the material characteristics of natural open spaces
Sound	Relates to the material characteristics of healing landscape, including the sound of silence
Diversity	Relates to the material characteristics of natural open spaces
Colour	Relates to the material characteristics of nature areas
The texture of the ground	Relates to the material characteristics of green areas
Safety	Relates to the social characteristics of open areas in the Netherlands
Spiritual	Relates to the symbolic characteristics of landscapes – the emotions in the movement and being physically present in nature
A feeling of home	Relates to the symbolic characteristics of landscapes – cultural diversity shape individuals' relationship with space
Green and blue space are inseparably intertwined	Green and blue space produce a similar sense of well-being and they are integrated
Green spaces' characteristics	Particular features of green space
Blue spaces' characteristics	Particular features of blue space
Slow down the mind and be present	Emotions during the transition process