

What is the value of the mental well-being benefits derived from cultural ecosystem services at the Willem Arntsz Hoeve?

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Abstract

We are currently experiencing a global mental health epidemic, with the proportion of the global burden of disease attributable to mental disorders accounting for 32% of disability-adjusted life years (Vigo et al., 2016). Despite a simultaneous decline in green spaces, and time spent outdoors, only relatively recently has the relationship between mental well-being and cultural ecosystem services received notable attention. This study evaluates the cultural ecosystem services currently present at Willem Arntsz Hoeve, near Den Dolder, and applies the IPBES framework to ascertain their value specifically in relation to mental well-being. To achieve this, a survey of visitors was conducted, along with 3 in-depth qualitative interviews of residents. A literature review was also performed to underline the deficiency of research in the field. The results of the study highlighted the importance of CES to visitors and residents, particularly through the enjoyment of nature, and physical recreation, which had a positive impact on their mental well-being.

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1. Introduction

Although historically receiving significantly less attention than the biophysical processes and services produced by ecosystems, a greater appreciation is developing for the value of cultural ecosystem services (CES) and the subsequent beneficial effects on human mental well-being. CES are usually defined as the non-material benefits that people obtain from the ecosystem through recreational, spiritual, educational, social, and aesthetic experiences (Millennium Ecosystem Assessment, 2005). The quantification of provisioning, supporting, and regulating ecosystem services is long-established and routinely used by policy-makers to equate natural systems and processes with economic value. However, the difficulty of attaching an economic value to religious, spiritual, or sense of place factors is more complex. Often trading markets don't exist, meaning CES have not been accurately valued or utilized prominently by policymakers. There are a variety of methods that can be used for valuing these non-material benefits, drawing on quantitative, qualitative data, or a mixture. Such methods can examine people's stated or revealed preferences, involve stakeholders, facilitate deliberations, and result in monetary or non-monetary valuations (Hirons et al., 2016). This study does not intend to fully enter the debate surrounding the accuracy and reliability of methods and their potential for subjectivity, although references are made with regard to survey and interview methods.

The Willem Arntsz Hoeve (WAH), situated near Den Dolder, was established in 1906 as a psychiatric facility; the site was developed with the vision that people need nature for relaxation, creativity, and their overall health. The 'soul of the WA Hoeve' has come to encapsulate this intrinsic relationship with nature, the sense of community with the neighbouring village, and its openness to innovative social and ecological ideas (Vrienden van de WA Hoeve, n.d.). In 2017, the municipal council of Zeist adopted the 'WA Hoeve area vision', a redevelopment project that Bouwfonds Gebedsontwikkeling (BPD) was selected to implement (bijlage 2 beeldplan). The project will have effects on biodiversity and red-listed species, community activities, recreational opportunities, noise and light pollution, and the overall social cohesion of Den Dolder. Further details of the proposal are given in the study sites section.

Alongside natural space for physical recreation, the WAH provides a space for community activities and social interactions. This occurs in various forms including art, educational, and ecological projects, which studies have shown can have an impact on the mental well-being of those participating. A well-known heritage site, the area has several historical pavilions and monuments that testify to its rich history, serving as both an educational resource and a space for reflection and remembrance. Throughout the 20th Century, the WAH continued to focus on pioneering innovative treatments for mental illness, integrating

art, crafts, and nature into treatments. Renowned psychologist, Carel Muller, resided at the site and despite being fired for his radical approach, his ideas were later implemented across the Netherlands (Goosen, Hans, n.d.).

The World Health Organisation's definition of mental health describes a "state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community." A range of socioeconomic, biological, and environmental factors contribute to an overall state of mental well-being. To assess the value of the CES at the WAH site, it is important to establish the links that connect CES and mental well-being. Whilst still in relative infancy, there is a growing body of empirical evidence that emphasizes the positive value of nature experiences for mental health, set against the detrimental impacts of increased time spent indoors and a decrease in participation in outdoor recreational activities (Bratman et al. 2019). The UN SDGs, under the goal of good health and well-being, state the target of 'reducing by one-third premature mortality from non-communicable diseases', through the promotion of good mental health and well-being (UN SDGs, 2015). Despite international recognition, an exploration of CES and mental well-being is in relative infancy, and a literature review was conducted to assess the current academic landscape and provide secondary data for our study.

1.1 Research question

The objective of this study is to assess the value of CES, specifically in the context of mental well-being. In order to address this, we shall be using the following research question:

What is the value of the mental well-being benefits derived from cultural ecosystem services at the Willem Arntsz Hoeve?

To help structure our research, we will detail:

- An overview of the cultural ecosystem services currently identifiable at the WAH.
- How the development plans proposed will affect the CES present.

In the following sections, this paper will examine the history of the study site, and explore the CES currently present. Using the IPBES framework, nature's contribution to people is evaluated through the benefits to mental well-being derived from the CES.

1.2 Literature review

Mental disorders affect more than one billion people globally (Rehm and Shield, 2019). Yet despite this evidently growing crisis, a literature review highlights that research that links

CES to mental well-being is lacking. Various frameworks such as the Common International Classification of Ecosystem Services (CICES) recognize the benefits of CES to mental well-being, they do not fully explore the importance of socioeconomic factors such as gender, age, occupation, or neighborhood characteristics (Astell-Burt et al., 2013).

The various psychological benefits from neurological changes in brain oxygen and hormone levels during physical exercise and the subsequent positive effects on mental well-being are well documented (Carter et al., 2018). Yet relatively few studies on this subject explicitly look at the role of CES or the benefits of 'green exercise'; physical exercise within a natural environment (Barton et al. 2010). The 'burden of disease attributable to mental disorders' has been increasing globally, but despite the complexity of economically valuing some CES, reducing the occurrence with which people are frequenting national health services is a clear benefit of protecting these services (Patel et al. 2018) (Cooley et al. 2020).

1.3 Overview of Cultural Ecosystem Services at WAH

Using the in-depth interviews conducted alongside documents provided by the Friends of WAH working group, the following were selected as the most important CES at the study site. Tourism, religious, and ceremonial services may also be identified, and whilst they have a potential impact on mental well-being, they remain outside the scope of this study. Also important to note is the potential overlap and interplay between categories.

Recreation

Physical recreation; running, walking, yoga, dog walking, etc. Other important recreational activities concern arts and crafts societies, along with community events that occur on the grounds.

Connection to nature

Understanding the relationships among people and between people and Mother Earth. In addition to valuing the intrinsic relationship between humans and mother earth, it places importance on living well, in harmony, and fostering a sense of community (IPBES, 2014).

Aesthetic appreciation

The value gained from the enjoyment of the natural environment. The study site contains a variety of woodland, heathland, and green spaces; a habitat for a variety of flora and several species of red-listed fauna.

Cultural heritage

Residents note the importance of the site as a place of remembrance and historical reflection. The presence of protected architecture, a memorial to commemorate the events during WWII, and monuments can sanctify historical personalities, groups, or events into the present social setup (Alderman & Dwyer, 2009).

Educational services

The site offers prospects for nature experience and environmental education for local citizens and visitors to the area. Links can be perceived here to recreation and cultural tourism services, in addition to the education of schoolchildren, university students, and policy-makers.

Social connection

The Stichting P'Arts facility and the community vegetable garden present are key elements of the site and are regarded as important facets of social cohesion.

1.4 Conceptual Framework (CF)

The conceptual framework of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) builds on previous models such as the Millennium Ecosystem Assessment (MEA, 2005) that simplify the complex interactions between the natural world and human societies. A key development is the recognition of nature's contributions to people (NCP), the positive or negative contributions that people obtain from nature. In addition to outlining the pervasive role that culture plays in defining all links between people and nature, it emphasizes the role of local knowledge in understanding nature's contribution to people (Díaz, S., et al. 2018).

Figure 1, a simplified model based on the IPBES framework and adapted to the WAH, illustrates the different relationships and interactions between ecosystem services and cultural ecosystem benefits. This simplified adaptation forms the foundation of this research and can be explained using the example of physical recreation, an important service in relation to mental well-being. Physical recreation is a cultural practice and is, in this scenario, enabled by the presence of footpaths that make the area accessible for runners and hikers. The construction of these pathways was a result of the demand for physical recreation. Combining the environmental and cultural elements enables certain cultural ecosystem benefits like health, tranquillity, and escapism, whilst simultaneously shaping the biophysical domain. Subsequently, both environmental spaces and cultural practices are facilitated. The model can be interpreted in the same way for other cultural services.

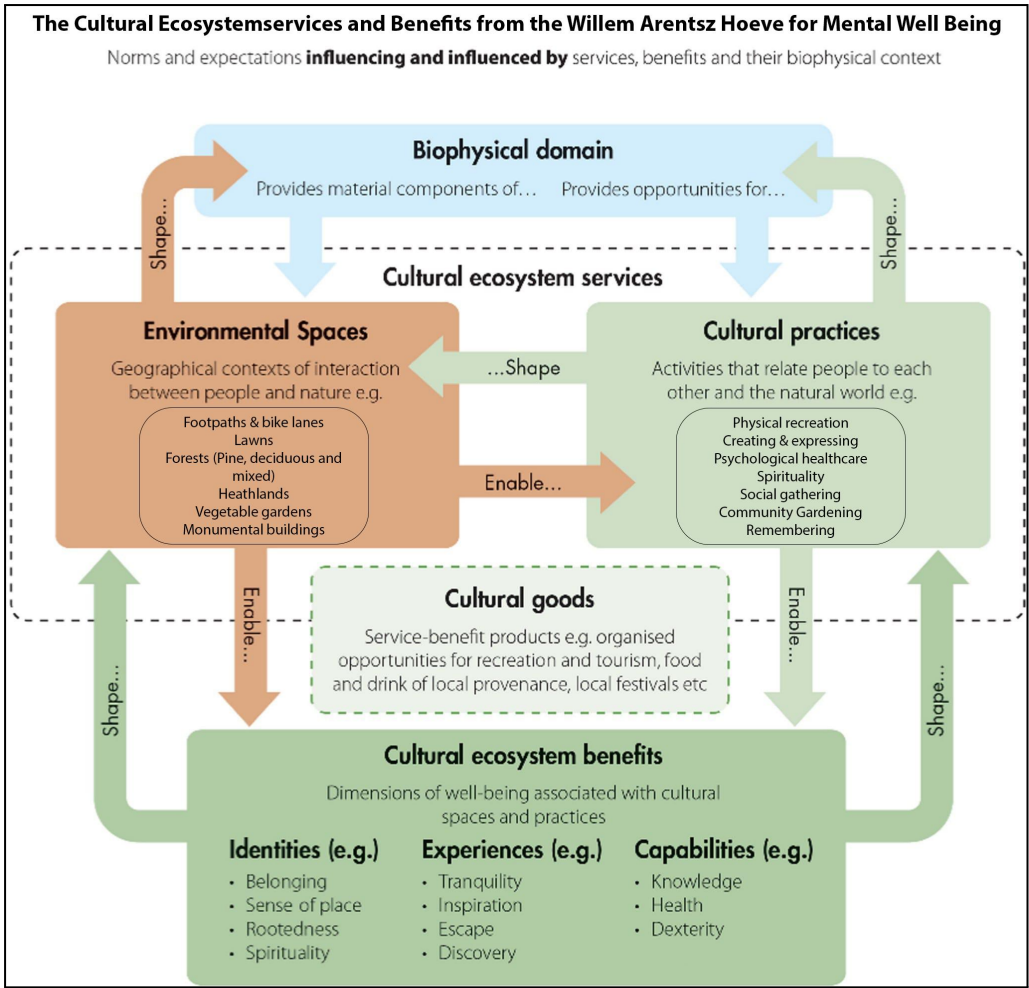


Figure 1: Conceptual model using the IPBES framework

Other frameworks have been considered, such as the Common International Classification of Ecosystem Services (CICES), which is used widely in Europe for identifying and communicating specific services, ES mapping, assessment, and valuation studies (Culhane, F. et al., 2020, Czúcz, B., et al. 2018). For the purpose of this study, however, it was decided that the extensive structure of the CICES model was excessive, as only CES were being evaluated.

2. Study site

As mentioned, the research will focus on the Willem Arntsz Hoeve in Den Dolder. The beautiful monumental buildings and majestic oak lanes that can still be admired today are a reference to the rich historical past of the area (Figure 2). To get a better understanding of what this area exactly means to the local residents and has meant to its residents and visitors in the past, it is important to examine the site in greater detail. This part of the research will therefore focus on the following three aspects: the past, the present, and the future of the WAH. The importance of all three aspects will become clear as the study progresses.

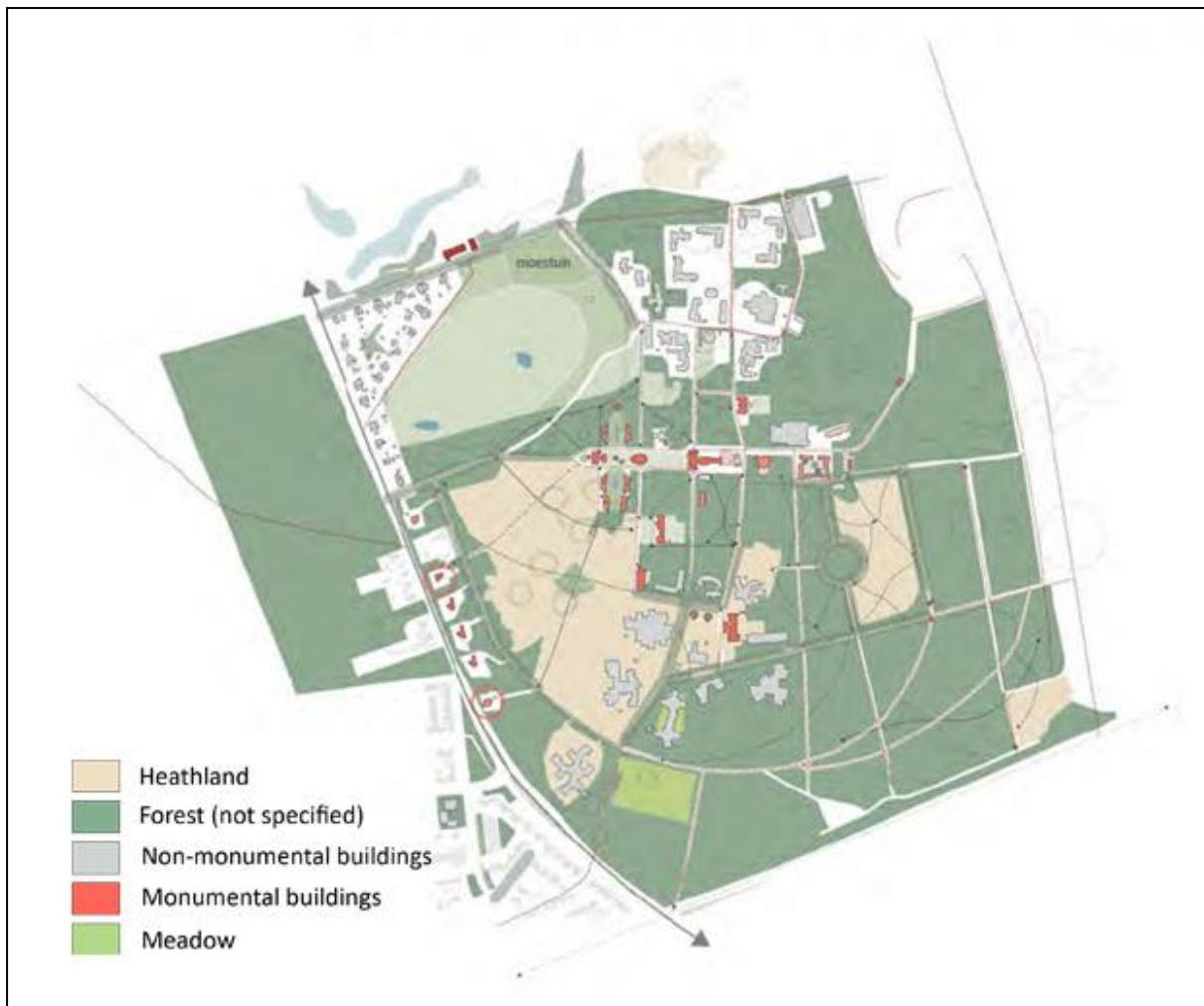


Figure 2: Map of the current state of the WAH (WA-hoeve Gebiedsvisie Definitief, januari 2017, 2017).

2.1 History

At the end of the 19th century, it was a desolate area of heathlands, but this changed after 1905 when the Willem Arntsz Foundation acquired the 207-hectare area (*WA-hoeve Gebiedsvisie Definitief, januari 2017, 2017*). The foundation itself already had a facility in the centre of Utrecht where people with a “mental illness” were treated, but the board was convinced that patients would be treated more effectively if they underwent their treatments amid the serenity of nature. About a thousand patients lived on the estate when the asylum was finally opened two years later (Dankers, Joost, 1996). Occupational therapy was a common means of providing patients with as normal an existence as possible, so weaving mills, tailoring, and flower greenhouses were present, and patients were offered work in the kitchen or on the estate itself. Social facilities such as sports and music clubs were also established. Performances from the theatre societies were held in the auditorium and were widely attended by villagers and patients. Nevertheless, the treatment of patients in the

pre-war period was characterized as 'severe', owing to the strict regime they were subjected to and distant separation from their families (Goosen, Hans, n.d.).

The Second World War marked an important turning point in psychiatric care, and so too in Den Dolder. Under the leadership of Carel Muller, the WAH became a pioneering institute in psychiatric care. Before the area's reputation soared to these heights, a low point preceded it. In World War II, first Jewish patients were taken away during razzias, then the WAH had to cope with a doubling of patients as other institutions in the coastal regions were seized by the Germans. The facilities were not equipped for this and, to make matters worse, they were forbidden from heating the buildings and food was scarce. In the end, 1163 patients did not survive the war (Danvers, 2020). The war did appear to give rise to a new approach within psychiatry, namely that patients were increasingly humanized. Director Carel Muller was a forerunner of these radical ideals of renewal and wanted his clients to live as normal a life as possible. His "dilution experiment" eventually failed, but not much later after his dismissal, his ideas were nonetheless implemented (*Carel Muller, gezicht van vernieuwing psychiatrie in jaren 70, overleden*, 2020). The WAH and the village formed a tight bond in the following years. Villagers enjoyed the beautiful forests on their walks, and patients were given the room to do their own shopping in the village. The grounds even hosted lavish parties where the audience consisted of a mix of villagers and patients.

2.2 Present

A change in the atmosphere occurred with the arrival of forensic psychiatric clinics on the premises. Where once people lived peacefully with the patients, the mood became grimmer as several residents confirmed to us. A major turning point that caused further deterioration in relations was the escape of Michael P. who subsequently murdered Anne Faber in 2017 (Hoving, 2019). Even now, five years later, the people of Den Dolder are still living with the consequences of this terrible event. The impact of the murder on a national level was immense, let alone for those who lived so close. Where previously life alongside the patients was part of everyday practice, it isn't anymore. Residents simply look at patients differently, and more suspiciously (Schouten, 2022). While some residents are only a little warier, for others, the consequences are profound. Several residents have armed themselves with pepper spray or cans of hairspray since the incident, they do not dare to walk their dogs alone at night, and have installed numerous security cameras (Gerling, 2022). Despite the tragic events and the profound impact on the village, the current situation of the estate is far from being merely negative. When we look at nature, we see some amazing developments. Badgers have frequently found their home on the WAH, the nightjar has established itself on the heathlands, and several pairs of pine marten are being monitored by a local ecologist. Warblers and woodpeckers also nest in the diverse forest. Anno 2022, almost 100 different species of birds have been observed, 18 species of mammals, 28 species of butterflies, and 280 recorded species of plants (Den Dolder - Willem Arntz bos (UT), n.d.). And all this in a relatively small area. These exceptional statistics reflect the wonderfully diverse area, free from extensive human intervention for decades, where you can find yourself in a completely new biotope at any moment.

2.3 Future

The new development plans of Bouwfonds Gebiedsontwikkelingen, mean in any case that the (forensic) clinics have to leave the site in 2027. Cultural institutions that were located (most have already gone) in the monumental buildings and some 3,000 trees will also have to make way for the construction of a new residential area, Bosch & Hei (see figure 3)

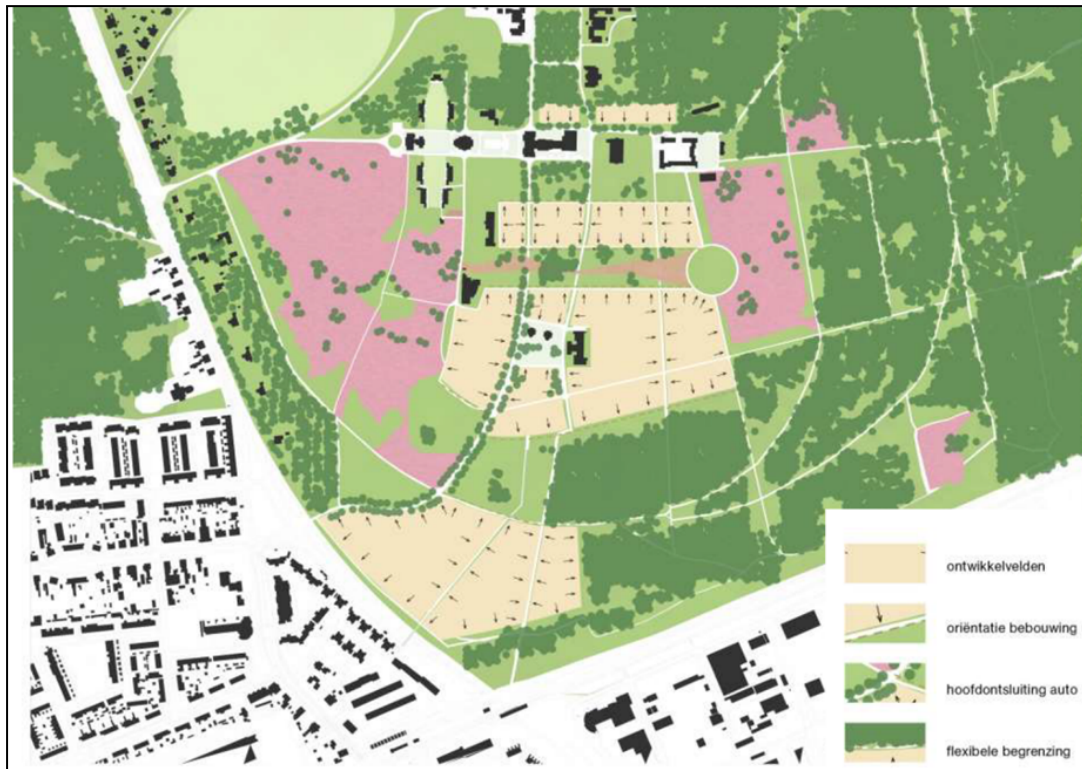


Figure 3: Map of the future building plans. There is a possibility that more houses will be built (WA-hoeve Gebiedsvisie Definitief, januari 2017, 2017).

The monumental buildings will remain, but the current diverse landscapes (consisting of forest, heathland, scrubland, and historic lanes) will largely be lost. The center of the WAH in particular will bear the brunt, with construction activities focusing mainly on this part. This will primarily involve low-density housing with low building heights, and on the historical central axis, the realization of small-scale flats is envisaged. About 190 new homes will be built, although it is not yet entirely clear what kind of houses they will be and who the target group will be (WA-Hoeve Area Vision Final, January 2017, 2017). Local residents strongly anticipate, however, numerous villas. To improve accessibility to the new neighborhood, new infrastructure will also be built, including roads in a north-south direction (see Figure 4).

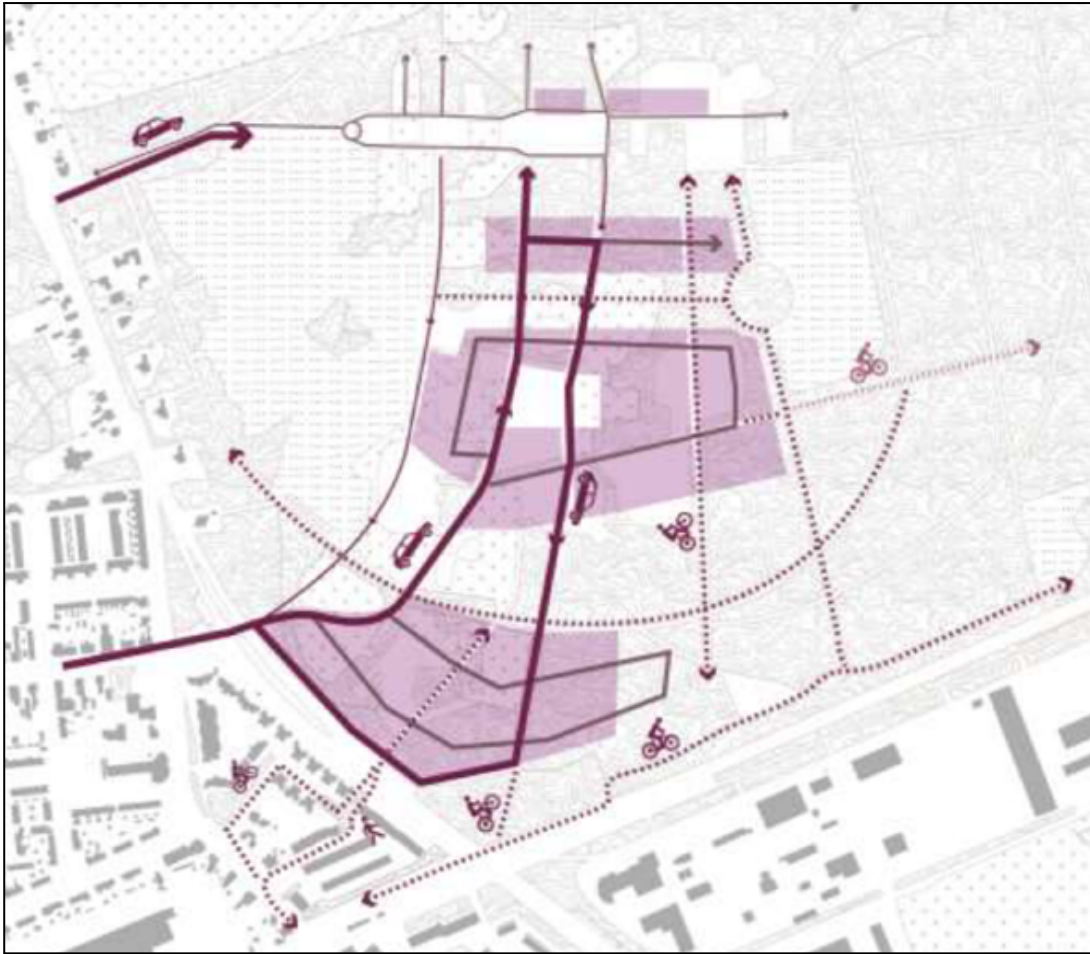


Figure 4: Infrastructure of the new residential area Bosch & Hei (WA-hoeve Gebiedsvisie Definitief, januari 2017, 2017).

In terms of culture and recreation, there will also be a lot of changes at WAH. To this end, the central axis should become the hub of the area. The preliminary plans include various catering establishments, a community center, workshops, a childcare center, and a bakery or brewery. There are also plans to create play areas for children and a fruit orchard. It has to be noted here that the final infill is not yet apparent, though it is clear that the central axis should offer facilities for residents from outside Den Dolder in addition to a neighborhood function.

A major consequence of the current plans is the division of the area into east and west. Although the plan takes into account two green corridors connecting the western part with the eastern part, they are very narrow, run directly in front of the houses, cross two roads, and do not include the most diverse forest areas that will be lost due to the construction. Several (rare) species are threatened in their existence as a result. Many of the species previously mentioned, such as the pine marten, badger, and nightjar, are highly susceptible to disturbance (Vogelbescherming, n.d.).

Unfortunately, the presence of these animals and the very diverse flora does not seem to be considered in the new plans. The 'Gebiedsvisie' even states that ecology is "not given the

highest priority" and will depend on other themes (*WA-hoeve Gebiedsvisie Definitief, januari 2017, 2017*). The residential area to be built and the associated infrastructure will completely cut off the western area, which includes a large moorland, from the eastern part. The western part, which is connected to the center of the Utrechtse Heuvelrug via an ecoduct, will logically not benefit from a nearby housing estate. Disturbance-sensitive species such as the badger and the pine marten will be the first to leave the area, leading to questions regarding the point and value of an expensive ecoduct (costing several million Euros) if the ecological value of the western part will decrease.

3. Methods

The methodology of this paper revolved around the following question: "What is the value of the mental well-being benefits derived from cultural ecosystem services at the Willem Arntsz Hoeve?" A mixed methods approach was used to answer this question, consisting of three in-depth interviews and an online survey.

3.1 Interviews

Three interviews were conducted in order to supplement any gaps in our survey data. This gave us the opportunity to look into the interviewees' motivations and beliefs behind their answers, in addition to gathering valuable qualitative data to help offer context to our survey data.

In the limited scientific literature that is available for analyzing CES, interviews are generally the preferred method (Chaudhary et al., 2019). Hence, we conducted three interviews: one with a local resident that is leading a plan of opposition to the development (interviewee one), one with a former psychiatric patient who lives on-site (interviewee two), and one with a former employee of the psychiatric facility (interviewee three). Each interviewee wished to remain anonymous, and will therefore be referred to as interviewee one, two, and three.

Each interviewee has been a first-hand witness to the profound changes the WAH has undergone in the last few decades. All share an intimate bond with the site and it is an important aspect of their lives. The interviews were guided by the survey questions (see 3.2) and were expanded upon to create a conversation about the interviewees' experiences at the WAH. Topics during the interviews included how the site has changed and what is valued most about the site. After each interview, we were able to extract what cultural ecosystem services interviewees valued at the site.

3.2 Survey

A survey acted as a basis for the majority of our research. The Organisation for Economic Co-operation and Development (OECD), a report that measures societal well-being through various social indicators, acted as a basis for formatting and phrasing questions in our

survey (OECD, 2013). Questions from the OECD emphasized explicit wording of questions, seeking respondents' motivations, and cohesive flow of survey questions (OECD, 2013, pp. 67).

3.2.1 Survey design

The online survey provided to respondents consisted of 13 questions that gauged demographics, benefits obtained from the WAH, and opinions on the proposed development of the site. There were 11 multiple-choice, linear scale, and checkbox questions with 2 open-ended questions at the end of the survey (see appendix 8.1) for the complete survey).

The first section of the survey assessed the demographic information of respondents, which asked respondents their age, gender, distance to the WAH, and the frequency of their visits to the site. This data was used to identify each respondent's relevance to the survey, as well as to identify the varying opinions among different demographics. The first section was concluded by having respondents select all CES they obtain from the WAH, with possible answers including enjoyment of nature, mental well-being, social connection, cultural connection, historical knowledge, physical recreation, and others (open question). The aim of this question was to acquire an overview of the general benefits that people get from the WAH.

The second section of the survey aimed to create a more detailed picture of what CES of the WAH were most highly valued by respondents. These questions were formatted with a linear scale and asked respondents to rate statements from 1 to 5, with 1 being "strongly disagree", 3 being "neutral", and 5 being "strongly agree". Respondents rated statements including "The WAH brings the community together", "The landscape of the WAH is unique compared to surrounding areas", and "After spending time at the WAH, I feel more relaxed". All questions explicitly mentioned the WAH, to focus respondents' attention on the study site, and mitigate against answers that were non-specific to the WAH.

The final section of the survey focused on the future building plans and assessed the level of understanding among respondents about the plans (with the housing shortages in mind) for the new residential area. Respondents were also asked if they would still visit the area, or what is left of it after the plans are realized. These questions were conducted in the aforementioned linear scale. Two open-ended questions concluded the survey by asking respondents if the housing development has a positive effect on them, as well as asking respondents to leave any additional comments about the WAH.

3.2.2 Distribution and sample size

Time and resource limitations meant the survey was distributed primarily through the three interviewees, which resulted in a total of 109 survey respondents. Hence, the sample was not completely random, as all the respondents were likely linked in some way to the interviewees. Due to the relatively high number of respondents, however, we are confident

that we have ascertained a relatively representative sample of the total population of Den Dolder.

4. Results and Analysis

The following chapter discusses the findings that have resulted from our research. We will discuss the survey results and use the interviews to contextualize the answers where possible. Furthermore, we will analyze and interpret the results so that it becomes clear what they precisely mean in relation to mental well-being derived from the WAH.

4.1. Demographics

The majority of respondents were 60 years or older (52%), with 42% being 36 to 60, and 5% being 18 to 35. Respondents were 65% female and 35%, male. The majority of respondents lived within 5 kilometers of the Willem Arntsz Hoeve, with some respondents even living on-site. Respondents who never or rarely visited the WAH were eliminated from the dataset, with the rest of the respondents visiting from once per year to multiple times per week (see Figure 5).

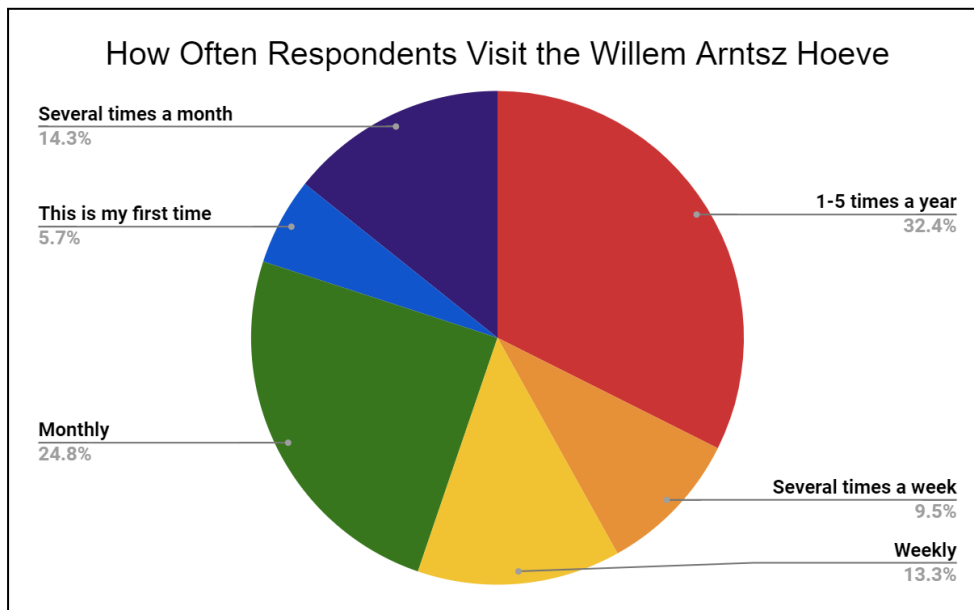


Figure 5: Graph of frequency of respondent visits

4.2. Benefits of Cultural Ecosystem Services

Respondents derive enjoyment of nature (90%), physical recreation (61%), mental well-being (52%), historical knowledge (41%), cultural connection (21%), and social connection (17%) from the WAH. When given the option to mention benefits that were not listed, several respondents mentioned their previous careers at the psychiatric clinic on-site, citing the connection they feel to patients. Others mentioned the rich artistic culture

attached to the WAH. The most common benefit mentioned was that respondents tend to their personal vegetable gardens on-site. Hence, enjoyment of nature, physical recreation, and mental well-being are the most valued CES by respondents.

4.2.1 Uniqueness of the Landscape

When asked to compare the WAH to surrounding areas, the majority of respondents (88%) strongly agreed or somewhat agreed that the WAH is unique. Evidence suggests that stakeholders place a higher value on the WAH than surrounding green areas and subsequently, derive more benefit from it due to its unique constitution of natural space and cultural history. The interviews resulted in similar answers. All three of them emphasized that the harmonious combination of nature and cultural history made the site unique.

4.2.2 Physical Recreation

As mentioned previously, 61% of respondents claimed to enjoy physical recreation when asked to select the CES they derive from the WAH. In a separate question, 60% of respondents strongly agreed with the following statement: "I like to use the WA Hoeve for physical activities". This demonstrates a consistent value of the ability to use the WAH for physical recreation. As physical activity is proven to improve mental well-being (Barton, J., et al., 2010), this large valuation of physical recreation by respondents suggests that this service in particular is important for the overall mental well-being of the residents of Den Dolder.

4.2.3 Relaxation

81% of respondents strongly or somewhat agreed that they feel more relaxed after visiting the WAH. Known to be a strong part of good mental well-being, a high relaxation measure indicates that the WAH has a considerable benefit on the mental well-being of respondents. When related to the uniqueness of the landscape, this suggests that respondents derive more relaxation, and therefore more mental well-being, from the WAH than other areas. This conclusion was substantiated by interviewee number three, who had experience in the field of psychiatric care, and emphasized the relative freedom people have when visiting the site. The surrounding areas are strictly regulated, resulting in a prohibition on leaving the footpaths for example, while visitors to the WAH are permitted to move around more freely, resulting in a stronger connection to nature.

4.2.4 Endangered Species

75% of respondents strongly or somewhat agreed that (potential) encounters with endangered species benefit the way they experience nature at the WAH. Interviewee number two, for example, described what the daily encounters with roe deer meant to him. The simple act of the animals just walking in front of his office window on quiet mornings brought him joy and a feeling of closeness to mother nature.

Interviewee one, in particular, strongly advocated on behalf of the animals on the estate. An account she recalled during the interview described one of the pine martens that was being followed by her and a fellow ecologist. Both were worried about the pregnant female after she suddenly disappeared a few months ago. Her disappearance coincided with the destruction of an old building. They suspected that the female had chosen this particular building to make her nest, and did not survive the demolition. The tragic event clearly had a massive effect on her and made her clearly very sad. This example illustrates how some people feel connected to the local wildlife and what it means to them. Although we will not assume that similar incidents have an equal effect on all the respondents, the effect of local or rare wildlife on people's experience of nature should not be underestimated.

4.2.5 Social, Cultural, and Historical Benefits

When asked if the WAH brings the community together, 67% of respondents strongly or somewhat agreed. Similarly, respondents gained cultural (21%), historical (41%), and social connections (16%) from the WAH. The aforementioned facilities located on-site such as Stichting P'Arts and the WWII Memorial promote social, cultural, and historical connections among visitors and residents. This can contribute to a feeling of belonging within the community and increase mental well-being.

Interviewee two explained the personal importance of the history of the estate. A part of his and the village's identity were closely connected to the rich history of the estate. He was proud of the achievements, and of the world-leading role of the psychiatric clinic in the past. The on-site monument was an important place to remember the atrocities of World War II for each interviewee. Even a relocation of the monument was not debatable, since the experience of this particular site was closely connected to its location on the estate; close to the edge of the eastern heathlands with a beautiful view that allowed people to contemplate life and commemorate the dead.

An interesting detail interviewee two noted was the social role the estate played in the past before the forensic clinics arrived. Large feasts were held on the historical axis, where the audience consisted of a mix of patients and local residents; this indicates the potential of the site. Although the social importance of the estate, in comparison to other indicators, is valued relatively low by respondents, we know that this has been significantly different in the past. The potential social value of the WAH is seemingly a lot bigger than the value now.

4.2.6 Safety

In response to the aforementioned death of Anne Faber in 2017, respondents ranked how safe they feel at the WAH when alone. 61% strongly agreed or somewhat agreed that they feel safe, with 27% of respondents feeling neutral on the matter, and 11% somewhat or strongly disagreeing. Despite the high level of perceived safety among respondents, it is important to acknowledge that the 38% that feel unsafe may derive lower mental well-being

benefits from the WAH. This statistic, however, is lower than expected when considering that some residents of Den Dolder take precautions like carrying pepper spray to increase their safety (Gerling, 2022).

4.3 Development of the Willem Arntsz Hoeve

When asked if they were aware of the building plans from Bouwfonds Gebiedsontwikkeling, 64% of respondents claimed to be already aware. In order to bridge any gap in the knowledge of respondents, a paragraph about the development and the timeline was provided. 71% of respondents strongly or somewhat disagreed that given the current housing crisis, 3,000 trees must be cut down to make room for housing. When asked if respondents would return to the WAH after the housing development is completed, there was an equal spread among answers, with 30% remaining neutral (see Figure 6). This large decline in visitors suggests a large decline in the value of the site, and potentially the mental well-being of Den Dolder residents.

A majority of respondents said that the housing development will not have a positive effect on them, with many citing that cutting down trees greatly affects their physical recreation. Other respondents voiced concern about the development turning Den Dolder into a busy area. Some respondents worry about how the development will affect the extensive amount of endangered species of the WAH, with one saying that “cutting down so many trees in this important nature reserve is outrageous”. Another respondent expressed that “nature sacrificed to [the housing development] is deplorable”. On the other hand, interviewees indicated that the relocation of the psychiatric clinics is a positive development in their eyes. This was especially evident when cross-referencing data from those who felt unsafe on the estate, as they will most likely benefit the most. The building plan relocation of the psychiatric clinics is not being received as a deterioration of the estate, unlike other developments.

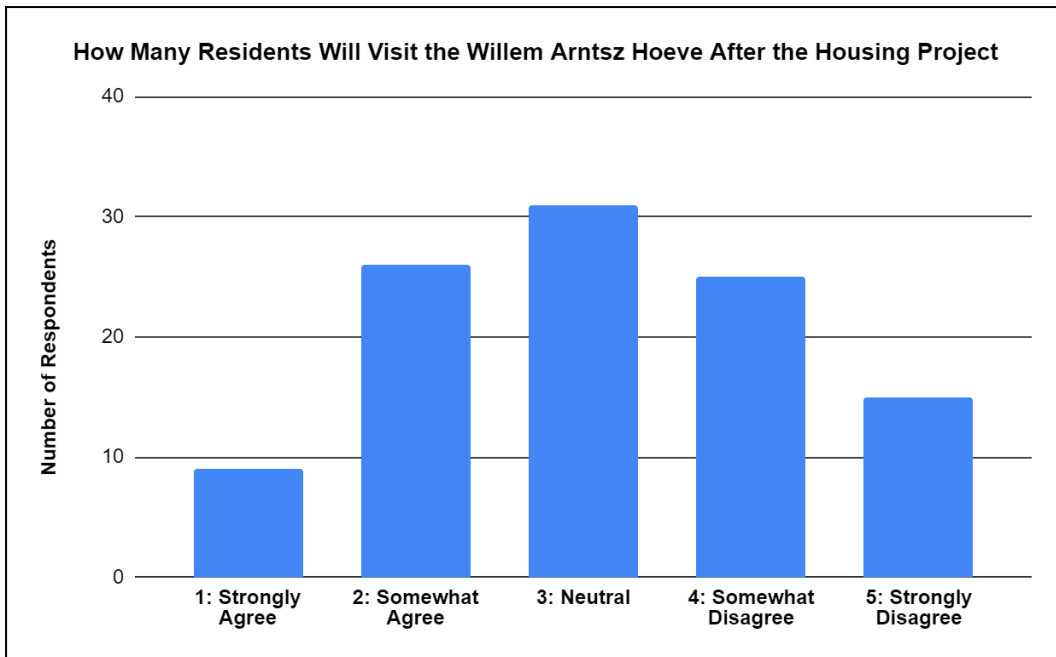


Figure 6: Graph of how many residents will visit the WAH after the housing project

When given the opportunity to provide any additional comments, respondents voiced concern about the transparency of the building plans and preserving the nature, culture, and history attached to the site. Many protested to move the development elsewhere, as greed seems to be the main reason for developing at the WAH: “Area owners, developers, and municipalities use cheap forest land as building land, while the forest area in the province of Utrecht has already decreased by almost 6% over the past 30 years”.

4.4 Age and gender-related preferences

Now we have a good overview of the main results, we will now focus on co-correlations between demographic data and the answers given. First, we will discuss what males and females value the most on the WAH.

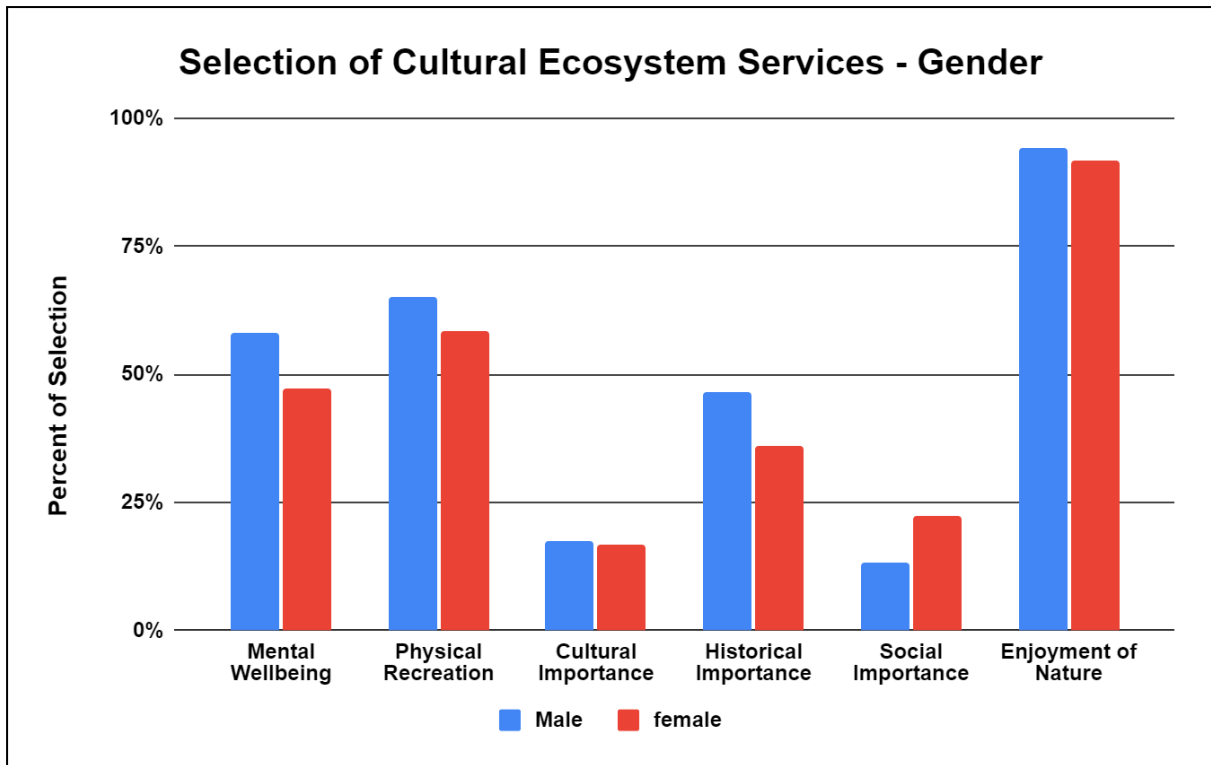


Figure 7: Graph highlighting male and female CES preferences.

Using Figure 7, it can be concluded that the preferences of males and females are reasonably similar, with a few minor exceptions. Cultural importance and enjoyment of nature are both valued similarly. However, the social value of the site is clearly more important for females than for males (although this is not valued very highly). Males place higher importance on the historical value of the site, as is the case for physical recreation. The value of the estate in relation to mental well-being, more specifically stress reduction and spirituality, is surprisingly valued higher by males than by females. Research by the Centraal Bureau voor de Statistiek (CBS) points to the opposite. 30% of women in the CBS survey considered spirituality (very) important, compared to only 21% of men (Coumans & van Muiswinkel, 2022).

The preferences per age group also resulted in some interesting insights. Physical recreation is valued the most by the age group 36-60, as is cultural importance. Historical importance is valued relatively equally between the three groups, although the 60+ value is marginally higher than the other two. A similar result is evident with the social value, only the other way around. The youngest category values this the most. The mental well-being indicator has again produced an interesting result. The youngest age group values the mental well-being aspects the most. Nature is, therefore, especially for the youngest age category, an important factor to reduce stress or gain spiritual enrichment.

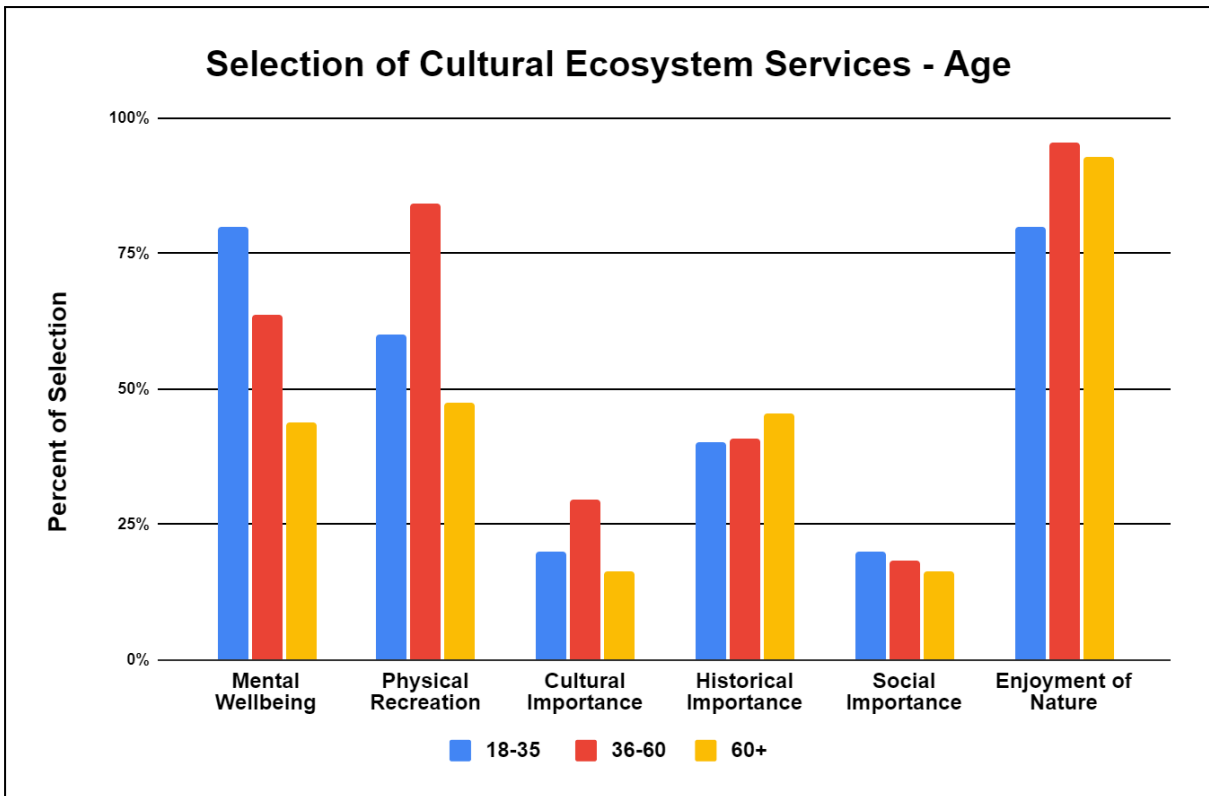


Figure 7: Graph highlighting CES preferences for each age group.

Hence, the results have demonstrated that there are certain CES at WAH that are significantly more valued than others. Enjoyment of nature (the uniqueness of the landscape, encounters with animals, etc.), physical recreation, and mental well-being (spirituality, stress reduction, etc.) are especially highly valued. Unfortunately for the residents of Den Dolder, those very services are likely to be affected the most by the building plans. Whereas cultural, historical, and social aspects will likely suffer minimal damage from the plans, this cannot be said about the previous three. The services that are being valued the most, are most likely to be lost if the construction of Bosch & Hei continues.

5. Discussion

The literature review offers insight into the limited research that has been so far conducted linking CES to mental well-being. Indeed, only relatively recently has awareness of the global deterioration of mental well-being been recognized. Due to the confluence of socioeconomic, political, and environmental factors, further research is needed to provide a more comprehensive picture of how CES affects mental well-being. Research conducted in some low-and middle-income countries (LMICs) highlights the negative impacts of nature interactions surrounding feeling safe, an important contributor to mental well-being (Nawrath et al., 2022). Whilst human interactions with dangerous megafauna are not an issue at the study site, the presence of medical patients on-site and incidents such as the

death of Anne Faber have raised concerns, which are difficult to account for in the scope of this study.

The use of the CICES framework in a future study would allow further measurement of the 'non-material characteristics of ecosystems that are important for people's mental or intellectual well-being (Czúcz, B., et al., 2018). In addition to providing another framework for comparison, it would be useful in a wider sense with the goal of convergence in ES classification systems (B. Czúcz et al., 2018). However, this goal is beyond the present study and requires considerably more academic attention.

It has been noted how the limited sample size and diversity may have affected survey results. In order to increase the reliability of the results, the sample pool would have to be extended further. Although we have a relatively significant portion of the total population of Den Dolder, some age groups are for example underrepresented. The 60+ group is by far the largest, while the 18-35 group represents the smallest. The difference is so substantial that it cannot be explained by the demographic profile of the village, even though the total group of young adults will probably be low in comparison to the older age groups. To make sure every age group is evenly represented in the survey, demographic research will have to be executed, since this specific data is not readily available.

The survey approach is overall an optimal method to reach a lot of people while minimizing the efforts. But as mentioned in the 3.1, using interviews would have resulted in a much more detailed image of what motivates people to choose certain options. The conclusion we would be able to draw would have been far more detailed. It is, therefore, for future research, an interesting approach and would give us even more insight into the mental well-being benefits Willem Arentsz Hoeve has to offer. There is however a trade-off situation that has to be considered here. Choosing the interviews will result in a more detailed dataset, but also an increased effort and a smaller sample pool in comparison to a survey. On October 10, 2022, an alternative plan for the development of the WAH site was submitted by the Vrienden van de WA Hoeve, describing nature-inclusive rebuilding of historic buildings and construction of apartments, aiming to preserve and enhance nature (Ende & Boer, 2022). A comparative study assessing the potential mental well-being impacts of the BAU scenario and the alternative plan proposed would be useful for policy-makers evaluating the plans.

One particular problem, which was difficult to overcome, was the physical limitations of the study site. Because we were focussing on a small area, which itself is surrounded by a relatively large forested region (Nationaal Park de Utrechtse Heuvelrug), it was a challenge to ensure the respondents were not giving responses based upon a general appreciation of nature, or the landscape and wildlife of the surrounding national park. It was therefore important to emphasize that the answers were only supposed to concern the WAH. We did that by mentioning the WAH in almost every question so that the respondent was reminded consistently of the scope of the research. Whether we have been successful remains to be seen. Unfortunately, there are no blueprints for a project like this focussing on a small

natural area amidst a larger national park. We can therefore not be sure if the respondents only gave their answers based on their experiences on the WAH. This is a limitation of using a survey in contrast to more in-depth interviews, which time constraints prevented us from conducting.

6. Conclusion

This study aimed to value the mental well-being benefits that are derived from cultural ecosystem services at Willem Arntsz Hoeve, using an adapted IPBES framework to guide research in the form of a questionnaire and in-depth interviews. A literature review was also conducted to provide contextual information about the challenges we faced. This review illustrated why it is perhaps unsurprising that the plans originally submitted for the redevelopment of the area focussed primarily on ecological impacts, and failed to adequately value the CES and their integral importance to the local community and residents. In the case of the Bosch and Hei plan, it can be reasoned that the lack of focus on CES is due to the difficulty of attaching value to 'non-measurable' ES, however, it is evident from the strong local resistance to the plan that the site has now been accurately valued. Visiting the site and conducting in-depth interviews demonstrated the variability in which people value the CES present (aesthetic value, recreational, historical), and this qualitative data is pivotal when attaching value to a site such as WAH.

What stands out in the results, is that the most value is derived from three services in particular; the enjoyment of nature, physical recreation, and the effect on stress reduction and mental well-being. Notably, it is the first and the latter of these services that will be most heavily affected by the new building plans. Although physical recreation is still possible on the estate when the plans have been completed, the experience will be markedly different in comparison to the present. Whether it will have a positive or negative influence, remains to be seen. The in-depth interviews revealed the enormous appreciation of nature on the WAH, suggesting that there is a close connection between people's decision to recreate on the estate, and the appreciation of the landscape, for example. Hence, **the cultural ecosystem services offered by the Willem Arntsz Hoeve are integral to the mental well-being of the surrounding area**, as these services are not offered to the same degree in surrounding areas.

The alternative plan recently submitted by the Vrienden van de Hoeve is a comprehensive document presenting nature-inclusive solutions for development, and crucially, gathers input from a range of stakeholders in the local area.

Whilst our results emphasized the importance of the unique site for mental well-being, there is significant space for a wider study, integrating our findings with ecological analysis and further survey data, to ascertain the full value of CES at WAH.

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8. Appendix

8.1 Survey



De culturele impacts van de Willem Arntsz Hoeve

Deze enquête wordt uitgevoerd in samenwerking met de masteropleiding Environment and Resource Management van de Vrije Universiteit Amsterdam. Met uw antwoorden zullen wij een waardering uitvoeren van de culturele ecosystemendiensten en de effecten op het geestelijk welzijn die de Willem Arntsz Hoeve (WA Hoeve) biedt.

 **chrisco0817@gmail.com** (not shared) [Switch account](#)



* Required

Wat is uw leeftijd? *

- 18 to 35
- 36 to 60
- 60+

Wat is uw geslacht? *

- Man
- Vrouw

Hoe dicht woont u bij de Willem Arntsz Hoeve? *

- Onder 5 kilometres
- 5 tot 10 kilometres
- 10+ kilometres

Hoe vaak bezoekt u de WA Hoeve? *

- Dit is mijn eerste keer
- 1-5 keer per jaar
- Maandelijks
- Meerdere keren per maand
- Wekelijks
- Meerdere keren per week
- Nooit

De volgende stellingen zijn voor mij van toepassing als ik de WA Hoeve bezoek. *

- Ik geniet van de natuur
- Ik ervaar een positief effect op mijn mentaal welzijn (zoals mindfulness, spiritueel en/of het verminderen van stress etc.)
- De WA Hoeve speelt een belangrijke rol in het onderhouden of opdoen van sociale contacten
- De WA Hoeve is cultureel van groot belang voor mij (Stichting P'Arts, Het Bezinningshuis, etc.)
- De WA Hoeve is een belangrijke historische plaats voor mij
- Ik gebruik de WA Hoeve voor fysieke recreatie (zoals wandelen, hardlopen, fietsen etc.)
- Other: _____

Geef de volgende vragen een cijfer van 1 tot 5, waarbij 1 staat voor "helemaal oneens", 3 voor "neutraal" en 5 voor "helemaal eens".

Het landschap van de WA Hoeve is uniek in vergelijking met omliggende gebieden *

	1	2	3	4	5	
Helemaal oneens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Helemaal eens

Ik gebruik de WA Hoeve graag voor fysieke activiteiten (bijv. hardlopen, wandelen) *

	1	2	3	4	5	
Helemaal oneens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Helemaal eens

Na een verblijf in de WA Hoeve voel ik me meer ontspannen *

	1	2	3	4	5	
Helemaal oneens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Helemaal eens

De aanwezigheid en mogelijke ontmoetingen met bedreigde diersoorten en andere dieren op de WA Hoeve hebben een positief effect op de manier waarop ik de natuur hier ervaar *

	1	2	3	4	5	
Helemaal oneens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Helemaal eens

De WA Hoeve brengt de gemeenschap samen *

	1	2	3	4	5	
Helemaal oneens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Helemaal eens

Als ik de WA hoeve bezoek, voel ik mij veilig, zelfs als ik alleen ben *

	1	2	3	4	5	
Helemaal eens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Helemaal oneens

Development of the WA Hoeve

Een gedeelte van de Willem Arntsz Hoeve is opgekocht door Bouwfonds Gebiedsontwikkeling en zal in een nieuwe woonwijk Bos & Hei veranderen met zo'n 400 huizen. De bouw zal beginnen nadat de psychiatrische instellingen Altrecht en Fivoor de WA Hoeve in 2027 verlaten. Voor het project zullen ongeveer 2,000 tot 3,000 bomen worden gekapt om plaats te maken voor onder andere villa's. In het gebied leven echter een groot aantal bedreigde diersoorten, waaronder de neushoornkever, dassen en boommarters. Als u meer informatie wilt over de geplande gebiedsontwikkeling verwijzen wij u graag naar <https://www.vriendenvandewahoeve.nl>.

Ik ben op de hoogte van de plannen van Bouwfonds Gebiedsontwikkeling *

	1	2	3	4	5	
Helemaal oneens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Helemaal eens

Met de huidige woningnood in het achterhoofd, begrijp ik dat er hier tot wel 3,000 bomen moeten worden gekapt om plaats te maken voor huizen *

	1	2	3	4	5	
Helemaal oneens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Helemaal eens

Ik zal de WA Hoeve blijven bezoeken, zelfs nadat het ontwikkelingsproject is afgerond *

	1	2	3	4	5	
Helemaal oneens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Helemaal eens

Denkt u dat de plannen van Bouwfonds Gebiedsontwikkeling en de realisatie ervan in de toekomst een positieve invloed op u persoonlijk zullen hebben? Waarom wel/niet? *

Your answer

Is er nog iets wat u kwijt wilt over de WA Hoeve, de toekomstplannen of de manier waarop u de natuur hier beleeft bijvoorbeeld? Laat het alstublieft hieronder achter en wees zo uitgebreid mogelijk!

Your answer
