‘Unharden The Garden’

Wageningen University MSc Student Working Group

The behavioural choices and motivations of citizens in relation to soil sealing

How Do You Prefer Your Garden?

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Abstract

Having a ‘green environment’ within the urban area is thought to be important for the sustainability and health of population living in the cities. A variety of factors put this green environment at risk. One of these risks is the significant increase in the sealing (or ‘tiling’) of private gardens. These gardens cover a decent amount of the urban area in the Netherlands and therefore they might matter in the bigger picture. Concerns over water management, biodiversity and public health issues have raised several initiatives against the sealing of these private gardens. These initiatives want to turn the tiling trend around and encourage people to ‘green’ their gardens. However, there is not much known about why people actually tile their gardens. This study explores the factors that influence citizens’ soil sealing decision-making. Build upon broad social theory literature, a survey was taken in two neighbourhoods (Amsterdam and Almere). The results show that garden decision-making is not only influenced by someone's environmental preferences. Other factors such as social networks, levels of uncertainty and demographic characteristics such as having children and the duration of residence influence the decision-making process. The outcome of this research can help to identify possibilities to change soil sealing behaviour.

This report presents the findings of a research done in the context of an Academic Consultancy Training project that has been commissioned by Alterra Wageningen UR. The research creates an opportunous start for Alterra Wageningen UR further research and can be seen as a building block in the transition towards a more sustainable and healthier city.

Keywords: private gardens, soil sealing, human behavior, environmental preferences, social networks, uncertainty, biodiversity, water management, public health

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1. Introduction

> *"At an alarming pace, green hedgerows, smooth lawns and multicoloured flower beds have been replaced by gray tiles, maintenance free patios and closely paved pathways. Especially in the cities this has major consequences…"*
>
> - Operatie Steenbreek introduction video[1]

'Operatie Steenbreek', an organisation established to reverse the petrification of the green environment, observed an increasing trend of sealing private gardens in urban areas. They argue that the sealing of these private gardens leads to problems with water management and a loss of biodiversity. 'Green' in the garden can according to Operatie Steenbreek (n.d.) also be an important factor in the reduction of stress and generally has a positive effect on the health and wellbeing of people.

With a fast growing world population, an increasing amount of people are expected to live in cities in the next decades. An important characteristic of cities is their high level of soil sealing. The soil performs several environmental, economic and social functions. Sealing the soil for infrastructural or other purposes has several ecological implications. It has been shown that high levels of soil sealing cause some significant problems to the environment (Scalenghe and Marsan, 2009). First of all, it leads to a loss of biodiversity in these (sub)urban areas. Flora and fauna are restricted on microclimate level, which can be reflected on larger scale. Soil sealing can affect the area's ecosystem services such as air filtration, recreational values and rainwater drainage (Bolund and Hunhammar, 1999). It is expected that extreme rainfall will occur more often due to climate change (IPCC, 2007). This in combination with a high soil sealing density generates an insufficiency of the sewer system. The rainwater flows directly into the sewer system. As the system cannot handle this amount of water at once, floodings might occur more often. Thereby, high soil sealing density is one of the main factors troubling water management in the cities. In addition, soil sealing rules out the positive effects a green environment can have on the physical and mental state of people.

As mentioned above, the sealing of the soil has some significant consequences. In the Netherlands, private gardens hold a significant amount of the city surface area. Operatie Steenbreek and other initiatives such as 'Amsterdam Rainproof' focus on greening gardens by changing the mindset of the people. By inspiring citizens to green their garden, they aim to make the city more resilient to heavy rainfall. Moreover, more green enlarges the quality of life in the urban area and can result in a higher biodiversity. Creating public awareness can contribute to a more climate resilient city. It is not the idea that removing one tile can change the environment. It is about changing the mindset, and that has to start somewhere and grow into society like an oil stain. However, not a lot is known on why people actually tile their garden or not. This report will therefore explore the behavioural choices and motivations of citizens in relation to soil sealing of private gardens and get a grasp on their role in the transition towards a sustainable and healthy green urban environment.

The report consists of two main parts. First, we elaborate on the context of our research (chapter 2). We explore the relevance of private gardens to a 'green environment' within

[1] https://youtu.be/mJWPI945Vbw - Operatie Steenbreek Introduction Video (Translation from Dutch)

the urban area. We discuss the three main concerns on the sealing of private gardens put forth by Operatie Steenbreek. We look at the different initiatives, organizations and institutions that have a stake in what people do with their gardens and evaluate their interests and problems. The second part of the report consists of our research on the behavioural choices and motivations of citizens in relation to the sealing of private gardens (chapter 3). The research is composed of mixed quantitative and qualitative methods built on a wide range of literature on social theory. The results of both qualitative and quantitative parts of the study are combined in a discussion. The context and research parts of this report come together in the conclusion and we finish with recommendations for future research and policy on influencing soil sealing behaviour in private gardens.

2. Context

In this part of the report we look at the context of our research. There are several organizations and initiatives involved in the movement striving for the de-tiling of private gardens. The main reasons that are being put forward by the involved stakeholders are related to water management, the ecosystem and public health. First, we discuss the relevance of private gardens as to whether their influence is significant to the concerns, discussing each concern individually (paragraph 2.1). After this we provide an overview of the different external stakeholders involved, providing an insight on their participation of this process (paragraph 2.2). These two parts together constitute the context that provides a sound foundation for our research.

2.1 Relevance of Private Gardens

As described in the introduction, there are several concerns related to the green environment of the city. In this section we assess the relevance of the propagated concerns in their relation to private gardens. Thereby we will be able to reflect on the relative importance of these concerns about soil sealing to private gardens.

2.1.1 Private Gardens and the Total Neighbourhood Area

In order to make substantial claims about the relevance of private gardens, we need to know how much area of the city is covered by private gardens. Therefore, we have generated maps that enable us to estimate the percentage of neighbourhood surface that is covered by private gardens (Annex 7.4). The samples we took are the same neighbourhoods that are the subject of our research (see chapter 3). The maps are based on a combination of information derived from Google Maps and EduGIS. In these maps, we classified three different forms of land-use; private gardens, open green space and impervious area. An impervious area is a space covered with an impenetrable material, which prevents water to infiltrate into the soil (Zwaagstra, 2014). This type of area includes residentials, offices, schools, parking areas, streets, sidewalks. The open green space, that allows water to flow through but is not relevant to our study, includes the park and agriculture area. The private gardens are the domestically owned land plots connected to the house.

The mapping provided us to conclude that private gardens take up 12,3% and 13,5% of the of the two neighbourhoods within the city of Amsterdam and Almere respectively

(table 1). The number might not seem significant, but taking into account that about half of both neighbourhoods constitutes of impervious area, this number actually becomes quite relevant to 'greening' the environment. Private gardens can be more easily changed and to lower costs than impervious parts, such as roads and buildings. Thereby private gardens have more potential contribute to the green environment of the urban area and can increase the green in the neighbourhood significantly.

Table 1. Neighbourhood land use

	Oosterparkbuurt	Muziekwijk Noord
Private Gardens	12.3%	13.5%
Open Green Space	23.3%	37.5%
Impervious Area	64.4%	49.0%

Now, we know the significance of the surface area private gardens can occupy in an urban neighbourhood, we turn to the different concerns related to soil sealing and their relative importance when discussing private gardens.

2.1.2 Private Gardens and Water Management

The first concern related to the petrification of private gardens is water management. Sealing the soil can be seen as an human intervention in the natural water cycle. This intervention manifests itself in the water runoff level. An increase in soil sealing correlates positively with the level of runoff flow (Artmann, 2013). In other words, causes more rainwater to flow directly into the sewer system, which can only that handle that much water. Therefore, one can argue that green areas are important in cities because they serve as retention and infiltration zones (Verbeeck et al., 2011). In his study, Zwaagstra (2014) looked specifically at private gardens. He compared the sealing of private gardens in three Dutch neighbourhoods and observed an increase in sealed area of private gardens between 1998 and 2013. Zwaagstra (2014) states that the increase of soil sealing of private gardens observed, only has a small effect on the total water runoff. However, he adds that a small increase in water runoff do not rule out other negative effects produced by local conditions. Therefore, in specific circumstances, the sealing of private gardens can cause problems with water management. Vineyard et al. (2015) did a research on the effect rainwater runoff has on the sewer system. Following their conclusions, greening gardens seems generally favorable for urban water management, because green areas can offer higher efficiency on wastewater treatment and cost reduction on sewer system construction and maintenance (Vineyard et al., 2015).

2.1.3 Private Gardens and the Environment

The second concern relates to the ecosystem within the city. Gardens contribute to biodiversity on various levels. According to Goddard et al. (2010) private gardens provide worth and unique resources for increasing urban biodiversity. They argue that, at an individual level, private gardens correlate broadly to heterogeneity of land-cover and vegetation species. Furthermore, at neighbourhood or urban level, private gardens form a green patch which increases total habitat area and decreases isolation for certain local species, such as birds and bees. In short, the interconnection of a cluster of private

gardens promotes species richness as well as brings residents to enjoy a closer encounter with the natural world (Cameron et al, 2012). It may be not an idea that is considered when choosing the garden organization, but the microclimate of gardens does contribute to the macro climate. Insects and other animals that visit the gardens are an important element in the ecosystem and its balance (De Groene Stad, n.d.). Cities are living organisms, with a dynamic metabolism to which green and its included diversity make it work (Newman, 1999; Beumer et al., 2010). Besides biodiversity, private gardens might also have an influence on temperature regulation. Sealed areas generate higher temperatures than green areas. The sealing of large areas can lead to undesirably high temperatures and generate so called 'heat islands' (Zwaagstra, 2014). We cannot indicate the exact influence of private gardens on biodiversity and temperature, but from the literature provided above we can presume that green gardens can potentially play an important role in the overall environmental quality .

Figure 1. Scaling up of private gardens

2.1.4 Private Gardens and Public Health

The third and final concern relates to the general belief that living in a green environment is good for mental and physical health. However, this general belief does not offer any clear cut evidence that there actually is a demonstrable relation between being healthy and having a green private garden. There is not a lot of literature on the impact of private gardens on public health. However, there are some interesting studies done on the relation between a green environment and health. A broad literature study on the relation between nature and health done by shows that contact with the natural environment affects the health and wellbeing of people in terms of air quality, physical activity, stress and having social contact. De Vries et al. (2003) did a study that showed a relation between general health indicators and living in a green environment. Nielsen and Hansen (2007) conclude on their findings that people dwelling in green areas seem to be less prone to stress and obesity. Also related to stress, Honold et al. (2015) show

that people living in houses with a view on high amounts of diverse kinds of vegetation experience significantly lower levels of stress. Although the literature available does not say anything about the relation between private gardens and public health, we do believe it is reasonable to say that the general relation between a green environment, contact with nature and health (mentally and physically) says something about the impact green private gardens potentially have on public health.

2.1.5 Conclusion on the Relevance of Private Gardens

We can conclude that private gardens are relevant to concerns related to soil sealing in cities. Looking at city water management, green gardens are a better alternative for both environmental and financial reasons. Related to the environment, sealed private gardens have a negative effect on urban biodiversity and create so called 'heat islands'. Green gardens also have a potential to contribute to the mental and physical health of the city's population. One individual garden is basically too small to have a significant contribution to solving the concerns related to high levels of soil sealing. However, a combination of all private gardens composes a large area that has the potential to contribute to sustainable water management, urban biodiversity and public health.

2.2 Role of the External Stakeholders

During a stakeholder meeting on the 8th of June 2016 hosted by the earlier mentioned organization 'Operation Steenbreek', the concerns mentioned above were put forward as major issues or challenges that should be addressed. During this meeting we had the possibility to observe and distinguish the different stakeholders and discern their different motivations and interests related to private gardens. All stakeholders present have a different relation to private gardens and the concerns related to soil sealing. In this section we elaborate on these stakeholders and their relative positions. First, we present the stakeholders, grouped into three broad domains, each briefly evaluated according to their own role and interest related to private gardens. Then, we briefly reflect on the relevance of what came out of this stakeholder meeting to our research.

Government Institutions. Municipalities are responsible for the sewer system. As argued above, private gardens have an influence on its functioning. Because municipalities are not able to force or instruct people directly how to use their own private garden, they started several activities to inspire citizens to 'green' their garden. These activities include creating example gardens in the streets, exchanging tiles for free plants and providing free advice from professional gardeners. In realizing these activities, municipalities work together with initiatives such as Amsterdam Rainproof and Operatie Steenbreek. Another important stakeholder in this domain are the Waterboards, this regional governmental institution is responsible for all issues related to open water management. Water management, seems to be the main interest of this group of actors.

Commercial Businesses. This group consists of the large commercial enterprises, their branch organizations and relatively small private garden landscapers. The Association of garden landscapers (VHG), developed a handbook called 'The Living Garden'. This handbook helps professional gardeners to meet the needs of consumers while keeping the importance of a green garden in mind. VHG recognizes that their target group is existing of people that are already willing to spend money on their gardens. From their

own research they concluded that maintenance is the biggest obstruct for people. Together with Dutch Garden Branch (among others), VHG started a promotional campaign to inform customers about how they can create a 'living garden'. However, commercial businesses depend on the demand of the customer. This also became apparent during the stakeholder meeting, where a representative of the Dutch Garden Branch stated: 'Alleen maar groen, zullen wij nooit doen' ('Only green, is something we will never do'). All in all, the main interests of this group are related to concerns about the influence sealing private gardens might have on biodiversity.

Civil Society Organizations. The final group of stakeholders involved are the civil society organization that are involved with private gardens. Organisations such as the Bird Association and Groei&Bloei (National Gardeners Association) are mainly interested in the conservation of biodiversity. Operatie Steenbreek, organizing stakeholder platform and stressing all three main concerns, is an organisation that focusses mainly on helping municipalities and encouraging them to create programs involved in the de-tiling of gardens. They are creating feasible instruments that can be used by municipalities.

Each stakeholder discussed has a certain interest in private gardens, ranging from particular responsibilities to larger environmental management and translating consumer preferences. During the stakeholder meeting a certain discourse about tiling was being reaffirmed in all presentations. It concerned the general idea about what is wrong about tiling and its negative effects. However, there also seemed to be some disagreement about certain aspects, such as 'how much green is needed?' and 'how should we steer people?'. Some municipalities, for example, talked about reaching people in a negative way; 'make tiling your garden just as unaccepted as smoking in restaurants'. Others referred to the importance of avoiding direct interference and emphasized positive stimulation. Overall, the main problem all stakeholders faced was how to reach not only the 'usual suspects', people already interested in 'green', but also the 'non-green' people. This problem of not knowing how to reach other people than the 'usual suspects' shows that there is still a lot unknown about what drives people in organising their private gardens. Researching individual drivers of garden tiling and greening is therefore an opportunity to fill this knowledge gap. Knowing this, we can move on to the second part of this report, a research on the motivations of individual garden owners.

3. Research

From the previous chapter on the context of this research we learned that a lot remains unknown about the motivations surrounding soil sealing behaviour of private garden owners. We also learned that these private gardens (when green) have the potential to contribute to water management, biodiversity and public health in the city. In this chapter of the report we present the results of the research we did on private garden tiling behaviour. First, we will elaborate on our theoretical framework on the factors that possibly influence the decisions of garden owners. Thereafter we discuss the research, explaining the methods and presenting the results. We conclude this chapter with a paragraph containing a reflective discussion of our results.

3.1 Theoretical Framework

Through exploration of the literature, several theories have come up that might explain tiling behaviour and choices. The organization of the private garden is a personal choice. However, the decision-making process can be influenced by external mechanisms. Behaviour is not a stand-alone act, it can be guided into certain directions by influences from others or the outside environment. We hypothesize that there are at least four factors influencing private garden decision-making: environmental preferences, social networks, income uncertainty and ownership, and physiological uncertainty. We elaborate on each of these factors below and hypothesize what the implication of the theory is on our thinking about private garden decisionmaking. Can these theories help us to explain why people choose to tile or green their gardens?

Environmental preferences

Research showed that overall, people tend to focus more on the aesthetics then on the biological biodiversity when organising their gardens (Beumer and Martens, 2015). The private garden is often not seen as a place of 'nature conservation'. This could be explained by the idea put forth by Macnaghten (2003), that people do not tend to value their personal environments as part of generalised abstractions such as 'biodiversity'. They rather feel connected to nature when conducting everyday practices. The research of Beumer (2014) showed that a gap can be found between what people prefer to see in their garden and how they actually organise it. Thereby, people's cognitive preferences and their visual preferences seem to mis-match. For example, people indicating to have a preference for tiled, low-maintenance gardens, choose a more green garden when presented a set of pictures. This suggests that some people that aesthetically prefer green gardens might base their actual decisions on (what they believe is) practical functionality rather than on aesthetic or ecological functionality. The distinction between function and appearance can distress people. Appearance might be nice, but practically it would not be ideal, and vice versa (Nassauer, 1995). Given there is a gap between action and preference, we can hypothesize that people with strong environmental preferences might not even have a green garden.

Social networks

Christakis and Fowler (2008) studied the smoking habits of over 12,000 people in a densely interconnected social network over the course of more than 30 years. The authors found that the decision to quit smoking happens collectively and individuals act under social pressure within their corner of the social network. The authors suggest that their findings support the idea that social norms may develop locally in small corners of the network, reinforcing the possibility of an individual to quit. The (non) maintenance of an individual's home and garden is also subject to social norms. 'Messiness' in the garden will not be accepted due to 'unspoken' norms of social relations. According to Nassauer (1995), people tend to not behave in a certain way or change due to the belief that the other person will not like it. This effect is stronger when members of the social network share similar ideas on relevant topics. If an individual's tiling behaviour is subject to social norms, we can expect to see a relationship between the tiling behaviour of an individual and that individual's friends or neighbours. We look at respondent's friends and neighbours because the collective behaviour effect might be due to social proximity and/or geographical proximity. On the grounds of people wanting to stick to the norms with their everyday behaviour and surroundings, we think that social

networks will influence garden choices and their actual composition. If people have neighbours or friends with tiled gardens, they are more likely to have tiled gardens as well.

Income Uncertainty and Ownership

Sandmo (1970), shows in his classical article, that increased uncertainty about future income may have effects on consumption and savings habits in two unique ways. *Income risk* refers to an individual's uncertainty about future income. Uncertainty about income increases savings as individual's need to protect themselves against the possibility that future income is lower. As the income invested into a garden is non-retrievable (or at least very non-liquid), money spent on a garden is best viewed as consumption. If an individual's future income is uncertain she will be less likely to provide the upfront and continuous costs required for a garden; that income may be needed in the future. *Capital Risk* is the uncertainty that one will be able to keep the benefits of his investment. This increased uncertainty makes one less willing to expose the resources he has saved, and will therefore consume them. For individuals living in a non-permanent residence, creating and maintaining a garden is a form of *capital risk*. Why invest in something if you are not sure that you will be able to benefit from it in the future when you move out of the house? People would not want to take capital risk, so choose the safer option. We hypothesize that if more certainty about income or staying in the house is present, people are willing to invest in a greener environment.

Psychological uncertainty

Hogg (2007) proposes a model where subjective uncertainty motivates individuals to take action to reduce uncertainty. In short, people are motivated to reduce uncertainty in areas of life that are important to them. Literature on home landscapes argues that people prefer gardens that show human intention (Nassauer, 1995). The trouble with a typical green garden is that it needs to be constantly maintained and requires constant attention. This means the an individual with a green garden possess the constant uncertainty of how and when work will be done on the garden to keep it in necessary order. Our hypothesis is that individuals experiencing higher levels of subjective uncertainty will be more apt to eliminate the uncertainty of the order of their home and garden. Note that this effect is separate from and analytically distinct from the income and capital uncertainty introduced above. Uncertainty of future income and life uncertainty, while possibly correlated, are not the same.

3.2 Methods

In this paragraph we explain the methods that were used in our research. In order to structurally gather results, a research location and appropriate methods for collection had to be determined. We set out to select two residential neighbourhoods, based on a diversity of demographical factors and a representative soil sealing density. We identified two neighbourhoods, one in Amsterdam (urban) and one in Almere (suburban). Based on a combination of information derived from Google Maps and EduGIS, a map was created for each neighbourhood to calculate the area of private gardens and thereby visualize the subject (Annex 7.4). Additionally, the maps are used in a ArcGIS story map.

A survey was the main contributor to data collection for this research. The survey consists of a total of 42 questions, which can be found in Annex 7.1 and 7.2. The questions in the questionnaire were created to test the hypothesis based on the theories on behaviour introduced in the theoretical framework above. A total of 100 surveys have been filled in, about 50 in each of the two neighbourhoods. As the survey consisted of open and closed questions, both a quantitative and qualitative methods have been used for the analysis. In the following part we elaborate on each method separately.

3.2.1 Quantitative Method

Quantitative analysis exploits the household survey data gathered for this research. We created variables based on the survey data (this is detailed in Annex 7.5). The analysis consists of two classes of regressions. The first regression took **TILE** as the dependent variable. **TILE** is an ordinal variable so we use an ordinal logit regression. A key assumption of this model is that explanatory variables have proportional effects across the various levels of the dependent variable. This assumption is met for modeling **TILE** (Annex 7.5).

The second regression models the change in tiling behaviour. **CHANGE** is a three level variable where providing information on respondents who changed their gardens by adding green, respondents who did not change their garden and respondents who changed their garden by adding tiles. In this case the *equal proportion assumption* is not met for several variables and we model the coefficients of these variables separately for the relationship between each level using *gologit2* in STATA (codes in Annex 7.5).

3.2.2 Qualitative Method

In order to have a more complete picture of people's tiling behaviour we conducted qualitative data collection as well. This was done in the form of open questions on the survey and informal conversations. The addition of qualitative data creates richer and more in-depth information. The respondents could more descriptively define reasons and actions for their behaviour, which could be absent in current literature. The specific open question which has provided most data was a question on how the respondents would behave if asked directly to remove their tiles (Question 42, to be found in Annex 7.1 and 7.2). It made respondents think about their individual scenario. The answers to this question have been digitalized and categorized using grounded theory. Grounded theory consists of three steps: open coding, focused coding and theoretical coding. Working through these steps, summarized parts of the answers were transformed into overarching themes and categories and elaborated upon. The 'informal conversations' notes that were made in the collection period, have been added to the categories of the previous coding. New insights retrieved from the qualitative questions were taking into account for the discussion and recommendations.

3.3 Results

In this section we present the results of our research. First, we look at the quantitative results of the survey and then move on to the qualitative findings.

3.3.1 Quantitative Results

Our survey results allow us to answer three questions. First, what factors are correlated with green garden outcomes. Second, what factors are correlated with decisions by respondents to change their gardens, either by adding more tiles or more green. Third, are these factors equally relevant across the urban and sub-urban settings of Amsterdam and Almere. Below, we review the results to these questions.

A note on how the results are presented: Given our interest in the *relationship* between various factors and tiling behaviour, results report relationship. For many results we report how a factor changes the probability that an individual has a garden that is *more green* than another (random) individual. Here 'more green' refers to one point on a five point likert scale (see Annex 7.1 and 7.2 for full survey).

Tiled or Green Gardens: Correlates of a 'Greener Garden'

We find that a respondent's preference about what an ideal garden should look like has the strongest correlation with the tiling outcome of their own gardens. The results show that those who prefer tiled gardens have more tiles in their own gardens and those who prefer green gardens have more green in their gardens. However, there are still a host of factors that are associated with tiling outcomes beyond stated preferences. We find that the tiling behaviour of a respondent's social network, the respondent's environmental preferences, and respondent's feeling of uncertainty towards the world are all significantly correlated with tiling behaviour. In addition, the time that a respondent has spent in their current residence and their expectations about how long they will remain in their current residence are also significantly correlated with tiling behaviour. Figure 2 provides information about the relative importance of each factor.

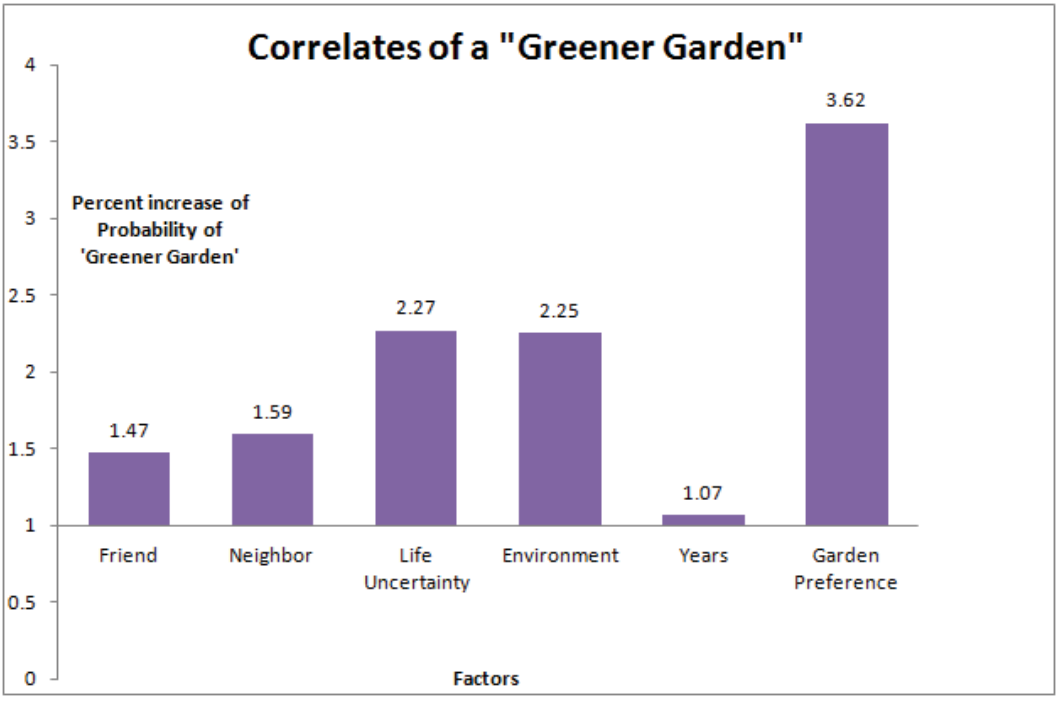

Figure 2. Correlates of a "Greener Garden"

Our survey results show that nearly 80% of respondents report positive attitudes towards nature. Figure 2 shows that those who reported the highest attitudes towards nature are more than twice as likely to have more green in their gardens than individuals with just slightly positive attitudes towards nature. Of the respondents surveyed, 65% of individuals reported a preference for green over tiled gardens. Respondents who prefered green gardens are nearly four times more likely to have more green in their garden than those who prefered tiles in the garden.

Beyond individual preferences, we also find that respondent tiling behaviour is correlated with the tiling behaviour of their social networks; both friends and neighbours have a similar relationship with respondent tiling behaviour. We asked respondents to tell us how many of their five closest friends and neighbours had tiled more than half their garden. Respondents who had one less friend (or neighbour) with a substantially tiled garden[2] are 1.5 times more likely to have a greener garden. This effect does not change based on the congruence of opinion between friends and the respondent. These findings are evidence that social networks influence the decisions people make about their gardens.

The more years a respondent had lived in their current residence the greener the garden. Chart 1 shows that every year an individual remains in the same residence increases his chance of having a greener garden by 7%. This results speak to the *capital uncertainty effect* mentioned above; respondents who are more certain they can benefit from their investment in a garden are more likely to make the investment.

Contrary to our prediction about psychological uncertainty, respondents who reported feeling more uncertain about their life and anxious about the future had greener gardens. Hogg (2007) argues that individuals who feel uncertain above their lives will take action to reduce that uncertainty. We hypothesized that, as a garden is continually in flux, uncertain individuals will tile their gardens to alleviate the anxiety associated with this sense of uncertainty. Yet, the results point in the opposite direction. Individuals who were more uncertain, agreeing to the proposition that they were uncomfortable about their life and nervous about the world for future generations, were more than twice as likely to have a greener garden than individuals who were neutral to the proposition. We look at some possible explanations for this unexpected result in the discussion.

Change in Gardens

Above, we explored factors that were correlated with greener gardens. Yet, nearly 40% of respondents report that they have not changed the surface sealing state of their garden since they moved into their current residence. Factors that motivate people to change their gardens may be different than the factors associated with the current state an individual's garden. Gardens are changed as houses are bought and sold, and the factors that motivate individuals to change their garden may change over time.

In this section we explore factors that are correlated with the decision to add more green to a garden and factors correlated with the decision to add more tile to a garden. Note that factors correlated with green garden change may not be negatively correlated with tile garden change. This is because a factor can increase the total pool of people

[2] Here "substantially" means a garden that is more than 50% tiled, the cut-off we used in our survey

changing their garden, thus adding to the change in one direction without diminishing change in the other direction.

A. Green change

Preferences about nature and about what makes an ideal garden are heavily correlated with respondents who said they changed their garden by making it greener. The blue bars in Figure 3 shows us that respondents who prefered a green garden over a tiled garden were roughly eight times more likely to add green to their garden than respondents who prefered tiled gardens over green gardens. Respondents who said their environmental preferences were above average are more than fifteen times more likely to have added green to their garden than respondents who thought their environmental preferences were just average. It should be noted that the vast majority (nearly 80%) of respondents rated themselves above average for environmental preference, and therefore self-reported "average" scores are in the bottom quarter of those surveyed.

Social networks, the tiling behaviour of either neighbours or friends, are not correlated with a *change* in the garden tiling. While income uncertainty and future residence plans are not correlated with change behaviour, respondents who have lived for longer in their residence are more likely to have changed their garden by adding more green. Every year that a respondent has lived in their residence, makes than 10% more likely to have added green their garden. While time lived in a residence gives respondents more time to change their garden, the effect also speaks to the capital certainty effect of being able to enjoy one's investment.

Respondents who were more uncertain, agreeing to the proposition that they were uncomfortable about their life and nervous about the world for future generations, were almost four times more likely to add green to their garden than respondents who were neutral to the proposition. Respondents who have at least one child are nearly eight times more likely to have changed their garden by making it greener than respondents who do not have a child.

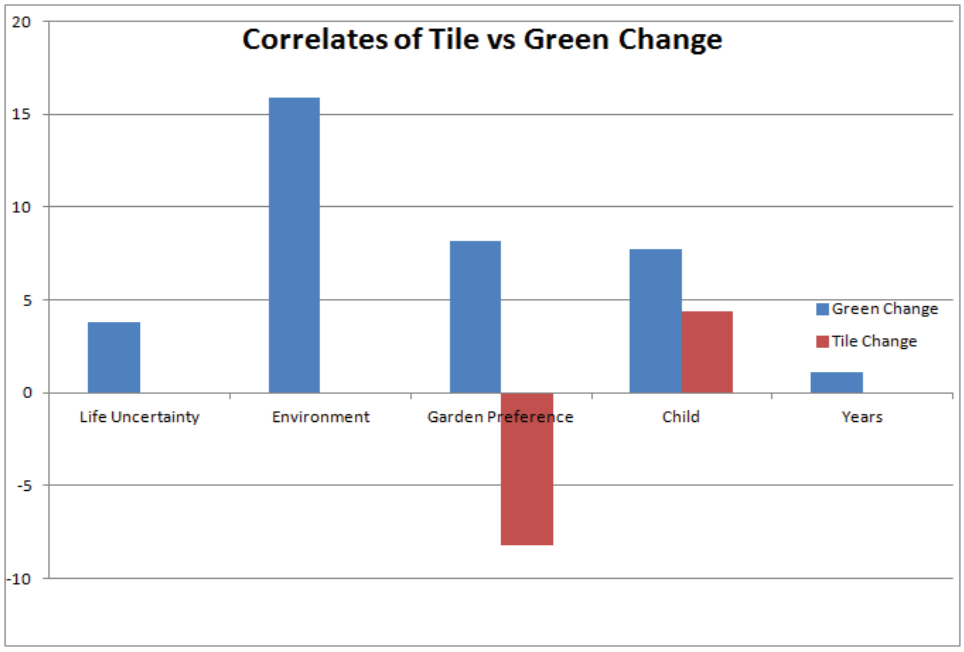

Figure 3. Correlates of Tile vs Green Change

B. Tiling change

We saw above that respondents who displayed preferences for green gardens more likely to add green to their gardens; but they are also less likely to tile their garden. Preference for a green garden reduces the probability that someone will tile their garden by a factor of eight, compared to those who prefer tiled garden.

In contrast, life uncertainty, years at residence, and environmental preferences, factors which are all correlated with people adding green to their garden, do not make people any less likely to tile their garden.

Having a least one child increases the chance of a person to add tiles to their garden by a factor of four, compared to someone who does not have a child. Having a child is the only factor that is positively correlated with both adding tiles and adding green to one's garden. Remember, this is possible because not everyone decides to change their garden; having a child increases the overall amount of people who change their garden and does so by increases the amount of people who both add green and add tiles to their garden.

Comparison between Urban and Suburban

Factors that influence tiling behaviour may differ across urban and suburban environments. The above (aggregated) analysis showed that higher tiling from both neighbours and friends was correlated with higher respondent tiling. However, when we look at Amsterdam and Almere separately, we find that neighbours, but not friends matter in Almere and friends, but not neighbours, matter more in Amsterdam.

The importance of environmental preferences for garden tiling differs across urban and suburban environments, as environmental preferences are correlated with greener gardens in Almere, but not in Amsterdam. This is interesting because parks and nature is much more accessible in Almere. Therefore, the (aggregated) result that respondent preferences for tiled gardens is correlated with more tiles seems to be driven by Almere.

Lastly, in Amsterdam there is evidence that social renters have more tiles in their garden. This result would corroborate our results related to the capital effect; the longer an individual has lived in their house and the more certain an individual is they will remain in their house in the future, the more green the individual has in the garden. However, it must be pointed out that we surveyed only 8 social renters in Amsterdam and these results should be treated with caution.

Our results above show that having a child is associated with garden change, either by adding tiles or adding green. However, when we break down this effect by city we find that the effect is driven by Almere, and we find no relationship between having a child and overall garden change in Amsterdam.

3.3.2 Qualitative Results

By asking respondents direct open questions, they were able to consider their own specific situation and give their own opinion on tiling or greening gardens. Thereby these questions might provide unexpected answers. Answers that help us to think outside the box of the closed survey questions.

We asked an open question about the use of the respondents garden to get a grasp on people's everyday practices in their gardens. To quickly visualize the results of this question, a word cloud was created (in Dutch). The activity mentioned most often was sitting (zitten), followed by eating (eten), sunbathing (zonnen) and relaxing (relaxen). Remarkably, the words gardening (tuinieren) and green (groen) were not often mentioned. Since this survey was taken during a week with sunny weather we have to keep in mind that these answers can differ when asked in a different season.

Figure 4. Wordcloud of favorite activities in garden

The most interesting answers were given to question number 42. This question asked the respondents quite directly is they would be willing to take tiles out of their garden, when asked by an environmental organization substantiated by the concerns mentioned earlier in this report. The answers given to this question were very diverse, however a certain flow of ideas can be distinguished and categorized. One of the major criticisms that was communicated is that there is not enough known among civilians about the reasons to change the garden and how these changes can affect the environment. Of the 70 respondents that have answered the open question, 15 were of the opinion that too little information about greenness of gardens is shared. To consider change, these people want to have more knowledge about the effects of tiles and/or green situation. However, they do not only want to know more about the reasons to change the garden, they also mentioned that they would like to be provided with ideas and options to do this. They indicated that they are unaware of which plants, trees or grasses are both valuable for the environment and applicable in their own gardens. This was also explicitly discussed in several informal conversations. Moreover, repeatedly respondents mentioned that by only giving the public good arguments to change, actual change becomes less forceful. Generally the respondents shared the opinion that everyone has their own right to decide what to do with their garden. However, awareness-raising of the public was mentioned as a powerful tool to initiate people's consideration for change into a greener private space. People might not always know how, but they are often willing to change.

A strong opinion that was voiced was the need for help in the process of change. 14 out of 70 answers included an indication that help from external actors would led them to consider change. The public does not simply want to take out a tile without knowing how to replace it. People would consider the idea of removing tiles, yet only if the environmental organisation pleading for it would provide help in the actual change and maintenance afterwards. Maintenance is what most people are uncertain about considering change. Suggestions to make a possibility from this bottleneck, is by promoting it as a collective initiative of the neighbourhood.

Related to the ‘helping’ theme is the recurring desire of the public for a subsidy or sponsoring in order to embark on the project of having a green garden. Financing a complete change seems too much of an investment without immediately noticeable positive effects. This connects to another point that was mentioned by one of the respondents, which is ‘receiving something in return’ for greening the gardens. Providing something for the community seems reasonable to do if individually benefits can be gained as well.

Asking the inhabitants directly provided ideas to on where to start and how to realize changes. The main outcomes are information provision and the need for help, in the various phases of change.

3.4 Discussion

We already touched upon some of the implications the results have for the hypothesis we made in the theoretical framework. In this discussion we further elaborate on some interesting implications our findings have for our hypothesis.

One of the most remarkable outcomes of our research was that contrary to prediction, respondents who reported feeling more uncertain about their life and more anxious about the future actually had greener gardens. We expected that, based on Hogg (2007), that people would take action to reduce uncertainty by tiling their gardens. With plants you do not know exactly how they will grow and influence your garden. Tiles are put into place one time and do not ‘move’. Plants thus seem to bring with them a more uncertain factor. The results however, showed the opposite. The results are based on the answers or three different questions on life uncertainty. One of the questions related to concerns over the world of the future generation. In this case, green gardens could be explained as a response of people taking pro-active steps by greening their garden (Warner et al., 2015). The uncertainty that the people carry with them is a broader environmental concern for the future. By greening their garden, they hope to reduce the degrading future of the ‘planet’. People cope with uncertainty in different ways, though most the most common reaction is to use certain steps from the past from which results are known (Lipshitz & Strauss, 1997). Another reason could thus be that having a green garden in the past might thus mean that repeating this helps to control uncertainty. Finally, landscapes with high levels of green can reduce stress levels (Cameron et al., 2012, Hartig et al., 2014). Possibly, people that are in general more uncertain, try to, consciously or unconsciously, reduce their stress levels by having greener gardens.

We hypothesized that, concerning the uncertainty about the income and ownership, when people are more certain about future income and housing, they are likely more willing to invest in a greener environment. The results showed that indeed, the longer people live in their current residence, the greener the garden will be. Our results are thus in accordance with the argument of Sandmo (1970) mentioned in the theoretical framework.

Our results show that social networks have a significant relationship with tiling behaviour and that this relationship differs per city. In the suburb Almere neighbours are the more significant factor, whereas in the urban Amsterdam, friends have a larger role. A possible explanation for this contrast might be the relatively greater interaction between

neighbours in the suburbs. A snide remark or pleasant compliment from a neighbour can go a long way, more likely in the suburban context where neighbourly interaction is common. In the city, the relative anonymity of neighbours could limit this effect. Therewith, the city gives the greater ability to choose friends who have similar ideas and behaviours, creates a greater importance and exposure. The ‘urban friend effect’ makes groups of people follow the same trend. This connects to the idea of Christakis and Fowler (2008) that social norms develop in small corner of the network, affecting individual decisions. To stay within their ‘similar’ group of people, they have to conform to the norm. If this means making their garden green or tiling it more, they will be prompted to perform this action. The need for help, discovered through qualitative results, can motivate people to conform more quickly to their circle.

Another result that was rather interesting was the fact that having children has an influence on change in both directions. Having a least one child makes it 4 times more likely for a person to add tiles to their garden, compared to the 7 times a person is more likely to change to more green. People mentioned a variety of reasons for changing their garden; extra tiles for playing football or running or more green to the get the kids more familiar with nature. Overall, the child results points to the proposition that people make changes to their garden at key points in their life, and having a child is one of those. This sheds some light on the result that the child effect is driven by Almere. It could be that the suburbs have attracted people are particularly interested in building spaces, tiled or green, for their children. It could also be that, while having a child motivates people in any location to change their living space, the suburbs allow greater opportunity for change.

From the literature we expected a discrepancy between people's preferences and their actions; we expected that preferences do not fully determine action. While the results show that a preference for green over tiled gardens has the largest correlation with tiling behaviour, our research indicates that many other factors matter beyond preferences. Moreover, we need to be careful in making any assumptions about the causal direction of preferences and tiling behaviour. It seems just as likely that an individual’s garden situation shapes his preferences, that the causal link also travels from the state of one's garden to the preferences one has. Untangling this relationship should at the top of any future research agenda. This is not simply an academic point, it has policy implications. Our results show that preferences weigh heavily on garden decision making. Yet, if these preferences are shaped socially (as opposed to being innate to an individual) policy makers can leverage the power of preferences by influencing the other factors shaping those preferences.

4. Conclusion

Having a green environment in the city is generally accepted as important to its overall sustainability. However, the petrification of cities continues and not only for roads, parking lots and buildings, also privately owned gardens are increasingly subject to soil sealing in the form of ‘tiling’. Organizations such as Operatie Steenbreek work together with municipalities and commercial gardening businesses to initiate a change from ‘tiling’ towards ‘greening’ gardens. The exact factors determining people to choose a tiled or green garden actually remained subject to speculation. Therefore the research

supporting this report aimed to explore the factors influencing decision-making in private gardens.

Two neighbourhoods within Amsterdam (urban) and Almere (sub-urban) were selected as sample areas. First, we looked at the context of the study. Mapping of private garden in both neighbourhood showed that the proportion of private garden is relatively small (12.3% and 13.5%). However, this number actually becomes quite relevant to 'greening' the environment since half of both neighbourhoods constitutes of impervious area. A study of the literature revealed that extensive sealing of private gardens has several negative impacts. Related to water management, it increases the water runoff level. Looking at the environment, sealed private gardens lead to a fragmentation of the natural ecosystem that causes a loss of biodiversity. Furthermore, green gardens contribute to the mental and physical health of the city's population. In short, these considerations seem to be the main arguments to the greening of private gardens.

Preference for green gardens is strongly correlated with both the current state of an individual's garden and the likelihood that the respondent has added green to his garden. While garden preference is the strongest correlation and the result exists across Amsterdam and Almere, we find evidence for the importance of several other factors. Our results show that tiling behaviour clusters across social networks, but that different types of networks may be important in different areas. We found that individual uncertainty and anxiousness about the future and individuals who have higher environmental preferences were more likely to have greener gardens.

Respondents who have a child are more likely to have changed their garden, both by adding tiles or by adding green. We interpret this as evidence that people make changes to their garden at life landmarks; importantly this relationship exists in Almere but not in Amsterdam. Higher preferences for a green garden both reduce the likelihood that an individual will add tiles and increases the likelihood that a respondent will add green. Environmental preferences, uncertainty about life, and duration of residence increase the likelihood that an individual changes the garden by adding green, but do not make it less likely that an individual adds tiles.

5. Recommendations

In order to encourage actual action and change, suggestions for future steps have been marked out in the form of recommendations. These recommendations can be taken into consideration by Alterra and other organisations involved with this change. They range from increase in knowledge to actual operations with direct effect.

One of the recommendations that can prove valuable is the focus on the main points of change in life. The fact that having children can affect the way people change their gardens in two directions shows that there is the possibility to inspire the people that now would choose to tile, to go for a green garden. Elaborating on knowledge on the specific changing points can give a clearer perception on when actions can be effective.

Another recommendation would be helping people get more knowledgeable about alternatives for their garden. Most people mention sitting and eating as main activities in the garden. However, there are possibilities to do this without tiling the complete

garden. Alternatives should be communicated through different channels. To create a more clear image among the people about what greener gardens can do, advice can be provided in the form of example gardens. Television programs do not give people a realistic expectation or drive to do the same. When making an example that ordinary people can execute, it gives them confidence to change their garden by themselves or with little bit of help.

As networks have proven to be an important factor, this has to be considered as well in the organisation of knowledge spreading. In policy making, it has to be realised that community or neighbourhood based initiatives can be more effective than inspiring people at an individual level. People are more willing to change is this will make them feel as if they conform to the norm. Attention should be given to networks and possibilities for spreading through the therewith connected other networks to create a so-called snowball-effect.

However, an important question remains on how to reach the people that are not interested and do not want to cooperate. Water management and biodiversity were not given as main reasons for having a greener garden. Maintenance however, is what most people mentioned as a disadvantage of the garden and as a main reason to tile. They are of the opinion that tiles give less maintenance than green gardens. To change towards green, people need to gain knowledge on how green gardens can also be less maintenance intensive. By cooperating with experts and communicating this to a broad range of people, results can be booked.

A recommendation of larger scale is that policy planners should also be made aware of private gardens as an interconnected network and not as separate entities. It is easier to prevent than cure something, which in this case is it easier to prevent tiles than to transform them to green.

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7. Annexes

7.1 Survey English Version

Garden Survey

Wageningen University

Date: ____ - ____ - _____

Introduction

The purpose of this survey is to contribute to the knowledge about behavioural choices for tiling or not tiling private gardens. The neighbourhoods for which the survey is designed are in Amsterdam and Almere. The survey is a tool for our project of the Academic Consultancy Training course of the Wageningen University. The survey is anonymous and will not be used for any commercial purposes. To fill in the entire survey takes approximately 5-10 minutes.

General questions

	No	Yes	Shared		
1. Do you have garden?	O	O	O		
	<5m2	5-10m2	11-15m2	16-20m2	>21m2
2. How big is your garden?	O	O	O	O	O
	0,5 hr	0,5-1 hr	1-2 hr	2-4 hr	5+ hr
3. How much time do you spend in your garden per week at this time of year?	O	O	O	O	O
	Fully tilled	Partially tilled	In between	Partially green	Fully green
4. What kind of garden do you have?	O	O	O	O	O
5. Did you change your garden ..if so, how was it before?	O	O	O	O	O

6. If you changed your garden, why did you change it?

Now I want to show you some pictures of private gardens.

	A	B	C	D	E	F
7. Indicate which of the gardens you prefer?	O	O	O	O	O	O

8. What do you use your garden for?
9. What do you like about your garden?
10. What do you dislike about your garden?

	Not at all	Not really	A little	Quite a bit	Absolutely
11. Do you have green fingers?	O	O	O	O	O

	Quarter of an hour	Half an hour	One hour	More than two hours
12. How much time do you spend maintaining your garden per week?	O	O	O	O

13. Do you experience problems with water in your garden. If yes, what have you done to deal with this?

The environment and nature

	Not at all	A little bit	Average	Pretty much	Very much
14. How much do you enjoy being in the nature (including parks/forests/beach)?	O	O	O	O	O
15. How important is nature in your and your families life?	O	O	O	O	O
16. How much do you enjoy animals found in nature?	O	O	O	O	O

	2 min.	5-10 min.	10-15 min.	15 min.+
17. How far do you have to walk to the park?				

	Less than once a month	Once a month	Once a week	A few times a week	Everyday
18. How often did you visit the park in your neighbourhood?	O	O	O	O	O

19. In what way is nature important to you?
20. Does your garden connects you to nature?
21. Do you feel a connection between your garden and nature?

Expectations about the future

I want to ask some questions about the prospects and expectations for you and your household now and in the future. Please answer the following questions based on your agreement with the following statements.

22. How long are you living in your current house? …… (years)

	Bought	Rental (Social)	Rental (Market)
23. What applies to the status of your house?	O	O	O

	I plan to be *moving sometime soon*	I plan to be *living here in the near future*	I plan to be *living here for quite some time*	I plan to be *living here for the rest of my life*	At the moment I have no idea
24. How long do you plan to keep living in this house?	O	O	O	O	O

	I Strongly Disagree	I Disagree	Indifferent	I Agree	I Strongly Agree
25. I expect that our (my) future income will be enough to maintain a comfortable standard of living.	O	O	O	O	O
26. I am comfortable with the direction my life is headed.	O	O	O	O	O
27. I am nervous about the world for the future generation.	O	O	O	O	O
28. Some days I feel buried by all of the things I need to do.	O	O	O	O	O

Social relations

Now I want to ask about your neighbours. Think of the five houses that are closest to your own in which the resident has a private garden.

29. How many of those 5 neighbours have tiles in more than a quarter of their garden? …..

30. How many of those 5 neighbours have tiles in more than half their garden? …...

Now I want to ask a couple questions about some of your close friends. Think of 5 close friends who have a private garden and with whom you talk with on a regular basis. Write down their initials if that makes it easier.

31.How many of those 5 friends have tiles in more than a quarter of their garden ? …...

32. How many of those 5 friends have tiles in more than half of their garden? …...

	Much less	A little less	About the same	A little more	Much more
33. Compared to yourself, how much do most of these friends value nature?	O	O	O	O	O

Demographics	Male	Female	Other
34. What is your gender?	O	O	O

	<15	16-25	26-45	46-65	>66
35. What is your age?	O	O	O	O	O

	<500	501-1000	1001-3000	>3001	-
36. What is your estimated income a month?	O	O	O	O	O

	Netherlands	Other namely,
37. What is your country of origin?	O	……
38. What is your parents country of origin?	O	…...

	Primary School	High School	HBO	WO / Uni	Other
39. What is the highest form of education you have completed?	O	O	O	O	O

	Single	Partner	Married	Divorced
40. What is your civil status?	O	O	O	O

	No	Yes	Number
41. Do you have children living in your household. If yes, how many?	O	O	…...

42. An environmental organization contacts you and claims that research shows that having a green garden promotes mental health, increases biodiversity and improves water management. They ask you to detile your garden. How would you respond? What would need to be done to create positive response?

7.2 Survey Dutch Version

Tuin Vragenlijst Wageningen University

Datum: ____ - ____ - _____

Introductie

Het doel van deze vragenlijst is kennis bij te dragen over het tegel-gedrag in tuinen. De wijken waarvoor deze vragenlijst is ontworpen bevinden zich in Amsterdam en Almere. De vragenlijst is een instrument voor ons Academische Consultancy Training project van de Wageningen Universiteit. De vragenlijst is anoniem en zal niet voor andere doeleinden gebruikt worden. Het invullen van de gehele vragenlijst kost ongeveer 5-10 minuten.

Algemene vragen over uw tuin

	Nee	Ja	Gedeeld		
1. Heeft u een tuin?	O	O	O		
	<10m2	10-20m2	21-30m2	31-40m2	>40m2
2. Hoe groot is uw tuin?	O	O	O	O	O
	0,5 uur	0,5-1 uur	1-2 uur	2-4 uur	5+ uur
3. Hoeveel tijd besteed u in uw tuin per week in dit seizoen?	O	O	O	O	O
	Volledig betegeld	Merendeel betegeld	Van beide evenveel	Merendeel groen	Volledig groen
4. Is uw tuin voornamelijk betegeld of groen?	O	O	O	O	O
5. Heeft u de tuin veranderd Zo ja, hoe was hij eerst?	O	O	O	O	O

6. In het geval dat u de tuin heeft veranderd, waarom heeft u hem veranderd?

Nu laat ik u graag een aantal afbeeldingen van tuinen zien.

	A	B	C	D	E	F
7. Geef aan welke tuin uw voorkeur heeft.	O	O	O	O	O	O

8. Waarvoor gebruikt u de tuin voornamelijk?
9. Wat vindt u het fijnste aan uw tuin?
10. Wat vindt u het minst fijn aan uw tuin?

	Nee	Niet echt	Een beetje	Redelijk	Jazeker
11. Heeft u groene vingers?	O	O	O	O	O
		Kwartier	Half uur	1 uur	2 uur +
12. Hoeveel tijd bent u per week kwijt aan het onderhouden van uw tuin?		O	O	O	O

13. Heeft u wel eens wateroverlast in uw tuin? Zo ja, heeft u hier iets aan gedaan of geprobeerd te doen en wat?

Omgeving en natuur

	Niet	Een beetje	Normaal	Redelijk	Heel erg
14. Hoe aangenaam vind u het om zich in de natuur te bevinden? (park / bos / strand)	O	O	O	O	O
15. Hoe belangrijk is natuur in uw en uw families leven?	O	O	O	O	O
16. Hoe graag ziet u dieren in de natuur?	O	O	O	O	O
		2 min.	5-10 min.	10-15 min.	15 min.+
17. Hoe ver lopen woont u van het park?		O	O	O	O
	Minder dan 1 keer per maand	Ong. 1 keer per maand	Ong. 1 keer per week	Een aantal keer per week	Iedere dag
18. Hoe vaak bezoekt u het park hier in de buurt?	O	O	O	O	O

19. Op wat voor manier is de natuur belangrijk voor u?
20. Verbindt uw tuin u met de natuur?
21. Voelt u een verbintenis tussen uw tuin en de natuur?

Verwachtingen van de toekomst

22. Hoe lang woont u in uw huidige woning? …… (jaren)

	Koophuis	Huur (Sociaal)	Huur (Markt)
23. Wat is de status van het huis waarin u woont?	O	O	O

	Binnenkort ga ik verhuizen	In de nabije toekomst blijf ik hier	Ik blijf hier nog een aardige tijd	Zolang als ik leef woon ik hier	Ik weet het niet
24. Hoe lang verwacht u in dit huis te blijven wonen?	O	O	O	O	O

Ik zou u graag een paar vragen willen stellen over u verwachtingen van de toekomst. Beantwoord de volgende vragen aan de hand van uw overeenkomst met de volgende uitspraken.

	Volledig oneens	Oneens	Neutraal	Eens	Volledig eens
25. Ik verwacht dat ons (mijn) toekomstige inkomen genoeg zal zijn voor een comfortabel leven.	O	O	O	O	O
26. Ik ben tevreden met het verloop van mijn leven.	O	O	O	O	O
27. Ik maak me zorgen over de wereld van de toekomstige generatie.	O	O	O	O	O
28. Sommige dagen voel ik me overrompeld door alle dingen die ik moet doen.	O	O	O	O	O

Sociale relaties

Nu stel ik u graag een aantal vragen over uw buren. Denk aan vijf huizen met een tuin dichtbij uw eigen huis.

29. Hoeveel van deze vijf buren hebben hun tuin voor meer dan *een kwart* betegeld? …...

30. Hoeveel van deze vijf buren hebben hun tuin voor meer dan *de helft* betegeld? …...

Nu stel ik u graag een paar vragen over een aantal van uw beste vrienden. Denk aan vijf van deze beste vrienden met wie u regelmatig praat. Schrijf hun initialen eventueel op om het makkelijker te maken.

31. Hoeveel van uw vijf vrienden hebben hun tuin voor meer dan *een kwart* betegeld? …...

32. Hoeveel van uw vijf vrienden hebben hun tuin voor meer dan *de helft* betegeld? …...

	Veel minder	Beetje minder	Evenveel	Beetje meer	Veel meer
33. Relatief aan uzelf, hoe waarderen de meeste van uw vrienden de waarde van natuur?	O	O	O	O	O

Demografische gegevens

	Man	Vrouw	Anders
34. Wat is uw geslacht?	O	O	O

	<15	16-25	26-45	46-65	>66
35. Wat is uw leeftijd?	O	O	O	O	O

	<500	501-1000	1001-3000	>3001	Liever niet
36. Wat is ongeveer uw maandelijks inkomen?	O	O	O	O	O

	Nederland	Anders namelijk,
37. Wat is uw land van herkomst?	O	…...
38. Wat is uw ouders land van herkomst?	O	…...

	Basis School	Middelbare School	HBO	WO	Anders
39. Wat is uw hoogst behaalde opleiding?	O	O	O	O	O

	Alleen-staand	Samen-wonend	Getrouwd	Ge-scheiden
40. Wat is u burgerlijke status?	O	O	O	O

	Nee	Ja	Aantal
41. Wonen er kinderen in uw huishouden? Zo ja, hoeveel kinderen?	O	O	…...

42. Een milieu-organisatie neemt contact met u op en verklaard dat uit onderzoek blijkt dat het hebben van een groene tuin bevorderlijk is voor de geestelijke gezondheid, de biodiversiteit verhoogt en het waterbeheer verbeterd. Zij vragen u daarom om uw tegels uit de tuin te halen. Hoe zou u reageren? Wat zou gedaan moeten worden om een positieve reactie te krijgen?

7.3 Pictures Question 6 Survey

A

B

C

D

E

F

7.4 Maps of Oosterparkbuurt and Muziekwijk Noord

7.5 Table of Quantitative Variables for Analysis

Variable	Var Family	Description	Construction
GENDER	Demographics	Gender of respondent	Q34
AGE	Demographics	Age of respondent	Q35
INCOME	Demographics	Income of household	Q36
ORIGIN	Demographics	Country where respondent was born	Q37
PARENT	Demographics	Country where respondent's parent were born?	Q38
EDUC	Demographics	Highest level education	Q39
CIVIL	Demographics	Civil Status	Q40
CHILD	Demographics	Number of children	Q41
PARKDIS	Demographics	Walking time to park	Q17
PARKVIS	Demographics	How often does respondent visit the park	Q18
FDTL25	Social Network	#/5 friends with .25 garden tiled	Q31
FDTL50	Social Network	#/5 friends with .50 garden tiled	Q32
NBTL25	Social Network	#/5 neighbours with .25 garden tiled	Q29
NBTL50	Social Network	#/5 neighbours with .50 garden tiled	Q30
CONGR	Social Networks	Environmental preference of friends compared to respondent	Q33 3=Congruence; create 3 level discrete
FCON	Social Networks	Interaction of friends's tiling behaviour and congruent environmental preferences	FDTL50*CONGR
NBCON	Social Networks	Interaction of neighbour's tiling behaviour and	NBTL50*CONGR

		congruent environmental preferences	
INCOMEU	Uncertainty	Economic uncertainty	Q25
LIFEU	Uncertainty	Attitudes about direction of life, future, anxiety	([flip]Q26+Q27+Q28)/3
YEARS	Ownership	Respondent years in house	Q22
HTYPE	Ownership	Ownership status of house	Q23
FUTURE	Ownership	How long does respondent plan to remain in the house	Q24
EVRN	Environmental Preferences	Attitudes on nature, animals, importance of nature to family	(Q14+Q15+Q16)/3
IDEAL	Garden Preference	Ideal Preference of garden, tiled to Green	Q7
FINGERS	Other	Do you have green fingers: Self identify as gardener?	Q11
TILE	Outcome 1	% of garden that is tiled	Q4
CHANGE	Outcome 2	% change in tiling since moving into house	Q5-Q4
Size	Outcome 4	Estimated size in square meters	Q2
Time	Outcome 5	Time spent in garden	Q3