land

MDPI

Article

Enhancing Urban Biodiversity: A Theory of Planned Behavior Study of the Factors Influencing Real Estate Actors' Intention to Use Nature-Inclusive Design and Construction Concepts

Mariët A. van Haaster-de Winter *, Marijke W. C. Dijkshoorn-Dekker, Thomas J. M. Mattijssen and Nico B. P. Polman

Wageningen Economic Research, Wageningen University and Research, Prinses Beatrixlaan 582, 2595 BM Den Haag, The Netherlands; marijke.dijkshoorn@wur.nl (M.W.C.D.-D.); thomas.mattijssen@wur.nl (T.J.M.M.); nico.polman@wur.nl (N.B.P.P.)

* Correspondence: mariet.vanhaaster-dewinter@wur.nl; Tel.: +31-70-3358330

Abstract: This paper presents the results of an exploration into the adoption of biodiversity-friendly practices by the real estate sector, by researching which factors determine companies' intentions to use nature-inclusive design and construction concepts (NID). NID represents practices in which nature and building are inextricably linked when (re)designing building projects. We applied the Theory of Planned Behavior (TPB), a well-known framework for studying behavior. A telephone survey was carried out among 103 employees at different types of companies in the real estate sector. The findings showed that attitude, social norms, and perceived behavioral control are all significant explanatory variables for the intention of using NID. Perceived behavioral control is the strongest predictor. In addition, interest in NID strengthens the predictive value of perceived behavioral control. The empirical findings in this study serve as a first attempt to provide insights into the determinants of behavior in favor of using NID and, by extension, looking for drivers for change. The study was carried out in the Netherlands, but the results may be applicable or interesting to other countries as well when looking for opportunities to enhance biodiversity in urban areas or considering how the real estate sector could give substance to their vital role in spatial developments.

Keywords: sustainability; behavioral change; building sector; green spaces; urban areas

Citation: van Haaster-de Winter, M.A.; Dijkshoorn-Dekker, M.W.C.; Mattijssen, T.J.M.; Polman, N.B.P. Enhancing Urban Biodiversity: A Theory of Planned Behavior Study of the Factors Influencing Real Estate Actors' Intention to Use Nature-Inclusive Design and Construction Concepts. *Land* **2022**, *11*, 199. https://doi.org/10.3390/land11020199

Academic Editor: Elizelle Juanee Cilliers

Received: 16 December 2021
Accepted: 19 January 2022
Published: 27 January 2022

1. Introduction

More than half of the world's population lives in urban areas, and this number is expected to increase [1]. While cities' populations keep growing, cities are challenged by environmental issues and planetary boundaries [2]. Loss of biodiversity is one of these issues and is considered as a top-five global risk [3]. Urban green space provides important values for increasing urban biodiversity [4], as well as for climate resilience and the livability of cities [5,6]. City planners are encouraged to consider biodiversity conservation as a core value in urban planning [7]. Although the importance of urban green space for biodiversity and citizens is now widely recognized [8,9], green space in and around cities is often limited by competing spatial claims [10]. Continuing urban expansion and declining maintenance budgets for green spaces put pressure on the available quality and quantity of green space in many cities [11,12]. As a consequence, urban biodiversity and the quality of life of urban citizens are threatened across the globe.

1.1. The Role of the Real Estate Sector in Nature-Inclusive Construction and Design

A sector that h s a major influence on spatial developments in cities is the real estate sector [8,13,14]. In this paper, the term "real estate sector" is used in its broadest sense to refer to a sector that includes (business) actors who are active in building and planning—and thus shaping—the urban environment, including architects, project developers, urban

planners, housing corporations, construction companies, landowners, and financial institutions. Despite the major role of the real estate sector in urban development, preserving or enhancing biodiversity is usually not one of its priority areas [8,15]. In fact, various studies indicate that the current real estate sector is not environmentally sustainable. It exerts great pressure on natural resources and contributes to the loss of biodiversity [15–17]. Nevertheless, urban biodiversity can recover and even improve when it is "built into the urban fabric", i.e., when it is truly and widely incorporated into construction projects and different urban infrastructures [18].

Over recent decades, scholars have come to realize that in the complexity of the modern city, strict managerial approaches to tackle urban issues often fail to achieve their desired outcomes because they lack recognition of the importance of stakeholder behavior [19] and of the fact that "firms or industry actors play critical roles in sustainability transitions" ([20]). In this regard, the real estate sector is no exception, especially because it has such a high environmental impact [15]. Therefore, the prominent role of the real estate sector in urban spatial development, combined with societal and environmental urgency for urban nature and biodiversity, demands a broader insight into the practices of real estate actors and opportunities for change.

Technical innovations are often necessary for the success of change, but what may be even more challenging is the social embedding of such changes in actual behavior. "Social" barriers are therefore as essential as "technical" ones [21,22]. From this perspective, promoting biodiversity-friendly practices by the real estate sector does not merely require the development of new forms of nature-inclusive design and construction (NID), but also an embedding of NID in actual behavior. Real estate companies need to change the way they are doing business to enhance (urban) biodiversity.

However, it is known that people do not change behaviors quickly. They often show little or no interest in new ideas or activities and are often unaware that their current behavior is problematic or will result in negative consequences. Behavioral change is a process that starts with recognizing and seeing things differently and encompasses moving through certain stages of change [23]. The adoption of NID shows similarities with circular economy [24–27], which currently emerges in the built environment [15]. Both concepts include the creation of new relationships with goods and materials and attempt to overcome the sustainable disadvantages of current behaviors.

Central to this study is the use of NID, in which nature conservation and construction activities are inextricably linked and reinforce each other. Ultimately, NID creates more biodiversity and a climate-adaptive and attractive living environment for residents and users. We understand NID as acting pro-actively in the interests of nature and biodiversity by integrating nature when building or renovating homes, offices, other buildings, or area development. When adopting such practices, flora and fauna are taken into account, preferably proactively at an early stage. Measures to be taken vary in ease of implementation and integration. Standard options include permeable pavements, insect hotels, or encouraging sparrows or bats to inhabit an area. However, creating a nesting box for a peregrine falcon or a green roof (or even a facade) requires a more specialized approach.

While there are many forms of NID that are already available in the urban environment, the uptake has often been slow. As we discussed above, this uptake will require conscious behavioral change among real estate stakeholders. Consider, for example, the behavioral changes required when using (new) roof tiles that are suitable for bats in buildings. These tiles cannot be inserted in buildings without prior thought about why and where to buy them, how to incorporate them in the building design, and/or where and how to install them. Thus, the first usage of such roof tiles requires significant modifications in existing procurement practices and procedures.

1.2. Research Objective and Scope

In the context of this background, we studied the development of new real estate practices for enhancing biodiversity in urban areas through the lens of behavioral change.

While the urgency for urban greening is clear, and it is also clear that the real estate sector has a big role to play, too little attention is currently being paid to the mechanisms that underpin behavioral change in this sector. The considerations of real estate stakeholders and the predictive factors for their engagement in NID are currently unknown. Although the literature highlights a number of innovative practices in which real estate actors incorporate biodiversity [28,29], insight into the perspectives of the sector as a whole is currently lacking. Addressing this knowledge gap can provide important insights for addressing the behavior of real estate stakeholders, with the aim of promoting NID and ultimately contributing to urban biodiversity.

Therefore, the aim of the present research was to explore factors determining companies' intentions to use NID. Through a survey, we gained insights into the considerations and practices of Dutch real estate actors in relation to NID. We did this by identifying the factors that determine companies' intentions to use NID.

This research was conducted in the Netherlands and specifically focused on those actors who are active in the real estate sector in a broad sense, i.e., the planning and construction of buildings and their (green or grey) surroundings. In the Netherlands, despite increasing attention, projects for nature-inclusive building are still developing only to a limited extent. The national government attempts to support a nature-inclusive development of urban regions, as highlighted by a letter to parliament from the responsible minister on 17 June 2020, in which she indicated her the ambition to make nature-inclusive building generally accepted [30]. In the recent coalition agreement by the new national government coalition, presented on 15 December 2021, the Minister of Housing, Spatial Planning and the Environment committed to focusing on solving bottlenecks to stimulate NID [31]. Several large and small cities have developed stimulating policies to further develop nature-inclusive building (e.g., Amsterdam, Arnhem, The Hague, and Zeist). There are also several initiatives at the provincial level, such as in the province of Zuid-Holland, to ensure that new building recovers or enhances biodiversity [32].

This paper starts with an explanation of the conceptual framework and then provides the methodology that was employed. It then provides the results, and finally presents and discusses the findings of the research.

2. Conceptual Framework

A framework that has been widely applied for predicting change in human behavior is the Theory of Planned Behavior (TPB), which was originally developed by Ajzen [33–35]. This framework has large predictive power [36] and has been used in various countries and behavioral domains, including health-related behavior, recycling behavior, physical activity, (organic) food purchasing, online purchasing behavior, and trade [37–41]. The TPB is based on the belief that behavioral intentions are the immediate predictors of behavior. Intentions, in turn, are influenced by three factors: a person's attitude towards the behavior, how much social pressure the person feels (i.e., social norms), and whether the person feels in control in performing the behavior (perceived behavioral control).

In general, the TPB views the intention to display a certain behavior as stronger when the three predictive factors are positive, making it more likely that a person will carry out this behavior [33]. Attitude is the first determinant that is assumed to capture people's overall evaluation of a specific behavior and its projected outcome [42]. The more positive an individual's evaluation regarding the outcome of using NID, the more favorable his or her attitude should be towards this behavior and, consequently, the stronger the intention to engage in NID. The second determinant is social norms, which are the perceived social pressures to perform a specific behavior. Different types of social norms are distinguished [43], and one is assumed to be more fruitful for behavior change [44]. This so-called "injunctive norm" refers to "what others think I should do" and represents perceived moral rules of so-called "significant others" (a given referent individual or a group or peer group) [45]. The last determinant is perceived behavioral control, which refers to the perceived ease or difficulty of performing a given behavior. It is concerned

with beliefs about control factors that can facilitate or interfere with executing a specific behavior. The greater the perceived behavioral control over using NID, the stronger the individual's intention to engage in such activities.

In this study, we applied the TPB to the real estate sector and the use of NID. By doing so, we aimed to predict when real estate actors are willing (or not willing) to engage in NID, and what factors are of particular relevance in this respect. Our conceptual model is presented in Figure 1 and shows how we applied the TPB in the present study. We expected that all of the TPB variables (attitude, social norms, and perceived behavioral control) are positively associated with the intention to use NID (hypothesis 1).

The TPB is, in principle, open to the inclusion of additional predictors [35] and for the purpose of this study we have explored the role of two other variables. First, we were curious about the role of interest, because adopting a new behavior such as NID is not an easy, singular action to perform; people need to modify their behavior significantly. Quite often a lack of interest is an obstacle to a successful change in adopting green building [46]. Interest in NID might influence the strength of the relationship between attitude/social norms/perceived behavioral control and intention (i.e., the moderating effect of interest in NID on respective relationships, such as the attitude-intention relationship). Therefore, we hypothesized that interest moderates the factors that can influence actors' intention to use NID (hypothesis 2).

Second, as a business's decisions could be influenced by the nature of the business (for instance, architects or construction companies might have different interests related to NID), the context of a company was added as an additional variable, given the heterogeneity of the sector. Both additional variables were employed independently from the way in which we measured attitude, social norms, and perceived behavioral control. Therefore, we hypothesized that company context is associated with the intention to use NID (hypothesis 3).

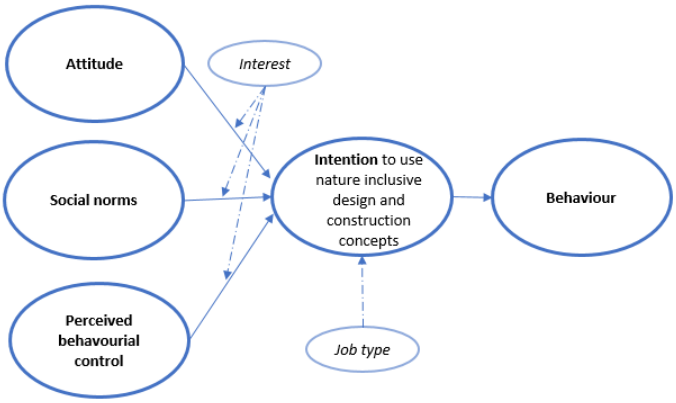

Figure 1. Conceptual model of this study based on the Theory of Planned Behavior (TPB). The solid arrows show the relationship between the TPB's variables and the dashed arrows show the effects of the additional variables.

3. Materials and Methods

3.1. Procedure and Participants

To obtain information on the relevant variables in this study, a survey method was adopted. For data collection, a structured questionnaire was developed and set out during June–August 2019 (before the outbreak of COVID-19). Respondents were invited to join the survey and, upon approval, were approached for an interview by phone. The interviews were held according to a fixed protocol, in Dutch, and consisted of closed-ended questions to prevent deviations from the central research questions. The protocol and the survey were developed by the authors of this article and slightly adapted after a pre-test among experts on either behavior or the real estate sector. The interviews were executed by a market research agency specializing in the real estate sector and their panel—the largest

one in The Netherlands—was used for drawing a sample. Respondents were recruited based upon the following company characteristics: the segment of the real estate sector, company size, geographical distribution, and the respondent's involvement in the strategic decision-making process within the company. The survey was widely disseminated; a total of 103 company representatives were interviewed by telephone (minimum ½ h), of which 88 were used for the statistical analysis based on consistency and company size. Companies smaller than 1 full-time equivalent were left out because of their small size; they were considered to be self-employed.

As noted, the study sample consisted of 88 participants, who were all involved in the strategic decision processes within their companies, with a mean working experience of 10.5 years (SD = 9.5). The most common types of company contexts were contractors/builders (27%), followed by architects (21%) and real estate managers (21%). Architects plan, design, and oversee construction of buildings, whereas contractors are in charge of the everyday oversight of a construction site. Real estate managers represent companies that are charged with operations related to real estate property for a fee (e.g., housing corporations). Other respondents (31%) included investors, brokers, and project developers.

3.2. Measures

As NID is a relatively new and not yet well-defined concept, the interpretation of NID, as used in this study, was explained to the respondents at the start of each interview (see Appendix A). The study then began with some single-item questions that asked participants to indicate their familiarity with and i1nterest in NID using a 5-point Likert scale ranging from (1) "completely disagree" to (5) "completely agree". For example, the questions included "To what extent was your organization familiar with NID prior to this survey?", "To what extent is your company interested in using NID?", and "To what extent are you already using NID?". These questions were followed by several questions designed to assess the TPB's variables. The TPB variables were measured in accordance with the work of Ajzen (e.g., [34,35]) and the items used were adopted from previously validated instruments and modified so that the focus was on using NID. The variables were explained in the next section and Table 1 shows the items and their accompanying Cronbach's alphas. The items used show good or acceptable internal consistency [47]. Finally, the questionnaire asked participants to provide some information about their backgrounds and the company's background.

Attitude: to assess the attitude towards the use of nature-inclusive design, participants evaluated three items on 5-point bipolar adjective scales, such as "useless—useful", "bad—good." Responses were aggregated to yield a measure of attitude [33,48].

Social norms: (injunctive) social norms were measured using three Likert scale items that asked the respondents whether they believed that their customers/funders/government wanted them to use NID (ranging from 1 = "completely disagree" to 5 = "completely agree").

Perceived behavioral control: the perceived behavioral control refers to the expected simplicity or difficulty with which one can perform the intended behavior. The items were measured using two Likert scale items and assessed to what extent people consider themselves capable of using NID (ranging from 1 = "completely disagree" to 5 = "completely agree").

Intention: The respondents were asked to indicate their intention to perform NID behaviors in the upcoming year, with three items as set out in the table [33].

Table 1. Items of the TPB's variables.

Variable	Item	Cronbach's Alpha
Attitude	Negative—positive Bad—good Useless—useful	0.85
Social Norms	I believe that our customers want us to build nature-inclusive in the coming year. I believe that our funders want us to build nature-inclusive in the coming year. I believe that the government wants us to build nature-inclusive in the coming year.	0.66
Perceived behavior control	I have the feeling that we will be able to build nature-inclusive in the coming year. If we wanted to, we could build nature-inclusive in the coming year. It is usually our decision whether we are going to build nature-inclusive in the coming year.	0.74
Intention	We intend to build nature-inclusive in the coming year. We would like to build nature-inclusive in the coming year. We are sure that we will be building nature-inclusive in the coming year.	0.94

3.3. Method

All analyses were carried out using SPSS, version 20. To compare the means between two groups, we used the student's *t*-test. To assess whether the TBP's variables that have been adopted are fit for use, we estimated Cronbach's alphas, which showed the level of internal consistency within a group of items. The range was between 0 and 1 and a higher Cronbach's alpha indicated that a scale was more reliable. To measure the strength of association between two variables and the direction of the relationship, we calculated the Pearson's correlation, which showed correlation, not causation. If a correlation between two variables is present, it can be positive or negative.

To test the hypotheses and identify which behavioral variables predict companies' intentions for using NID, multiple linear regression analysis was conducted, which is a statistical technique that uses two or more independent variables to predict the outcome of a dependent variable. We included analysis of multicollinearity using variance inflation factors (VIF) to determine the independence of variables in our model. If the VIF was smaller than 10, multicollinearity was not a problem in this study. As the hypothesis indicated, we did not focus only on direct relationships between variables, but also focused on whether the relationship between two variables depends on (is moderated by) the value of a third variable and, therefore, we examined the moderating role of interest. For the moderating analysis, we used the PROCESS macro for SPSS and mean-centered the variable "interest".

4. Results

4.1. Current Situation

The interviews started with a discussion of the current NID practices among the respondents, as presented in Table 2. Of the respondents, 61% indicated that they were already somewhat involved in NID, while a further 36% indicated that they were not yet involved but expected to become involved in the future. Only 3% of the respondents indicated that they did not expect to become involved in NID. Furthermore, 33% of all respondents indicated that their company already has a vision with respect to NID.

Table 2. Involvement of companies in NID (n = 88).

	Percentage
1. Currently involved in NID	61%
2. Not yet involved in NID, expecting to become involved in the future	36%
3. Not expecting to become involved in NID	3%

4.2. Motivations for and Barriers to Engaging in NID

In Table 3, companies' main motivations for engaging in NID are highlighted, based on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). Concerning the motivations (Table 3) to engage in NID, this shows some quite significant differences between companies that are already involved in NID and companies that are not yet involved. The most important motivation for engaging in NID was, "We want to do something good for society," but the contributions to the public image of the company were also a very important reason to engage in NID. The respondents who were already involved in NID ranked these motivations significantly higher than did those who were not yet involved.

Table 3. Main motivations for engaging in NID on a 1–5 Likert scale (n = 88).

	Companies Involved in NID	Companies Not Involved in NID
We want to do something good for society *	4.2	3.7
It is good for our public image *	4.0	3.4
NID sets us apart from others	3.4	3.3
It fits within our way of working **	3.3	2.3
The risk-reward ratio is acceptable	3.2	2.9
We have enough knowledge on NID **	3.1	2.3
NID is part of the customer demand *	2.9	2.3
Conservation or improvement of market position	2.8	2.7
NID is required for certification that we aim for	2.2	2.1

Notes: * significant at the 5% level and ** significant at the 1% level.

Table 4 highlights the main barriers that companies experience in relation to NID on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). In this table, the differences between the two groups are generally quite small and not significant. The most important barrier was a perceived lack of willingness to pay among customers. Companies that are not yet involved in NID believed, more often than companies that were involved, that NID would involve too much uncertainty and would not fit with their way of working.

Table 4. Main barriers for engaging in NID on a 1–5 Likert scale (n = 88).

	Companies Involved in NID	Companies Not Involved in NID
Insufficient willingness to pay amongst customers	3.7	3.6
NID involves too much uncertainties *	2.8	3.3
Management of green is a problem	3.1	3.2
Not necessary for our market position	3.0	3.1
Complicated due to municipal rules or procedures	3.3	3.1
The risk-reward ratio is not acceptable	2.9	3.0
We have insufficient knowledge on NID	2.7	2.9
Technology has not yet been developed far enough	2.8	2.7
NID does not fit within our way of working *	2.1	2.6
Insufficient support for NID within our company	2.1	2.5

Notes: * significant at the 5% level.

4.3. Model Results

Descriptive statistics and Pearson's correlations between the study's variables are presented in Table 5. These figures show that on average, companies show a positive attitude,

positive perceived behavioral control, and a positive intention to use NID. Respondents indicated that they perceived moderately low social pressure to use NID.

Table 5. Descriptive statistics and correlations for study variables.

	Mean	SD	1.	2.	3.	4.	5.
1. Attitude	3.96	0.86	1	0.165	0.370 *	0.543 *	0.450 *
2. Social norms	2.84	0.86		1	0.413 *	0.412 *	0.512 *
3. Perceived behavioral control	3.23	1.05				0.429 *	0.651 *
4. Interest	3.65	1.11				1	0.553 *
5. Intention	2.94	1.32					1

Notes: * significant at the 1% level.

Table 6 presents the results of regression analysis on the intention to use NID. The variables explained a moderate proportion of the variance (R2 = 0.55). Attitude, social norms, and perceived behavioral control were significant explanatory variables for the intention to build nature-inclusively. There were positive relationships between attitude, social norms, and perceived behavioral control in using NID, as hypothesized (H1). Therefore, if one of these variables increased, it had a positive effect on the intention to build nature-inclusively (i.e., it increased with it). Of the three variables, the perceived behavioral control had the largest coefficient and thus the greatest influence on intention. A coefficient indicates the degree to which the dependent variable increased (or decreased), with an increase in the associated variable of 1. In this case, when the behavioral control increased by 1, the intention to build nature-inclusively increased by 0.56, on a scale of 1 to 5.

Table 6. Predictors of behavioral intention to use NID.

	Coefficient	VIF
Constant	−1.56 *	
Attitude	0.41 *	1.17
Social norms	0.39 *	1.22
Perceived behavior control	0.56 *	1.36

Notes: * significant at the 1% level.

In the next stage of analysis, to test H2, the main model was further used to explore whether interest played a moderating role. The same model was applied, now including the moderating effect of interest in NID on the attitude-intention relationship, the social norms-intention relationship, and the perceived behavioral control-intention relationship. The results revealed that the relationship between perceived behavioral control and intention was moderated by interest in NID ($\beta = 0.15$, se = 0.08, $p < 0.05$). However, interest did not moderate significantly the relationship between either attitude or social norms and intention towards using NID ($\beta = 0.09$, se = 0.10, $p = 0.382$ and $\beta = 0.02$, se = 0.11, and $p = 0.885$). Hypothesis 2 was thus partly supported. Simple slope analyses showed that among those who had a relatively high interest in NID (1SD above the mean), the stronger the perceived behavioral control was, the higher the intention was to use NID ($\beta = 0.46$, se = 0.13, and $p < 0.001$). Among those who showed a relatively low interest (1SD below the mean), there was a positive but weaker relationship between perceived behavioral control and the intention to use NID ($\beta = 0.79$, se = 12, and $p < 0.000$). Thus, for individuals who experienced high levels of interest, the link between perceived behavioral control and intention to use NID was stronger, compared to individuals who experienced low levels of interest.

In the final part of the survey, the context of a company was added to the model, as a business's decisions could be influenced by the nature of the business. A regression analysis was run in the same manner as before. Table 7 indicates that by adding controls for the company context, the estimated coefficients for attitude and social norms decrease, whereas perceived behavioral control increases. Thus, the variables for architects and real

estate development were positive for the intention to use NID, indicating, as hypothesized, the importance of company context (hypothesis 3).

Table 7. Predictors of behavioral intention to use NID, including company contexts.

	Coefficient
Constant	−1.42
Attitude	0.24 *
Social norms	0.41 **
Perceived behavioral control	0.61 **
Company context	
- Contractors/builders	0.33
- Architects	0.60 *
- Real estate development	0.72 *

Notes: * significant at the 5% level and ** significant at the 1% level.

5. Discussion and Conclusions

The aim of the present research was to explore factors determining companies' intentions to use NID. The results supported hypothesis 1. All key variables (attitude, social norms, and perceived behavioral control) were significant predictors of the intention to use NID. The findings of this study showed that interest partially moderates the relationships among the key variables and the intention to use NID. Thus, hypothesis 2 was partly confirmed. Interest only moderates the relationship between perceived behavior control and the intention to use NID. This means that the positive effect of perceived behavioral control on the intention to use NID is even stronger for companies with a high level of interest. Finally, company context directly influenced the intention to use NID (hypothesis 3), particularly for architects and real estate managers. This hypothesis could be explained by the fact that architects and real estate managers deal with NID on a more strategic level, as opposed to builders, who operate on an operational level. Thus, we provided empirical evidence that a company's intention to use NID is determined by attitude, social norms, perceived behavioral control, and company context. In addition, interest is an indirect aspect to consider when it comes to the adoption of NID. Targeted interventions could support the adoption of NID, and it is important to take interest into account in the development of future interventions.

As our analysis showed, the appeal of nature-inclusive construction for real estate stakeholders lies in social factors, as well as in business models. The most important motivation for incorporating a nature-friendly approach lies at the level of values—doing something good for society. However, the contribution to image and distinctiveness also has a motivating effect. Our analysis showed that Dutch real estate actors are aware of their corporate social responsibility [16], but they also engage in NID because they perceive it as beneficial for their business interests. Even so, while NID is perceived as beneficial for the image and distinctiveness of real estate companies, they do not engage in NID because of profit margins or potential extra income; respondents experienced a low willingness to pay among customers and perceived this as the most important barrier to engaging in NID. In this respect, NID might be good for the profile of companies, but many real estate stakeholders still need to develop adequate business models to profit financially from the engagement in NID [49].

A main difference between companies that are already engaged in NID and those that are not yet involved relates to how well NID fits within companies' ways of working and matches their knowledge and experience with NID. On average, companies that build nature-inclusively were more likely to find that such an approach is in line with the operational working method within the company and that there is sufficient knowledge about nature-inclusive building. Those that are less involved in NID felt that it involves too much uncertainty.

In addition to the main findings, we would like to highlight the role of social norms that could accelerate the adoption of NID-specific behavior, and sustainable behavior in general. A social norm is something that is developed by several individuals or groups together, but small incentives are needed to make the new behavior the standard or common practice. It is known [33,45] that people are more likely to perform a type of behavior if they feel that other people around them also do so or find it important to do so. Therefore, this awareness could be used in many interventions aimed at behavioral change [50]. Our study showed that moderately low social pressure to use NID was perceived. Those responsible within the companies did not feel a great deal of (dis)approval from their peers or significant others. Therefore, promoting social norms with respect to NID can help to motivate real estate stakeholders, as well as other actors, in preserving or enhancing urban biodiversity. To mobilize behavioral change in the real estate sector—and beyond—in favor of biodiversity, actions could be developed to normalize NID as desired behavior.

For example, communication activities such as developing a contest, structurally drawing attention to the subject in trade journals, or—more compellingly—including nature-inclusive buildings as a requirement in tender procedures or in administrative rules and regulations related to, for instance, permits for construction projects, could be considered.

Our main contribution to the literature is that we studied the enhancement of biodiversity in urban areas through the lens of behavioral change of real estate stakeholders/actors who play key roles in urban spatial development. It is recommended that behavior itself be understood before trying to change current behavior [50]. In addition, we provided empirical evidence for the mechanisms that underpin behavioral change in the real estate sector. Considering the important role that the real estate sector plays in urban development and the need to engage that sector in the field of urban biodiversity [8,15], the findings offer positive insights for greater involvement of the Dutch real estate sector in urban greening through NID. The majority of interviewed companies were already involved in NID, and from the perspective of growth it is important to highlight that almost all respondents that were not yet involved in NID expected to become involved in the future.

To conclude this article, some limitations of the present study need to be addressed. First, the research was undertaken in a specific setting of the Dutch building environment; hence, any generalizability of its findings for different contexts (e.g., other countries) should be treated with caution. The general approach to study the intention to adopt NID provides an opportunity for the analysis to be replicated in urban areas in other countries to ascertain whether companies in different subsectors within the building sector behave similarly. In this study, we focused on representatives of companies, as they act as agents of change. However, they can operate only within the constraints of a company, which can be either stimulating or restraining.

Further research could also be conducted to explore additional factors to enhance biodiversity by deploying the unconscious aspects of behavior. We examined leads for behavioral change in the conscious parts of behavior, as it is reasonable to expect that nature-inclusive building will require a certain degree of conscious thinking or planning. However, processes operate unconsciously as well, and as such influence behavior [51]. Unconscious processes, such as emotions, biases, and impulses, were not included in this survey. Exploring these processes and biases may provide further clarity and represent a promising extension of this study, and could bridge the failure to translate intentions into behavior (the so-called "intention-behavior gap") [52]. Finally, although this study was carried out in the Netherlands, the results may be applicable or interesting to other countries as well, when looking for opportunities for giving substance to the real estate sector's vital role in spatial developments or enhancing biodiversity in urban areas, and as such contribute to a more sustainable and circular world.

Author Contributions: Conceptualization, M.A.v.H.-d.W., M.W.C.D.-D., T.J.M.M. and N.B.P.P.; methodology, M.A.v.H.-d.W., M.W.C.D.-D., T.J.M.M. and N.B.P.P.; validation, M.A.v.H.-d.W., M.W.C.D.-D., T.J.M.M. and N.B.P.P.; formal analysis, M.A.v.H.-d.W. and N.B.P.P.; investigation, M.A.v.H.-d.W.,

M.W.C.D.-D. and T.J.M.M.; resources, M.A.v.H.-d.W., M.W.C.D.-D., T.J.M.M. and N.B.P.P.; data curation, M.A.v.H.-d.W. and N.B.P.P.; writing—original draft, M.A.v.H.-d.W., M.W.C.D.-D., T.J.M.M. and N.B.P.P.; writing—review and editing, M.A.v.H.-d.W., M.W.C.D.-D., T.J.M.M. and N.B.P.P.; supervision, M.W.C.D.-D.; project administration, M.W.C.D.-D.; funding acquisition, M.W.C.D.-D. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Dutch Ministry of Agriculture, Nature and Food Quality, and Wageningen University and Research, with the theme "Nature-inclusive Transitions" [grant number KB36-005-004].

Institutional Review Board Statement: Ethical review and approval were waived for this study due no personal or sensitive information was gathered and no formal approval needed to be officially obtained.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data collected for the purpose of this study are available in Dutch: see [53].

Acknowledgments: We would like to acknowledge Danny Taufik for his valuable support, and three anonymous reviewers for their valuable feedback.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

This questionnaire is about nature-inclusive construction in (re)development of real estate, also referred to as "nature-inclusive design and construction concepts" (NID).

NID means taking nature and biodiversity into account in the process from planning to implementation and incorporating this in the building or the (public) environment so that more diverse plant and animal species can live there. This will give the living environment of both animals and people a boost.

- In new and rebuilt buildings across all kind of levels or phases, e.g., during the design phase or when decisions about investments are made, and in whichever field the company is active.
- For example, by creating green facades, roofs or indoor gardens, planting trees and bushes, integrating nest boxes or special roof tiles, or creating natural ponds.
- It is all about proactively acting for the benefit of biodiversity and integrating nature into current practices.

Real estate: (re)development, construction projects, and area development in the Netherlands.

References

1. United Nations. *World Urbanization Prospects: The 2018 Revision (ST/ESA/SER. A/420)*; United Nations: New York, NY, USA, 2019.
2. Rockstrom, J.; Steffen, W.; Noone, K.; Persson, A.; Chapin, F.S., III; Lambin, E.F.; Lenton, T.M.; Scheffer, M.; Folke, C.; Schellnhuber, H.J. A safe operating space for humanity: Identifying and quantifying planetary boundaries that must not be transgressed could help prevent human activities from causing unacceptable environmental change, argue Johan Rockstrom and colleagues. *Nature* **2009**, *461*, 472–476. [CrossRef] [PubMed]
3. World Economic Forum. *The Global Risks Report 2021*, 16th ed.; World Economic Forum: Geneva, Switzerland, 2021.
4. Fuller, R.A.; Irvine, K.N.; Devine-Wright, P.; Warren, P.H.; Gaston, K.J. Psychological benefits of greenspace increase with biodiversity. *Biol. Lett.* **2007**, *3*, 390–394. [CrossRef] [PubMed]
5. Raymond, C.M.; Frantzeskaki, N.; Kabisch, N.; Berry, P.; Breil, M.; Nita, M.R.; Geneletti, D.; Calfapietra, C. A framework for assessing and implementing the co-benefits of nature-based solutions in urban areas. *Environ. Sci. Policy* **2017**, *77*, 15–24. [CrossRef]
6. Lima, M.F.; Ward Thompson, C.; Aspinall, P. Friendly communities and outdoor spaces in contexts of urban population decline. *Land* **2020**, *9*, 439. [CrossRef]
7. Liu, J.; Slik, F. Are street trees friendly to biodiversity? *Landsc. Urban Plan.* **2022**, *218*, 104304. [CrossRef]
8. Opoku, A. Biodiversity and the built environment: Implications for the Sustainable Development Goals (SDGs). *Resour. Conserv. Recycl.* **2019**, *141*, 1–7. [CrossRef]

9. Lepczyk, C.A.; Aronson, M.F.; Evans, K.L.; Goddard, M.A.; Lerman, S.B.; MacIvor, J.S. Biodiversity in the city: Fundamental questions for understanding the ecology of urban green spaces for biodiversity conservation. *BioScience* **2017**, *67*, 799–807. [CrossRef]
10. Haase, D.; Frantzeskaki, N.; Elmqvist, T. Ecosystem services in urban landscapes: Practical applications and governance implications. *Ambio* **2014**, *43*, 407–412. [CrossRef]
11. Burton, M.; Dempsey, N.; Mathers, A. Connecting making and keeping: Design and management in place-keeping. In *Place-Keeping*; Routledge: London, UK, 2014; pp. 145–170.
12. Kabisch, N. Ecosystem service implementation and governance challenges in urban green space planning—The case of Berlin, Germany. *Land Use Policy* **2015**, *42*, 557–567. [CrossRef]
13. Roebeling, P.; Saraiva, M.; Palla, A.; Gnecco, I.; Teotónio, C.; Fidelis, T.; Martins, F.; Alves, H.; Rocha, J. Assessing the socio-economic impacts of green/blue space, urban residential and road infrastructure projects in the Confluence (Lyon): A hedonic pricing simulation approach. *J. Environ. Plan. Manag.* **2017**, *60*, 482–499. [CrossRef]
14. Sealey, K.S.; Binder, P.-M.; Burch, R.K. Financial credit drives urban land-use change in the United States. *Anthropocene* **2018**, *21*, 42–51. [CrossRef]
15. Munaro, M.R.; Tavares, S.F.; Bragança, L. Towards circular and more sustainable buildings: A systematic literature review on the circular economy in the built environment. *J. Clean. Prod.* **2020**, *260*, 121134. [CrossRef]
16. Battisti, F.; Guarini, M.R.; Chiovitti, A. The assessment of real estate initiatives to be included in the socially-responsible funds. *Sustainability* **2017**, *9*, 973. [CrossRef]
17. Vanags, J.; Butane, I. Major aspects of development of sustainable investment environment in real estate industry. *Procedia Eng.* **2013**, *57*, 1223–1229. [CrossRef]
18. Thomson, G.; Newman, P. Cities and the anthroposcene: Urban governance for the new era of regenerative cities. *Urban Studies.* **2020**, *57*, 1502–1519. [CrossRef]
19. Stubbs, M.; Lemon, M.; Longhurst, P. Intelligent urban management: Learning to manage and managing to learn together for a change. *Urban Stud.* **2000**, *37*, 1801–1811. [CrossRef]
20. Köhler, J.; Geels, F.W.; Kern, F.; Markard, J.; Onsongo, E.; Wieczorek, A.; Alkemade, F.; Avelino, F.; Bergek, A.; Boons, F. An agenda for sustainability transitions research: State of the art and future directions. *Environ. Innov. Soc. Transit.* **2019**, *31*, 1–32. [CrossRef]
21. Egbue, O.; Long, S. Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions. *Energy Policy* **2012**, *48*, 717–729. [CrossRef]
22. Rohracher, H. Managing the technological transition to sustainable construction of buildings: A socio-technical perspective. *Technol. Anal. Strateg. Manag.* **2001**, *13*, 137–150. [CrossRef]
23. Prochaska, J.O.; Di Clemente, C.C. Transtheoretical therapy: Toward a more integrative model of change. *Psychother. Theory Res. Pract.* **1982**, *19*, 276. [CrossRef]
24. Chizaryfard, A.; Trucco, P.; Nuur, C. The transformation to a circular economy: Framing an evolutionary view. *J. Evol. Econ.* **2020**, *31*, 475–504. [CrossRef]
25. Merli, R.; Preziosi, M.; Acampora, A. How do scholars approach the circular economy? *A systematic literature review. J. Clean. Prod.* **2018**, *178*, 703–722.
26. Ellen MacArthur Foundation. Towards the circular economy. *J. Ind. Ecol.* **2013**, *2*, 23–44.
27. Stahel, W.R. The circular economy. *Nature* **2016**, *531*, 435–438. [CrossRef] [PubMed]
28. Cinderby, S.; Bagwell, S. Exploring the co-benefits of urban green infrastructure improvements for businesses and workers' wellbeing. *Area* **2018**, *50*, 126–135. [CrossRef]
29. Ziogou, I.; Michopoulos, A.; Voulgari, V.; Zachariadis, T. Implementation of green roof technology in residential buildings and neighborhoods of Cyprus. *Sustain. Cities Soc.* **2018**, *40*, 233–243. [CrossRef]
30. Dutch Government. *Letter to Parliament about Nature-Inclusive Building*; Ministry of Agriculture, Nature and Food Quality: The Hague, The Netherlands, 2020. (In Dutch)
31. Dutch Government. *Coalition Agreement "Looking out for Each Other, Looking Forward to the Future"*; Parliament: The Hague, The Netherlands, 2022. (In Dutch)
32. Province of South Holland. *Covenant on Climate-Adaptive Building in South Holland*; Province of South Holland: The Hague, The Netherlands, 2018. (In Dutch)
33. Ajzen, I. The theory of planned behavior. *Organ. Behav. Hum. Decis. Processes* **1991**, *50*, 179–211. [CrossRef]
34. Ajzen, I. *The Theory of Planned Behavior: Reactions and Reflections*; Taylor & Francis: Abingdon, UK, 2011.
35. Ajzen, I. The theory of planned behavior: Frequently asked questions. *Hum. Behav. Emerg. Technol.* **2020**, *2*, 314–324. [CrossRef]
36. Armitage, C.J.; Conner, M. Efficacy of the theory of planned behavior: A meta-analytic review. *Br. J. Soc. Psychol.* **2001**, *40*, 471–499. [CrossRef]
37. Fishbein, M.; Ajzen, I. *Predicting and Changing Behavior: The Reasoned Action Approach*; Taylor & Francis: Abingdon, UK, 2011.
38. Gopi, M.; Ramayah, T. Applicability of theory of planned behavior in predicting intention to trade online. *Int. J. Emerg. Mark.* **2007**, *2*, 348–360. [CrossRef]
39. Grazioli, V.S.; Lewis, M.A.; Fossos-Wong, N.; Larimer, M.E. Attitudes toward protective behavioral strategies: Do they predict use of strategies and alcohol outcomes over time? *Addict. Behav.* **2018**, *87*, 190–195. [CrossRef] [PubMed]

40. Yadav, R.; Pathak, G.S. Intention to purchase organic food among young consumers: Evidences from a developing nation. *Appetite* **2016**, *96*, 122–128. [CrossRef] [PubMed]
41. Hardeman, W.; Johnston, M.; Johnston, D.; Bonetti, D.; Wareham, N.; Kinmonth, A.L. Application of the theory of planned behavior in behavior change interventions: A systematic review. *Psychol. Health* **2002**, *17*, 123–158. [CrossRef]
42. Greaves, M.; Zibarras, L.D.; Stride, C. Using the theory of planned behavior to explore environmental behavioral intentions in the workplace. *J. Environ. Psychol.* **2013**, *34*, 109–120. [CrossRef]
43. Cialdini, R.B.; Kallgren, C.A.; Reno, R.R. A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. In *Advances in Experimental Social Psychology*; Elsevier: Amsterdam, The Netherlands, 1991; Volume 24, pp. 201–234.
44. Smith, J.R.; Louis, W.R.; Terry, D.J.; Greenaway, K.H.; Clarke, M.R.; Cheng, X. Congruent or conflicted? The impact of injunctive and descriptive norms on environmental intentions. *J. Environ. Psychol.* **2012**, *32*, 353–361.
45. Minton, A.P.; Rose, R.L. The effects of environmental concern on environmentally friendly consumer behavior: An exploratory study. *J. Bus. Res.* **1997**, *40*, 37–48. [CrossRef]
46. Darko, A.; Chan, A.P. Review of barriers to green building adoption. *Sustain. Dev.* **2017**, *25*, 167–179. [CrossRef]
47. Taber, K.S. The use of Cronbach's alpha when developing and reporting research instruments in science education. *Res. Sci. Educ.* **2018**, *48*, 1273–1296. [CrossRef]
48. Petty, R.E.; Wegener, D.T.; Fabrigar, L.R. Attitudes and attitude change. *Annu. Rev. Psychol.* **1997**, *48*, 609–647. [CrossRef]
49. Mattijssen, T.J.M.; Dijkshoorn-Dekker, M.W.C.; Kortstee, H.; Polman, N.B.P. Nature-inclusive Real Estate: Lessons learned in three Real Estate Projects in Dutch Cities. *Int. J. Sustain. Urban Dev. in review*.
50. Michie, S.; Atkins, L.; West, R. The behavior change wheel. In *A Guide to Designing Interventions*, 1st ed.; Silverback Publishing: London, UK, 2014; pp. 1003–1010.
51. Kahneman, D. *Thinking, Fast and Slow*; Macmillan: New York, NY, USA, 2011.
52. Vermeir, I.; Verbeke, W. Sustainable food consumption: Exploring the consumer "attitude–behavioral intention" gap. *J. Agric. Environ. Ethics* **2006**, *19*, 169–194. [CrossRef]
53. Van Haaster-de Winter, M.A.; Dijkshoorn-Dekker, M.W.C.; Polman, N.B.P.; Mattijssen, T.J.M.; Kortstee, H. *Natuurinclusief Bouwen: Wat Beweegt de Nederlandse Vastgoedsector? Onderzoek Naar Motieven, Barrières en Gedrag in de Transitie Naar Meer Groen (NID: What Drives the Dutch Real Estate Sector? Research into Motives, Barriers and Behavior in the Transition towards More Green and Biodiversity)*; Wageningen Economic Research: The Hague, The Netherlands, 2020. (In Dutch)