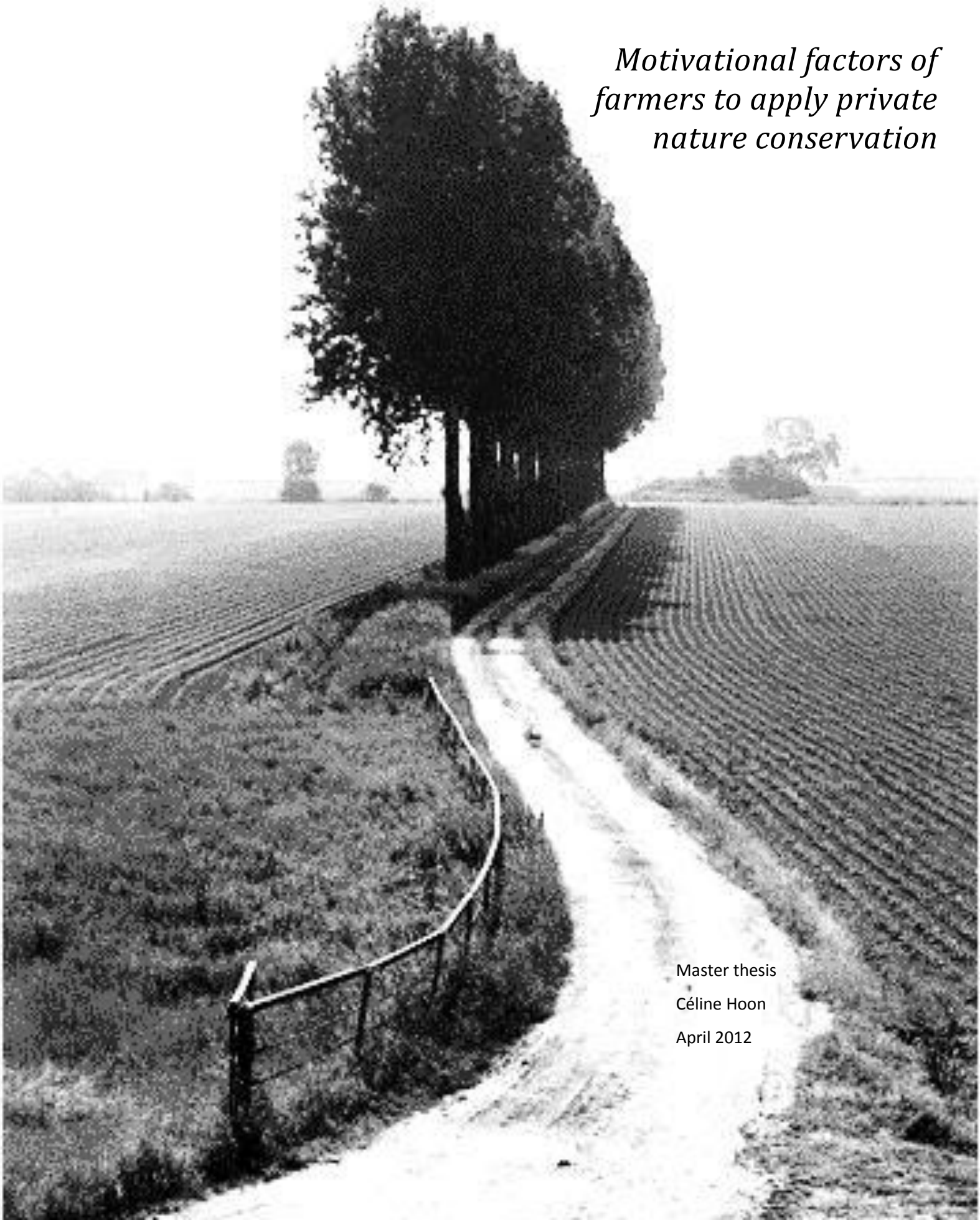
Wageningen University – Department of Social Sciences – Chairgroup: Communication Strategies

Me and my farm

Motivational factors of farmers to apply private nature conservation



Master thesis

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Me and my farm. Motivational factors of farmers to apply private nature conservation.

Master thesis

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Voorwoord

Wellicht is het voorwoord het beste dat het schrijven van een thesis te bieden heeft. Eindelijk hoef ik geen andere bron te vermelden dan de kraamkamer van mijn eigen brein. Er hoeft geen draft versie langs het strenge oog van menig ervaren onderzoeker, geen enkele bewering is door statistische berekeningen geteisterd geweest.

Maar, wie heeft ooit gezegd dat het schrijven van een thesis 'leuk' zou zijn? Menig verhaal deed mij vooraf denken dat het een onoverkomelijke en gemene berg was, die enkel beklommen moest worden om uiteindelijk je diploma in ontvangst te mogen nemen. Bij tijd en wijlen leek dit vermoeden uit te komen, ware het niet dat er altijd weer een bemoedigend woord, dampende kop koffie of geniale ingeving om de hoek was, die mij de goede kant op stuurde. Het gros van de tijd bleek het juist een leerzame en interessante exercitie, waar ik met veel plezier aan gewerkt heb! Daarnaast wie worstelt, komt boven en dus ligt hij hier.

Had hij hier niet gelegen zonder de hulp van anderen? Wie zal het zeggen. Feit is dat hij hier zeker niet in huidige vorm had gelegen zonder de hulp van anderen. Daarom wil ik in de eerste plaats mijn begeleider Anne Marike Lokhorst heel hartelijk bedanken. Zonder haar aanstekelijke enthousiasme was ik waarschijnlijk menig 'ik-stel-het-wel-uit-tot-later' fase niet te boven gekomen. Na elk gesprek ging ik met een goed gevoel weg en had ik altijd weer inspiratie om de volgende stap te nemen. Aan het begin van Anne Marikes zwangerschapsverlof heeft Marijn Poortvliet haar rol glansrijk overgenomen en ook hem wil ik bedanken voor de wijze raad en hulp bij het afronden van deze thesis. De gesprekken met Geert de Snoo, mijn tweede begeleider, heb ik als zeer waardevol ervaren en deze hebben mij gestimuleerd om een stap verder te denken dan in eerste instantie noodzakelijk leek. Bedankt daarvoor! Zonder de opdracht van Rob le Rutte vanuit DLG had deze thesis er zeker niet gelegen en hem wil ik dan ook graag bedanken voor de prettige samenwerking. Ook bedank ik natuurlijk alle boeren, zonder wiens medewerking er geen onderzoek was geweest.

Dan eindig ik toch maar met de woorden van een ander, die bevatten immers vaak meer wijsheid dan ikzelf bezit.

"*Ieder beest bidt op zijn manier*." Tom Lanoye

Céline Hoon
Wageningen, 3 april 2012

Abstract

If the Ecological Main Structure is to be realized in 2021, more farmers will have to start applying private nature conservation. Therefore motivational factors of farmers to implement this on their farmland were investigated. A questionnaire study was done, in which 98 farmers participated, in order to test two behavioural models, namely the value belief norm theory (VBN) and the model of goal directed behaviour (MGB). To these models additional variables were added such as connectedness to nature , place attachment, trust and self-identity. The models were tested using hierarchical linear regression analysis, however no support was found for the VBN nor the MGB model. The variables that appeared to be significant predictors of behaviour were past behaviour, self-identity, place attachment and connectedness to nature and intention. Farmers who have performed nature conservation in the past, feel that it is part of who they are and/or feel attached to the natural world around them seem more likely to apply private nature conservation. Attachment to their farm had a negative impact on behaviour. All these concepts tap a kind of emotional and this suggests that the decision to start applying private nature conservation is a complex decision that is highly influenced by emotions.

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1. Introduction

Land-use activities have had a major impact on the earth's surface (Foley, et al., 2005). Landscapes have changed as a result of deforestation, agricultural practices, urbanization and other human activities. Deforestation can for example have a major impact on the surface water balance, because it often causes an increased surface runoff and river discharge. Urbanization leads to the development of so called urban heat islands, which is a concept that refers to the fact that some urban areas have a climate that significantly differs from rural landscapes (Taha, 1997). Compared to 'clean' atmosphere concentrations pollution in urbanized areas can be ten times higher and also temperatures can be on average 2°C higher.

Current human practices are exhausting the earth's natural capital (MEA, 2005) and this has had large consequences for ecosystems all around the globe. One of those environmental impacts has been a severe decrease in biodiversity (Turner, et al., 2007). Biodiversity can be defined as "*the variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part*" (MEA, 2005).

At the moment biodiversity is mostly threatened by the demand for land of the increasingly growing world population and current extinction rates are estimated to be 100 to 1000 times higher than natural extinction rates (Chapin, et al., 2000). This loss of biodiversity is likely to have major ecological and economic consequences. Pimentel et al. (1997) estimated the worldwide benefits of biodiversity, both economically and ecologically to be worth $2928 billion per year, which is 11% of the total world economy[1].

Ecosystems provide human well-being directly through means of water, food and fiber supply (MEA, 2005). For example, especially poor people from developing countries, who live in rural regions are dependent on biodiversity as an insurance for providing basic living conditions and are therefore also more vulnerable to its degradation. Besides that ecosystems provide regulating, cultural and supporting services, as they play a role in the regulation of climate and floods; and provide recreation and aesthetic enjoyment.

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[1] This was calculated by summing up the estimated worldwide values of waste disposal, soil formation, nitrogen fixation, bioremediation of chemicals, crop breeding (genetics), livestock breeding (genetics), biotechnology, biocontrol of pests (crops), biocontrol of pests (forests), host plant resistance (crops), host plants resistance (forests), perennial grains (potential), pollination, fishing, hunting, seafood, other wild foods, wood products, ecotourism, pharmaceuticals from plants and forest sequestering of carbon dioxide. These values were based upon literature review (Pimentel, et al., 1997).

Not only do ecosystem directly influence human well-being, indirectly they also contribute to human security, health, social relations and freedom of choice and action (idem). For instance, biodiversity has an impact on access to water and other elementary resources for a satisfactory life (Diaz, Fargione, Chapin, & Tilman, 2006). Changes in biodiversity will alter the equilibrium in an ecosystem and have a great impact on its resilience (Chapin, et al., 2000). As a consequence ecosystem services are affected as well, as for example a greater biodiversity results in more productive plant communities and ecosystems with a larger nutrient retention (Tilman, 2000).

A worldwide declaration on Biological Diversity was made to significantly decrease biodiversity loss by 2010 (CBD, 2004). Europe has set itself the goal of a complete stop of biodiversity loss by 2020 (European Commission, 2011; PBL, 2009). Worldwide the decline in the surface of nature areas is one of the main causes of a loss of biodiversity (PBL, 2009). In order to protect biodiversity it is therefore of high importance to assign new nature areas and protect existing ones.

At the core of the European Union approach for nature conservation is Natura 2000: a network of protected nature areas spread all over Europe. It is aimed at protecting Europe's most vulnerable species and habitats (idem). The Natura 2000 guideline requires every EU member to assign these protected nature areas. For the Netherlands there are 162 Natura 2000 areas and almost all of those areas are part of the National Ecological Network (Groenfonds, Natuurmonumenten, Landschappen, Grondbezit, & Staatsbosbeheer, 2010). The National Ecological Network or Ecological Main Structure (EMS) was developed in 1990 and is a network consisting of high quality nature areas. Its main goal is to expand and connect those areas (PBL, 2009).

The EMS should be realized in 2021 and eventually should cover 728 500 ha and 6.3 million ha of water areas (PBL, 2009; Rijksoverheid, 2011). A substantial part of the EMS consists of nature areas that already existed in 1990, the government has established three ways of realizing the other 275 000 ha:

- The acquisition and management of new areas (50%)
- Private nature conservation (15%)
- Agricultural nature conservation (35%) (PBL, 2009)

Applying private nature conservation means land owners dedicate part of their property to nature. This implies the land will get another destination, instead of 'agricultural land' it will now be registered as 'nature'. In exchange for this they get a one-off monetary compensation for the devaluation of their land and an annual subsidy for management of the land. In agricultural nature conservation the main purpose of the land will remain to be farm land, however the land owner will carry out certain activities in order to allow for the growth of natural species (idem).

Even though the total EMS area continues to grow annually, the growth has been stagnating and will not be sufficient to meet the 2021 goal (PBL, 2009; Rijksoverheid, 2011).
Nationwide the agricultural nature conservation surface has been growing steadily, however some provinces have seen a stop in growth or even a decline. At the end of 2009 only 53 759 ha of the 91 000 ha of agricultural nature conservation had been realized (CBS, PBL, & WageningenUR, 2010a). For private nature conservation only 15% of the total area of 42 771 ha was realized (CBS, PBL, & WageningenUR, 2010b). If the current trend is to be continued, only 60% of the EMS will be realized in 2018 (PBL, 2009). The question therefore is how land owners can be persuaded to apply private or agricultural nature conservation on their property.

When it comes to natural resource management the influence of social psychological factors is often overlooked (Stratford & Davidson, 2002). Land users tend to be seen as individuals driven by rational decision making, while ignoring the fact that in reality they function as "*complex identities in complex associations whose actions are framed by both formal and informal, implicit and explicit, socio-cultural practices*" (idem). Also Wilson (2001) reports that farmers often tend to be seen to react for a large part only to outside forces, whilst neglecting possible changes from within (as in Burton and Wilson (2006)).

However, Simon (1957) already acknowledged "*that people do not necessarily indulge in economically optimal decision making, but instead may optimize social, intrinsic and/or expressive goals*". This lead to the development of the behavioural approach, that studies decision making using actor-oriented quantitative methods and therewith tries to comprehend individual behaviour of farmers or land owners (Burton, 2004). Applying the behavioural approach, Lokhorst, Staats, Van Dijk, Van Dijk and De Snoo (2011) used concepts from social psychology to study farmers' motivation to increase biodiversity on their farmland. They showed that factors such as attitude, subjective norm, self-identity and personal norms are correlated with (non-)subsided practices concerning nature conservation.

Social psychology literature also reports other, less rational, factors influencing decision making. However, when it comes to the field of environmental psychology these factors tend to get less attention. As Kals and Maes (2002) state environmental psychology has often overlooked the effect of emotions, as most models are based on the theory of planned behaviour (Ajzen, 1991) that only indirectly incorporates the emotional aspect, via attitude formation. Nevertheless, emotions such as self-blame, indignation and anger were found to correlate, positively or negatively, with other ecological conservation behaviours such as energy consumption, choice of traffic and financial support of nature conservation (Kals, Schumacher, & Montada, 1999). Even though these factors that

influence decision making in a less rational way also appear to be important with regard to environmental decision making, when it comes to the relationship between farmers and conservation practices, still little is known about them.

As stated above, the realisation of the EMS is behind schedule. Despite extra policy efforts the realization of private and agricultural nature conservation remains difficult. Halfway only 15% of the goal of 275 000 is met. If the government is to continue its current practices it will probably not achieve its goal (Wiertz, Sanders, & Kranendonk, 2007). Especially the realisation of private nature conservation is running behind schedule (CBS, et al., 2010b), therefore this study will focus on private nature conservation practices. More farmers will have to start carrying out these practices. However, in order to be able to convince farmers to cooperate, insight in the way they reason and decide about private nature conservation is needed. As mentioned before, social psychological factors often have a large impact on decision making. Therefore this study investigates the motivational factors of farmers in relation to private nature conservation.

Research objective

This has led to the following research objective:

to help increase the amount of land owners participating in private nature conservation by investigating their motivational factors to apply this on their land.

Research question

From this follows the research question of this study:

What motivational factors influence land owners' decision making when it comes to applying private nature conservation on their land?

In the next chapter a theoretical background will be given and previous research relating to the subject will be discussed. Three different behavioural models will be presented, after which two models to explain farmers' behaviour in relation to private nature conservation will be proposed. The chapter on Materials and methods will discuss the study population and questionnaire that was developed to answer the research question. In the fourth chapter the results of the questionnaire will be presented and the last chapter will summarize the results and compares them with other studies. The limitations of this study will be discussed and suggestions for further research will be given.

2. Theoretical background

In order to investigate the motivational factors influencing farmers' decision making process in relation to private nature conservation, first a literature review was done. Findings from previously done research can provide more insight in the variables that might influence the decision to apply private nature conservation. Three behavioural models will be discussed, namely the theory of planned behaviour, the model of goal directed behaviour and the value belief norm theory. Based upon this literature review two models to explain farmers' behaviour are proposed.

2.1 Theory of planned behaviour

The theory of planned behaviour (TPB) states that the best predictor for performing a certain behaviour is the intention to perform that behaviour (Ajzen, 1991). Intention is, in turn, predicted by three other determinants, namely attitude, subjective norm and perceived behavioural control (PBC). The concept of attitude is a personal evaluation of the behaviour, it refers to whether someone has a positive of negative appraisal of the specific behaviour. These attitudes are formed by salient beliefs towards a certain object or behaviour, as stated by the expectancy-value model (Fishbein & Ajzen, 1975). Beliefs are developed by relating certain attributes to a behaviour and associating it with other behaviours, events or characteristics. In this model the strength of each belief is multiplied by the value the individual assigns to this belief. For example, a farmer may believe nature conservation has a positive effect on biodiversity and results in a more beautiful landscape. If this farmer then highly values biodiversity and the way the landscape looks, he will develop a positive attitude towards nature conservation. The sum of all the relevant beliefs, multiplied by its values together form the attitude towards the behaviour. These beliefs can either have an cognitive or affective origin. That means that beliefs can be based upon deliberate thinking or emotions and feelings.

Subjective norm reflects the perceived social pressure from (important) others to perform a certain behaviour (Ajzen, 1991). This means that when an individual expects that these important others will approve or disapprove of this behaviour, he will respectively be more or less likely to perform this behaviour. The subjective norm is again formed by the belief someone holds about other's approval multiplied by the motivation to comply. So, for instance a farmer who thinks important others disapprove of farmers who do not apply nature conservation, may feel an urge to therefore carry out this behaviour. If so, he will be more likely to apply nature conservation. However, if the farmer does not feel an urge to act in accordance with the opinion of others, he will experience a less stronger subjective norm.

Perceived behavioural control (PBC) refers to one's perception of his/her ability to perform a certain action. It indicates whether someone believes that it will be easy or difficult to express a certain behaviour. PBC influences behaviour directly as well as indirectly, via intention. Perceived behavioural control was added to the initial model of Fishbein and Ajzen (1975), the theory of reasoned action (TRA). It was added after comments on the TRA that stated that behaviour was not only influenced by whether someone is willing to perform the behaviour, but also by whether he or she is able to perform this behaviour. PBC influences behaviour through intention, as someone may have certain beliefs about whether he or she can perform the behaviour or not. PBC also influences behaviour directly as constraints such as time, money, skills, etc. have an impact on whether someone actually can perform the behaviour (Ajzen, 1991). For instance, a farmer who has a positive attitude towards carrying out private nature conservation, might still not perform the behaviour. He can for example feel that it will take too much time to behave according to his attitude. This belief may influence his intention, but also directly impacts his behaviour. If the farmer has no time to apply private nature conservation, he is not able to do so. See Figure 1 for a schematic overview of the theory of planned behaviour.

The TPB is a commonly used model in social psychology and is applied to many fields of behaviour. In the field of pro-environmental behaviour the TPB has been studied in relation to many different behaviours. For example, with regard to the use of a transferium that enables to quickly change from private to public transport, more positive attitudes, positive subjective norms and high perceived behavioural control were found to correlate with higher intentions (De Groot & Steg, 2007). In the work of Eriksson and Forward (2011) the TPB was also successfully used to explain pro-environmental travel mode choices, such as bike and bus use. Amongst other behaviours that could be predicted by applying the TPB are the use of renewable energy (Hansla, Gamble, Jullusson, & Garling, 2008; Litvine & Wustenhagen, 2011), recycling behaviour and waste minimization (Tonglet, Phillips, & Bates, 2004), and the purchase of organic food (Arvola, et al., 2008).

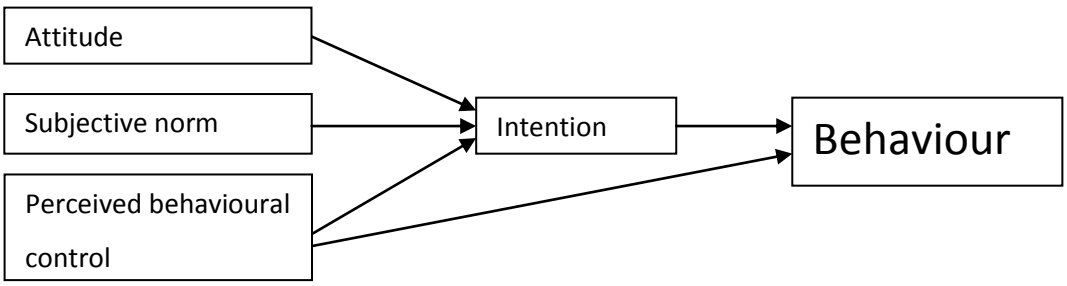

Figure 1 Theory of Planned Behaviour (Ajzen, 1991)

In line with the fact that PBC was later added to the initial TRA, the TPB is also open for the inclusion of other variables. Ajzen (1991) stated: "*The theory of planned behavior is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behavior after the theory's current variables have been taken into account*". Many researchers have, successfully, added extra variables to the TPB and some of these will be discussed below. In the study of Eriksson and Forward (2011) that was mentioned above, for example, the concept of descriptive norm was added to the model. A descriptive norm refers to behaviour that is actually commonly performed by (important) others, in contrast to the concept of subjective, or injunctive, norm, that relates to what others value to be important behaviour. Adding this type of norm significantly improved their model, with an additional 5-6% of the variance in intention to choose for pro-environmental modes of transportation explained. In the analysis below, I have selected those variables that, according to the literature, seem most suited for the current study.

In contrast to most of the pro-environmental behaviours described above, such as travel mode choice, using green electricity, etc. applying private nature conservation is a decision that comes with high behavioural costs. It is a decision that will highly impact a farmers' way of working. Part of his land, on which his income depends, will have to be managed in a different way. Besides that, it is a one-time decision that cannot easily be reversed. Once a contract has been signed to apply private nature conservation, the farmer will be forced to carry this out for at least the coming 30 years. This might mean that this decision is influenced by other factors or taken in a different way. Therefore one should be careful to generalize these results and apply them to the subject of private nature conservation.

Fielding et al. (2005) applied the TPB in the nature conservation field and studied farmers' motivations for carrying out riparian zone management. They found that farmers with strong intentions to carry out conservation practices relating to riparian zone management held significantly different beliefs. Strong intenders showed more positive attitudes and analyzed the costs and benefits to be more positive. They attenuated the costs of riparian zone management and believed that the benefits were likely outcomes of their behaviour. Strong and weak intenders did not differ in their beliefs related to the costs. Costs needed, such as time, labour and money were in both groups identified as difficulties that come with riparian zone management. However, strong intenders significantly attributed more value to the benefits of the behaviour. So, this shows that farmers' intention are influenced by their attitudes, especially by beliefs about the benefits of the behaviour. Strong intenders also perceived more normative support from environmental groups and saw less

barriers that would impede them from carrying out the actions. Their research implicates that beliefs about the benefits rather than the costs of riparian zone management seem to be important when it comes to promoting these behaviours. This highlights the importance of attitudes and subjective norms when it comes to explaining farmers' conservation behaviour. Farmers with more positive attitudes and who experience a stronger subjective norm, could be more likely to apply private nature conservation.

In a similar study on farmers' motivations for applying subsided and non-subsidized conservation practices Lokhorst, Staats, Van Dijk, Van Dijk and De Snoo (2011) also used the TPB as a theoretical framework. They found a relationship between attitude, subjective norm and the intention to perform subsidized practices. Non-subsidized practices were related to those two factors as well, but also correlated with perceived behavioural control (Lokhorst, et al., 2011). This means that farmers who have more positive attitudes or who experience that important others in their surroundings have a positive attitude towards nature conservation might be more willing to apply it on their farm.

They also showed that adding to concepts of personal norms and self-identity to the model increased the amount of variance explained. The concept of personal norms stem from the norm-activation theory, developed by Schwartz (1977). It refers to experienced feelings of obligation to carry out a certain behaviour and may be felt as something that one 'should' do. In order for this sense of obligation to be experienced, these personal norms have to be activated. This happens when someone acknowledges his or her behaviour to have negative consequences and he or she feels responsible for these consequences (Harland, Staats, & Wilke, 2007). Self-identity is the degree to which someone feels the behaviour is part of him or herself (Lokhorst, et al., 2011).

In case of subsidized practices there only was a significant relation between self-identity and behaviour and in case of non-subsidized practices both personal norms and self-identity predicted behaviour. This shows that farmers may have different underlying motivational reasons for performing subsidized and non-subsidized conservation practices. Farmers may perform non-subsidized practices because they feel they have to, whereas in case of subsidized practices they can attribute the reasons for performing the behaviour to the fact that they are paid for it. In that case the behaviour can be regarded as a way to obtain a reward. When they are not paid, they must have other reasons for performing the behaviour and that might lead the farmers to believe that it is part of 'who they are' (Lokhorst, et al., 2011).

Fielding, Terry, Masser, and Hogg (2008) used an extended model of the TPB as well. To this model they added the influence of intergroup perceptions, perceived groups norms and group

identification. The concept of intergroup perceptions refers to the extent to which someone identifies a situation to be part of 'us' or 'them'. This might influence behaviour, as they argue, people may trust others that are not part of their group less, and as a result are less willing to accept messages from them. Perceived groups norms differ from subjective norms, in the sense that they refer to the norms and expectations from group members instead of generalized important others. It is argued that someone's social identity is derived by emphasizing the resemblances within a group and magnifying the differences with others who do not belong to the group. The more someone identifies with a certain in-group, the more he or she will adhere to group norms. The research of Fielding et al. (2008) showed the importance of supportive normative reference groups. Farmers who identified strongly with their other in-group members looked to them for guidance on their behaviour and are more influenced by the in-group than by the out-group. Also more adherence to supportive group norms correlated with higher intentions and particularly in the case of farmers who indentified strongly with their group. On the contrary farmers who held more negative perceptions of their intergroup were related with lower intentions, however this effect only occurred in the case of low-group identifiers.

This might suggest that farmers who identify strongly with their group are primarily influenced by in-group views, whereas low identifiers both look to the in-group, as well as the out-group for guidance with regard to the decisions they make (idem). This research shows the importance of including a measure for the influence of others on behaviour of farmers. Farmers' behaviour may not only be based on their own opinion, but also by the beliefs and expectations of others.

This is also consistent with the findings of Beedell and Rehman (2000) who found that farmers who are more aware of environmental issues seem to be more influenced by conservation reference groups. They added the determinant 'perceived moral obligation' as a factor to the TPB, as many farmers expressed they experienced a feeling of obligation to take care of the natural areas on their farmlands. This is a concept similar to that of personal norm, used by Lokhorst et al. (2011). Farmers who were a member of a group that provides environmental and conservation advice in the UK (FWAG) appeared to experience greater social pressure from this and similar groups than non-members. They also held more positive beliefs and experienced stronger social norms (Beedell & Rehman, 2000).

As shown by the analysis above, the theory of planned behaviour seems to be a useful model when it comes to explaining applying agri-environmental schemes and more general pro-environmental behaviour. However, in most researches additional concepts were used, besides

attitude, subjective norm and perceived behavioural control and often this resulted in more powerful models. It seems that when using only the TPB constructs a narrow explanation of the variation in behaviour is obtained.

2.2 Model of goal directed behaviour

With the model of goal directed behaviour (MGB) Perugini and Bagozzi (2001) propose an extension of the TPB. Besides the original TPB concepts, the model of goal directed behaviour takes into account the positive and negative anticipated emotions that come with a certain behaviour. And though the role of emotions has rarely been studied in relation to nature conservation, recent developments in the field of neuroscience showed that emotions work as a basic mechanism that stand at the basis of human development and evolution (Carrus, Passafaro, & Bonnes, 2008). The role of emotions will be discussed in more extent later on.

The MGB also includes the concepts of frequency and recency of past behaviour. By including past behaviour, the MGB accounts for information and knowledge that is obtained in the past, if an individual has already performed a specific behaviour. These aspects are neglected in the theory of planned behaviour (Perugini & Bagozzi, 2001). Perugini and Bagozzi (2001) used the concept of past behaviour according to Ouellette and Wood (1998). Past behaviour can influence behaviour in two ways. First, for behaviours that are performed regularly it can lead to habit formation. This means that these behaviours are performed in an automatic way, without someone thinking about whether or not, why or how to perform the behaviour. For behaviours that are performed on a less regular basis, past behaviour can have an impact on the development of intentions. For such behaviours, past behaviour is mediated by deliberate thinking and works together with attitude, social norms and PBC to form an intention (Carrus, et al., 2008).

Besides that, the MGB introduces a distinction between desire and intention to perform a certain behaviour. Desire can be defined as "*a state of mind whereby an agent has a personal motivation to perform an action or to achieve a goal. Such motivation is based on an integration of different sources of appraisals (e.g. emotional, evaluative, social) and represents the first step towards a decision to act, typically followed by an intention to do so. Therefore, desires should be distinguished from concepts such as intentions, attitudes and goals*" (Perugini & Bagozzi, 2004). Desires differ from intentions in the sense that they are seen to be less feasible and less related to a specific target or result. They also may relate to a broader and unlimited temporal frame (Carrus, et al., 2008). See Figure 2 for an overview of the model of goal directed behaviour.

Carrus et al. (2008) applied the model of goal directed behaviour in order to explain two types of pro-environmental behaviour. They showed the importance of taking up past behaviour in the model. For both the use of public transport and household recycling, frequency of past behaviour appeared to be the strongest predictor of desire and intention in their model. Besides that anticipated emotions, and especially negative anticipated emotions appeared to be significant in predicting both the use of public transport and household recycling behaviour.

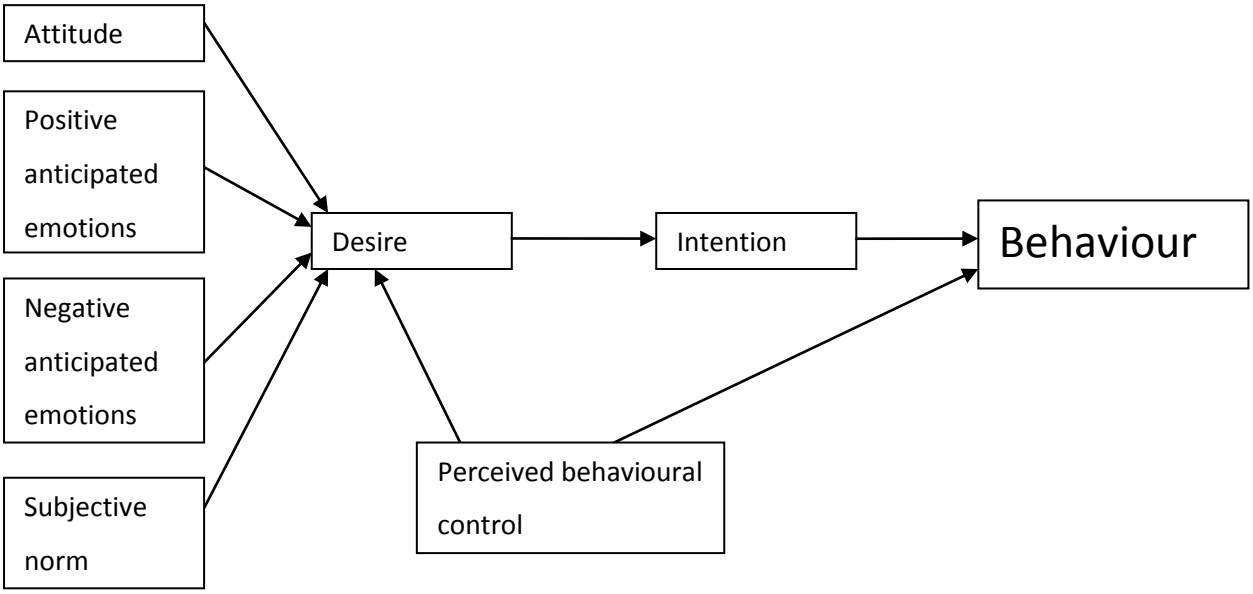

Figure 2 Model of goal directed behaviour (Perugini & Bagozzi, 2001)

These variables, such as anticipated emotions, past behaviour and desire, have to the best of my knowledge, not yet been studied in the context of nature conservation. However, it seems likely that they might be of influence on the decision making process of farmers when it comes to applying private nature conservation. This may especially be the case for anticipated emotions and desire. Past behaviour may be of less influence as private nature conservation is often a onetime decision that cannot easily be reversed. Due to the fact that the farmer signs a contract, once the decision has been made he will be obliged to carry out the behaviour in the future. Anticipated emotions however might play a larger role in the decision making process, as will be argued in the next paragraph.

2.2.1 The role of emotions

In a few other studies that were not related to the MGB the role of emotions has also been discussed. The importance of the emotional aspect of decision making was for example demonstrated by Kals, Schumacher, and Montada (1999). They state that ecological behaviour cannot be considered to be the result of rational choice thinking only. They found that emotions such as self-blame, indignation and anger were found to correlate, positively or negatively, with ecological conservation behaviours such as energy consumption, choice of traffic and financial support of nature conservation (Kals, et al., 1999). They found, for example, that indignation about a lack of nature protective actions could be explained by a) an awareness about the fact that proper nature functioning is threatened, b) the recognition of the social or moral norm that it is important to protect nature and c) the conviction that other agents (such as governments, enterprises) have efficient ways to reduce environmental degradation at their disposal, however d) they ignore their responsibilities to adequately protect nature (idem).

Kals et al. (1999) defined emotional affinity towards nature as: '*a positive feeling of inclination by a set of cognitive appraisals and attributions*' and it covered items such as love of nature, feeling good or safe in nature and experiencing a oneness with nature. Using multiple regression analysis they found that emotional affinity together with indignation and interest in nature explained in total 47% of the variance in behaviour. However, in contrast to the decision to start applying private of agricultural nature conservation, their research was directed at more 'small scale' behaviours that are relatively easily performed by individuals that show their willingness to protect nature (for example installing water-saving devices or solar panels) and personal behaviours that protect nature (such as protecting nature during outdoor stays).

Pooley and O'Connor (2000) studied the factors environmental attitudes were based upon with regard to the logging of native forests, urban development and the restriction of vehicle emissions. Therewith they distinguished between cognitions (beliefs) and affect (emotions). They found that affect was a significant predictor of environmental attitudes in all three cases and explained a significant additional part of the variance. Attitudes thus do not seem to be based upon a cognitive component solely, as already stated in the paragraph about the TPB. Pooley and O'Connor (2000) showed that environmental attitudes have both an cognitional aspect (beliefs) and a affective component (emotions or feelings). However, an attitude does not necessarily have to be based on all three aspects.

Gosling and Williams (2010) studied the relationship between two forms of emotional associations amongst farmers: the role of connectedness to nature and attachment to place in

relation to higher cost conservation behaviours such as protecting local vegetation on their farmland and planting new trees. These concepts refer to a connective affection an individual can experience in relation to nature in general or a specific place respectively. When someone feels attached to a place he or she experiences an emotional bond with that place. Connectedness to nature is experienced when someone has the idea he or she is a part of nature. His sense of the self is expanded and includes other living organisms (Schultz, 2000).

Place attachment has been found to predict types of simple conservation behaviours, such as sorting recyclable waste (Vaske & Kobrin, 2001). However, in their study Gosling and Williams (2010) found no significant relation between place attachment and native vegetation management of farmers. In a similar study Raymond, Brown and Robinson (2011) also found no correlation between place attachment and native vegetation management. They divided place attachment into five components, namely place identity, place dependence, nature bonding, family bonding and friend bonding and none of these dimensions was found to correlate with either native vegetation planting behaviour or the intention. However, in their study some components of place attachment did influence the antecedents of behaviour. Nature bonding was for example a significant predictor of personal norm and awareness of consequences, the degree to which someone acknowledges his or her behaviour might have negative consequences on the environment. Also family bonding correlated with awareness of consequences. They also found a relationship between family bonding and more general environmental concerns. This shows that, although no direct significant relationship was found between place attachment and behaviour, it might still be of interest, as antecedents of place attachment can influence farmers' decision making process.

Connectedness to nature, the extent to which someone experiences him or herself to be a part of nature, had a moderate, though significant correlation with behaviour in the study of Gosling and Williams (2010). Other research confirms this relationship (Mayer & Frantz, 2004; Schultz, 2001). This indicates that farmers who feel more related to nature are more willing to take actions when it comes to protecting the landscape they live in.

2.2.2 The role of trust

The concept of trust has also been rarely studied in relation the nature conservation or agri-environmental schemes. However, it can be thought to influence the decision making process of farmers. As people do not have the time to access and adequately judge all relevant information, trust may be used as a heuristic to come to a decision (Terwel, 2009). Heuristics are rules of thumb people may use as guidance in decision making.

Trust can be defined as: "*a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another*" (Rousseau, Sitkin, Burt, & Camerer, 1998). To the best of my knowledge, the role of trust has not been studied in relation to pro-environmental behaviour yet. However, Polman and Slangen (2008) studied the role trust in relation to concluding AES-contracts. They found that trust in the government increased the participation in contracts and stated that trust is a required condition for farmers to enter into a contract.

2.3 Value belief norm theory

Most of the studies mentioned earlier used the theory of planned behaviour (TPB) (Fielding, et al., 2005; Fielding, et al., 2008; Lokhorst, et al., 2011) or its extension, the model of goal directed behaviour (Carrus, et al., 2008) to explain pro-environmental behavour. Other studies find their base in the value belief norm theory (VBN) that was proposed by Stern (2000) and builds on Schwartz's norm-activation theory (NAT) (Schwartz, 1977).

In the VBN behaviour is predicted by a causal chain that moves from more constant and central characteristics and beliefs of a person further to focused ideas about the relationship between humans and the environment, its consequences and someone's perceived sense of obligation to take pro-environmental action (Stern, 2000). It states that someone's personal moral norms are the most proximate predictors of an individuals' environmental behaviour. As described earlier, the concept of personal norms refers to a experienced obligation to perform a certain behaviour as one thinks it is something that one 'should' or 'ought to' do. Personal norms, in turn, stem from a set of biospheric, altruistic and egoistic values. These values together influence someone's ecological worldview (as assessed by the New Environmental Paradigm (NEP) (Dunlap, Van Liere, Mertig, & Jones, 2000)), its consequences (Adverse Consequences for valued objects. AC) and the person's sense of obligation to take action (perceived Ability to Reduce threat, AR) (Stern, 2000). See Figure 3 for the complete causal chain.

Personal norms originate from more general beliefs about the environment and associated values. These beliefs and values can be divided into biospheric, altruistic and egoistic value orientations. In a biospheric orientation beliefs about the environment and the biosphere are most important when it comes to acting in a pro-environmental manner. Decisions are based upon their impact on the whole ecosystem and the biosphere (J. De Groot & L. Steg, 2008). When an individual adheres to a social-altruistic value orientation he or she will mostly consider and decide to act upon the perceived benefits and costs for other people. Someone who has an egocentric value orientation

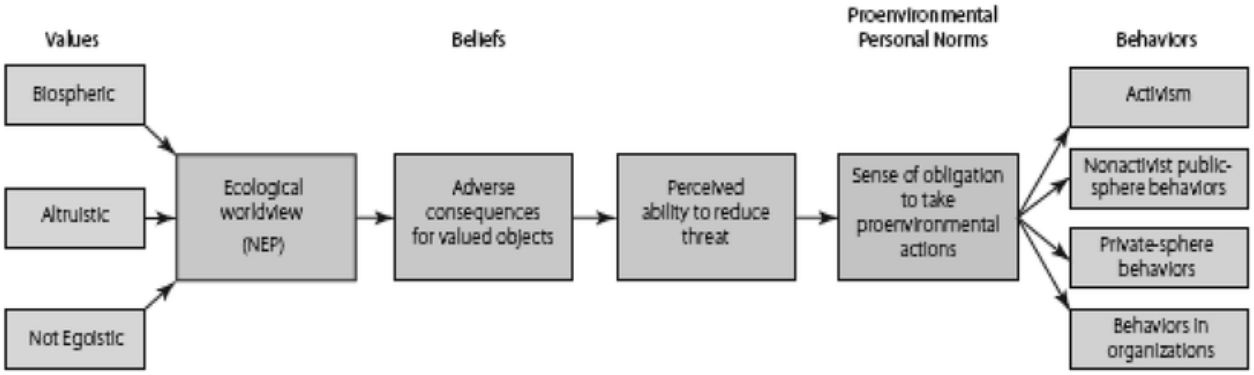

Figure 3 Value belief norm theory (Stern, 2000)

mainly bases his or her decision to act upon the perceived benefits and costs of the behaviour for him or herself personally.

Together these three value orientations impact someone's ecological worldview, that is based on the New Environmental Paradigm (NEP). The NEP was developed to asses rudimental beliefs about nature itself and how human beings are related to that. As Dunlap et al. (2000) state it measures an individual's fundamental beliefs about "*humanity's ability to upset the balance of nature, the existence of limits to growth for human societies, and humanity's right to rule over the rest of nature"*. The NEP is seen to have an impact on more specific beliefs and attitudes about matters concerning the natural world and the environment (idem).

Someone's ecological worldview influences his or her beliefs about the Adverse Consequences for valued objects (Stern, 2000). These are beliefs that reflect the extent to which an individual attaches meaning, are threatened by certain environmental conditions. If someone beliefs it is within his or her power to reduce this threat (AR), personal norms that can lead to pro-environmental behaviour can be activated. The individual can then take action that leads to reduction of this threat.

As Schultz (2001) stated the environmental concern and motivation to act people experience, will differ based upon the value orientation they adhere to. A biospheric value orientation will lead to actions based upon a need to avoid negative effects for nature as a whole. A social-altruistic concern originates from a desire to protect all people from negative consequences. An egoistic concern is based upon avoiding costs and keeping benefits for oneself.

Steg, Dreijerink, and Abrahamse (2005) applied the VBN to the field of pro-environmental behaviour and studied factors that influenced the acceptability of energy policies for household CO_2 reduction. In their study personal norm significantly predicted acceptability judgments and explained 29% of the variance. They also found significant evidence for the rest of the VBN causal chain as each

single variable could significantly predict the next. The mediating effects were also confirmed as PN mediated the relationship between AR and acceptability; AR mediated the relationship between AC and PN and AC the one between NEP and AR. The NEP in turn mediated the relationship between values and AC and the three value orientations, biospheric, altruistic and egoistic were significant predictors of the NEP. People who felt a stronger moral commitment to decrease household energy use correlated with higher levels of acceptability of energy reduction policies. Also willingness to reduce car use (Nordlund & Garvill, 2003) and commitment to protect biodiversity (Menzel & Bögeholz, 2010) were explained using the VBN.

Raymond et al. (2011) used the VBN as a theoretical background in their study on native vegetation management of farmers. They tested the VBN model and compared it with an extended VBN model that also included place attachment, as explained in the paragraph about the role of emotions. Both models had significant, though very modest explanatory power. They conducted their study in two regions of Australia. In one region the base model could explain 11% and in the other 8% of the variance. Adding the concept of place attachment resulted in better, though still modest, predictions of 22% and 11% respectively.

2.4 Proposed models

The literature above presents the two main streams of reasoning in current social psychology, related to pro-environmental behaviour. Based upon that, two models are proposed with regard to farmers' behaviour in relation to applying nature conservation on their farmland. The first model represents the value belief norm theory. The second model reflects the theory of planned behaviour and its extension the model of goal directed behaviour.

The first model shows causal chain of the VBN variables. As explained above, farmers' willingness to participate in private nature conservation may be affected by their personal norms. These norms are developed through the causal chain that starts with general values that are considered important in life. These values in turn might influence farmers' ecological worldview, as measured by the NEP (Dunlap, et al., 2000). This worldview might impact the AR and AC, which leads to different personal norms. For example, farmers adhering to biospheric values, such as preventing pollution or respecting the earth, who are be more aware of the negative consequences of their behaviour, and who know what they how to behave in order to undo these negative consequences, might be more willing to apply private nature conservation.

Connectedness to nature and place attachment were added to this path, as these factors may add to someone's identity (Schultz, Shriver, Tabanico, & Khazian, 2004). The degree to which

someone feels part of nature has an influence on the kind of concerns he or she develops. The more someone experiences to be connected to nature of a certain place, the more he or she will develop biospheric concerns (Schultz, 2000; Schultz, et al., 2004). This is the result of the fact that one does not only experience concerns for himself, but also for other living organisms. And as someone feels more close to nature or a place, his motivation to help increases as well (Mayer & Frantz, 2004). Especially farmers, who spent a large amount of their time in the natural world and are often bound to a specific place, due to the location of their farm, might develop a specific feeling of connectedness to nature or a certain place. Expected on the literature above, this feeling might influence their willingness to participate in private nature conservation. Figure 4 gives an overview of the VBN model.

The second model represents the model goal directed behaviour. Here intention is seen to be the most proximate predictor of the actual behaviour. Farmers who intend to apply private nature conservation are probably more likely to actually do so. Predicting this intention is the desire to act. This desire is developed through attitude, positive and negative anticipated emotions and subjective norm. A farmer who for example thinks positively about private nature conservation, beliefs he will feel happy and relieved when he has met his goal concerned with nature conservation and experiences important others value nature conservation as well, might feel the desire to act accordingly.

Perceived behavioural control can impact both the desire to perform the behaviour as the actual behaviour itself. If a farmer beliefs he is not able to perform the behaviour, he might be less eager to do so. At the same time, even though a farmer thinks positively about private nature conservation, if he beliefs he is not able to apply it, he will not perform the behaviour.

As explained above, one's self-identity may influence the kind of concerns he or she experiences. However, self-identity may also impact behaviour via the MGB path. As additional factor to the TPB self-identity has been able to predict intentions (Lokhorst, et al., 2011; Mannetti, Pierro, & Livi, 2004; Sparks & Shepherd, 1992).

Trust was also added to predict desire. As Polman and Slangen (2008) found it that the existence of trust increased participation in AES-contracts. However, to my knowledge it has not been studied in relationship to the TPB, MGB or VBN.

Frequency and recency of past behaviour were removed from the MGB. As explained before, private nature conservation is not a 'simple' kind of behaviour, of which the decision to perform it can be taken every time before performing the behaviour. Due to the contractual base of the

behaviour, once a decision has been taken the farmer is obliged to carry it out in the future. A representation of the MGB model can be found in Figure 5.

2.5 Hypotheses

Based upon the proposed model above, the following Hypotheses were developed

H1 The VBN model will predict private nature conservation behaviour.

H2 Place attachment will be positively associated with biospheric values

H3 Connectedness to nature will be positively associated with biospheric values

H4 The MGB model will predict private nature conservation behaviour.

H5 Self-identity will be positively associated with desire.

H6 Trust will be positively associated with desire.

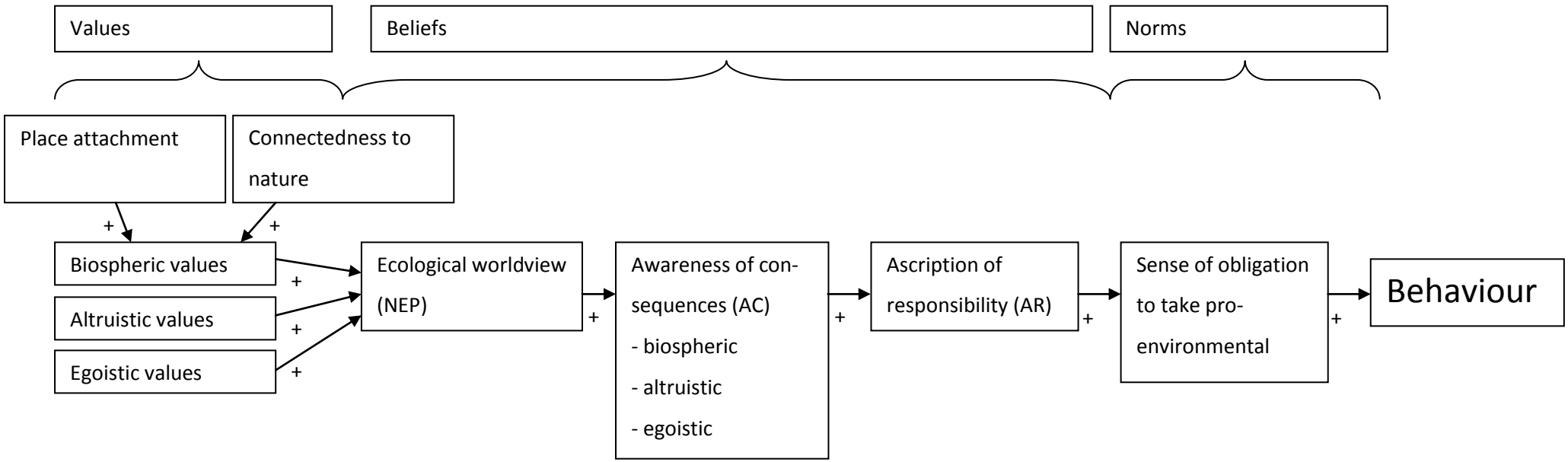

Figure 4 Proposed model based upon the value belief norm theory (Stern, 2000) for explaining farmers' behaviour when it comes to applying private nature

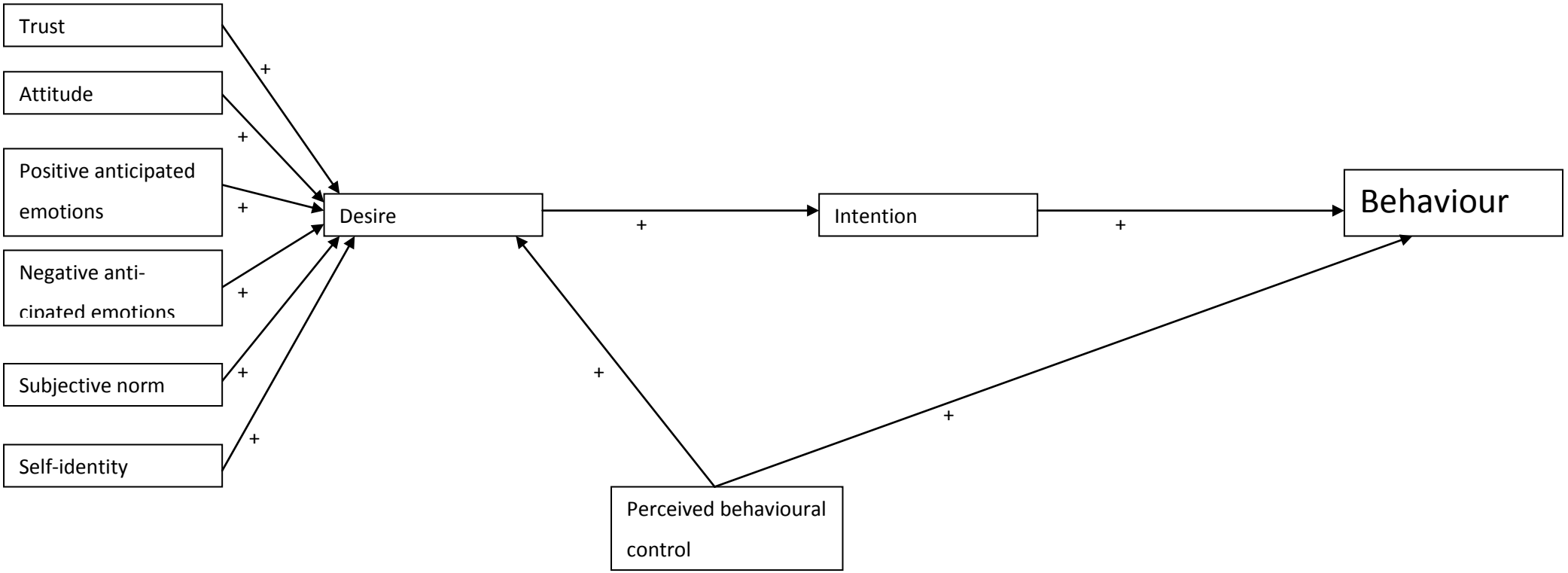

Figure 5 Proposed model based upon the model of goal directed behaviour (Perugini and Bagozzi, 2001) for explaining farmers' behaviour when it comes to applying private nature conservation on their farm.

3. Materials and methods

3.1 Study population and sample

The study population consisted of all owners of agricultural land currently located in the Ecological Main Structure (EMS). This means land owners could either own or rent land situated in the EMS. Besides that also land owners whose land was only partly located in the EMS were included in the study population. The population was restricted to this area, as only these land owners can apply for subsidized private nature conservation.

As the population was restricted to agricultural land, only land owners having land that is currently used for agricultural purposes were taken into account. On September 21st, 2011 the government decided to reduce the EMS area with 100.000 ha (Rijksoverheid, 2011). However at the time at which the sample was taken, as the new EMS was not known. Therefore the EMS that was applicable until that date was used.

The total population consisted of 9500 land owners in total. From this population a sample of 500 was taken. Data about the population were obtained with the help of DLG (Dienst Landelijk Gebied). The Dutch governmental organization DLG is the executive organ concerned with the acquirement of new nature areas for the EMS. DLG provides farmers with information and negotiates with them about the application of private nature conservation. DLG requested that land owners which were currently negotiating with DLG about a contract related to nature conservation were removed from the sample. This was done because DLG feared the questionnaire could interrupt the negotiation process. Therefore the sample was checked for sensitive files and in total 20 land owners were excluded, resulting in a sample of 480.

3.2 Procedure

Land owners were informed about the questionnaire and invited to participate with the use of a letter. The letter explained the goal of the research, provided instructions for filling in the questionnaire. It also informed to participants about the way the results would be used. The letter was sent on December 21th, 2011. A copy of the initial invitation can be found in Appendix I. The participants were also informed about the fact that the research was developed in cooperation with DLG. As a reward, farmers could receive a book about farming and nature conservation. Besides that they also had the option to be kept informed about the results of the research.

The actual questionnaire was conducted using Qualtrics.com, an online provider for distributing surveys. Farmers could reach the questionnaire, by going to www.dlg.nl, where in the left

column a link was placed to the actual survey. In order to get access to the survey, the participants had to fill in a password. If farmers were not able to fill out the questionnaire online, they had the opportunity to request for a paper copy that was sent by mail and could be returned using a prepaid envelope. A copy of the questionnaire (in Dutch) can be found in Appendix II.

Four invitation letters were returned, because the addressee had moved or the letter was undeliverable. All the other farmers who had not filled in the questionnaire by January 4th, 2012 (455) were contacted by telephone between January 4th and January 16th 2012.
They were asked whether they had received the initial invitation to participate, and if so, they were reminded to fill out the questionnaire. If they indicated they had not received the invitation, they were asked whether they still wanted to participate and were given a short explanation about the research. In that case, the farmers were sent an email with a link to the survey, and their password and participation number or this was given to them during the telephone conversation. Also when the participants indicated they had lost or thrown away their initial invitation, but still wanted to participate, they received again their password and participation number either by phone or email.

On January 27th, 2012 the link to the questionnaire on the website of DLG was removed and the survey was closed. In total 94 participants completed the questionnaire, of which 9 were filled out on paper.

3.3 Questionnaire scales

All items were tested using a 5-Point Likert scale and most scales were ranged from completely disagree / completely agree. Exceptions are mentioned below. The items for each of the scales were combined and divided by the total number of items for that scale in order to come up with an average score for each variable. Table 1 gives an overview of the variables included in the questionnaire and their source.

Values were measured using the value instrument developed by De Groot and Steg (2008) that distinguishes between the biospheric, egoistic and altruistic value orientations. Originally this scale included 13 values, however one biospheric value (unity with nature) appeared to be missing in the questionnaire. The values were translated into Dutch and behind each value, a short explanation was given between brackets to clarify what was exactly meant with the value. The 12 values were rated from very unimportant / very important. The egoistic value orientation includes the values social power, wealth, authority, influential and ambitious (α = 0.82). For the altruistic value orientation included the values equality, a world at peace, social justice and helpful (α = 0.82). The biospheric value orientation consisted of the values preventing pollution, respecting the earth and protecting the environment (α = 0.86).

Ecological worldview was measured using the revised NEP scale developed by Dunlap et al. (2000). This scale consists of 12 statements, for example "We are approaching the limit of the number of people the earth can support" (α = 0.83). Translations were taken from Lokhorst et al. (2011).

Awareness of consequences (AC) was measured using three items which were constructed after Steg et al. (2005). For each value orientation one item was taken, translated and rewritten to apply it to the field of nature conservation (α = 0.79). For example, the item for egoistic consequences was "Nature conservation will result in a better world for me and my children".

Ascription of responsibility (AR) was measured using two items, also constructed after and translated from Steg et al. (2005) (α = 0.79). A sample item is "I feel jointly responsible for the loss of biodiversity".

Personal norm was measured using the items of Lokhorst et al. (2011), as they were already translated to Dutch. The items used were "I feel a strong personal obligation to carry out private nature conservation" and "I would feel guilty if I did not carry out private nature conservation" (α = 0.83).

Private nature conservation behaviour was measured using the items "I currently apply private nature conservation" and "I currently spend time on private nature conservation (α = 0.94).

Attitude was measured according to Ajzen and Fishbein (1980), again using the translations of Lokhorst et al. (2011). A sample item is "I think that private nature conservation is very negative / very positive" (α = 0.93).

S*ubjective norm* was measured using the item "Most people who are important to me think it is important that I carry out private nature conservation" (Ajzen & Fishbein, 1980).

Perceived behavioural control was measured using the scale of Ajzen and Fishbein (1980). The item "I am capable of carrying out private nature conservation" was ranged on a scale from completely disagree / completely agree. The item "Is it easy or difficult for you to carry out private nature conservation?" was ranged from very difficult / very easy (α = 0.61).

Self-identity was measured according to Lokhorst et al. (2011) using the items "Private nature conservation practices are part of who I am" and "Private nature conservation practices are something that is typical for me" (α = 0.86).

Desire was measured with the two following items: "I want to carry out nature conservation" which was rated on a scale from completely disagree / completely agree; "My wish to carry out private nature conservation can be described as: no wish / very strong wish" (α = 0.88).

In order to measure *positive and negative anticipated emotions*, first 8 items were included on the possible goals farmers could have when applying nature conservation. These goals were partly derived from Lokhorst et al. (2011), namely "making the enterprise profitable", "making the landscape more beautiful", "positively contributing to the image of farmers" and "contributing to positive effects on nature". The other three goals were added in consultation with a DLG employee and were "making specific parcels profitable", "enhance productivity on other parcels" and "giving the land a functional destination when I retire". Besides that farmers had the ability to state one additional goal themselves. The goals were rated on a scale from very unimportant / very important. Then the participants were asked to state what their most important goal was. Keeping this most important goal in mind, they were then asked to rate the items on positive and negative anticipated emotions. These items were also taken from Lokhorst et al. (2011). A sample item for positive anticipated emotions was "When I reach this goal I will feel happy" (α = 0.91). The items for negative anticipated emotions were formulated as follows: "When I *do not* reach this goal I will feel disappointed" (α = 0.93).

Place attachment was measured using the scale from Gosling and Williams (2010). A sample item is "I am happiest when I am on my farm" (α = 0.85).

Connectedness to nature was also measured using items from Gosling and Williams (2010), using for example the item "I often feel I am a part of nature" (α = 0.80).

The items to measure *intention* were constructed after Perugini and Bagozzi (2001). The items, for example "I intend to carry out private nature conservation on my farm within the coming two years", were rated from definitely not / for sure (α = 0.93).

Trust was measured using the items about trust and trustworthiness from Terwel (2009). Trust was measured both towards the government in general (α = 0.87) and DLG (α = 0.95). The items "To what extent do you trust the government / DLG" and "to what extend do you consider the government / DLG to be trustworthiness" were rated on a scale from not at all / completely.

The *demographic variables* age, gender and education level were also included in the questionnaire. Besides that a question was incorporated on past behaviour, as the participants were asked whether they had performed any kind of nature conservation in the past.

Table 1 The variables and scales included in the questionnaire concerning motivational factors of farmers to apply private nature conservation on their farmland

Variable	Scale	Sources	No. of items	Cronbach's α
Values	Biospheric	Translated from De Groot and Steg (2008)	5	0.82
	Altruistic		4	0.82
	Egoistic		3	0.86
Beliefs	The revsed NEP scale	Translated from Dunlap, Van Liere, Mertig, and Jones (2000)	15	0.83
	Awareness of egoistic consequences	Constructed after and translated from Steg, Dreijerink, and Abrahamse (2005)	1	0.79
	Awareness of altruistic consequences		1	
	Awareness of consequences for the biosphere		1	
	Ascription of Responsibility	Constructed after and translated from Steg et al. (2005)	2	0.79
Norms	Personal Norms	Lokhorst, Staats, Van Dijk, Van Dijk, and De Snoo (2011)	2	0.83
Attitude		Lokhorst et al. (2011)	3	0.93
PBC		Lokhorst et al. (2011)	3	0.61
Subjective norm	Injunctive norm	Lokhorst et al. (2011)	1	-
Trust	Trust towards the government	Constructed after and translated from Terwel (2009)	2	0.87
	Trust towards the government		2	0.95
Self-identity		Lokhorst et al. (2011)	2	0.86
Desire		Lokhorst et al. (2011)	2	0.86
Anticipated emotions	Goal	Lokhorst et al. (2011)	8	-
	Anticipated positive emotions		5	0.91
	Anticipated negative emotions		5	0.93
Connectedness to nature		Translated from Gosling and Williams (2010)	6	0.80
Place attachment		Translated from Gosling and Williams (2010)	8	0.85
Intention		Constucted after and translated from Perugini and Bagozzi (2001)	4	0.93
Behaviour			2	0.94

4. Results

4.1 Exploratory factor analysis

Before the hypotheses were tested, factor analyses were conducted in order to identify the underlying variables of the used questionnaire scales. A principal component analysis was performed for all scales with more than 2 items, using Varimax rotation with Kaiser Normalization.

The scales for positive anticipated emotions, negative anticipated emotions, intention and attitude revealed, as expected, one factor. They accounted for 74.68; 77.41; 82.06 and 88.66% of the variance, respectively. The values scale, showed, as expected three factors with eigenvalues greater than 1, revealing the three different value orientations (i.e. biospheric, altruistic and egoistic). Biospheric values accounted for 18.51% of the variance, altruistic values for 25.59% and egoistic values for 23.82%.

The NEP scale revealed four factors with eigenvalues greater than 1. However, as the NEP scale was initially included as a single measure to asses one's ecological worldview, for further analyses the items were taken together as one single variable. As Dunlap et al. (2000) state "*It [internal consistency] provides a reasonable rationale for combining a set of items into a single measure rather than creating ad hoc dimensions that emerge from various factoring techniques*", thus they recommend to treat the NEP scale as one single variable if no meaningful sub dimensions occur. In total 62.62% of the variance was explained.

The connectedness to nature scale revealed two factors with eigenvalues greater than 1. The two items "I never feel a personal bond with things in my natural surroundings, like trees, wildlife or the view on the horizon" and "When I think about my place on the planet, I consider myself to be on top of a pecking order among all living things" loaded highly on the second factor. They were therefore excluded from further analysis. The other 4 items together explained 64.21% of the variance.

Also the place attachment scale showed two factors with eigenvalues greater than 1. Only the item "I wouldn't want to farm anywhere else" loaded highly on the second factor and was excluded from further analysis. The other factors accounted for 56.42% of the variance.

For Ascription of responsibility the item "My contribution to the loss of biodiversity is negligible" was excluded from further analysis, because this resulted in a considerably higher α (0.79 instead of 0.44).

4.2 Descriptive statistics and correlations

Means, standard deviations and Pearson correlation coefficients for the VBN and the MGB model are shown in Table 2 and Table 3 respectively. For the VBN model, private nature conservation correlates positively with, PA, CNS, egoistic, altruistic and biospheric values, NEP, AR and personal norm. Also past behaviour correlates with current behaviour, so having performed nature conservation in the past, is associated with private nature conservation behaviour.

For the MGB model, a significant positive correlation exists between private nature conservation and attitude, positive anticipated emotions, subjective norm, self-identity, PBC, desire and intention. No significant correlation is found with trust towards the government and DLG, and negative anticipated emotions. Besides that a high correlation exists between intention and desire. Self-identity also correlates highly with those two variables.

Table 2 Means, standard deviations and Pearson Correlation coefficients among the variables of the VBN model[a]

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Age	35.17	10.16	1															
2. Gender	1.11	0.32	-.11	1														
3. Education level	3.78	1.21	-.26*	-.10	1													
4. Past behaviour	1.42	0.50	.19	-.02	-.16	1												
5. Place attachment	4.18	0.63	-.04	.03	-.14	-.13	1											
6. Connectedness with nature	4.02	0.69	.10	-.21*	-.06	.17	.30**	1										
7. Egoistic values	2.72	0.77	-.26*	.00	-.05	-.08	.07	-.02	1									
8. Altruistic values	4.06	0.66	.13	.00	-.11	.01	.34**	.21*	.23*	1								
9. Biospheric values	4.09	0.61	.23*	.00	-.08	.29**	.08	.26*	.05	.53**	1							
10. NEP	3.02	0.61	.27*	.01	-.04	.21*	-.12	.17	-.20	.21*	.52**	1						
11. Egoistic AC	3.27	1.11	.25*	-.09	-.02	.22*	-.04	.16	.01	.31**	.57**	.58**	1					
12. Altruistic AC	3.36	1.15	.26*	-.08	.01	.18	.01	.25*	.09	.29**	.48**	.49**	.81**	1				
13. Biospheric AC	2.77	1.08	.00	-.12	.13	.06	-.10	.12	.15	.13	.19	.40**	.36**	.43**	1			
14. Ascription of responsibility	2.64	0.89	.13	-.02	.10	.22*	-.12	.27**	.07	.21*	.36**	.50**	.51**	.60**	.80**	1		
15. Personal norm	2.23	1.14	.27**	.04	-.14	.39**	.078	.34**	-.01	.42**	.57**	.53**	.57**	.60**	.15	.40**	1	
16. PNCB	2.77	1.66	.29**	-.11	-.07	.68**	-.23*	.22*	.03	.19	.39**	.34**	.41**	.35**	.12	.24*	.61**	1

a * Correlation is significant at the 0.05 level (two-tailed); ** Correlation is significant at the 0.01 level (two-tailed). NEP = New Ecological Paradigm; AC = awareness of consequences; PNCB = private nature conservation behaviour

Table 3 Means, standard deviations and Pearson Correlation coefficients among the variables of the MGB model[b]

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	35.17	10.16	1														
2. Gender	1.11	0.32	-.11	1													
3. Education level	3.78	1.21	-.26*	-.10	1												
4. Past behaviour	1.42	0.50	-.19	.02	.16	1											
5. Trust towards government	2.39	1.00	-.16	.00	-.04	.11	1										
6. Trust towards DLG	3.13	1.03	-.01	-.01	.00	.12	.55**	1									
7. Attitude	3.75	0.84	.28**	-.04	.03	-.33**	.00	.11	1								
8. Positive anticipated emotions	3.40	1.04	.14	.03	-.09	-.14	.04	.22*	.54**	1							
9. Negative anticipated emotions	2.49	1.03	.06	-.01	.00	-.07	.03	.21*	.26*	.38**	1						
10. Subjective norm	2.17	1.31	.33**	.06	.00	-.36**	.03	.08	.43**	.34**	.24*	1					
11. Self-identity	3.01	1.27	.29**	-.04	-.06	-.44**	.04	.13	.62**	.66**	.20	.59**	1				
12. PBC	3.53	0.94	.22*	.13	-.02	-.37**	-.14	.09	.50**	.46**	.24*	.42**	.56**	1			
13. Desire	3.15	1.24	.28**	-.06	-.09	-.43**	-.03	.19	.54**	.61**	.33**	.50**	.75**	.63**	1		
14. Intention	2.94	1.16	.16	-.08	.01	-.43**	-.05	.15	.59**	.63**	.28*	.45**	.79**	.61**	.78**	1	
15. PNCB	2.77	1.66	.29**	-.11	-.07	-.68**	-.04	.03	.43**	.36**	.14	.53**	.72**	.51**	.65**	.73**	1

b * Correlation is significant at the 0.05 level (two-tailed); ** Correlation is significant at the 0.01 level (two-tailed). PBC = perceived behavioural control; PNCB = private nature conservation behaviour

4.3 Regression analysis VBN model

In order to test Hypotheses 1, 2 and 3 hierarchical linear regression analysis. This analysis included the variables of the VBN model. The regression analysis consisted of 7 steps. In the first step the demographic variables, namely age, gender and education level were entered in order to control for relationships with private nature conservation behaviour. In order to control for past nature conservation behaviour, this variable was also entered into the model at the first step. In the second step, place attachment and connectedness to nature were included. The third step involved biospheric, altruistic and egoistic values in the model. For the next steps, subsequently the NEP scale, awareness of consequences, ascription of responsibility and personal norm were added to the model.

Before testing the hypotheses, the underlying model assumptions were checked. There did not seem to be any multicollinearity as none of the correlations in the correlation matrix exceed 0.9. The Durbin-Watson statistic was calculated to be 2.28, which is close to 2. According to Field (2009) values close to 2 indicate that the residual terms should be uncorrelated. The standardized residuals seemed to be normally distributed, so there did not appear to be a violation of the assumption of normally distributed errors. The scatter plot of the standardized predicted values and the standardized residuals showed a non-random pattern, which might indicate a violation of the assumption of linearity. However in this case, the pattern appeared to be due to the categorical aspect of the answer possibilities. The pattern revealed 10 lines, which corresponds with the way behaviour was measured. Two items were used, both ranging from 1 – 5, after which the items were added together and divided by two, giving 10 possible values.

Table 4 gives an overview of the outcomes of the regression analysis. Only past behaviour, place attachment, connectedness to nature, egoistic values and personal norm appeared to be significant predictors in the model.

The demographic variables, age, gender and education level did not have a relationship with private nature conservation behaviour. Place attachment and connectedness to nature did contribute significantly to the model, however not via the expected way of biospheric values. So they did not seem to be mediated by biospheric values, but directly related to behaviour. Also, in contrast to the expectation place attachment had a negative regression coefficient, meaning that farmers who experience a stronger attachment to their farm and the place where they live are less likely to perform private nature conservation.

The addition of steps 4, 5 and 6 were not significant. That means that ecological worldview (as assessed by the NEP), awareness of consequences and ascription of responsibility did not

contribute significantly to the model. Also no evidence was found for any form of mediation. So there was no substantial evidence found for the consecutive chain of variables as proposed by the value belief norm theory. This means no support was found for Hypotheses 1, 2, and 3. Connectedness to nature and place attachment were able to predict private nature conservation behaviour, however, not via the way of biospheric values and the VBN chain. Subsequently a regression analysis was performed including only the significant predictors of the first analysis. The results are shown in Table 5.

Table 4 Results of Regression Analysis for the VBN model[c]

Steps	1	2	3	4	5	6	7
Age	.17[x]	.12	.15[x]	.11	.07	.07	.11
Gender	-.10	-.08	-.07	-.10	-.08	-.05	-.08
Education level	.06	.05	.03	.04	.01	.02	.05
Past behaviour	.62***	.53***	.49***	.49***	.45***	.48***	.41***
Place attachment		-.18[x]	-.22*	-.20*	-.22*	-.24**	-.22*
Connectedness to nature		.25*	.23*	.23*	.28**	.31**	.25*
Egoistic values			.19*	.21*	.21*	.21*	.22**
Altruistic values			-.01	-.01	-.02	-.02	-.07
Biospheric values			.14	.03	-.03	-.03	-.08
NEP				.19[x]	.01	.11	.03
Egoistic AC					.21	.22	.18
Altruistic AC					.03	.09	-.01
Biospheric AC					-.01	.16	.20
Ascription of responsibility						-.25	-.27[x]
Personal norm							.37**
ΔR^2	.48***	.05*	.05*	.02	.03	.02	.06*
Adjusted R^2	.45	.48	.52	.54	.55	.56	.61

c Standardized regression coefficients are reported for the respective regression steps, including demographic variables and past behaviour (step 1); demographic variables, past behaviour, place attachment and connectedness to nature (step 2); demographic variables, past behaviour, place attachment, connectedness to nature and egoistic, altruistic and biospheric values(step 3); demographic variables, past behaviour, place attachment, connectedness to nature, egoistic, altruistic and biospheric values and NEP (step 4); demographic variables, past behaviour, place attachment, connectedness to nature, egoistic, altruistic and biospheric values, NEP and awareness of consequences (AC) (step 5); demographic variables, past behaviour, place attachment, connectedness to nature, egoistic, altruistic and biospheric values, NEP, AC and ascription of responsibility (AR) (step 6); demographic variables, past behaviour, place attachment, connectedness to nature, egoistic, altruistic and biospheric values, NEP, AC, AR and personal norm(step 7). N was 77.

[x] $p < .10$ (two-tailed)

* $p < .05$(two-tailed)

** $p < .01$(two-tailed)

*** $p < .001$ (two-tailed)

Table 5 Results of Regression analysis of significant predictors of the VBN model[d]

Steps	1	2	3	4
Past behaviour	.66***	.55***	.55***	.42***
Place attachment		-.24**	-.26**	-.27***
Connectedness to nature		.26**	.28**	.18*
Egoistic values			.18*	.16*
Personal norm				.37***
ΔR^2	.44***	.08**	.03*	.10***
Adjusted R^2	.43	.50	.52	.62

d Standardized regression coefficients are reported for the respective regression steps, including past behaviour (step 1), past behaviour, place attachment and connectedness to nature (step 2), past behaviour, place attachment, connectedness to nature and egoistic values (step 3) and past behaviour, place attachment, connectedness to nature, egoistic values and personal norm (step 4). N was 77.
* p <.05(two-tailed)
** p <.01(two-tailed)
*** p <.001 (two-tailed)

Based on this analysis a new, more concise model is presented for the explanation of farmers' behaviour in relation to private nature conservation. This model is shown in Figure 6.

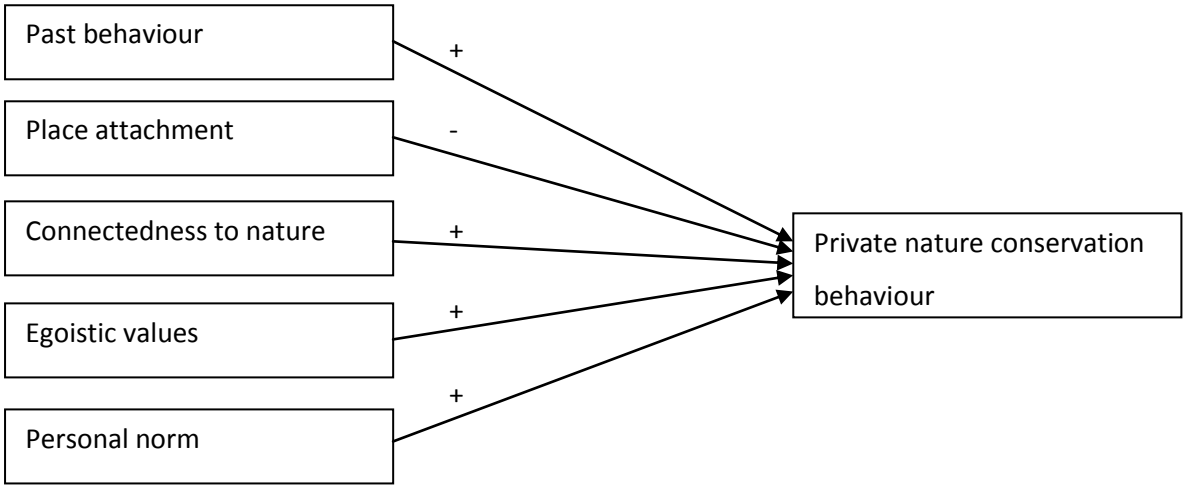

Figure 6 Model of farmers' behaviour in relation to private nature conservation on the basis of the significant VBN model variables

As egoistic values had an unexpected, positive relationship with private nature conservation behaviour, a new regression analysis was performed with a median split based upon egoistic values. The same regression analysis as above was performed, however this time two groups were formed, one group that scored above the median for egoistic values and the other group that scored below the median. Egoistic values itself were excluded from the regression analysis.

The results show that farmers who score high on egoistic values differ in the way they take decisions about private nature conservation. For the group that scored low on egoistic values, all the other variables in the model remained to be significant. So past behaviour, place attachment connectedness to nature and personal norm were are able to predict behaviour. However, for farmers who scored high on egoistic values the addition of place attachment and connectedness to nature did not contribute significantly to the model anymore. A complete overview of this analysis can be found in Appendix III.

4.4 Regression analysis MGB model

In order to test the MGB model, a hierarchical linear regression analysis was performed as well. Herewith the Hypotheses 4, 5 and 6. The first step again included the demographic variables age, gender and education level, together with past behaviour. In the second step trust towards the government, trust towards DLG, attitude, positive anticipated emotions, negative anticipated emotions, subjective norm, self-identity and PBC were included in the model. In the third step desire was added. The fourth step involved inclusion of intention in the model.

Again, first the model assumptions were tested. The outcomes of these tests resembled the outcomes for the test of the VBN model. Again there were no correlations above 0.9, which could indicate multicollinearity. The Durbin-Watson statistic was 2.06, which indicated the residuals are uncorrelated. The histogram of the standardized residuals and P-P plot of the standardized residuals supported the assumptions of normally distributed errors. The scatterplot of the standardized predicted values and the standardized residuals showed the same non-random pattern, that was seen in the VBN model. Again, this could be due the way the dependent variable was measured. The results of the analysis can be found in Table 6.

Past behaviour, self-identity and intention are in this model able to predict nature conservation behaviour. The addition of step 3 was non-significant, so the inclusion of desire, before intention is not justified by this sample. No support was found for the Hypotheses 4, 5 and 6. None of the model of goal directed behaviour variables (except intention) were able to contribute significantly to the model.

Trust towards the government nor towards DLG appeared to be significant predictors of behaviour. Self-identity was not able to predict desire, however it did contribute significantly to behaviour. Besides that there were indications for partial mediation of intention on the relationship between self-identity and private nature conservation behaviour.

Consequently a hierarchical regression analysis was performed including only the significant predictors from the MGB model. Past behaviour and self-identity were included in the first step. The second also involved intention. The results are shown in Table 7.

Table 6 Results of the Regression Analysis for the MGB model[e]

Steps	1	2	3	4
Age	.13	-.04	-.04	.00
Gender	-.10	-.10	-.10	-.06
Education level	.02	-.02	-.02	-.04
Past behaviour	.68***	.44***	.44***	.41***
Trust towards the government		-.03	-.03	.02
Trust towards DLG		.04	.04	.01
Attitude		-.15	-.15	-.17*
Positive anticipated emotions		-.07	-.07	-.14[x]
Negative anticipated emotions		.05	.05	.05
Subjective norm		.02	.02	-.01
Self-identity		.68***	.68***	.57***
Perceived behavioural control		.04	.04	-.02
Desire			-.01	-.16
Intention				.42**
ΔR^2	.53***	.25***	.00	.04**
Adjusted R^2	.50	.74	.73	.78

e Standardized regression coefficients are reported for the respective regression steps, including demographic variables and past behaviour (step 1); demographic variables, past behaviour, trust towards the government, trust towards DLG, attitude, positive anticipated emotions, negative anticipated emotions, subjective norm, self-identity and perceived behavioural control (step 2); demographic variables, past behaviour, trust towards the government, trust towards DLG, attitude, positive anticipated emotions, negative anticipated emotions, subjective norm, self-identity, perceived behavioural control and desire (step 3); demographic variables, past behaviour, trust towards the government, trust towards DLG, attitude, positive anticipated emotions, negative anticipated emotions, subjective norm, self-identity, perceived behavioural control, desire and intention (step 4). *N* was 77.
x $p < .10$ (two-tailed)
* $p < .05$(two-tailed)
** $p < .01$(two-tailed)
*** $p < .001$ (two-tailed)

Table 7 Results of Regression analysis of significant predictors of the MGB model[f]

Steps	1	2	3
Past behaviour	.71***	.47***	.45***
Self-identity		.52***	.29**
Intention			.31***
ΔR^2	.51***	.21**	.04***
Adjusted R^2	.50	.71	.75

f Standardized regression coefficients are reported for the respective regression steps, including past behaviour (step 1), past behaviour and self-identity (step 2) and past behaviour, self-identity and intention (step 3). *N* was 77.
* $p < .05$(two-tailed)
** $p < .01$(two-tailed)
*** $p < .001$ (two-tailed)

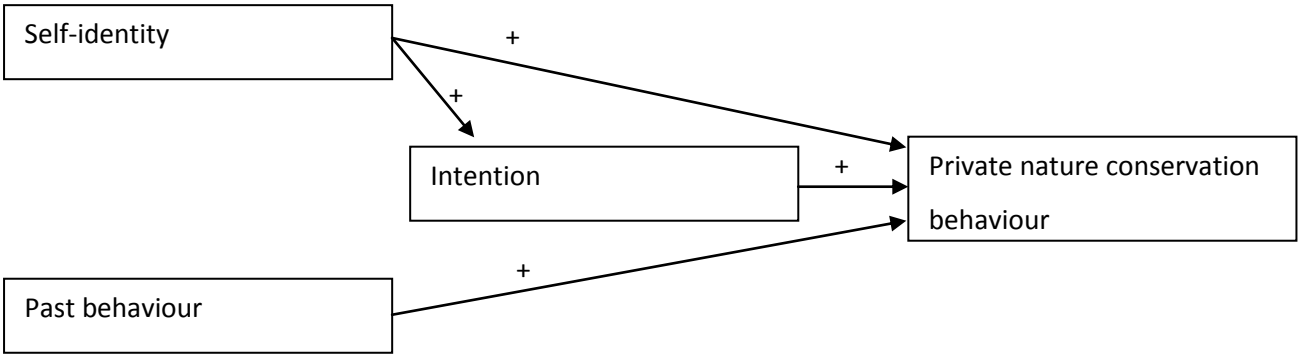

Figure 7 Model of farmers' behaviour in relation to private nature conservation on the basis of the significant MGB model variables

A Sobel test was performed to test for the significance of the partial mediation of intention on the relationship between self-identity and private nature conservation behaviour. The fact that the t-value of self-identity decreased from 8.04 to 3.52 after the inclusion of intention indicated this mediation. The Sobel test confirmed this relationship ($Z = 2.98$, $p < .01$).

Based upon the analyses above, a new model was proposed with respect to farmers' private nature conservation behaviour in relation to the MGB variables. This model is shown in Figure 7.

5. Discussion and conclusion

5.1 Summary of the results

In order to investigate farmers' motivational factors to apply private nature conservation on their farmland, two models were proposed based on literature research. These models were extended with additional factors that might impact farmers' conservation practices.

To the first model, based upon the value belief norm theory (Stern, 2000) the variables trust towards DLG, trust towards the government and self-identity were added. The model was tested using hierarchical linear regression. Past behaviour, place attachment, connectedness to nature, egoistic values and personal norm appeared to be significant predictors of behaviour. However, no support was found for the actual VBN theory, so Hypothesis 1 could not be supported. Concerning Hypotheses 2 and 3, place attachment and connectedness to nature did not predict biospheric values. Yet, they were able to significantly predict private nature conservation behaviour itself. In contrast to the expectation, place attachment appeared to have a negative relationship with private nature conservation behaviour. The other variables had a positive contribution.
On the basis of this analysis a new model was proposed in relation to farmers' private nature conservation behaviour, only including the significant predictors. This model had a satisfactory explanatory power.

The other model, based on the model of goal directed behaviour (Perugini & Bagozzi, 2001) was extended with the concepts of connectedness to nature and place attachment. For this model only past behaviour, self-identity and intention contributed significantly to behaviour. So no support was found for the Hypotheses 4 and 6. Concerning Hypothesis 5, self-identity did not contribute to desire, nor any substantial evidence for mediation by desire was found. However, it did contribute to behaviour and was mediated by intention. Again a model was proposed including only the significant predictors from the initial analysis. The model had a good explanatory power. Also evidence was found for the partial mediation of self-identity by intention.

In both models past behaviour appeared to be a significant predictor of current behaviour. Past behaviour was measured as nature conservation behaviour in general and not only private nature conservation behaviour. So it appears that (also) having performed other nature conservation practices in the past, may have an impact on performing private nature conservation in the future.

5.2 Theoretical implications

In this study no substantial support was found for the value belief norm theory nor the model of goal directed behaviour. This contradicts previous research that found evidence for these theories in different fields of pro-environmental behaviour. This might be due to the fact that these models are most often applied to fields that involve 'easy' and short-term decision making processes, such as household recycling (Steg, et al., 2005), using public transport (Carrus, et al., 2008), or agricultural nature conservation (Raymond, et al., 2011). These decisions impact a limited time span and are relatively easily reversed. Private nature conservation, however, is a decision with profound implications that will last for a time span of at least 30 years. Apparently this involves another way of reasoning, guided by another kind of decision making process. As Stern (2000) states "*for personal behaviours that are not strongly favored by context (e.g., by being required or tangibly rewarded), the more difficult, time-consuming, or expensive the behaviour, the weaker its dependence on attitudinal factors*". The factors that were significant in influencing decision making were based upon feelings, place attachment, connectedness to nature and self-identity are constructs that all measure an emotion. This indicates that this decision making process is by far the result of a rational process solely.

One of the variables that did make a major contribution to private nature conservation behaviour in this study was self-identity. In the MGB model, self-identity made a large contribution to behaviour, both directly and indirectly via intentions. This suggests that private nature conservation is a practice that is performed by farmers who feel that it is something that is part of who they are, or even a way of living. On average, farmers scored neutral on self-identity, however there was quite some variation on this scale. This means that farmers in general do not see private nature conservation as part of their identity. Though, farmers who do feel this is the case, seem generally more likely to carry out the behaviour.

Besides that, private nature conservation is a practice that hardly generates any profit. This means that farmers who are merely interested in earning money will probably be less likely to engage in these practices. Farmers who do carry out private nature conservation must thus have other reasons to do so. These results are in line with the study of Lokhorst et al. (2011) who found that self-identity was related to the intention to perform non-subsidized nature conservation practices. They gave another possible explanation for the relationship between self-identity and behaviour, based on self-perception theory (Bem, 1972). This theory states that people base the image they have of themselves on the way they act, rather than vice versa. With private nature conservation farmers carry out practices that influences their way of running their business very

much, but at the same time are hardly profitable. This could lead the farmer to attribute the reason for performing the practices to the fact that it is something that it is part of who he is.

Next to self-identity, place attachment was a significant predictor of behaviour. In previous studies no relationship (Gosling & Williams, 2010) or a positive relationship (Raymond, et al., 2011) between place attachment and nature conservation behaviours has been found. In this study, place attachment had, at first sight, an unexpected negative regression coefficient. On average participants scored high on this scale, with a relatively small variation around the mean. So in general farmers seem to be highly attached to the farm and land they live on. This is similar to the study of Gosling and Williams (2010). A possible explanation for this negative relationship is that private nature conservation is a practice that goes against the ideas of a farmer of taking good care of his land. The results indicate that for a farmer, being attached to his farm means that he values his farming practices and the way the landscape is managed as it is. Applying private nature conservation might contradict this vision, as it means a completely different way of managing the land. It means giving up part of this land, giving it a completely different destination. Besides that it will result in a landscape that differs from a traditional agricultural landscape. Applying private nature conservation means changing part of the function of the farm, while apparently farmers are very much attached to it. Farmers seem to value to be farmers, not nature conservationists.

At the same time, connectedness to nature, a concept incorporated to measure farmers' attachment to their natural environment, contributed positively to private nature conservation, which is consistent with the findings of Gosling and Williams (2010). This relationship suggests that farmers who experience a bond with the natural world are more likely to apply private nature conservation. This can also be linked to the concepts of self-identity and personal norm. Farmers who are more 'conservation oriented' tend to feel a stronger bond with nature, think that it is part of who they are and experience a personal obligation to carry out private nature conservation. Similar to place attachment, connectedness to nature had a high overall mean and a relatively small variation around this mean. So in general farmers seem not only to experience a strong connection with the place where they live, they also feel highly attached to nature and the natural world around them. This reveals a strange contradiction where place attachment is negatively correlated and connectedness to nature is positively correlated with private nature conservation practices. On one hand farmers appreciate nature, but at the same time conserving it themselves seems to interfere with their ideas of running a farm business, which they also highly value.

Also egoistic values contributed positively to behaviour. This was quite against the expectation as rather biospheric and altruistic were thought to contribute to the application of

private nature conservation. On average, participants scored relatively low on this scale, which means they rated these values as rather unimportant in their lives. An additional regression analysis revealed that for farmers who score above average on egoistic values, the variables of place attachment and connectedness to nature are not significant predictors of behaviour. These are farmers who have indicated that social power, wealth, authority, influence and ambition are important values in their lives. As such they might be more business-oriented. This shows that farmers might have different objectives with their farm, some may see it as a way to make profit, while for others it may be more a way of living. These farmers may therefore also have different reasons for applying private nature conservation.

5.3 Practical implications

The fact that past nature conservation behaviour appeared to be a significant predictor in both models could be used in promoting private nature conservation. As the decision to start applying private nature conservation is one that, as explained earlier, comes with high behavioural costs. It is a decision that has a contractual base, that will impact the farm for the coming 30 years. First involving farmers in 'easier' forms of nature conservation, may lower the threshold to also start applying private nature conservation later on.

Also the fact that in general farmers scored high on connectedness to nature and the positive relationship it had with private nature conservation behaviour could be used by for example governmental organizations. Emphasizing the positive effects of private nature conservation on the natural world and triggering feelings of connectedness may help to convince farmers to engage in these conservation practices. However, for this aspect also the negative relationship with place attachment should be kept in mind, as these kinds of messages might contradict with the feelings of farmers to care for their farm business.

It seems that farmers now tend to see private nature conservation as a practice that interferes with their way of running a business. The promotion of private nature conservation could be more successful if it focuses on incorporating its practices in a farming business in a sense that it is seen as another end result produced by the farmer. Now it seems farmers see private nature conservation as 'giving up' land, though nature can also be regarded as another product produced on the farm. As shown, farmers who see private nature conservation as part of their practices and part of their self-identity are more willing to apply it on their farm. For example, Morris and Kirwan (2011) distinguish between a vertical approach to promoting ecological behaviours, where farmers are rewarded with subsidies to apply certain environmental management practices that originate from governmental programmes such as AES. In this case, taking care of the environment is seen as

external to the other farming practices. The other approach Morris and Kirwan (2011) point to is vertical in a sense that ecological development is linked to the quality of food production. The fact that the food is produced in a sustainable environment is an added value to the end product of the farm and this is emphasized to consumers. With such an approach, nature conservation can be incorporated as another farming strategy and it might overcome the feeling farmers have that private nature conservation impedes with their other practices.

5.4 Limitations and future research

A major limitation of this study is the small sample size. Though an initial sample of 480 farmers was approached, the low response rate resulted in only 98 farmers who participated in the study. However, due to missing values, some of the parameters could only be assessed with 77 responses. This may limit the generalizability of the results to the total population. The low response rate could be due to the fact that the survey was distributed via the internet. However, the participants also had the opportunity to request for a paper version of the questionnaire. The fact that internet was used could also have led to a response bias, where farmers who have access to and are familiar with the internet were more likely to respond. However, again, the opportunity to fill in the questionnaire on paper should have overcome this bias.

Besides that, it is likely that farmers who are already more interested in private nature conservation or nature conservation in general were more eager to fill in the questionnaire. The resistance some farmers may feel against nature conservation and the current policy of the Dutch government may have lead them to not be willing to participate in the study.

Future research could look more into the emotional aspects in relation to decision making about private nature conservation, in particular the role of place attachment and connectedness to nature. Place attachment had a high overall mean in this sample, which means farmers in general seem to experience a strong connection with their farm and farmland. Future research could investigate the exact impact place attachment has on the willingness to apply private nature conservation. Besides that, place attachment might also impact other fields of farmers' (conservation) behaviour. It would also be interesting to further investigate the horizontal approach and incorporating private nature conservation in the end product of the farm, as explained in the previous paragraph and see whether that would be a more suitable approach in order to convince farmers to apply private nature conservation.

The way of reasoning and decision making that is involved with these high cost behaviours is also worth of further investigation, as apparently it did not seem to follow traditional behavioural

models such as the VBN of MGB. More insight in these processes can contribute to the promotion of nature conservation, as at the moment only few farmers are willing to apply it.

5.5 Conclusion

The goal of this research was to investigate motivational factors of farmers to apply private nature conservation on their land. The results indicate that farmers may have several objectives for their farm and farmland and have complex ideas about how to look after it. It appeared that neither the value belief norm theory nor the model of goal directed behaviour could be applied in this situation due to the profound impact of the decision to apply private nature conservation.

Though other important factors have shown to impact farmers' behaviour. Self-identity, past behaviour, intention, egoistic values, connectedness to nature, place attachment and personal norm appeared to be significant predictors of private nature conservation behaviour. It was shown that farmers are very much attached to their farm and the land they live on and private nature conservation might be a practice that contradicts these feelings of place attachment. Based upon the significant variables in the original VBN and MGB models two alternative models were proposed. Both models could explain a good amount of variance, with 62% and 75% respectively.

As stated in the introduction, more farmers will have to start applying private nature conservation if the goal of realizing the Ecological Main Structure in 2021 is to be met. This can be realized by taking the emotional aspect of the decision making process into account and focusing the promotion of private nature conservation on incorporating the conservation practices in the farm business as a whole. Farmers should not feel as if private nature conservation means having to give up part of their land or work, as it is shown they highly value this. Instead, private nature conservation should be regarded as another farm product.

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Appendix I: Invitation letter

Geachte agrarische ondernemer/ grondeigenaar,

De manier waarop in Nederland het beheer van de natuur is georganiseerd, is aan het veranderen. Boeren, landgoedeigenaren en particuliere grondbezitters nemen steeds vaker de rol van natuurbeheerder op zich. Praktisch betekent dit dat grond wordt ingericht en beheerd als natuur. Soms is er nog wel beperkt extensieve agrarische productie mogelijk. Voor het omzetten van productiegrond naar natuurgrond zijn regelingen beschikbaar die een financiële vergoeding bieden voor waardevermindering en inrichtingskosten. Vanuit Wageningen Universiteit (sectie Communicatie Studies) zijn wij nieuwsgierig naar de achterliggende motieven en argumenten die u zou hebben om tot zo een keuze van omzetting te komen. Wij hebben daarom samen met de Dienst Landelijk Gebied (DLG) een onderzoek opgezet. Door dit onderzoek hopen we beter te begrijpen hoe u beslissingen neemt over uw grondgebruik en hoe u denkt over natuurbeheer binnen uw bedrijfsvoering.

We willen u daarom graag een aantal vragen stellen over dit onderwerp. We gebruiken daarvoor het internet. Op de website www.dlg.nl vindt u aan de rechterzijde een knop (Onderzoek Natuurbeheer). Als u op de knop klikt, komt u bij de vragenlijst. U dient het wachtwoord en het nummer in te voeren dat op de sticker staat aangeven. Deze sticker vindt u onder aan deze brief. Het beantwoorden van de vragen kost ongeveer 20 minuten. Wilt u de vragenlijst invullen voor **23 januari 2012**?

Uw mening is van groot belang voor dit onderzoek!

Als u geen toegang heeft tot internet en toch de vragen wilt beantwoorden, dan kunt u vragen om het toezenden van een schriftelijke vragenlijst. Dit kan door te bellen naar 06-43176198 (Celine Hoon, studente Wageningen Universiteit).

Als dank voor het beantwoorden van de vragen willen we u graag het boek “Natuurlijk lukt het!” aanbieden. Dit boek is in 2009 uitgegeven door het ministerie van LNV en LTO Nederland. Dit boek geeft naast 10 verhalen over hoe boeren natuurbeheer integreren in hun bedrijfvoering ook achtergrondinformatie over het beheren van natuur door boeren.

Wilt u dit boek ontvangen, dan kunt u dit aangeven na het beantwoorden van de vragen op de website. We zullen u daarna het boek toesturen. Wilt u op de hoogte worden gebracht van de resultaten van dit onderzoek? Geef dan ook dit aan, aan het einde van de vragenlijst.
Heeft u vragen over het onderzoek, dan kunt u die stellen door een mail te sturen naar Celine Hoon (celine.hoon@wur.nl), of door haar te bellen via 06 43176198.

Dit onderzoek heeft **niets** te maken met een mogelijke aanvraag voor omzetting naar natuur die u heeft ingediend bij uw provincie. En tegelijk heeft het ook niets van doen met beslissingen van provincies over de wijze van uitvoering van het particulier natuurbeheer in de toekomst.
Uw antwoorden worden uiteraard anoniem verwerkt. Het nummer dat u invult bij de vragenlijst, wordt alleen gebruikt voor uw adres om u het boek en/of de resultaten van het onderzoek toe te sturen.

Hartelijk dank voor uw medewerking!

Hoogachtend,

Mevr. dr. A.M. Lokhorst
Universitair docent Communicatie studies

Appendix II: Questionnaire

Vragenlijst Particulier natuurbeheer

Toelichting op het invullen van de vragenlijst

Deze vragenlijst is opgesteld door de Wageningen Universiteit in samenwerking met de Dienst Landelijk Gebied.

Het invullen van deze vragenlijst duurt ongeveer 20 minuten. Voor u aan het invullen begint, raden wij u aan de onderstaande voorbeelden en tips zorgvuldig te lezen.

Een aantal vragen heeft de volgende vorm:

1. Mijn wens om particulier natuur te beheren, kan worden omschreven als

GEEN WENS	ZWAKKE WENS	MATIGE WENS	STERKE WENS	ZEER STERKE WENS
1	2	3	4	5

Als u een sterke wens heeft om particulier natuurbeheer uit te voeren, omcirkelt u de 4 onder 'Sterke wens' aan.

Vragen worden ook in een andere vorm gesteld. Dan staat onder elkaar een reeks vragen of stellingen met daarachter enkele keuzemogelijkheden. U wordt gevraagd in hoeverre u het met die stellingen eens bent. Boven zo'n serie vragen of stellingen staat steeds wat de mogelijkheden betekenen. Dat ziet er bijvoorbeeld als volgt uit:

		GEHEEL MEE ONEENS	EEN BEETJE MEE ONEENS	NIET EENS/ NIET ONEENS	EEN BEETJE MEE EENS	GEHEEL MEE EENS
a.	De mens heeft het recht om de natuur te wijzigen, om in zijn behoefte te kunnen voorzien	1	(2)	3	4	5
b.	Planten en dieren hebben net zoveel bestaansrecht als mensen	1	2	3	4	(5)

Indien u het met stelling a 'Een beetje oneens bent', omcirkelt u de 2 onder 'Een beetje mee oneens'. Indien u het met stelling b 'Geheel eens' bent, omcirkelt u de 5 onder 'Geheel mee eens'.

Een aantal vragen is als volgt geformuleerd:

1a. Wat is uw geslacht?

- Man
- Vrouw

In dat geval kleurt u het rondje in voor het antwoord dat voor u van toepassing is. Mochten er meerdere antwoorden mogelijk zijn, dan staat dit bij de vraag aangegeven.

Het eerste deel van deze vragenlijst zal specifiek betrekking hebben op particulier natuurbeheer.
Het tweede deel van de vragenlijst zal over wat algemenere zaken gaan, zoals de waarden die u in uw leven belangrijk acht en uw beeld van de natuur.

Belangrijk!

Voor alle vragen in deze enquête geldt:

- Het is de bedoeling dat u het antwoord invult dat als eerste reactie bij u op komt. Een antwoord is nooit 'goed' of 'fout'. Het is zelfs raadzaam om niet te lang stil te staan bij elke vraag. Dat voorkomt veel twijfel, zodat u niet langer met het invullen bezig bent dan nodig is.
- Het is noodzakelijk dat u de vragenlijst zonder hulp van anderen invult. Het gaat om uw persoonlijke antwoorden.

Alvast heel hartelijk bedankt voor het invullen!

Deelnemernummer: _____

Deel 1: Particulier natuurbeheer

Het eerste deel van deze vragenlijst zal specifiek gaan over particulier natuurbeheer.

1. Omcirkel alstublieft het antwoord waarin u zich het meest kan vinden.

a. Particulier natuur beheren vind ik

ZEER NEGATIEF	TAMELIJK NEGATIEF	NIET NEGATIEF, NIET POSITIEF	TAMELIJK POSITIEF	ZEER POSITIEF
1	2	3	4	5

ZEER ZINLOOS	TAMELIJK ZINLOOS	NIET ZINLOOS, NIET ZINVOL	TAMELIJK ZINVOL	ZEER ZINVOL
1	2	3	4	5

ZEER ONBELANGRIJK	TAMELIJK ONBELANGRIJK	NIET BELANGRIJK, NIET ONBELANGRIJK	TAMELIJK BELANGRIJK	ZEER BELANGRIJK
1	2	3	4	5

b. Is het voor u makkelijk of moeilijk om particulier natuur te beheren?

ZEER MOEILIJK	TAMELIJK MOEILIJK	NIET MOEILIJK, NIET MAKKELIJK	TAMELIJK MAKKELIJK	ZEER MAKKELIJK
1	2	3	4	5

c. Ik ben goed in staat om particulier natuur te beheren.

GEHEEL MEE ONEENS	EEN BEETJE MEE ONEENS	NIET MEE EENS, NIET MEE ONEENS	EEN BEETJE MEE EENS	GEHEEL MEE EENS
1	2	3	4	5

d. Ik wil graag particulier natuur beheren.

GEHEEL MEE ONEENS	EEN BEETJE MEE ONEENS	NIET MEE EENS, NIET MEE ONEENS	EEN BEETJE MEE EENS	GEHEEL MEE EENS
1	2	3	4	5

e. Mijn wens om particulier natuur te beheren, kan worden omschreven als:

GEEN WENS	ZWAKKE WENS	MATIGE WENS	STERKE WENS	ZEER STERKE WENS
1	2	3	4	5

2a. Heeft u in het verleden particulier natuur beheerd of een andere vorm van natuurbeheer op uw bedrijf toegepast?

- Ja, ga door met vraag 2b
- Nee, ga door met vraag 3

2b. Zo ja, wat voor natuurbeheer? (Meerdere antwoorden mogelijk)

- ☐ Particulier natuurbeheer
- ☐ Agrarisch natuurbeheer
- ☐ Het beheren van landschapselementen
- ☐ Een andere vorm van natuurbeheer

2c. Indien u heeft aangegeven een andere vorm van natuurbeheer op uw bedrijf te hebben toegepast, zou welke vorm dit is?

_____

2d. Hoe lang heeft u in het verleden natuurbeheer toegepast?

KORTER DAN 1 JAAR	1 T/M 3 JAAR	4 T/M 6 JAAR	7 T/M 10 JAAR	LANGER DAN 10 JAAR
1	2	3	4	5

3. Hoe belangrijk zijn de onderstaande doelen voor u bij het uitvoeren van particulier natuurbeheer?

	ZEER ONBELANGRIJK	TAMELIJK ONBELANGRIJK	NIET BELANG-RIJK, NIET ONBELANGRIJK	TAMELIJK BELANGRIJK	ZEER BELANGRIJK
a. Het bedrijf winstgevend of rendabel maken	1	2	3	4	5
b. Specifieke percelen rendabel maken	1	2	3	4	5
c. Het landschap mooier maken	1	2	3	4	5
d. Bijdragen aan positieve effecten op de natuur	1	2	3	4	5
e. Het positief bijdragen aan het imago van de boeren	1	2	3	4	5
f. Productie op andere percelen verhogen (door verhoging biodiversiteit)	1	2	3	4	5
g. Het land een functionele bestemming meegeven als ik stop met mijn bedrijf	1	2	3	4	5
h. Anders, namelijk_____	1	2	3	4	5

4. Welke van de acht doelen die u hierboven hebt beoordeeld, vindt u het belangrijkste doel van het beheer dat u voert?

Belangrijkste doel: _____ (vult u hier aub in wat uw belangrijkste doel is bij het uitvoeren van particulier natuurbeheer)

5. De volgende vragen gaan over uw belangrijkste doel bij het uitvoeren van particulier natuurbeheer. Wanneer u dit doel voor ogen houdt, in hoeverre bent u het dan eens met de volgende stellingen?

	GEHEEL MEE ONEENS	BEETJE MEE ONEENS	NIET EENS, NIET ONEENS	BEETJE MEE EENS	GEHEEL MEE EENS
a. Als ik dit doel haal, voel ik mij blij	1	2	3	4	5
b. Als ik dit doel haal, voel ik mij opgelucht	1	2	3	4	5
c. Als ik dit doel haal, voel ik mij trots	1	2	3	4	5
d. Als ik dit doel haal, voel ik mij zelfverzekerd	1	2	3	4	5
e. Als ik dit doel haal, voel ik mij tevreden	1	2	3	4	5
f. Als ik dit doel *niet* zou halen, voel ik mij teleurgesteld	1	2	3	4	5
h. Als ik dit doel *niet* zou halen, voel ik mij schuldig	1	2	3	4	5
i. Als ik dit doel *niet* zou halen, voel ik mij ongemakkelijk	1	2	3	4	5
j. Als ik dit doel *niet* zou halen, voel ik mij gefrustreerd	1	2	3	4	5
k. Als ik dit doel *niet* zou halen, voel ik mij boos	1	2	3	4	5

6. In hoeverre bent u het eens met onderstaande stellingen?

	GEHEEL MEE ONEENS	BEETJE MEE ONEENS	NIET EENS, NIET ONEENS	BEETJE MEE EENS	GEHEEL MEE EENS
a. Particulier natuur beheren hoort bij wie ik ben	1	2	3	4	5
b. Particulier natuur beheren is iets dat typisch iets voor mij is	1	2	3	4	5
c. Ik voel een sterke persoonlijke verplichting om particulier natuur te beheren	1	2	3	4	5
d. Ik zou me schuldig voelen als ik niet particulier natuur zou beheren	1	2	3	4	5
e. De meeste mensen die belangrijk voor mij zijn, vinden het belangrijk dat ik particulier natuur beheer	1	2	3	4	5
f. De meeste mensen die belangrijk voor mij zijn, beheren zelf particulier natuur	1	2	3	4	5
g. Ik beheer momenteel aan particulier natuur	1	2	3	4	5
h. Ik besteed momenteel tijd aan het particulier beheren van natuur	1	2	3	4	5

7a. Doet u op dit moment ook aan andere vormen van natuurbeheer?

- Ja
- Nee

7b. Zo ja, welke vormen van natuurbeheer? (Meerdere antwoorden mogelijk)

- Agrarisch
- Anders

8. Geef hieronder aan welk antwoord het meest op uw situatie van toepassing is.

	ZEER ZEKER NIET	WAARSCHIJN-LIJK NIET	MISSSCHIEN WEL MISSCHIEN NIET	WAARSCHIJN-LIJK NIET	ZEER ZEKER WEL
a. Ik ben van plan om binnen de komende twee jaar particulier natuur op mijn bedrijf te beheren	1	2	3	4	5
b. Ik heb de intentie om in de toekomst particulier natuur te beheren	1	2	3	4	5
c. Ik zou in de toekomst meer natuur particulier willen beheren	1	2	3	4	5
d. Ik zou mijn huidig particulier natuurbeheer willen uitbreiden	1	2	3	4	5

Deel 2: Algemeen deel

U bent nu aangekomen bij het tweede deel van de vragenlijst. Dit deel van deze vragenlijst gaat over uw algemene kijk op het leven en de natuur.

9. Waarden zijn zaken die mensen al dan niet belangrijk vinden in het leven. Hieronder staan 12 waarden omschreven. Kunt u van elke waarde aangeven hoe belangrijk u die vindt in uw leven?

	ZEER ONBELANG-RIJK	TAMELIJK ONBELANGRIJK	NIET BELANG-RIJK, NIET ONBELANGRIJK	TAMELIJK BELANGRIJK	ZEER BELANG-RIJK
a. Sociale macht (controle over anderen, dominantie)	1	2	3	4	5
b. Rijkdom (materiële bezittingen, geld)	1	2	3	4	5
c. Autoriteit (het recht om leiding te geven, te bevelen)	1	2	3	4	5
d. Invloed (het streven om invloed uit te kunnen oefenen)	1	2	3	4	5
e. Ambitie (het streven om carrière te maken)	1	2	3	4	5
f. Gelijkheid (gelijke kansen voor iedereen)	1	2	3	4	5
g. Wereldvrede (een wereld vrij van oorlog en conflicten)	1	2	3	4	5
h. Sociale gelijkheid (het corrigeren van onrecht, zorgen voor de zwakkeren)	1	2	3	4	5
i. Behulpzaamheid (werken voor het welzijn van anderen)	1	2	3	4	5
j. Het voorkomen van vervuiling (het beschermen van natuurlijke bronnen)	1	2	3	4	5
k. De aarde respecteren (harmonie met andere organismen, soorten)	1	2	3	4	5

l. Het milieu beschermen (het behoud van de natuur)	1	2	3	4	5

10. Niet iedereen heeft hetzelfde beeld van wat natuur is en zou moeten zijn in Nederland. De volgende vragen gaan over *uw* beeld van de natuur.

Vindt u de volgende dingen echte natuur of niet?

	HELEMAAL GEEN NATUUR				ECHTE NATUUR
a. Moerassen	1	2	3	4	5
b. Maïsvelden	1	2	3	4	5
c. Spreeuwen	1	2	3	4	5
d. Overstromingen	1	2	3	4	5
e. Kamerplanten	1	2	3	4	5
f. Oude boerderijen	1	2	3	4	5
g. Onkruid tussen tegels	1	2	3	4	5
h. Stadsparken	1	2	3	4	5
i. Een boer op zijn tractor	1	2	3	4	5
j. Bloemrijke wegbermen	1	2	3	4	5
k. Katten en honden	1	2	3	4	5
l. Koeien in de wei	1	2	3	4	5
m. Spinnen	1	2	3	4	5
n. De mens	1	2	3	4	5

11. Nu volgen nog een paar uitspraken over natuur. Met sommige uitspraken zult u het misschien eens zijn, met andere bent u het misschien niet eens. We willen graag weten wat u van elk van deze uitspraken vindt.

Bent u het eens met de volgende uitspraken?

	GEHEEL MEE ONEENS	BEETJE MEE ONEENS	NIET EENS, NIET ONEENS	BEETJE MEE EENS	GEHEEL MEE EENS
a. Dode bomen in het bos moeten worden opgeruimd	1	2	3	4	5
b. De mens mag de natuur gebruiken zoals hij zelf wil	1	2	3	4	5
c. In Nederland bestaat geen echte natuur	1	2	3	4	5
d. De mens moet de natuur soms helpen, door bijvoorbeeld in koude winters wilde dieren te voeren	1	2	3	4	5
e. De natuur is minder kwetsbaar dan sommigen denken	1	2	3	4	5
f. Niet elke zeldzame plant in de natuur hoeft beschermd te worden	1	2	3	4	5
g. Om de natuur te beschermen moeten sommige gebieden afgesloten worden voor bezoekers	1	2	3	4	5
h. Bermen langs de weg moeten netjes gemaaid worden	1	2	3	4	5
i. Hoe langer een natuurgebied door de mens met rust is gelaten, des te groter is de waarde van dit gebied	1	2	3	4	5
j. Hoogspanningsmasten (elektriciteitsmasten) en windturbines (moderne windmolens) maken natuurgebieden minder waardevol	1	2	3	4	5

12. Geef aan in welke mate u het eens bent met de volgende stellingen.

	GEHEEL MEE ONEENS	BEETJE MEE ONEENS	NIET EENS, NIET ONEENS	BEETJE MEE EENS	GEHEEL MEE EENS
a. We naderen de grens van het aantal mensen dat de aarde kan verdragen	1	2	3	4	5
b. De mens heeft het recht de natuur te wijzigen, om in zijn behoeften te kunnen voorzien	1	2	3	4	5
c. Als de mens zich met de natuur bemoeit, heeft dat vaak rampzalige gevolgen	1	2	3	4	5
d. Menselijke vindingrijkheid zal ervoor zorgen dat we de aarde niet onleefbaar maken	1	2	3	4	5
e. De mensheid is het milieu ernstig aan het misbruiken	1	2	3	4	5
f. De aarde heeft voldoende natuurlijke bronnen, als wij leren ze verstandig te gebruiken	1	2	3	4	5
g. Planten en dieren hebben net zoveel bestaansrecht als mensen	1	2	3	4	5
h. Het evenwicht van de natuur is sterk genoeg om de invloed van sterk geïndustrialiseerde landen te kunnen verdragen	1	2	3	4	5
i. Ondanks onze speciale vermogens zijn wij als mensen nog steeds afhankelijk van de wetten der natuur	1	2	3	4	5
j. De zogenaamde "ecologische crisis"die de	1	2	3	4	5

mens bedreigt, wordt schromelijk overdreven

	GEHEEL MEE ONEENS	BEETJE MEE ONEENS	NIET EENS, NIET ONEENS	BEETJE MEE EENS	GEHEEL MEE EENS
k. De aarde heeft net als een ruimteschip een beperkte ruimte en beperkte voorraden	1	2	3	4	5
l. De mensheid is er om over de rest van de natuur te heersen	1	2	3	4	5
m. Het evenwicht in de natuur is erg gevoelig en gemakkelijk verstoord	1	2	3	4	5
n. Mensen zullen uiteindelijk genoeg over de natuur te weten komen om er over te kunnen heersen	1	2	3	4	5
o. Wanneer we op de huidige koers doorgaan, zullen we binnen afzienbare tijd een ecologische catastrofe meemaken	1	2	3	4	5

13. Kunt u aangeven in welke mate u het eens bent met onderstaande stellingen?

	GEHEEL MEE ONEENS	BEETJE MEE ONEENS	NIET EENS, NIET ONEENS	BEETJE MEE EENS	GEHEEL MEE EENS
a. Natuurbeheer zal resulteren in een betere wereld voor mijzelf en mijn kinderen	1	2	3	4	5
b. Natuurbeheer zal bijdragen aan een betere kwaliteit van leven voor mensen	1	2	3	4	5
c. Over een aantal decennia zullen duizenden soorten uitgestorven zijn	1	2	3	4	5
d. Ik voel me mede verantwoordelijk voor een verlies aan biodiversiteit	1	2	3	4	5

	GEHEEL MEE ONEENS	BEETJE MEE ONEENS	NIET EENS, NIET ONEENS	BEETJE MEE EENS	GEHEEL MEE EENS
e. Ik voel me mede verantwoordelijk voor een vermindering van het totale natuuroppervlak	1	2	3	4	5
f. Mijn aandeel in het behouden van biodiversiteit is verwaarloosbaar	1	2	3	4	5

14. Ook hier vragen wij uw mening over een aantal stellingen. In hoeverre bent u het eens met de volgende stellingen?

	GEHEEL MEE ONEENS	BEETJE MEE ONEENS	NIET EENS, NIET ONEENS	BEETJE MEE EENS	GEHEEL MEE EENS
a. Ik ervaar dat ik deel uit maak van de natuur	1	2	3	4	5
b. Ik voel me vaak verbonden met de natuurlijke wereld om mij heen	1	2	3	4	5
c. Ik ervaar geen persoonlijke band met dingen in mijn natuurlijke omgeving, zoals bomen, wilde dieren of het uitzicht aan de horizon	1	2	3	4	5
d. Mijn eigen welzijn is gekoppeld aan het welzijn van de natuurlijke wereld	1	2	3	4	5
e. Ik herken en waardeer de intelligentie van andere levende organismen	1	2	3	4	5
f. Als ik kijk naar mijn plaats op aarde, dan zie ik mezelf aan de top van de rangorde ten opzichte van alle andere levende organismen	1	2	3	4	5

15. Kunt u aangeven in welke mate u het eens bent met onderstaande stellingen

	GEHEEL MEE ONEENS	BEETJE MEE ONEENS	NIET EENS, NIET ONEENS	BEETJE MEE EENS	GEHEEL MEE EENS
a. Ik ben het gelukkigst als ik op mijn boerderij ben	1	2	3	4	5
b. Mijn boerderij is mijn meest favoriete plaats	1	2	3	4	5
c. Ik mis mijn boerderij echt wanneer ik te lang weg ben	1	2	3	4	5
d. Mijn boerderij is de beste plaats om de dingen te doen waar ik van hou	1	2	3	4	5
e. Mijn boerderij laat zien wat voor type persoon ik ben	1	2	3	4	5
f. Ik zou nergens anders een boerderij willen hebben	1	2	3	4	5
g. Ik voel dat ik mezelf kan zijn als ik op mijn boerderij ben	1	2	3	4	5
h. Wat mij betreft zijn er betere plaatsen om mijn tijd te besteden dan op mijn boerderij	1	2	3	4	5

16. Kunt u aangeven in welke mate u vertrouwen hebt in de twee onderstaande instanties?

	HELEMAAL NIET	NIET	NEUTRAAL	EEN BEETJE	VOLLEDIG HELEMAAL
a. In welke mate vindt u de overheid een betrouwbare instantie?	1	2	3	4	5
b. In welke mate vertrouwt u de overheid?	1	2	3	4	5
c. In welke mate vindt u DLG (Dienst Landelijk Gebied) een betrouwbare instantie?	1	2	3	4	5
d. In welke mate vertrouwt u DLG (Dienst Landelijk Gebied)?	1	2	3	4	5

In welke mate bent u tevreden met de regelgeving met betrekking tot particulier natuurbeheer?

- Zeer ontevreden
- Ontevreden
- Niet ontevreden, niet tevreden
- Tevreden
- Zeer tevreden
- Niet bekend met deze regelgeving

Hieronder kunt u uw antwoord met betrekking tot de regelgeving toelichten:

_____
_____
_____
_____
_____
_____

17. Tot slot stellen wij u enkele algemene vragen.

a. Wat is uw geslacht?

- o Man
- o Vrouw

b. Wat is uw leeftijd?

_____

c. Wat is uw hoogst afgeronde opleiding?

- o MAVO/VMBO
- o HAVO
- o VWO
- o Middelbare beroepsopleiding (MBO)
- o Hogere beroepsopleiding (HBO)
- o Universitaire opleiding (WO)

d. Bent u van plan binnen nu en vijf jaar te stoppen met uw bedrijf?

- o Ja
- o Nee

e. Heeft u een opvolger voor uw bedrijf?

- o Ja
- o Nee

f. Hoe lang bestaat uw bedrijf al?

- o Minder dan 5 jaar
- o Tussen de 5 en de 10 jaar
- o Tussen de 10 en de 20 jaar
- o Tussen de 20 en de 30 jaar
- o Tussen de 30 en de 40 jaar
- o Tussen de 40 en de 50 jaar
- o Meer dan 50 jaar

g. Welke oppervlakte (hectare) heeft u in gebruik?

	ha totale bedrijfsoppervlakte (kadastrale maat)
	ha productieve grond
	ha grond met beheersovereenkomst of bestemming natuur
	ha grond met beheersovereenkomst of bestemming natuur (EHS)

h. Wat bent u van plan te gaan doen met het geld dat u krijgt als vergoeding voor het particulier natuurbeheer?

- Investeren in bedrijf
- Voorzien in levensonderhoud, vergoeding voor gewerkte uren
- Sparen
- Anders
- Wil ik liever niet zeggen
- Ik doe momenteel niet aan particulier natuurbeheer

i. Wat voor soort bedrijf heeft u?

- Akkerbouw
- Fruitbouw
- Gemend bedrijf
- Kippen
- Melkvee
- Pluimvee
- Vleesvee
- Varkens
- Anders

j. Wat voor type boerderij heeft u?

- Biologisch
- Biologisch-dynamisch
- Gangbaar

k. In welke provincie ligt uw bedrijf?

- Drenthe
- Flevoland
- Friesland
- Gelderland
- Groningen
- Limburg
- Noord-Brabant
- Noord-Holland
- Overijssel
- Utrecht
- Zeeland
- Zuid-Holland
- Wil ik liever niet zeggen

l. Maakt u winst of verlies met uw bedrijf?

- Ik maak winst
- Ik maak winst noch verlies, ik speel quitte
- Ik maak verlies
- Wil ik liever niet zeggen

m. Hoe rendabel is het particulier natuurbeheer dat u uitvoert of hebt uitgevoerd?

- Verlies
- Klein verlies
- Kostenneutraal
- Kleine winst
- Winst
- Wil ik liever niet zeggen
- Ik heb nog nooit particulier natuurbeheer uitgevoerd

U bent nu klaar met het invullen van deze vragenlijst. Wij bedanken u hartelijk voor uw tijd en moeite!

Indien u nog vragen of opmerkingen heeft, kunt u deze hieronder kwijt.

_____
_____
_____
_____
_____
_____

Wilt u graag een boek ontvangen of op de hoogte worden gehouden van de resultaten van dit onderzoek, dan kunt u dat hieronder aangeven (meerdere antwoorden mogelijk). DLG zal u deze kosteloos toesturen, als dank voor uw medewerking.

- ☐ Ja, ik ontvang graag het boek 'Natuurlijk lukt het!' over het beheren van natuur door boeren
- ☐ Ja, ik wil graag op de hoogte gehouden worden van de resultaten van dit onderzoek

U kunt de vragenlijst retourneren, door hem in de bijgevoegde retourenvelop terug te sturen voor **23 januari 2012**.

Hartelijk bedankt!

Appendix III: Regression analysis egoistic values

Table I Regression analysis of the significant predictors in the VBN model, including only farmers that scored low on egoistic values[a]

Steps	1	2	3
Past behaviour	.61***	.50***	.38**
Place attachment		-.32*	-.36**
Connectedness with nature		.28*	.23*
Personal norm			.40***
ΔR^2	.38***	.13*	.14***
Adjusted R^2	.38	.46	.59

a Standardized regression coefficients are reported for the respective regression steps, including past behaviour (step 1), past behaviour, place attachment and connectedness to nature (step 2), past behaviour, place attachment, connectedness to nature and personal norm (step 3). N was 37.
* p <.05(two-tailed)
** p <.01(two-tailed)
*** p <.001 (two-tailed)

Table II Regression analysis of the significant predictors in the VBN model, including only farmers that scored high on egoistic values[b]

Steps	1	2	3
Past behaviour	.73***	.63***	.49***
Place attachment		-.19	-.17
Connectedness with nature		.22[x]	.09
Personal norm			.37**
ΔR^2	.52***	.05	.09**
Adjusted R^2	.53	.55	.64

b Standardized regression coefficients are reported for the respective regression steps, including past behaviour (step 1), past behaviour, place attachment and connectedness to nature (step 2), past behaviour, place attachment, connectedness to nature and personal norm (step 3). N was 40.
[x] p < .10 (two-tailed)
* p <.05(two-tailed)
** p <.01(two-tailed)
*** p <.001 (two-tailed)