

Article

Governance Practices That Facilitate Nature-Inclusive Behaviour

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Abstract

When it comes to encouraging nature-inclusive behaviour, a ‘one-size-fits-all’ approach is still often used in practice. The literature suggests that approaches which take account of the differences between people are much more effective. However, research into how this should be tackled is still insufficient. This study aims to identify promising governance approaches that can effectively support behavioural change towards nature-inclusive behaviour. We conducted eight case studies across the Netherlands, applying an action-research approach to explore how citizens’ behaviour can be influenced in practice. Behavioural change was analysed using an adapted I-change model, while governance approaches were examined through the Policy Arrangement Approach. The findings from the case studies informed the design and implementation of targeted interventions. The results demonstrated that citizens differ substantially in their intentions to adopt nature-inclusive behaviour and therefore require approaches tailored to their specific needs and behavioural states. Importantly, the study also showed that all groups—including those who had initially not considered changing their behaviour—can potentially be encouraged to do so. Key triggers for behavioural change include ability factors, supporting factors, social-cultural influences, and information factors. We recommend that governmental organisations initially collaborate with receptive groups that are already active in nature-inclusive practices. Through this cooperation, governments can subsequently engage citizens in the preparation state by removing barriers to participation. Finally, people in the contemplation and pre-contemplation states can be reached by linking greening initiatives to liveability and by offering accessible social activities.

Keywords: nature-inclusive behaviour; behavioural change; I-change model; policy arrangement approach; greening measures



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1. Introduction

1.1. Nature-Inclusive Society

Throughout Europe, there is increasing attention to the value of nature in addressing societal challenges such as climate change, sustainable cities, and human health [1–4]. Related to these challenges, the Netherlands wants to move towards a nature-inclusive society. That is, a society in which there is more room for (biodiverse) nature and valuable landscapes [2,5]. Environmental quality strongly depends on patterns of human behaviour [6,7]. Therefore, authorities increasingly appeal to citizens to actively contribute to a nature-inclusive society, for example by way of the care for biodiversity, involvement in nature protection and management, and taking measures to adapt to climate change,

such as greening gardens [2,8–12]. However, citizens cannot do this alone: collaboration (co-creation) with other citizens, organisations and governments is necessary to have a real impact and to initiate the transition to a nature-inclusive society [13,14].

1.2. Nature-Inclusive Behaviour and Different Groups of Citizens

Responsible behaviour towards nature and the environment is described by many terms, such as green behaviour, sustainable behaviour, pro-environmental behaviour, etc. [15]. In this article we use the term: nature-inclusive behaviour. Nature-inclusive behaviour refers to citizens who undertake activities for nature and the environment in a broad sense, individually and together with other citizens, organisations and/or governments. These activities are integrated into their daily life. Citizens can take on a nature-inclusive role in different ways, for example as enumerators (citizen scientists), storytellers (informing others about nature and the environment), or restorers (polling trees, etc.) [16].

Analyses of socio-economic differences in participation in citizen initiatives are limited; however, existing studies show a clear over-representation of highly educated, older individuals and men among participants of citizens' initiatives [17]. Lower income and ethnic groups appear to participate less in citizen science for nature management [18]. Fors et al. [19] emphasise the risk that not all groups—which may include immigrants, low-income people, elderly and people with disabilities—have equal access to decision making towards green initiatives (see also [20]). Rigolon and Gibson [21] argue that community engagement efforts can contribute to more equal access to urban green such as parks.

A willingness to change one's behaviour towards nature and environment depends on individual motives, triggers and conditions. Hines et al. [22] conclude that environmentally responsible behaviour is related to cognitive and personality factors; Stobbelaar et al. [11] include contextual factors and information factors. They state that a nature-inclusive citizen is someone who is aware of nature inclusivity, is motivated to contribute to it, has the intention to do so and ultimately contributes in some way. There is evidence that not all citizens have equal willingness to behave in more nature-inclusive ways [23,24]. Some are already active, others are considering becoming active, still others are difficult to reach. Although research shows that nature is good for people [25], some citizens dislike nature in the form of leaves in the garden or plaque on their car [24,25]. For some, this goes so far that there is even a (not always justified) fear of nature (biophobia [26]). Citizens can be motivated into action by various motives and triggers, for example a concern for nature, but it could also be an invitation from a neighbour [27]. However, not all motivated citizens become active [27].

Another finding is that stimulating nature-inclusive behaviour works best if people are encouraged to work on their own ideas [28]. Often these ideas are about 'light green' nature instead of 'ecologists-nature' and include social or economic features [29]. A condition to successfully mobilise citizens seems therefore to broaden the storyline of programmes from pure nature conservation to include social and economic goals [10].

1.3. A Challenge: How Can Governments Encourage Nature-Inclusive Behaviour, and Address the Different Groups of Citizens?

As noted earlier, behavioural change is a key tool for achieving environmental goals [6,7]. Governments and environmental organisations can bring about behavioural change by implementing interventions that build on current behaviour. Governance and policy therefore serve to enable and structure such interventions, rather than directly changing behaviour themselves [30] (see Figure 1). Behavioural change interventions can be described as a process in which there are various entry points through which interventions can influence that behaviour [11,30]. However, this does not always work equally well;

many interventions do not have the desired effects. There is literature suggesting that part of this problem stems from the way organisations are structured [31–36]. Another part of the problem lies in the type of interventions carried out [37]. On the one hand, this relates to the fact that no distinction—or too little distinction—is made between target groups [38], nor is account taken of different contexts (including physical-ecological and socio-economic contexts) [39–41]. For instance, Fors et al. [19] state that participation approaches often do not address the specific barriers for marginalised groups, such as lack of skills or resources, limited access to information, or distrust of governments.

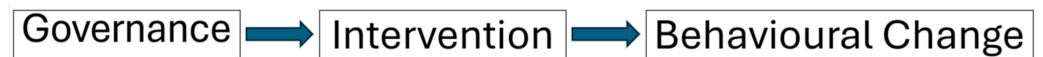


Figure 1. Interventions relate governance with behavioural change.

On the other hand, this relates to the fact that no distinction is made regarding the state of behavioural change at which individuals are positioned. This means that a ‘one-size-fits-all’ approach is used too frequently, even though it is clear that it does not really work, and such an approach has different effects on different groups [42–45]. Much greater attention must therefore be paid to the differences between people if we are to learn how to change behaviour [46]. However, reasons why governments continue to adopt the ‘one-size-fits-all’ approach include: simplicity, scalability, political feasibility and low implementation costs. Disadvantages include a mismatch with the context, lower effectiveness and inequality in outcomes.

Because in practice, little attention is paid to behavioural change among different groups, there is also limited understanding as to what does and does not work for these groups [38]. Furthermore, there is little insight into how people at different states of behavioural change should be approached, particularly when it comes to nature-inclusive behavioural change [47]. This means that little is known about what characteristics these interventions must possess in order to be effective. Studies on societal engagement show a variety of instruments such as consultation, co-production/co-decision-making, rules, subsidy schemes, web-tools to collect citizens’ ideas, neighbourhood programmes or managers, or individual guidance by (municipal) employees or social organisations that specialise in supporting initiatives and volunteers (e.g., [8–10,12,48,49]). Sometimes policies use combined interventions, such as subsidy and individual guidance (see, e.g., [28,50]). A combined intervention often refers to combining an economic or infrastructural intervention with a social intervention [51], whilst little research has yet been carried out on different aspects that drive behavioural change (such as psychological and environmental aspects). Stobbelaar et al. [11] have put forward the hypothesis that a combination of interventions targeting different parts of the behavioural state may provide added value. In other words, to investigate why interventions do or do not work, it is necessary to examine precisely what happens in reality [44]: shifting focus from the broad ‘what works’ question to ‘what works, for whom, in what circumstances, and why’.

The aim of this paper is to contribute to theory development on interventions and governance that promote nature-inclusive behaviour. To address this aim, we posed the following research question: What are the most promising governance approaches and interventions for governments and green interest organisations to increase nature-inclusive behaviour, particularly among different citizen groups? Sub questions are:

1. To what extent do citizens change their behaviour?
2. What factors triggered behavioural change?
3. Which governance and interventions contributed to the change?

1.4. Reading Guide

In Section 2, we describe the design of the action research and how it was supported by the Policy Arrangement Approach (PAA) for describing the context and governance of behavioural change, and by a ‘green behavioural change’ model to analyse the behavioural change itself. In Section 3, we first describe the initiatives using the PAA model (Section 3.1), after which we use the green behavioural change model (an adopted I-change model) to show how people in the initiatives changed their behaviour (Section 3.2). This is followed by an analysis of the importance of governance elements (PAA) for behavioural change (Section 3.3). In Section 4, we discuss measures that can be taken to encourage people to exhibit more green behaviour and propose a new model on nature-inclusive interventions. In Section 5 we summarise the main conclusions.

2. Materials and Methods

2.1. The Project ‘Facilitation of Nature-Inclusive Behaviour of Citizens’

Between 2022 and 2024, the research project ‘Facilitation of Nature-inclusive behaviour of citizens’ was carried out in the Netherlands. The aim of the project was to increase our understanding of how municipalities and green interest organisations can stimulate nature-inclusive behaviour. The overarching methodology was action research: research conducted with stakeholders, aimed at increasing well validated knowledge [52] while simultaneously contributing to societal improvement [53]. Participants were municipalities, green interest groups and universities of applied sciences. This research was largely qualitative, because the exact nature of the relations between governance and behavioural change first needed to be established [44].

For this article, eight initiatives from the research programme were researched. In these initiatives, municipalities and green interest organisations collaborated with citizens on green activities, such as (urban) greening, biodiversity, nature experiences and volunteering, and each initiative aimed to increase in nature-inclusive behaviour, addressing various target groups (see Table 1). The initiatives were selected to illustrate different forms of nature-inclusive behaviour and to enable the study of different approaches to stimulating behavioural change among specific target groups. In these eight initiatives, it was possible to observe behavioural change and to link this change to specific interventions.

All eight initiatives had a specific target group. Three neighbourhood initiatives focus on citizens with low social-economic status (SES) (Wijkgroenagenda Arnhemse Broek; Stadsoase, and Natuur om de Hoek). The latter involves citizens with a migration background. Also, Voorschool is a low-SES initiative, focusing on a preschool education at locations in multiple low-SES neighbourhoods of Emmen. Some of the initiatives focus on children and want to reach adults as well (parents) through reaching the children, for example Voorschool and Natuur om de Hoek. Both initiatives centred on urban green parks focused on park visitors. The Natuurzone initiative focuses on visitors of the Natuurzone and for the Zintuigenbos initiative physically disabled visitors are their target group. The other two initiatives focus on a more general public: citizens of the city of Arnhem (Andere Arnhemmers) in order to raise awareness; and citizens of the province Friesland (Valuta voor Veen), who are approached to be a part of the carbon credits from farmers in the peat wetlands of their province.

2.2. Project Approach and Methods

For all initiatives, the following steps were undertaken (see Figure 2): research (assessment of the current situation), workshops (planning the intervention), intervention execution (action), and focus-group evaluation (reflection). First, to analyse the initiatives, 79 semi-structured interviews were conducted using the Policy Arrangement Approach

(PAA, see Section 2.3). In these interviews, the initiating organisations and actors were questioned about their goals and activities for nature and nature-inclusiveness. Per initiative, between 6 and 11 interviews were conducted. Each interview lasted about an hour.

Table 1. The eight selected initiatives.

Initiative	Description of the Initiative	Municipality
Wijkgroenagenda (Green neighbourhood plan): Arnhemse Broek	The municipality supports citizens of Arnhem neighbourhoods in their plans and ideas about urban greenery.	Arnhem
Andere Arnhemmers (Other Arnhemmers)	Biodiversity campaign aimed at raising citizen awareness of the richness of urban greenery.	Arnhem
Stadsoase (City oasis)	Stimulating biodiversity and making urban nature accessible and fun for the neighbourhood, including a broad variety of inhabitants.	Zaanstad Kleurenbuurt
Voorschool (Preschool)	Organising nature experiences for children in preschool education.	Emmen
Valuta voor Veen (Money for peat)	Giving farmers an alternative income by selling carbon credits for peat wetlands and exploring how citizens can be a part of that.	Friesland (province)
Natuur om de Hoek (Nature around the corner)	Nature education for low-income groups or citizens with a migration background and encouraging a more nature-inclusive lifestyle.	Leiden Zuidwest
Zintuigenbos (Sensory forest)	Providing nature experiences in a green area for all target groups, including people with physical disabilities.	Almere
Natuurzone (Nature zone)	Adding ecological value and societal use to the Natuurzone, a nature area near Purmerend.	Purmerend

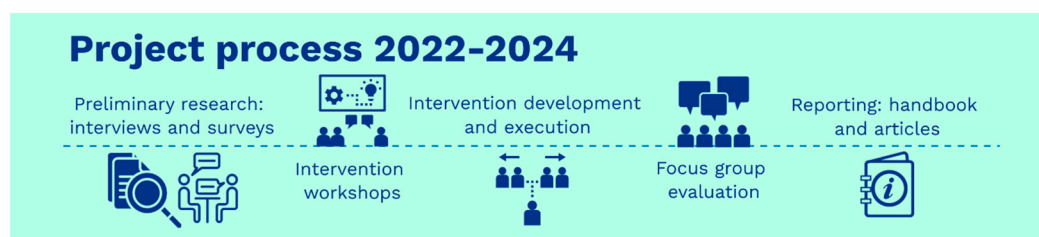


Figure 2. The project process.

A survey based on the green behavioural change model [11,54] was conducted among the target groups of the initiatives, to find out to what extent they have nature-inclusive goals, if they were aware of the initiative and if so, how they perceive the initiative, and what barriers they perceived to cooperate in the initiative. The number of respondents varied per initiative between 829 respondents (both initiatives in Arnhem) and 17 (Natuur om de Hoek). Larger numbers of respondents were recruited via online survey; door-to-door approaches proved less successful.

Using the interviews and survey results, a workshop was held with stakeholders of each initiative separately (including the target group). In these workshops, a challenge in terms of societal engagement and/or nature-inclusive behaviour was formulated. Next, a small, manageable and durable intervention was determined to resolve this challenge and to increase nature-inclusive behaviour in the target group. These interventions were carried out for all initiatives except for the Valuta voor Veen initiative. After the interventions were carried out, reflexive focus groups were carried out to discuss the effects of the interventions. Descriptions of behavioural change in the cases were made on the basis of our own observations and on the observations of others, that were validated in the reflexive workshops. Based on all study results, general lessons were drawn about promoting nature-

inclusive behaviour and the most promising governance tools to stimulate nature-inclusive behaviour were identified.

2.3. Analytical Framework: The Analysis of Governance Approaches for Behavioural Change

2.3.1. Policy Arrangement Approach (PAA): Governance Arrangements to Increase and Stimulate Behavioural Change

We required a theoretical framework that connects individual behaviour with the social surroundings, networks, and institutional contexts in which individuals operate [55]. This perspective is applied in Social Practice Theory [56,57] in which not the individual is central to the analysis, but social and collective practices: the set of activities and actors in their physical, social, societal, and institutional context.

An analytical tool that has recently been widely applied to analyse such social practices is the Policy Arrangement Approach (PAA) [58–60]. Although policy arrangements are considered to be temporarily stable structures, there is also room for agency in these practices. Actors, while they are being influenced or restricted by the arrangement, can also actively influence the arrangement [48,61]. The PAA as an analytical tool considers four analytical dimensions of practices/arrangements: actors, discourses, rules and resources. In this research, we used the PAA in two ways. Firstly, to analyse the strengths and weaknesses of the specific ‘governance’ of each case. The specific implementation of the four dimensions in each case characterises the governance of each initiative to increase nature-inclusive behaviour. This analysis led to the identification of a challenge, and subsequently to specific small-scale interventions for each initiative. Secondly, we used the PAA dimensions to describe how governments and green organisations were able to stimulate nature-inclusive behaviour, and to identify promising governance approaches for behavioural change based on these observations.

The PAA dimensions were defined as follows:

- **Discourses.** The analysis of discourses includes the goal of the initiative, and the views and storylines of the actors involved; a set of core ideas about nature, nature-inclusive behaviour and behavioural change related to nature and biodiversity. Also, it addresses how discourse contributes to behavioural change, such as through an inviting storyline.
- **Actors (government, non-government).** The analysis of this dimension identifies the actors involved in an initiative and how the constellation of actors contributes to the increase in nature-inclusive behaviour, for example through cooperation with a certain type of actor or applying certain expertise. The main focus lies on the actors who constitute the organisation, such as municipalities, green interest organisations, businesses, and possibly includes citizens. However, the citizens that form the target group of the initiative are distinguished separately.
- **(Formal and informal) rules.** The analysis focuses on rules, such as norms, values, policy, or legislation, or corporate culture of the initiative or governments involved, which determine the possibilities and limits for actors to increase nature-inclusive behaviour.
- **Resources.** The analysis focusses on the items that are available to actors to influence the outcomes of the practice in order to increase nature-inclusive behaviour, such as materials, money, land, knowledge, and skills that can for instance be used to invite or guide (newly) involved citizens.

2.3.2. Nature-Inclusive Behaviour and Behavioural Change in Citizens as a Result of Governance Approaches

Nature-inclusive behaviour refers to activities for nature in a broad sense, both individual and collective practices involving other citizens, organisations and/or governments; in this research it varies from individually greening a garden, waste recycling, participating

in nature management or organised nature activities, volunteer work, or citizens initiatives for (urban) green.

Behavioural change refers to a process of becoming more or less active over time and (having willingness to) undertake activities. In this project, we used a green behavioural change model (Figure 3) that describes factors influencing behaviour and behavioural change. The model states that behaviour is the result of a person's intentions and abilities. A person's intention state can range from no intention to change (pre-contemplation) to an intention to change the behaviour (preparation). Shifting upwards in intention states may lead to actual nature-inclusive behaviour (the behavioural state). A person's abilities and obstructing or supporting factors determine whether their intentions will be realised into action. Important abilities are making plans to implement intentions by specific actions to reach the goal behaviour, and actual skills. Motivational factors, such as various attitudes, social influences, and self-efficacy, determine a person's intention. Motivational factors are determined by various predisposing factors, information factors (the quality of messages, channels and sources used) and awareness factors (knowledge, risk perceptions and cues to action).

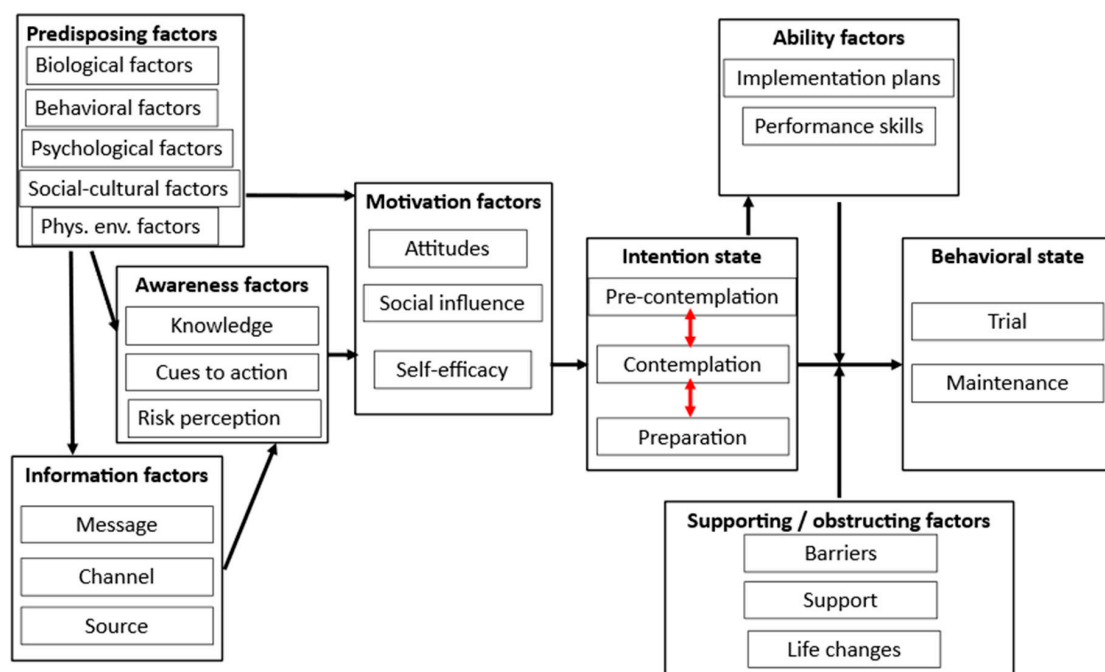


Figure 3. The green behavioural change model [11,54]. Behaviour is the result of a person's intentions and abilities. A person's intentions can range from no intention to change (pre-contemplation) to an intention to change (preparation). A person's abilities and supporting/obstructing factors determine whether their intentions will be realised. Motivational factors determine a person's intention. Motivational factors are determined by various predisposing factors, information factors and awareness factors.

In short: the model contains a range of elements that together determine in which intention or behavioural state a person is, and thus also which elements are leverage points to help changing behaviour.

All elements of the green behavioural change model were incorporated in the survey. In Section 3 of this article, only those factors have been included that were identified as triggers for behavioural change in the analysis and that were influenced by the governance and the interventions. These factors are: ability factors, supporting factors and information factors. It means that predisposing factors, awareness factors and motivation factors are not further described (factors which are more personal and psychological and did not fall within the scope of this research).

2.3.3. Categories of People, Based on Their Willingness to Become Active (Intention States) or Actual Behaviour (Behavioural State)

The concept of intention state (Table 2) was used to describe: 1. In which intention state people in the target groups of the initiatives are; and 2. if people in the cases shifted from one level of intention state to another level (or not), either by the initiative itself or by our intervention. It gives clues about how groups of citizens can be triggered to engage in nature-inclusive behaviour by the initiatives and interventions in our research. The intention states can be described as follows [11,54]:

- Pre-contemplation state: People in this state are often difficult to change because these people cannot be reached, or they do not want to change because they do not support the aim of the behavioural change. For this group, the choice to take action depends on the amount of time and money or on the availability of compelling regulations/financial incentives [22,60,62]. It is also possible that they have not yet heard of the possibilities to change (low level of awareness).
- Contemplation state: This group is also difficult to change, because next to the fact that they do not know how to change because of lacking ability factors and existing obstructing factors, they also have other priorities. They should be approached via other aspects of greening their neighbourhood that are more a concern for them, like its liveability.
- Preparation state: Those who are ready to act in a nature-inclusive manner, but who experience practical objections between dream and action. This group wants to behave nature-inclusive but does not think they can. With the right support (removing barriers, adding competence), this group can take action relatively easily.
- Besides the Intention state, the model identifies the ‘behavioural state’. This is a state in which people have started to actually act in nature-inclusive ways. People that are in the behavioural state can be practicing this behaviour (trial) or can persist in this behaviour (maintenance).

Table 2. Characteristics of intention states and behavioural state [11].

Intention/Behavioural State	Variable
Pre-contemplation	Low level of knowledge; little attitude + no intention
Contemplation	Higher level of knowledge; some awareness; moderate attitude; uncertainty about contribution
Preparation	Positive attitude; wants to contribute; sees obstacles
Behavioural state	Already active; contributes either structurally (maintenance) or incidentally (trial)

2.3.4. Analysis of the Data

The analysis of the data took place by the following steps: (1) The analysis of the interviews results. An interview-report was produced and shared with the respondents. One researcher of the core research team (which consisted of ten social researchers) was responsible for the initial analysis and writing a ‘case-study report’ for his or her specific initiative. The results were then discussed between all case-holders and subsequently validated with the societal and government-professionals of each initiative in the workshops. NVivo 2020/R1 1.6 was used to get an overall image of the dimensions of the PAA in the cases. (2) The survey results were gathered in different ways according to the possibilities in the case (door by door, street interviews, internet) and subsequently analysed per case using SPSS 28. An overall analysis was not possible due to large differences in response, moment and type of data collection. (3) Analysis of effect of the interventions in the workshops and

reflexive sessions took place through active interaction between researchers and societal and government professionals of the initiative. The workshops led to workshop-reports, which were discussed among the core research team.

Finally, all these data were discussed in the core research team and translated in a leaflet with the most promising governance tools, in which input of all initiatives was used. For this article, we then added an interpretive analytical step interpreting the observed data in terms of the behavioural change model and the PAA dimensions.

- We categorised the observed behavioural change in target groups in the initiatives in terms of ‘moving upwards in intention state’.
- We identified triggers for the observed behavioural change in terms of a selection of factors of the behavioural change model (supporting factors, ability factors, information factors).
- We related the observed behavioural change and triggers to the governance (PAA) dimensions.

The above steps together led to a qualitative insight in how the governance in each initiatives worked and to what extent people/the target groups participated and showed behavioural change. The actual (amount of) behavioural change and associated triggers were identified based on all data, but the main sources differed slightly for several of the initiatives (see Table 3).

Table 3. The main sources of behavioural change and triggers.

Source of Information	Direct		Indirect	
	<i>Already active; contributes either structurally (maintenance) or incidentally (trial) *</i>	<i>Survey **</i>	<i>Interviews ***</i>	<i>Communication with initiative representatives ****</i>
Wijkgroenagenda Arnhemse broek	Target group present at workshops	Yes	Yes	
Stadsoase, Kleurenbuurt	Contact target group during activities	Yes	Yes	
Voorschool Emmen	Contact target group during interactive sessions	Yes	Yes	
Zintuigenbos	Contact target group during activities	Yes	Yes	
Andere Arnhemmers		Yes	Yes	Conversation with member of the initiative
Valuta voor Veen		Yes	Yes	Sharing during intervention workshop
Natuurzone		Yes	Yes	Researcher spoke with the government employee

* Researchers themselves observed nature-inclusive behaviour/behavioural change and spoke with members of the target group about their triggers by participative practice (workshop, interactive sessions or the activities/interventions). ** Direct response of target group by survey. In the survey there are questions that help identify triggers of people, they write down if they changed their behaviour due to the initiative or not and why (which we translated into the triggers). *** Organisers/government employees and other members of the initiatives share their observations with researchers in interviews. **** Organisers/government employees and other members of the initiatives share their observations with researchers in workshops/interactions.

3. Results

3.1. Results of the Analysis of the Initiatives: Challenges and Interventions

In this section, we briefly describe the eight initiatives and the specific challenges and interventions identified for each of them (see Table 4). The challenges and interventions are specific and unique for every initiative and are therefore individually addressed. In this section, we briefly indicate the PAA dimensions (which will be further explored in Section 3.3).

3.1.1. Wijkgroenagenda Arnhemse Broek (Arnhem)

The policy for Wijkgroenagenda Arnhemse Broek aimed to green the city (rules). Money and civil servants were allocated to the execution of this policy (resources). These

civil servants reached out to neighbourhood residents and local green organisations, to join the municipality in greening plans (network). The story centres about the role of green in reaching liveability and other functions (discourse). The challenge identified during the workshop was that not all inhabitants were sensitive to this storyline. At Arnhemse Broek, active residents were mobilised to connect with less active residents, who often had a low social-economic status (low-SES) or were vulnerable due to problems such as social isolation. The idea was that a fellow neighbour would have more success in gaining trust and persuading people to join forces.

3.1.2. Stadsoase (Zaandam)

The municipality of Zaanstad has a policy aimed at greening the city (rules). It has allocated resources to make this happen, like appointing civil servants and appointing money to projects (resources). The story is that nature is good for people (discourse). The challenge is to reach people living in lower SES neighbourhoods. The Kleurenbuurt neighbourhood is home to many low-income residents from around seventy different nationalities, who sometimes experience difficulties understanding Dutch and to understand each other. To stimulate their involvement with the district and with each other (network), nature activities were organised such as an insect safari through the neighbourhood.

3.1.3. Valuta Voor Veen (Friesland)

Valuta voor Veen is an initiative set up by the province of Friesland to compensate farmers for preventing carbon emission due to peat drying out. Despite limited resources (in terms of funding and manpower), it was possible to translate a politically complex issue (rules) into a story (discourse) about the positive aspects of carbon credits that is picked up by companies (network). However, the story did not resonate with residents (who think of greenwashing with carbon credits). The challenge that was defined during the workshop is to create a story that resonates with residents and share that story with them. The intervention was to tell a positive story of certification of carbon reduction in a peat landscape, with farmers as narrators sharing their story of success.

3.1.4. Natuur om de Hoek (Leiden)

Another low-SES neighbourhood initiative is Natuur om de Hoek in the district Leiden Zuidwest. The initiative focuses on collaboration between local green organisations (network) to reach residents with a story that nature is fun (discourse). And that, just like with a football club, you can also “join the nature club.” This idea is supported by the municipality of Leiden with policy (rules), but not with resources. Due to the limitations in the network (only green parties) and limited budget, manpower and network, Natuur om de Hoek is poorly able to reach people with less affinity with nature. The identified challenge was to create a broader actor network (actors) better connected with the target group. The intervention was to combine forces of green and social parties in the district. A welfare organisation joined in, and an activity was organised focussing on birdwatching and the annual Dutch garden bird count.

3.1.5. Voorschool (Emmen)

This initiative wants to organise nature experiences for children in preschool education. At the start of the project, no green activities had yet been implemented. For the preschool, including more nature within the existing themes of the preschool was the challenge. The intervention involved introducing green and nature-inclusive behaviour by kindergarten teachers and children, by connecting two nature or environment related activities to every preschool theme, for example ‘food’ or ‘health’ (discourse). Teachers and parents help or assist with the activities (actors).

Table 4. Triggers for behavioural change across the initiatives.

Behavioural Change	Initiative	Challenge	Intervention	Target Group(s)	What Were the Triggers for Behavioural Change?	Behavioural Change
To behavioural state from preparation	Natuurzone	Adding social value to the mainly ecological goals of the Natuurzone	Nature working day; guided excursion; park access; informational signage	Residents of Purmerend	Supporting factors: removing barriers—access to the park Ability factors: materials, knowledge	Participants in a nature working day; more visitors come for the species in the park
To behavioural state from contemplation	Wijkgroenagenda Arnhemse Broek	Reaching more vulnerable residents of Arnhemse Broek	Social green activities; urban gardening; greening and cleaning the neighbourhood with other residents	Neighbourhood residents with low-SES	Social cultural factors: social contact, support Ability factors: learning (green) skills from role-models	Urban gardening, in green maintenance of the neighbourhood, becoming role models for others
	Andere Arnhemmers	Improving the visibility and publicity of the initiative to reach more residents	Joining with small activities; information campaign: booklet, city nature map	Citizens with little/no knowledge of nature	Ability factors: materials, tools to learn new things	Small increase in awareness and use of green in the city
To behavioural state from pre-contemplation	Stadsoase	Stimulating involvement of (vulnerable) residents in the neighbourhood.	Social green activities: counting and discovering; in a community garden	Low-SES residents of the Kleurenbuurt	Social cultural factors: social green activities Ability factors: skills, resources, materials	People became more engaged in social interaction, increased use of the garden
	Wijkgroenagenda Arnhemse Broek	Reaching more vulnerable residents of Arnhemse Broek	Greening and cleaning the neighbourhood with other residents	Hard to reach vulnerable neighbourhood residents with low-SES	Social cultural factors: meeting peers, sharing stories, joys and sorrows	People were activated by role models to incidentally become active in green maintenance of the neighbourhood; mainly a social effect
	Natuur om de Hoek	Reaching more low-SES residents with nature activities	Nature activities such as counting and discovering; social green activities	Neighbourhood residents with low-SES in Leiden Zuidwest district	Social cultural factors: social green activities Ability factors: skills, resources, and materials	60 people of target group joined in a bird counting day for the first time in their life
	Voorschool	Educating preschool children about nature	Nature and green activities in preschool	Children, parents, teachers in elementary school located in a low-SES neighbourhood	Ability factors: materials, skills, knowledge, experience	Children (and parents indirect) connected with nature

Table 4. Cont.

Behavioural Change	Initiative	Challenge	Intervention	Target Group(s)	What Were the Triggers for Behavioural Change?	Behavioural Change
To preparation from contemplation	Zintuigenbos	Improving accessibility of the sensory forest for physically disabled people	Invite to/taking part in a panel for improving accessibility	Park visitors, including physically disabled people	Information factors: request for feedback	By participating, people gave insight into barriers which now need to be removed
To contemplation from pre-contemplation	Valuta voor Veen	Involving citizens in carbon credits of local farmers on peat lands	Information campaign: sharing success stories of local farmers	Residents of the province of Friesland	Information factors: story about local carbon credits	People are more aware of local carbon credits
People who remained in pre-contemplation	Natuurzone	Adding social value to the mainly ecological goals of the Natuurzone	Nature working day; excursion; visiting the park; information sign	Visitors of the Natuurzone	Information factors; resistance to increased public awareness and visitor attraction	No behavioural change: some people are opposed to human activities in the park
	Andere Arnhemmers	Improving the visibility and publicity of the initiative to reach more residents	Joining with small activities; Information campaign: release of booklet and city nature map	Green nature groups	Information factors: however, opposition to wide knowledge and access	No behavioural change: some groups want to protect species against human involvement
	Valuta voor Veen	Involving citizens in carbon credits of local farmers on peat lands	Information campaign: sharing success stories of local farmers	Residents of the province of Friesland	Information factors: story of local carbon credits is received as greenwashing	No behavioural change: people still are not convinced

3.1.6. Andere Arnhemmers (Arnhem)

The goal of Andere Arnhemmers is to reach the inhabitants of Arnhem with a story about nature that is radically different from the conventional stories. It says that the city Arnhem is situated in nature (instead of the other way around), that animals and plants (the other Arnhemmers) live everywhere (discourse). This story is to be brought by a network of organisations (network/actors) that have not enough money (resources), and it was unclear where the network organisation was institutionally embedded (rules). Andere Arnhemmers mainly struggled with the visibility of their actions. A publicity campaign, with the release of a booklet and city nature map, was the intervention that was set up. The group that this initiative tries to reach are residents with little or no engagement with nature.

3.1.7. Zintuigenbos (Almere)

The Zintuigenbos is a forest that invites visitors to experience the forest with all senses (discourse). The board of the Zintuigenbos wants the forest to be accessible for everybody (rules), that is including (physically) disabled persons (actors). However, for physically disabled people the park was less accessible. As an intervention, a test panel was established, consisting of people varying in age but all with physical disabilities such as poor sight or reduced mobility. This panel evaluated the park and contributed ideas and recommendations on how to improve the accessibility for the physically disabled.

3.1.8. Natuurzone (Purmerend)

In the fringe of the city of Purmerend the Natuurzone has been developed to compensate for the loss of nature in other parts of town. The primarily ecological goals needed to be combined with stronger social components. An alliance of municipality, green groups and volunteers (network) is monitoring the ecology of the area but is also challenged to improve experiencing nature by inhabitants. Therefore, a new story about the area that attracts people (discourse) is needed. The goal for this park is to receive all residents of the municipality, to educate visitors about nature and ecology and to add social value. To support this aim, an information sign was developed and placed in the park, informing visitors about its nature. As interactive social activity, an excursion was organised as well as a volunteer workday in the park.

3.2. Behavioural Change in Target Groups and Triggers for This Behavioural Change

This section discusses behavioural changes observed among the citizens targeted by the initiatives or project interventions, based on the distinguished intention states in Figure 3: 'preparation state', 'contemplation state' and 'pre-contemplation state', and to which the 'behavioural state' was added. In Table 4 the triggers that initiate the changing intentions or behaviour are described. Some initiatives are discussed more than once in the text below, because different groups of people in these initiatives reacted differently or had different roles in the behavioural change process.

3.2.1. People Who Moved to the Behavioural State (Acting) from the Preparation State

In only one case was an intervention specifically directed at the preparation group: Natuurzone. In this case, we witnessed that people changed from preparation to the behavioural state, mainly motivated by ability factors, and supporting factors, particularly the removal of barriers. In the initiative Natuurzone, people were allowed to enter the park (removing barrier), were instructed how to help managing the area and were provided with tools to do so (ability factors).

3.2.2. People Who Moved to the Behavioural State from Contemplation

In two initiatives, we found that people in the contemplation state needed more incentives to change behaviour than people in the preparation state. For this group, a combination of triggers proved relevant: social contact and peer influence (social-cultural factors), learning green skills (ability factors) and low-key activities. An example of a combination of these triggers can be seen at the Wijkgroenagenda Arnhemse Broek. Citizens with psychological and societal problems were activated by a welfare-organisation to start working on greenery, and they formed a working group ('Green Broek'). These citizens were activated based on appealing to quality of life and a social story, involving getting to know each other and helping and supporting each other. Initially they started to be involved in an open-air vegetable garden ('the Torentuin'), and then they went on into the neighbourhood to clean and green their living environment. In the latter case they also became role models for other inhabitants.

3.2.3. People Who Moved to the Behavioural State from Pre-Contemplation

In four cases, people changed from pre-contemplation to action (such as joining in nature activities and gardening, see Box 1). Triggers were social cultural actors such as: (free) social activities, social contact between children and parents, and providing a place for sharing stories and experiences. The activities were also directed at ability factors: for example, showing people how to use binoculars. For this group it proved necessary to intervene on several entry points of the behavioural change model. The process started with organising the target group (social-physical factors) and informing them (information factors). When this led to motivation, improving ability factors and removing barriers (supporting factors) helped to activate these people to join in nature related activities. This made it possible to help people in one step from the one end of the spectrum to the other, but it took a lot of effort.

Box 1. Examples of initiatives that went from pre-contemplation to the behavioural state.

Natuur om de hoek is a low-SES area, where most of the inhabitants are not involved in nature. Nature is not part of their life, but a lot of them are meeting at activities organised by social workers. They organise activities to activate and bind the inhabitants. Via these organisations it was possible to reach the inhabitants for joining nature activities. Parents and children were both invited. Parents came for sociability and because their children could have a nice day. But being there, they started to get interested in birds, especially the children. During the Bird Festival intervention, signs of nature involvement are expressed among citizens: "I am going to watch birds more often!" So, the success factor here was using the existing structures to reach the inhabitants and the trigger was having a nice day and helping them to do something completely new (ability factors).

The management of **Voorschool Emmen** wanted to include more nature activities in their programme. The problem was that they did not know how to do that. The intervention was to interactively develop a series of activities that could be used by the teachers and supporting parents, who were not educated in nature at all. Through trial and error these lessons became a success. So, it was possible to shift teachers and children from pre-contemplation (not thinking about nature at all) to the behavioural state, by actively encouraging participation. This intervention was a success because the management was eager to change and because of the support of scientists who interactively developed nature programmes with the teachers. This very much increased the ability of the teachers and parents to include nature in the preschool programme.

In the initiative of the **Stadsoase**, inhabitants of the Kleurenbuurt in Zaanstad were asked in which nature related activities they were interested. Vegetable gardening was the most popular activity mentioned. A place for vegetable gardening was established and the inhabitants were helped to start gardening. Included in the gardening programme were also some ecological activities like spotting insects, which is interesting for the inhabitants because there is an interaction between insects and gardening. So, the interventions were very much related to the interests of the inhabitants and to increase their ability factors, especially in the field of collectively organising gardening. Barriers were removed (finding an area for gardening).

In the studied low-SES cases (Wijkgroenagenda Arnhemse Broek, Voorschool Emmen, Stadsoase, Natuur om de Hoek), social cohesion is the biggest theme. So, these neighbourhood residents are sensitive to stories about doing things together. A strategy to reach the residents is via other local residents and via welfare organisations. Organising a continuing string of small low threshold activities proved to be successful (for the latter, see the Leiden case in the textbox). An example of this combined approach is the case Wijkgroenagenda Arnhemse Broek. Residents of Arnhemse Broek became incidentally active in joining social activities on an organised green neighbourhood day: cleaning the neighbourhood and working in gardens. They were triggered by their neighbours, who functioned as role models in this intervention (see Section 3.2.2). So, the success factor was reaching out via local people and helping them to become active, both in a psychological way (just starting to become active) and in an educational way (what exactly to do). Their ability to start working is increased.

3.2.4. People Who Moved to Preparation from Contemplation

To bring about behavioural change, ‘knowing’ is the first step. Knowing/information is especially important for people who do not move to action yet, but who did start to prepare to be active. An example of this is Zintuigenbos. Here the intervention was to invite a group of visually disabled people for a test panel to think about how the park needs to be changed in order to be accessible by disabled people. Visually disabled people were encouraged to think about a new lay-out of the sensory forest that removes barriers. The final goal is to achieve physical changes in the forest, but these changes have not yet been implemented. Now only the group that joined the working group changed from contemplation to preparation due to the information that was given about how the forest could be used, which changed their attitude (it was a call to action). They now really want to use the forest, but due to still existing physical barriers they are not yet able to do so.

3.2.5. People Who Moved to Contemplation from Pre-Contemplation

This shift in behaviour also starts with information. An example is Valuta voor Veen: some of the citizens of Friesland have moved from pre-contemplation to contemplation. They have a willingness to consider adopting certification schemes; whereas, previously they were opposed, because they thought the CO₂ certification schemes to be greenwashing. In this case, some of the farmers started to invest in better communication towards citizens, which may have contributed to the change in willingness of these citizens to consider becoming active (i.e., consider buying certification schemes).

3.2.6. People Who Remained in Pre-Contemplation

The pre-contemplation group exists in all cases. The group consists of two subgroups: the unconscious group and the not willing conscious group. The unconscious group is a difficult group because firstly they are difficult or impossible to reach. Secondly, they do not feel the need to change because they are more concerned about other problems in their lives than greening the environment, especially in low-SES neighbourhoods. A large part of them cannot change because they are psychologically unable to do so, or have too many other problems (money, relationships, work, etc.).

The not willing conscious group strongly resist changing. For example, because they experience nuisance from greenery (falling leaves, changes in daily walking patterns because of new green areas, etc.). A very different reason for opposition against changing behaviour is if people want to protect species against human influence. For example, in the Natuurzone, people were—in order to protect ecology—opposed to human activities in the park. Also in Andere Arnhemmers, a bat-working group finds it is against their ideas of nature protection to focus people’s attention to these species. In addition, the not willing

conscious group can also not be convinced that the goals are really contributing to greening. For example, many citizens in the Valuta voor Veen initiative thought negatively about the CO₂ certification schemes in terms of greenwashing, and still do.

3.3. Governance Approaches and Interventions That Contributed to the Behavioural Change

In this section, we discuss how citizens were encouraged to move into different states of behavioural change. To analyse these processes, we applied the Policy Arrangement Approach (PAA). We demonstrate the need for different governance approaches and interventions across the various initiative, especially the difference between initiatives in low-SES neighbourhoods and other cases (Table 5). In this overview we focus on the individual elements of the Policy Arrangement Approach to analyse their contribution to changing behaviour. In practice, the elements of the PAA are interconnected and mutually reinforcing.

Table 5. Governance approaches for low-SES neighbourhoods versus the other initiatives.

Municipality/Green Interest Organisations	Mixed-SES Cases	Low-SES Cases
Governance efforts	Facilitation	Active Organisation
Story/discourse	Nature-focused discourse	Connecting to residents' everyday concerns (liveability)
Resources	Money	Time, money, materials, knowledge
Network	Connect to existing network	Build a network
Rules	Policy aimed at biodiversity	Policy aimed at social cohesion

In all initiatives, **discourses** constitute an important governance dimension contributing to behavioural change. The interviews revealed that some of the initiatives combine several storylines, in order to address different groups (Natuurzone, Andere Arnhemmers). This typically involves storylines emphasising the value of 'light' nature and green spaces, for example to raise awareness for the many plant and animal species living in Arnhem (Andere Arnhemmers). However, in cases involving low-income groups, a direct 'green' narrative appeared insufficiently appealing to activate people; it is necessary to link with their own experiences. People are primarily concerned with making ends meet (Stadsoase, Wijkgroenagenda Arnhemse Broek, Voorschool). Some of the cases developed storylines connecting green to the stories that are alive in the neighbourhood like livelihood. Interventions, such as organising small social and green activities, are a vehicle to express these storylines in practice. This proved to work in some of these cases to activate people. However, we do need to remark that in 80% of the initiatives in our project (also including initiatives in high SES neighbourhoods or the general public), the storylines are about social elements, for example about meeting each other.

As can be seen in above examples, inventive ways of giving information are needed in the cases. Traditional, untargeted communication channels—such as generic information campaigns—proved insufficient to achieve behavioural change among some groups of citizens (see for example Andere Arnhemmers). Personal contact and the visibility of initiatives, for example via community centres, other residents and through small-scale activities, ensure involvement (see, e.g., the interventions in Natuur om de Hoek, Wijkgroenagenda Arnhemse Broek, Stadsoase). In order to increase awareness, social networks and channels of people and parties who know the target groups well can be used. It was important to facilitate these people in their communication. This helped ensure that messages are aligned as closely as possible with citizens' lived experiences. It worked to take into account the scepticism that may exist with words such as sustainability or nature and to talk as

much as possible from the needs of the neighbourhood (such as social cohesion, perhaps combating heat, drought and water nuisance).

The provision of **resources** was crucial in supporting behavioural change. In the four low-SES neighbourhood initiatives in this research, it is clear that multiple resources are necessary but lacking, such as money, manpower, knowledge and materials. In three of the four initiatives, time and manpower are mentioned as a challenge (Stadsoase, Wijk-groenagenda Arnhemse Broek and Voorschool). For example, an initiator is needed to put the materials and activities that were chosen as interventions, in motion. In *Natuur om de Hoek*, the target group has no knowledge; the welfare organisation needs to put all the resources in the initiative to build it up. Voorschool was lacking materials to carry out a nature lesson; the initiative bought a nature education box. In the other (non-low-SES) cases, financial resources—sometimes accompanied by additional staff capacity—were often the only external resources required for which the municipality is needed; the initiatives themselves have for example the required materials and knowledge. The initiative *Valuta voor Veen* for example, wanted to put an effort into building a story to share with citizens. The farmers can take on the communicating, but they did need money for marketing and manpower/money to communicate with citizens. Also, initiative *Zintuigenbos* needed (only) money to put measures in place; they already had an organisation and the required knowledge.

In low-SES initiatives, building new **networks** proved essential. For example, in the initiatives Voorschool and Stadsoase. In the latter, there was no organisation or group in the neighbourhood to connect to, so this was the first step to take. For *Natuur om de Hoek*, *Naturalis* built a network to connect all green and social organisations and schools in Leiden, but in the low LES neighbourhood Leiden Zuidwest there were no active green groups. Also, in Arnhemse Broek, there was no neighbourhood or district council who could, for example, hold regular meetings to connect the community. The municipality needed to organise meetings from the ground up. This organisational role of the municipality or initiative creates a delicate balance between self-management by residents, which must be stimulated as much as possible for the sense of ownership, and the ongoing support that is necessary to keep things running.

In several of the initiatives, by starting from the needs in the neighbourhood, other parties than ‘green groups’ or green organisations come into the picture to work with citizens. This concerns: social work, neighbourhood managers, neighbourhood associations, etc., who can bring new groups of people into the collaboration around green. To link with social organisations, who have better access and expertise to connect with residents of neighbourhoods, was a success factor in several cases. The intervention ‘organising social activities’ proved fundamental in this essentially social, neighbourhood-oriented work. ‘Green’ is not the focus but an added element: a community centre organises activities, and these happen to be green activities.

Involvement of (already active) local residents helped as an intervention to connect to residents in low-SES neighbourhoods. Other local residents were perceived as more trustworthy and approachable than professionals. They may also find that there may be other problems that need to be resolved first. For example, in the Arnhemse Broek, there are now neighbourhood coaches, volunteers from the neighbourhood, who go door to ask people how things are going and whether they want to participate in sustainability and greening. The welfare organisations also have access to this group of people.

In some of the other initiatives, with different target groups (not low-SES), it was possible to connect to existing networks, for example in the initiative *Andere Arnhemmers* and *Valuta voor Veen*, where it was relatively easy to build upon existing networks. On average, eighteen organisations are linked to the initiatives in their network. In some of these neigh-

bourhoods, the organisational capacity is strong. In the case of Wijkgroenagenda's Arnhem, there are also some high-SES-neighbourhoods. Here, there were already green groups or neighbourhood groups present who were willing to become active (preparation state). The municipality only needed to facilitate them and did not need to organise the structures.

In general, it was good to identify already-active actors (citizens or green groups) and work with them to gain supporters (see Wijkgroenagenda Arnhemse Broek en Natuurzone). These residents were helpful to deal with resistance to greening (part of the pre-contemplation group). Often, this is a creative, active group.

With regard to **rules**, low-SES initiatives were often embedded in policy frameworks aimed primarily at social cohesion. Policies for social cohesion are an important condition to create the structures for social work which can help to connect residents, before green elements can be added to activities. Stadsoase and Wijkgroenagenda Arnhemse Broek are good examples; both initiatives started with places to meet and social activities. Many of the other initiatives are embedded in policies aimed at biodiversity and green, for example Valuta voor Veen, Zintuigenbos and Natuurzone. In non-low-SES cases, citizens could more readily engage with policies centred on biodiversity (and the storylines that come with the policies). However, we did witness that the stories about biodiversity needed more social elements in order to connect people (see Discourses).

In several of the non-low-SES initiatives the municipality/initiative only needed to facilitate, that is, make things possible, often in terms of rules and policies. An example of municipal facilitation through adaptive rules can be found in the Natuurzone case: entry to the park was prohibited, now it is accessible. In Valuta voor Veen a rule that hinders participation is that citizens cannot buy certificates. This barrier still needs to be solved.

4. Discussion

In this section we discuss the outcomes in relation to the three sub questions:

1. To what extent do citizens change their behaviour?
2. What factors triggered behavioural change?
3. Which governance and interventions contributed to the change?

We also discuss our contribution to theory on governance and interventions that promote nature-inclusive behaviour.

4.1. Change in Behaviour

In seven cases, participants became active (i.e., entered the behavioural state). 'Becoming active' refers to a range of activities, from participation in one-off small-scale events (like a bird counting day) to more structural activities like joining a working group that is busy with greening a neighbourhood. Some low-SES neighbourhood residents (in four cases) became active, two in terms of one-day-small-scale activities, and in one case even developing into role-models that will go on to activate others. We observed a relationship between the intention state from which participants started and the type of activities they engaged in: people that started from the lowest intention state (pre-contemplation) did smaller and more ephemeral activities like birdwatching, while people that started from the preparation or contemplation state were doing more intensive practises like regularly visiting a park, or even becoming a green role-model for others. Shifts in intention state without immediate behavioural change were observed in two cases: from contemplation to preparation and from pre-contemplation to contemplation. Although these are sometimes only small steps and often amount to little more than trials (see Figure 3), they indicate that change is possible even in the pre-contemplation state. Long-term support is needed to sustain the behaviour in the maintenance state.

Remaining in a pre-contemplation state was observed in four cases, in two of which citizens are opposed to societal activity in nature areas or afraid that species will be disturbed due to human activities; and in one case, people are still not convinced of the value of buying certification schemes despite information campaigns.

Although such transitions are difficult and do not occur frequently, our research shows that it is not always necessary to shift from one level to the next. However, to reach such larger steps, many triggers are necessary to help: making a social environment, giving information, helping to perform, removing barriers like rules and money. To reach these groups, small, practical actions were needed.

An important question concerns the sustainability of these changes, especially for people changing from the pre-contemplation to the behavioural state (which is in itself remarkable). It is not clear whether they will continue showing this behaviour. Sometimes we witnessed durable changes (maintenance in Figure 3) in cases like Stadsoase, where people consistently changed their behaviour. In other cases, we saw enthusiasm for doing the new things, without knowing how durable this will be. For example, in Natuur om de Hoek, bird watching was a completely new experience for a lot of people living in Leiden Zuidwest. This elicited a lot of enthusiasm, especially among children. They were surprised by the wealth of (colourful) species living in their neighbourhood [63]. These trials (as part of behavioural state, see Figure 3) are a good starting point for repeated activities in that area. Perhaps other activities, maybe more organisational activities, are necessary for reaching the maintenance phase [64]. Long term research should shed light on that.

4.2. *Many Motivations and Thus Also Many Triggers to Become Active*

In this action-research project, we actively supported participants in changing their behaviour. In many cases real changes could be identified. Our findings support earlier work by Mattijssen [27] and Stobbelaar et al. [11], showing that engagement in nature-inclusive behaviour can be triggered by a wide variety of factors. An invitation from a neighbour, a personal experience, but also a response to policy developments [27], or even a change in the physical lay-out of the city [65]. A good example of the neighbour as trigger can be seen in the case of Wijkgroenagenda Arnhemse Broek. People who would normally not open the door when the bell rings, are more willing to open the doors when they are addressed by the role models (friends of the neighbourhood), who are their neighbours [66,67].

Moreover, by applying a model that distinguishes between different states of behavioural change (pre-contemplation, contemplation, preparation and the behavioural state), we could better identify what is necessary to help these people to perform or to increase their nature-inclusive behaviour. As Table 4 shows, the main triggers to become active (the behavioural state) are supporting factors/removing barriers and stimulating ability factors. The supporting factors are, e.g., opening a park; stimulating ability factors are, e.g., learning green skills and getting materials. For shifting up on the lower states, e.g., from pre-contemplation to contemplation, the focus is more on getting information. Social-cultural factors, particularly peer interaction and social contact, were almost always necessary and consistently supportive, in the sense of organising and meeting peers. These findings are in accordance with the green behavioural change model [11] that predicts that different triggers are necessary to change behaviour starting from different intention states.

Besides nature management, which is according to Mattijssen [27] the activity that most active citizens groups engage in, we see that nature-inclusive behaviour in our cases are very basic activities, such as someone willing to look at an information panel, or to visit a park. It also appears that activities triggering engagement do not necessarily need to be explicitly focused on greening to activate and organise low-SES and low intention state

people as a start towards real green change ('just drinking coffee' as they state it). It looks like that activities that successfully trigger people are a combination of what people like to do given the intention state they are in, what can be done in the area (is there a park available et cetera) and the abilities of the organisations surrounding these people. This differs between for instance welfare organisations and nature organisations.

4.3. Governance to Deal with Behavioural Change, Especially People Who Are Hard to Reach

Our research shows that successful behavioural change requires governance and interventions to be aligned with both the intention state of individuals and the socio-economic status (SES) of the target group. However, governance practice often still follow a 'one-size-fits-all' approach, which is also noted by Fors et al. [19]. This especially can be seen in the groups that remained in the pre-contemplation state that were often approached with the same intervention as people in the other states. This led to no change in the pre-contemplation group. For example, in the initiative of Andere Arnhemmers, citizens in the contemplation phase responded to the intervention of introducing a booklet, a map with natural elements and bird camera's through changing their behaviour by visiting nature more often. In contrast, some green groups in this case did not exhibit behavioural change because they felt opposed to the idea of human involvement with species such as bats. They saw the used material as a threat. This demonstrates the importance of identifying distinct target groups and to adjust the intervention to every group. For instance, the municipality of Arnhem does small research into the group composition of a neighbourhood before it starts the neighbourhood plan trajectory.

On top of this, the cases confirm the notion that a combination of governance and interventions is needed to reach people in different intention states and SES in the target group [28,68,69]. Table 5 shows the differences between the governance approaches between low-SES neighbourhoods and other areas or initiatives that were mentioned in the interviews. In the latter, the emphasis can lie at facilitating. Municipalities can facilitate groups that are already active in greening the area and link them to other groups. The story can emphasise the effects on nature quality, because that is the main concern of green groups. Our research confirms findings of other research [10,28,29] that policies to increase societal engagement with nature work well if the storylines and activities are about light green nature or connect to social elements. What is new is that we could address this need especially for the people in the contemplation state. For them it is vital to see the more social elements of greening an area while for people in the preparation state it is more an extra. This differentiated approach also ensures that the risk of ecological objectives being overshadowed by functional objectives (shade, social interaction, etc.)—a risk feared by some [70,71]—is mitigated.

With regard to resources, the mixed-SES cases mainly required financial support, while in the low-SES cases also time, material and knowledge are needed. This is because in the mixed-SES cases often green groups are active and those are already rather skilled.

Low-SES neighbourhoods require substantially greater effort from municipalities or other facilitating organisations aiming at greening the area. They may take the lead in organising, which often starts with policy aiming not only at greening but also at social cohesion and liveability, because that is what people are concerned about. Such cases may require knowledge, funding, time, and material resources. But the main thing is to start to get these people organised, not necessarily directly around green. This shows the large effort needed in these cases. Van Santen [72] shows that it can be helpful to mobilise the strong points of every organisation involved in the neighbourhood, such as welfare organisation: access to low-SES people, nature organisations: knowledge, etc.

The cases also show that informal rules are important in organising change [73,74]. These are often underestimated in behavioural change projects. Agreements among participants give a structural base for organisations that help people to change behaviour, as can, e.g., be seen in the Kleurenbuurt, where inhabitants made their own organisation around urban gardening with the help of an external bureau. On the other hand, formal rules in the form of policy aiming at biodiversity is very helpful in discussions with other people or groups, because this gives official support to greening actions, which is, according to some interviewees, often lacking. In low-SES areas it is helpful to combine policy aiming at biodiversity with policy aiming at social cohesion. In the low-SES cases it works best if social cohesion is promoted by working together on greening [11].

Literature says that people with low-SES tend to have a more short-term orientation, whilst those with high SES tend to have a more long-term orientation [75]. This is linked to the sense of control over their lives that people with high SES experience, which gives them the scope to reflect and also to invest in the future. Furthermore, people with low SES are less likely to feel that their actions make a difference (self-efficacy) [75,76]. It is therefore not easy to persuade them, on rational grounds, to do something for nature. That is why offering enjoyable activities (light green) and emphasising ‘what’s in it for me’ is, for those with low SES, a sensible first step towards achieving nature-inclusive behaviour.

4.4. A New Model for Behavioural Change Towards Nature-Inclusive Behaviour

Many scholars have shown that behavioural change interventions are often ineffective [42–45]. A key reason for this is that a ‘one-size-fits-all’ approach is often adopted. Using a combination of PAA and I-change model, our study provides insights into how more targeted interventions can be implemented.

The I-change model distinguishes three key steps: knowing, wanting and being able (external barriers or internal competencies; see Table 2, which describes four states). We have seen that, in homogeneous groups, it was relatively easy to determine which state of the behavioural change process people were at and how to respond accordingly. Examples include the ‘belevingsbos’, where the inability to act was very clearly the central issue. External barriers had to be removed to give visually impaired visitors access to the forest.

However, in other cases, groups are much more diverse: there are people who lack knowledge (knowing), who are not motivated to engage in nature-inclusive behaviour (wanting), or who, for example, are physically unable to do so (being able), and there may also be some people who are already active. In several cases, but especially in Wijkgroenagenda Arnhemse Broek and Natuur om de Hoek, municipalities and other organisations were searching for strategies to reach these different groups. Our research has clarified a number of points. We found that interventions were most successful when local authorities started by engaging people and organisations that were already active, or that wished to do more but were unable to do so because of existing barriers (see Wijkgroenagenda Arnhemse Broek and Natuur om de Hoek–Leiden [77]). This strategy resembles the logic of the diffusion curve [77–79]. The initial coalition of active stakeholders can subsequently help reach broader groups of residents and organisations. In particular, this coalition can support people in the preparation state by helping them acquire the necessary skills and by removing external barriers, a ‘barrier-removal-first’ approach [80]. Already active people, such as neighbourhood green groups but certainly also welfare organisations, possess valuable local knowledge about opportunities and challenges for greening initiatives, while excluding them may generate resistance. Furthermore, neighbourhood organisations and welfare organisations are often perceived as more familiar and trustworthy than local authorities and are therefore better positioned to reach people in the contemplation state.

The coalition of these parties subsequently devises interventions aimed at those people who are either not yet willing to engage or not yet aware of the issue. (Figure 4). Veltri [44] likewise argues that involving actors such as frontline staff contributes to the design of appropriate interventions. The findings suggest that the PAA provides a useful framework for designing effective intervention. The Policy Arrangement Approach demonstrates how the various dimensions—Discourse, Network, Resources and Rules—interact and can reinforce one another [81]. In successful cases, local authorities and local stakeholders complement one another. They find common ground in the discourse, reinforcing and giving concrete form to it through interaction tailored to the local context. The local authority can draft rules that are suitable for greening initiatives, mobilise the network internally within the authority, and deploy resources such as funding.

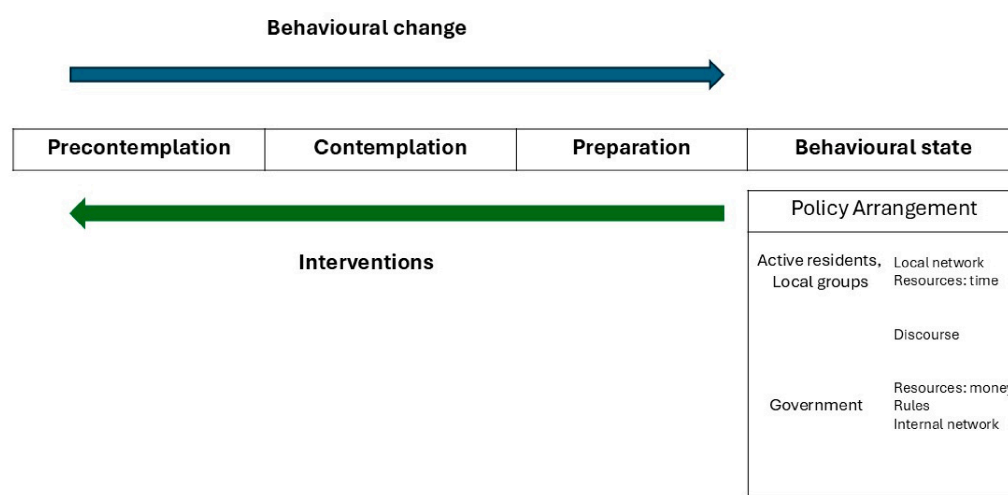


Figure 4. A behavioural change strategy based on the combination of the adapted I-change model and the Policy Arrangement Approach. An intervention based on a stable and active arrangement of network, discourse, resources and rules can start approaching people in behavioural state, followed in turn by people in the preparation phase, contemplation phase and precontemplation phase. This is the opposite of the stages people go through when changing their behaviour.

Local (social) organisations, but also other residents, may have access to local networks and know how to reach people in the neighbourhood. They may also have greater time resources than local authorities. Working together, they are often the first to reach those in the preparation state (who are willing but unable), helping them acquire the necessary skills or demonstrating that external barriers have been removed. This expanding group of active participants can subsequently influence those in the contemplation state, particularly when they broaden the narrative on nature to include quality of life [82–85]. As shown in the Section 3, all initiatives employ a broader discourse. The empirical study further demonstrates that some people in the pre-contemplation state can also be reached through trusted intermediaries and role models. The experiences from Wijkgroenagenda Arnhemse Broek and Natuur om de Hoek show that local green groups, welfare organisations and respected community members can occasionally engage even those who are initially not considering nature-inclusive action.

At the same time, people in the pre-contemplation state remain difficult to reach. The cases of Natuur om de Hoek (Leiden) and Wijkgroenagenda (Arnhem) demonstrate that, in addition to using a broader discourse (engagement), it is important to reduce pressure and lower participation thresholds [77]. For example, in Natuur om de Hoek (Leiden), a children’s activity was organised during the national bird-counting event, during which older people could socialise and participate informally [63]. Similarly, the Wijkgroenagenda

relied on role models and trusted local institutions to engage residents. A key lesson from these cases is that behavioural change initiatives should have a clear understanding of the intention state of their target groups, as this enables interventions and communication strategies to be tailored accordingly.

These findings also highlight the idea that a behavioural intervention need not be a one-way process, but that the person receiving the intervention can also become part of the intervention. Literature suggests that this type of co-production can lead to higher quality decisions and (green) management [86,87]. An example of this is Voorschool Emmen, where—through an iterative process of trial and error involving continuous interaction with the target group—a green education programme was developed. It demonstrates that there is a middle ground between the ‘one-size-fits-all’ approach and an individualised approach, as this method makes it possible to identify people as groups and to approach them as such. The findings further suggest that the strategy can be adapted to the distribution of behavioural groups (within a neighbourhood). Where there are many networks of people in the behavioural and preparation states, it is easier to carry out an intervention than in neighbourhoods where networks are lacking and many people are in the pre-contemplation state. In such cases, networks will first need to be established.

4.5. Limitations of the Study

As said in the Section 2, the initiatives were chosen to illustrate various nature-inclusive behaviours and to enable the research of various ways of stimulating behavioural change among specific target groups. After analysing the initiatives we saw that most of the initiatives focus on the step pre-contemplation to behavioural state. This limits the significance of analysis on the other steps. In a new study stratified samples could be taken to enable a more balanced study of the states of behavioural change. Furthermore, new studies could focus on the precise way in which a state of behavioural change is reached and how some people manage to skip states.

Our research was mainly qualitative. The quantitative survey was held and analysed individually for each case. Differences in response rates, timing, and data collection methods prevented an overall analysis. The survey contributed to establishing the interventions for each case. However, interpreting the observed data in terms of the behavioural change model was carried out qualitatively. This means we cannot draw quantitative conclusions on the size of the behavioural change that was established during this action research.

The scope of this study was the Netherlands, a country with a strong civil society [88]. Here, the government can easily collaborate with environmental and social groups/organisations to achieve behavioural change. This means that the results could be limited to countries with similar societal circumstances. One hypothesis that emerges from a number of cases involving weaker civil societies is that governments must first work to bring people together.

Some initiatives were fairly small. This means that the influence of the people behind these initiatives is greater, both in terms of those who exert influence and those who are influenced. On the one hand, this has been addressed by the fact that we carried out a qualitative study, which gave us a clear insight into the mechanisms at work within the initiatives. On the other hand, further studies are needed to determine how behavioural change occurs from one state to the next.

Although behavioural change was achieved in all cases, this does not mean that everyone in those cases changed their behaviour. In small-scale projects such as ‘Natuurzone’, ‘Voorschool’ and ‘Stadsoase’, this was indeed achieved. In large-scale projects such as ‘Natuur om de Hoek’ and ‘Wijkgroenagenda’, it was possible to get a proportion of the population to change their behaviour. This demonstrated that people at a particular state

of behavioural change—including difficult states such as pre-contemplation—can change their behaviour with the right intervention. However, it was not possible to reach some of the people, a lack of manpower possibly contributed to this. Further research into ways of reaching more people efficiently is recommended.

5. Conclusions and Recommendations

This paper examines how governments and green interest organisations can stimulate and increase nature-inclusive behaviour, with particular attention to addressing different groups of citizens. We analysed the strengths and weaknesses of governance approaches and interventions aimed at behavioural change, and identified what governance and interventions proved effective for different target groups. Conclusions are:

The cases indicate that behavioural change may be possible across different intention states when interventions are appropriately tailored (i.e., move from preparation, contemplation, or pre-contemplation to the behavioural state). Every neighbourhood or area consists of groups of people situated in different intention states. Each group requires a specific type of governance approach. Considerably more effort is required to support people in the pre-contemplation state than those in higher intention states. For the first group, more resources are needed (time, money, knowledge), in combination with a broader discourse than just 'it is good for nature', and effort should be made in creating networks that unite people especially. Cooperation with welfare organisations is also helpful in reaching people in the lower behavioural states. In this project, low-SES neighbourhoods were characterised by a relatively larger proportion of people in lower intention states compared with other neighbourhoods. This implies that in such cases greater emphasis needs to be placed on socio-cultural factors, particularly on initiating processes that organise and connect people. A next step can be giving information and raising awareness before starting to really help them to change behaviour and becoming active. From a strategic perspective, we recommend that governmental organisations initially engage with receptive groups or residents, such as those already active in greening initiatives. These groups constitute natural allies for governments seeking to green an area. Together with them, governments can start to reach people in the preparation state. For this group, the most important measure proved to be the removal of barriers to participation in nature-inclusive activities, particularly with regard to rules and resources. Subsequently, individuals in the contemplation state can be reached through narratives that emphasise the role of green spaces in liveability and everyday quality of life. That is because they are mostly concerned about their daily life. People in the pre-contemplation state can often be reached most effectively by offering accessible social activities as an entry point. In short: the most effective interventions are those carried out in collaboration with local people, groups and institutions, and are tailored to the state of behavioural change at which people are at.

Our theoretical contribution is that the combination of PAA and the adapted I-change model presented here fills a gap in our understanding of effective interventions for (nature-inclusive) behaviour. This combination demonstrates that an effective intervention emerges when citizens are addressed by local actors and with stories that they can relate to. Furthermore, they should be viewed as a potential part of the network. The order in which citizens are approached by the intervention is the reverse of the states of behavioural change.

Our work has the following policy implications: we have seen that, from a policy perspective, things can go wrong at two levels: within the organisation and within the intervention. Regarding the organisation: a strong vision (discourse) on greening the city helps to align rules, resources and internal networks towards greening (as we see in Arnhem). Regarding the interventions: form strong coalitions with like-minded stakeholders to jointly devise and implement effective interventions.

Future research could compare governance approaches across countries, examine long-term behavioural persistence, and quantitatively test the governance–behaviour relationships proposed in this study.

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Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy restrictions.

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