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A Managerial and Behavioral Approach in Aligning Stakeholder Goals in Sustainable Last Mile Logistics: A Case Study in the Netherlands

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Abstract: Stakeholders play vital roles in the implementation of sustainable last mile logistics solutions. Therefore, the first step in setting up successful sustainable last mile logistics is to conduct stakeholder analysis. This paper analyzes the goals of the stakeholders in the Heijendaal living lab, a city logistics project that uses two hubs for bundling goods to be delivered to the Heijendaal campus in The Netherlands. We use the Theory of Planned Behavior and Policy Deployment to present a qualitative case study, which examines the goals of stakeholders in relation to their roles in the supply chain and in the organization, and if these goals lead to their expected participation behavior. Results show that stakeholders have economic, social, and environmental goals and that some of these goals are prominent within certain groups of stakeholders along the supply chain and within the organization. In addition, the set goals do not always lead to participation behavior of stakeholders due to identified disruptions and habits. This study identifies the importance of information sharing and collaboration within the supply chain, the leading role of middle-level managers in translating strategic to operational goals, and the stimulation of behavioral factors to increase participation of stakeholders in the living lab.

Keywords: city logistics; living lab; Policy Deployment; stakeholder analysis; sustainable last mile logistics; Theory of Planned Behavior

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1. Introduction

The increased urbanization in European cities combined with increased consumption has led to sustainability-related problems in city centers and their logistics. Despite its contribution to approximately 5% of the European Union (EU) GDP and employment of 10 million people [1], the EU transport sector is one of the largest contributors of CO₂ emission, congestions, and accidents in the cities, affecting the social well-being and health of city inhabitants [2–4]. In order to improve the livability of the cities and to achieve a 90% cut in transport emissions by 2050, the EU made the Green Deal on sustainable and smart mobility strategies for EU transports [1]. Part of the Green Deal includes city logistics strategies that focus on zero-emission vehicles, smart delivery designs, and planning and management of the logistics of goods [5–7]. One popular solution to decrease the movements in cities is the use of city hubs. A city hub enables incoming trucks to unload goods outside the city, bundles these goods, and performs efficient and emission-free last mile logistics. City hubs were shown to be cost-efficient, saved time and fuel, and contributed to a reduction of CO₂ [8,9].

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Most city logistics projects involve various stakeholders such as supply chain actors, government, and knowledge institutes (e.g., [10,11]). The presence of multiple stakeholders in city logistics is complicated. Stakeholders have different interests and views, which are often conflicting, in terms of their goals and the management and decision-making of the project [12]. For instance, the sustainability goals from a consumer point of view could require investments from suppliers, thereby complicating the economic goals of suppliers. Therefore, managing stakeholders' interests and preferences at the beginning of a project is crucial to gain wide support for any city logistics project [13]. Failure to take into account the goals and views of the stakeholders has resulted in the termination of many city logistics projects. This results, for instance, in inadequate usage of hubs, misallocation of cost and benefits, the reluctance of the government in providing subsidies, wrong location and type of vehicle choices, and/or poor organization of the city logistics projects (see for example [5,14,15]).

A traditional way of doing stakeholder analysis in a project is by looking at the alignment of goals of different actors in the supply chain (e.g., [16]). However, we found out prior to this research that within a stakeholder group, goals may vary at different management levels. In the end, it is the individuals who represent organizations and interact with other stakeholders, both within the supply chain and their own organizations. Therefore, this paper argues that in order to analyze the goals of stakeholders, it is important to look at both the alignment of goals within the supply chain and between the various management levels of an organization.

This research focuses on the Heijendaal living lab, a city logistics project that aims to improve the sustainability of delivering goods in Nijmegen, the Netherlands, using the City and Campus hubs. This living lab is an outcome of the signed agreement among the three organizations in the Heijendaal campus, namely the university, hospital, and university of applied sciences, to test sustainable last mile delivery. By definition, a living lab promotes a user-centered, open-innovation ecosystem, integrating transdisciplinary research within a public-private-people partnership (4Ps) [17]. The concept of living labs has been applied in city logistics as a method for action-driven partnerships that follows a solution-driven approach [18,19] and as an approach to foster stakeholders' engagement in co-creating policies [20]. This is translating to the Heijendaal living lab through its setup, which looks at a new way of working through the collaboration of supply chain actors, academia, and governments, and finding an optimal solution for cost-efficient, consolidated and emission-free "last mile" logistics of goods in the Heijendaal campus through learning-by-doing. Since the Heijendaal living lab has a Business-to-Business structure and involves large organizations such as suppliers and receivers, the participation of each actor is influenced at various management levels.

The research questions of this study are: (1) What are the goals of each stakeholder in relation to the role in the supply chain and the management level within an organization? and (2) To what extent do these specified goals lead to successful participation in sustainable last mile logistics? To answer these questions, we use a framework of organizational and behavioral mode choice processes developed by Bogers [21] as part of a multimodal research project [22]. Boger's framework is based on the Theory of Planned Behavior (TPB), which explains that the intentions of individuals serve as the basis of their behavior, and the Policy Deployment, which assesses the alignment of the goals of the top, middle, and lower level managements. Since this research is exploratory in nature and is the first step in understanding the setup of the living lab, we used a qualitative research method. By understanding the goals that each stakeholder finds important across the supply chain and within the organization, possible improvements can be recommended to enhance the participation of stakeholders in the living lab. Ultimately, these improvements could promote the continuous use of the sustainable last mile logistics concept by supply chain actors even after the living lab ends.

The next section starts with explaining the research framework. This is followed by an explanation of the qualitative case study method of this research. Next, the results on Sustainability **2021**, 13, 4434 3 of 19

different stakeholder goals and whether or not these goals lead to participation in the Heijendaal living lab are presented. This is followed by a discussion of the importance of goal alignment in order to gain a high probability of success in last mile logistics and possibilities to enhance goal alignment. Finally, this paper concludes with the learnings from stakeholder analysis and recommendations on how to improve stakeholders' participation in the living lab.

2. Theoretical Framework

Multi-Criteria Decision Making methodologies, such as Social Cost-Benefit Analysis and MAMCA, have been applied to solve multi-stakeholder city logistics challenges (see for example [23-27]). These methodologies involve multiple stakeholders in the implementation process and assess quantitatively the different criteria of stakeholders based on a set of alternatives, to determine the best solution to achieve consensus among stakeholders. However, in reality, sustainable city logistics projects are complex in nature, with stakeholders having various degrees of power, influence, and organizational backgrounds, making the actual implementation of these methods often challenging. Gammelgaard [6] argues to instead use organizational theory on change management, to gain insights on the changes that are needed in the process to improve the implementation of city logistics. An important element of the organizational change process is understanding individual behavior in an organization, as individuals eventually are the agents driving change [28]. TPB is a behavioral approach and has been proven to be useful in sustainable logistics decision making, such as on the choice of transportation [29,30], implementing green practices in logistics [31], and route choices [32]. The behavioral approach in city logistics is still under-researched and this study is a contribution to this field. In combination with the Policy Deployment, this study gives a deeper understanding on how decision happens at organization and supply chain levels in city logistics.

The theoretical framework of this study combines the Stakeholder Analysis and the framework developed by Bogers [21] of organizational and behavioral mode choice processes. By involving key stakeholders in an open-innovation ecosystem like a living lab, it creates new knowledge and leads to a change in practice [33]. Bogers' framework emphasizes the importance of understanding the decision-making at organizational and individual levels through the lens of TPB and Policy Deployment. TPB highlights individuals as decision-makers while Policy Deployment highlights that individuals are also part of an organization comprised of multiple levels. Therefore, using TPB combined with Policy Deployment can help understand how the decision-making of an individual at various management levels takes place. The next section explains the Stakeholder Analysis, Policy Deployment, and TPB, the link between these theories, and the complete research model.

2.1. Stakeholder Analysis

City logistics involved multiple stakeholders, which are defined as "any group of people, organized or not organized, who share a common interest or stake in a particular issue or system" [34]. City logistics stakeholders can be classified into three: (1) industrial, represented by suppliers, hubs, and freight carriers; (2) institutional policymakers; and (3) consumers, the receivers of goods [35,36]. In any project, like city logistics, stakeholders have different goals and interests [11]. Industrial stakeholders have an interest in the financials such as costs and revenues and the process performances that include delivery time, volume, and responsiveness. Institutional stakeholders are interested in aspects such as reduction in congestion, accidents, pollutions, and noise in the cities. Consumers' interests focus on service levels that involve timeliness, costs, and traceability. Conducting stakeholder analysis helps to understand the interests and expectations of multiple stakeholders, which can be used to shape stakeholders' decisions [37].

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2.2. Policy Deployment

To understand how strategies are deployed across multiple levels of an organization, we use the theory of Policy Deployment (also called Hoshin Kanri). The Policy Deployment is a tool that ensures that the goals of a company are in alignment with different management levels, namely strategic, tactical, and operational levels [38]. At a strategic level, a company or individual sets overall long-term goals in alignment with the company's strategies, which are based on the characteristics of the company and the demand of its network. These long-term goals are made measurable at the tactical level (mid-term goal) using Key Performance Indicators (KPIs) [39]. The measurement of KPIs is based on the set metrics (short-term goals) at an operational level.

Policy Deployment is useful to understand the sustainability goals of organizations at various management levels in a supply chain. An example of this is GreenSCOR, a dedicated tool that identifies measurable sustainability goals, such as zero emissions, environmental certifications, reduction in waste, use of green materials, collaboration with suppliers, and so on [40,41].

2.3. Theory of Planned Behavior

Individuals are decision-makers at different levels in the organization. The TPB predicts and explains individual behavior based on the combination of three behaviorspecific factors [42,43]. These three factors are (1) attitude towards a behavior, (2) subjective norms, and (3) perceived behavioral control. The attitude towards behavior is determined by one's belief that the behavior leads to either favorable or unfavorable outcomes. The subjective norms are influenced by external environments such as family, education, or peers, and result in perceived societal standards on how a person should (or should not) perform the behavior. The perceived behavioral control refers to the resources or opportunities present in performing the desired behavior. Together, the combination of these three factors determines the intention, which ultimately becomes the basis of an individual's behavior. The intention is an indicator of how strongly a person is willing to try a certain behavior or decision. The behavior is the final outcome of whether the intention is carried out or not. As a rule of thumb, the stronger the three behavior-specific factors to an individual, the stronger the intention to perform the behavior in question. In some cases, intentions do not automatically lead to the desired behavior because habits and disruptions can overrule intentions [32,44,45]. Habits include automatic and repetitive behavior, like frequently used routes and modes of transports [46], while disruptions refer to changes that interrupt the planned action, such as a system failure

2.4. The Research Framework

The research framework used in this study links Policy Deployment and TPB. The framework in Figure 1 presents processes in terms of how the set goals play a role in determining behavior (process A) and how behavior-specific factors influence set goals, which affect the intention and behavior of individual stakeholders (process B).

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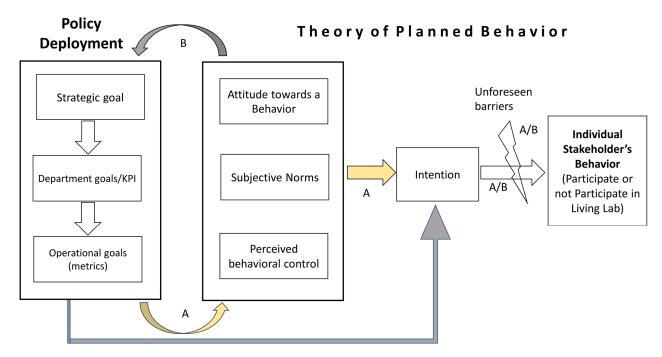


Figure 1. The theoretical framework adapted from the framework of organizational and behavioral mode choice processes as developed by Bogers (2017).

In process A (refer to the first box), the set sustainability goals of an organization are formulated at a strategic level, and are then translated to the department and operational goals. These goals can be related to zero-emissions, financial and social goals. Some of these sustainability goals can be prominent to a specific organization based on their stakeholder roles (industrial, institutional, and consumers) in city logistics. The sustainability goals influence the individual behavior-specific factors such as attitudes, beliefs, and perceived behavioral control. These factors determine the intentions that ultimately lead to behavior, which refers to the participation in the living lab of individuals at various organizational levels. In support of this process, Montani et al. [48] argue that a goal may influence the cognitive process and decision-making of an individual based on a goal regulation perspective. Individuals envision the future based on the set goals and make a plan of action to achieve the desired goals. Even though the intention to pursue a goal is present, it is also possible that the behavior of an individual is not aligned with his intention due to unforeseen barriers that include habits [32,44] or disruptions [21].

In process B (refer to the second box), the behavioral factors of an individual have an influence on how the goals are set within the various levels of organizations. As argued by Dholakia and Bagozzi [49], the set goals of an individual could also be an outcome of the pre-decisional psychological processes, such as investments in resources to obtain information, norms and beliefs, and confidence. For example, some studies have shown that the sustainability attitude and values of an individual have an influence on the sustainability goals setting of a company at both strategic and operational levels and/or individual decisions to adopt sustainable practices (e.g., [21,50,51]). Selecting a goal leads to the formation of intention, which serves as the basis of decision-making [52]. These two processes are called goal setting and goal implementation, respectively [53]. Goal setting is the process in which goals are set to maximize the realization of intentions. In general, a strong intention to pursue the goal is based on the belief that a given goal is both highly desirable and feasible [43]. While intention is merely a desired end state, the goal

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implementation is the behavior to achieve the goal. The implementation helps individuals (or companies) to close the gap between the initial goal setting and meeting the goals. In this research, we will focus on the process B in explaining the result.

3. Materials and Methods

The research design of this study is an exploratory qualitative case study design. The next section explains the case study background, followed by the case study analysis and the data collection.

3.1. Case Study Background: Heijendaal Living Lab

The Heijendaal campus hosts three organizations: a hospital, a university, and a university of applied sciences. The Heijendaal campus is characterized by sizable flows of students, patients, visitors, and employees, and supplies needed for research, treatment, and teaching to each of these organizations. This situation leads to traffic congestion and consequently to negative impacts on the environment and quality of life. In order to reduce these negative consequences, the three organizations have decided to collaborate in a long-term living lab project, with the aim to gradually learn by doing. As an initial solution for the campus, a new concept has been proposed consisting of newly established City and Campus hubs, where shipments are bundled and delivered with zero emission vehicles to the organizations.

3.1.1. Heijendaal Living Lab Stakeholders

The Heijendaal living lab follows a Triple Helix approach, in which the innovation is the outcome of a collaboration between three parties—government, private sector, and knowledge institutes. In this research, we focused on the following stakeholders in the supply chain: suppliers, City and Campus hubs, and receivers (the three Heijendaal organizations). According to the supply chain structure of the Heijendaal living lab (Figure 2), the suppliers first deliver their goods to the City hub. From the City hub, the goods are delivered either directly to the three Heijendaal organizations or to the Campus hub, which will deliver the goods to individual Heijendaal organizations.

Most suppliers are large organizations and therefore involve decision-makers at strategic, tactical, and operational levels. The same applies to the three organizations at the Heijendaal campus. At the strategic level, we find the boards of the Heijendaal organizations and the steering group of the living lab. The tactical level managers consist of mainly procurement managers. The operational level includes the employees of logistics, procurement, Information and Technology departments, campus stores, and facility goods users. The Campus hub is located within the goods reception of the academic hospital and plans have been made to use this hub for the last mile distribution to the three academic organizations. The operations at the Campus hub are under the supply chain department of the hospital, whose head is also part of the steering group committee of the living lab. The City hub is located at the periphery of the city and is used for bundling and transporting goods using zero emission transport to the campus. Unlike the Campus hub and receivers, which have approximately 4000-11,000 employees, the City hub is a small private company with few people (between 11–50). This means that its organizational process is simpler when compared to bigger supplier companies and academic organizations.

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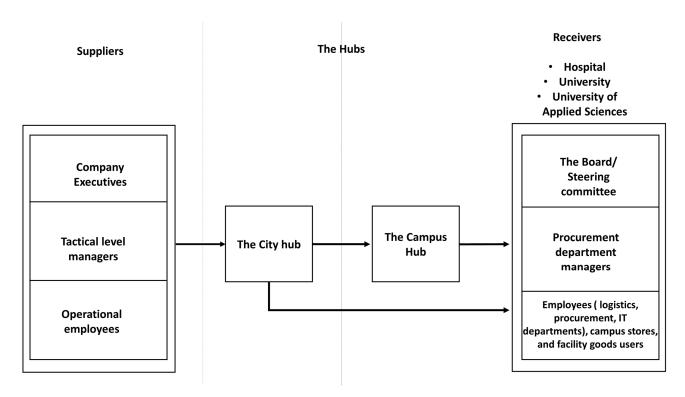


Figure 2. The supply chain structure that aims to deliver the goods to receivers in the Heijendaal living lab.

3.2. Case Analysis

The case of Heijendaal living lab is a new phenomenon, because - unlike most other last mile logistics solutions - this living lab is initiated by three large receivers. This results in a market driven (instead of subsidy driven) learning-by-doing approach. Therefore, this research follows the qualitative case study method of Yin [54], which addresses the hows and whys of a research in a contemporary event. A qualitative case study draws conclusions based on the depth and quality of information provided by the respondents, rather than the size of the samples [55]. The collection of data is guided by the analytical concepts that will help to understand the goals and behaviors of various stakeholders in Heijendaal living lab. Table 1 summarizes these analytical concepts including their definitions and how they are useful in the practical research. This case is further analyzed by iteratively cross checking and comparing theory and empirical data [54,56]. First, the results were presented using the analytical concepts. Second, the patterns, similarities and differences in terms of how the goals of each stakeholders lead (or do not lead) to participation in Heijendaal living lab were identified. And third, we compared our findings to our framework in terms of how the individual behavioral factors influence goals, which ultimately lead to actual individual behavior.

3.3. Data Collection

Multiple methods were employed in collecting data. First, a total of sixteen in-depth interviews were conducted from December 2019 to June 2020 which include the executives (six) of which three are procurement department heads, employees of the organizations in Heijendaal campus (four), suppliers (two), hubs representatives (two), municipal public servant (one), and internship student (one). To ensure the representativeness of the samples, the choice of respondents are based on three criteria, (1) knowledge of the living lab, (2) involvement in this project, and (3) their positions in the organization and supply chain of the living lab. Interviewees provided information concerning the goals of the stakeholders in the project, the behavioral factors that contribute to their choice of

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behavior in the living lab, and their current behavior. To ensure the validity of this research, the open-ended questions in the interviews were based on a set of analytical concepts and were adapted to the different groups of stakeholders (see Table 1). Cross-checking of answers for the goals of other stakeholders was done during interviews to increase the reliability of the research. Second, literature and organizational reports were reviewed to further support the identified goals of each stakeholder in the interviews. And third, observations of the situations in the campus are used to validate the findings of the interviews.

Table 1. The summary of analytical concepts and how they are applied in the case of Heijendaal Living Lab.

Analytical Concepts		Definition	Key Questions	Expected Outcome	
Goals		A goal is "a cognitive representation of a desired endpoint that impact evaluations, emotions, and behaviors" [57] Which goals do you have in mind for your organization [and/or department] and for the living lab project?		Lists of economic, social, and environmental goals of individual stakeholders	
	Attitude belief that the behavior leads to either favorable participation participation [43]		How will this project benefit your organization? What do you expect will be the outcomes of the Heijendaal living lab?	Individual feeling (positive or negative) in relation to the living lab	
Behavioral factors	Subjective norms	Refers to perceived social pressures, that are influenced by the standards set by the society on how a person should (or should not) perform the behavior [43]	How important is sustainability in your organization? What does sustainability mean to you?	Answer to whether there is an urgency to act sustainably (yes or no)?	
	Perceived behavioral control	Resources or opportunities present in performing the desired behavior [43]	Would it be feasible for your organization to participate in the Heijendaal living lab? (Why orwhy not?)	Factors that could permit	
Behavior		An act of carrying out or not, the individual action when the opportunity ap- pears [43]	Is your organization (Are you) currently participating in the Heijendaal living lab? Why or why not?	Individual decision to participate (or not) in the living lab	

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Unforeseen barriers	These are the unpredicted hurdles that hinder the execution of intended behaviors. Examples include habits, which are repeated actions, routines, or past behaviors, and disruptions, which refers to sudden changes such as system failure [47]	What are the main challenges, or bottlenecks in the Heijendaal living lab project? Do you think that the goals of your organization will be the same as the goals of other organizations? Is there an alternative solution in addition to the suggested logistics structure that could improve the sourcing (or supplying) of goods to the Heijendaal campus?	Set of constraints that overrule the intention of a stakeholder to participate in the Heijendaal living lab.
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4. Results

This section presents the results of the stakeholder analysis. The first part answers the question: What are the goals of each stakeholder in relation to the role in the supply chain and the management level within the organization? The second part answers the question: To what extent do these specified goals lead to successful participation in sustainable last mile logistics?

4.1. Stakeholder Goals

The goals of the following stakeholders are presented in Table 2: suppliers, the City and Campus hubs, and receivers in Heijendaal living lab. These goals are the performance criteria that each stakeholder finds important for participating in Heijendaal living lab. From a sustainability point of view, the stakeholder goals can be classified as environmental, economic, and social goals.

Table 2. Individual stakeholder goals in relation to the role in the supply chain and in the management level within the organization.

Stakeholders	Management Levels		Specific Goals	Sustainability Dimension	
Suppliers	Strategic		Circularity of products More efficient process Reduction of environmental footprints People's development	Environmental, Social, Economic	
Suppliers			Improved contracts with customers	Economic	
			Supply more volume Affordability of using the city hub	Economic	
The City hub Strategic - Rev - Up		Reduced environmental pollution Revenue Upscaling the operation (More umes and expanding)	Environmental, Social, Economic		
The Campus Hub	Tactical -		Efficiency in receiving of goods	Economic	
	Operational	-	Job security	Economic	
Receivers (Heijendaal Organizations)	Strategic	-	Zero emission Less accidents and improved health	Environmental, Social, Economic	

		- Centralizing purchasing behavior of	
		employees	
		- Sustainable innovations	
		- Upscaling	
_	Tactical	- Collaboration for joint tendering	Economic
	Operational	24/7 deliveryTraceability and improved delivery	Economic
		in locations	

Sources: Interviews.

4.1.1. Goals between Different Supply Chain Actors

In this section, we looked at the goals of different supply chain actors that are in different management levels and compared them with other actors. Looking at stakeholder goals of different actors such as suppliers, City hub, and Heijendaal organizations at a strategic level, all goals were focused on the overall sustainability criteria and therefore were aligned. According to one of the board members of a receiving organization, "[Our] number one goal is zero emission in the campus in 2025. There is much traffic, such as trucks, but also cars in general and bikes in this campus. People are walking all over the campus. [Our] number two goal is reducing the accidents in the campus". Both the City hub and the Heijendaal organizations aimed to improve sustainability impact by upscaling the operation of the City hub through an increase in the supplier's use of the City hub and an increase in the number of customers. For suppliers, participating in the Heijendaal living lab was a strategy to engage in sustainable operations.

Examining the goals of the supply chain actors at tactical and operational levels, the economic goals appeared to be more prominent. Some goals were aligned at a tactical level, such as the collaboration goals of tactical managers of suppliers and receivers. In a few cases, the collaboration resulted in the use of the City hub because the suppliers and receivers shared costs. There were also goals that were not aligned at an operational level. For example, the standard rate for using the City hub did not work well with some suppliers. As mentioned by one of the interviewees, "A challenge is that for every supplier, you have to find a business case". In addition, the Campus hub aimed to improve efficiency by bundling the orders and the receiving of goods for employees of Heijendaal organizations. However, a number of unnecessary priority deliveries were still made by employees, as observed in the Campus hub.

4.1.2. Goals between Management Levels of One Supply Chain Actor

In this section, we analyzed the goals within one organization by comparing the goals in two levels: strategic vs tactical and tactical vs operational. We did this for both the cases of suppliers and receivers.

Looking at the alignment of goals between strategic and tactical levels, these two levels had a different focus but were mostly aligned. For the suppliers, establishing relationships and contracts with receivers at the tactical level led to the use of the City hub, which contributed to achieving the sustainability goals of the supplier company at a strategic level. In another case, some middle-level managers of suppliers chose to join sustainable initiatives for the company, such as engaging in sustainable projects, even though sustainability is not promoted at a strategic level. For the receivers, the joint collaboration of procurement department heads is expected to generate more volume of supplies, which will enable them to demand suppliers to use the City hub in delivering goods to the Heijendaal campus. As a consequence, there would be less movement of goods at the campus and there would be more centralized ordering for the three organizations. The establishment of the Campus hub also aligned with centralizing the purchasing behavior of employees, which was also part of the strategic goals of Heijendaal organizations. By having unified

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ordering and addressing systems, the flow of orders and incoming goods can be centralized. Similar to the case of suppliers, other middle-level managers of the receiving organizations also chose to incorporate sustainable decisions in their work regardless of whether sustainability is part of the strategic goals or not.

Looking at the goals at tactical and operational levels, the goals for suppliers are aligned while the alignment for the Campus hub and receivers was still unclear. For suppliers, the collaboration established by key account managers with receivers could result in more affordable use of the City hub, which was an important indicator at the operational level. For the Campus hub, the tactical goal was to improve the efficiency of the flow of goods through combining the ordering and receiving processes of the Heijendaal organizations into one standard process. However, for employees, it was unclear whether the standardizing of the logistics process through the Campus hub could lead to fewer working hours and possible elimination of other receiving departments or a shift in their tasks. In addition, the training to comply with the standard process was perceived as additional work by employees of the university. For the receivers, employees perceived the 24/7 delivery as a form of higher service level, while the plan at both strategic and tactical levels was to bundle the purchasing of goods within the organization, which could lead to fewer ordering moments and longer lead times.

4.2. Goals and Participation in Sustainable Last Mile Logistics

This section presents the individual behavioral factors, unforeseen barriers, and the actual behavior of stakeholders in the living lab (refer to Table 3). Using these elements of the theoretical framework (refer back to Figure 1), we explain the extent to which the specified goals of stakeholders lead to successful participation in sustainable last mile logistics.

Table 3. Summary of behavioral factors, actual behaviors, and unforeseen barriers for the stakeholders of Heijendaal living.

Stakeholders	Management Levels	Individual Behavioral Factors			Unforeseen Barriers	Actual Behavior
		Attitude towards participation	Subjective norms (Urgency to act sustainably?)	Perceived behavioral control (Factors that control participation)		Participating or not participating?
Suppliers	Strategic	Positive and negative	Yes			- 6
	Tactical	Positive and negative	Yes	Nature of products, own logistics structure/departmen t		Some are participating. Majority do not participate (yet).
	Operational	Positive and negative	Yes	Costs of participation, Small volume of supplies		
The City Hub	Strategic	Positive	Yes	Volume of goods from suppliers		Participating
The Campus Hub	Tactical	Positive and negative	Yes	Differences in IT system		Participating with limited support

	Operational	Positive and negative	Yes	Job uncertainty	Lack of time	Participating with limited support
	Strategic	Positive	Yes		Lack of time	Participating
Heijendaal Organizations	Tactical	Positive	Yes		Better tender contracts with other parties	Participating
	Operational	Positive/Negative	Yes	More work Time Uncertainty	24/7 delivery culture IT system not supported	Participating with limited support

Sources: Interviews and organizational websites.

4.2.1. Individual Behavioral Factors

The attitude towards participation in the Heijendaal living lab is mixed. On the one hand, the City hub and the Heijendaal institutions at strategic and tactical levels were very positive towards the living lab, because they believed that Heijendaal living lab can bring about a sustainable impact. On the other hand, the suppliers, the campus hubs, and Heijendaal organizations at operational levels were not always positive towards the initiative. For suppliers, some had a positive attitude, especially when the living lab was aligned with the sustainability goals of the company. These were the participating suppliers in the living lab. However, most had a mixed attitude due to the perceived lack of financial benefits in the living lab. For employees of the campus hub, there was less enthusiasm due to the fear of additional work and fear of losing their job. In addition, some employees perceived uncertainty due to missing information on the planning and progress of the project. For other employees, the centralization of purchasing was seen as a bureaucratic and less flexible system.

In terms of the subjective norms, all stakeholders still found sustainability important, either on a personal or organizational level. The sustainability norms for some stakeholders were prominent and had clear effects on the goal setting in the organization. These stakeholders were also the ones who currently participated in the living lab. For instance, some suppliers at strategic and tactical levels were convinced that in order to be 'futureproof', meaning being able to adapt to all sustainability requirements in the future, it was best to include sustainability in the goals of the company as early as possible. The Green Deal in the Netherlands (see [58]), which push transport companies towards zero emission goals, was also seen as inevitable by some suppliers. Therefore these suppliers directed their operations towards sustainability. The executive of the city hub also had a strong orientation towards sustainability, both at personal and organizational levels. Similar to supplier views, the representative of the City hub mentioned: "We are stepping on an early stage of this whole zero emission future. This will be the future, let us be honest". This value or belief contributes to how the sustainability elements such as efficient bundling, track and trace systems, and zero emission delivery, were set as part of the sustainability performance of the City hub. For the executives of the Heijendaal living lab, their belief in making a sustainable Heijendaal campus was the reason why the living lab existed in the first place.

The perceived behavioral controls were also factors that limited the participation of many stakeholders in the Heijendaal living lab. For some suppliers at a tactical level, the nature of the company products could complicate the participation. For instance, some

suppliers found it difficult to combine services while at the same time storing the product at the City hub. Others found it difficult to store hardware products of high value because it would result in high storage costs. In addition, others could not participate (yet) because they had their own transport facilities and own logistics employees. Switching from having their own logistics structure to delivering their goods to a city hub could be an expensive decision.

At the operational level, some suppliers saw the high operational costs of using the City hub. For example, some suppliers supplied only limited volume to Heijendaal organizations, thus using the City hub could lead to unprofitable business cases. Other suppliers that used couriers still found the rate of their current couriers cheaper as compared to using the City hub. For the City hub, it had in general no problem with participation. However, if it continues to receive little volume from suppliers, it could encounter issues in covering its operating costs. At the operational level of the Campus hub and Heijendaal organizations, the perceived high workload of employees came from the differences in the IT systems and the ordering and receiving procedures of goods of the three Heijendaal organizations. Aligning the systems and procedures could take a lot of time in addition to the normal work of employees. The job uncertainty issue arose based on the required restructuring of the ordering and receiving procedures.

4.2.2. Unforeseen Barriers

There were also a number of unforeseen barriers such as habits and disruption factors that limited the efficient participation of currently participating stakeholders in the Heijendaal living lab. Habits include the ordering culture of employees, such as last-minute, unbundled, small order size, and next-day delivery. Disruption factors include the interruption in the participation process despite the positive intention. There were three disruption factors that were identified in the field. First was an opportunity for the procurement department to also find collaboration in sourcing goods outside the living lab. For instance, universities could join tendering processes with other universities while hospitals could also join with other hospitals, particularly if the collaboration could save costs for the organization. As a consequence, the procurement department may engage in a collaboration that is either sustainable or non-sustainable. The second was the time issue. It required time and information sharing to determine which goods were suited for joint tendering within and outside the living lab. In addition, the executive and employees lacked the time to work on the living lab. Third, the IT ordering system did not support the change in buying behavior of employees (e.g., ordering 24/7 or on priority).

5. Discussion

Using the theoretical framework in Figure 1, we reflect on how the alignment of stakeholder goals at supply chain and organizational levels, using policy deployment, can influence the success of a city logistics project. We then extend the discussion on the importance of influencing behavioral factors of TPB to encourage decision-makers to participate in sustainable last mile logistics. Finally, we discuss how to cope with the unforeseen barriers in order to lead stakeholders towards sustainable decisions.

5.1. Goal Alignment

Goal alignment in sustainable last mile logistics that involve multiple stakeholders is complex and challenging, yet it can improve the chance of success of the last mile logistics project. Literature has shown so far the isolated analysis in terms of the alignment of stakeholder goals at project [59], supply chain [11,13], and management [60] levels. The unique contribution of this research to literature is that it provides overall insights into the alignment of goals at the supply chain and organizational levels to determine stakeholders' participation in sustainable last mile logistics. In general, if the sustainability ambitions

are shared by stakeholders in the project, along the supply chain, and between the management levels, the more likely it is that they will participate in sustainable last mile logistics. Organizations that incorporate sustainability in their goals, could serve as a starting point to determine suitable partners for sustainable last mile logistics. We will discuss below how to align goals at supply chain and organizational levels, in order to achieve effective participation in sustainable last mile logistics.

5.1.1. Alignment of Goals at Supply Chain Level

Aligning stakeholder goals in sustainable last mile logistics can help to optimize individual supply chain actor's resources and can strengthen each other's position in the industry [61]. If a supply chain actor experiences goal alignment, the more likely it will see the benefits leading to participation in last mile logistics. Based on the result, supply chain actors experienced both alignment of goals (e.g., the case of the executives of Heijendaal organizations and the City hub; tactical managers of suppliers and receivers) and misalignment of goals (e.g., suppliers and the City hub; operational employees of Heijendaal organizations and the Campus hub). Supply chain actors whose goals align with other actors are currently participating in the living lab, while those whose goals do not align with other actors are limited in their participation. To align the goals within the supply chain, coordination and collaboration must be further strengthened. Information sharing as part of collaboration can help solve bottlenecks in sustainable last mile logistics [62]. For instance, knowing the information about the customers of suppliers outside the Heijendaal organizations can help to increase the volume of goods to be delivered to the City hub and can further increase the bundling of goods to consumers. For coordination, the procurement departments can demand suppliers to use the City hub by incorporating this as a standard requirement of the tendering process. Finally, intervention from the receiver could help other suppliers (e.g., sharing of costs in the use of hub) to clearly realize the benefit of participating in the living lab.

5.1.2. Alignment of Goals at Management Levels

Policy deployment has been useful in understanding how the sustainability goals of an organization are translated at different management levels. This study shows that the traditional top-down approach in translating organizational goals from strategic to operational level does not always result in the expected alignment of goals within an organization. Based on the results, on one hand, alignment of goals exists between strategic and tactical levels for both suppliers and receivers. However, the alignment of goals between the tactical and operational levels for receivers is still unclear. Due to this, the realization of the strategic goal of an organization is currently sub-optimal. On the other hand, some cases of suppliers and receivers show that the sustainable behavior of an organization exists at middle-level managers despite the lack of promoting sustainability goals at a strategic level.

In order to improve the alignment between tactical and operational goals, it may help to strengthen the role of the middle-level managers as "boundary spanners". Boundary spanners have both a high level of contact with the external environment of an organization (or department) and with the internal of an organization that they work with [63]. As boundary spanners, middle-level management serves as a hub for information and knowledge on various topics, like problem definition, project assessment, resource identification, and matters related to decision making [64]. In addition, middle-level management has an important role in integrating the strategic goals with the values, which are determined by societal, cultural, and religious experiences of employees, in the workplace [65]. This could work well in the living lab since the procurement department heads are part of the steering group committee and interact with suppliers as well as employees. The middle-level managers could be the medium in communicating plans and updates on the project at strategic and operational levels, in facilitating the interactions with the employees, and in identifying the bottlenecks at lower levels.

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5.2. Behavioral Factors

The insights of this study also conform to the literature that emphasizes the importance of influencing individual behavioral factors to help an organization set sustainability goals and engage in sustainable projects (see for example [51,66]). As seen in the results, a decision-maker who has a sustainability background or an affinity to sustainability incorporates sustainability goals and KPIs within the organization, and therefore is more likely to perform sustainable actions (e.g., participating in the living lab). As a consequence, stimulating sustainable personal norms, attitudes, and control is necessary. As shown in the studies of Sparkman and Walton [67] and She and MacDonald [68], an increase in an individual's exposure to normative and sustainability information improves the individual attitude and behavior towards sustainability. Alternatively, incorporating "green human resource practices", such as hiring someone who already has a sustainability mindset and training, especially young employees, can help an organization achieve its sustainability goals [69].

5.3. Unforeseen Barriers

Consistent with our framework in Figure 1 and the literature [45,70,71], this study has identified multiple unforeseen barriers, which mostly exist at a personal level and hinder achieving the desired behavior in sustainable last mile logistics. These include (1) habits, such as last-minute, unbundled, small order size, or next day deliveries and (2) disruption factors such as possible collaborations of procurement department outside the project, the lack of time of employees for project tasks on top of their normal job and the lack of IT system that supports employees to improve their ordering behavior. Addressing these unforeseen barriers is needed towards improved participation of stakeholders in sustainable last mile logistics. Raising awareness can play a key role in addressing habits to move towards sustainable behavior [72,73]. For example, increased awareness could be achieved by adding a function in the IT system that informs employees of the consequences of 24/7 delivery such as added costs and more CO2 emission. In this way, employees become more aware of their actions and the disruption factor related to the lack of an IT system to support sustainable behavior can also be addressed. Addressing the disruption factor related to lack of time requires the organization's support (time and financial) to allow its employees to implement change, such as making the participation in the project part of their normal work.

6. Conclusions

This study combines managerial and behavioral approaches in analyzing the goals of each stakeholder in relation to their role in the supply chain and within the organizations and the extent to which these goals lead (or do not lead) to successful participation in sustainable last mile logistics. Individual stakeholders in the living lab have economic, social, and environmental goals and some of these goals are prominent with certain groups of stakeholders. In general, some stakeholders share the same goals while others do not among supply chain actors and within the different management levels.

Based on the results, there are three main conclusions derived from this study. First, if the sustainability goals of stakeholders are aligned along the supply chain and between the management levels, the more likely the organization will participate in sustainable last mile logistics. On a supply chain level, alignment could be achieved via information sharing and collaboration, requiring the use of the City hub on a tendering process, and intervention of receivers to help suppliers. On an organizational level, middle-level managers could play an important role as boundary spanners by translating strategic goals to operational levels, by influencing cultures at lower levels, and by bringing information and insights to both lower and upper levels. Second, influencing individual behavioral factors such as attitude, norms, and control, could lead individuals and organizations to set sustainability goals and to participate in sustainable last mile logistics. Strengthening

the behavioral factors may include individual exposure to sustainability, training, and hiring personnel based on their affinity to sustainability. Third, coping with unforeseen barriers such as habits and disruption factors could improve the sustainable behavior of an individual and eventually the organization as a whole. This could be done by increasing awareness, such as by adding an IT function that will inform employees of the consequences of their buying behavior, and by making the participation in sustainable last mile logistics part of an individual's work.

The limitations of this study include the use of only one case that focuses on one country using solely qualitative analysis. For further research, the behavioral and managerial approaches done in this study can be expanded to other sustainable last mile logistics and supply chain projects in multiple areas inside and outside the Netherlands. The qualitative analysis can also be extended to quantitative research, such as measuring the effects of behavioral factors on goals, which influences intention and behavior, and determining the weights of stakeholders' criteria for participation using any Multi-Criteria Decision-Making tool. Further research may also include how TPB and Policy deployment could serve as instruments to align goals and influence decision-making in the organizations and supply chains. Others could also focus on how to overcome disruptions and habits in making decisions. Finally, as a consequence of this outcome to the living lab project, future studies could explore how to facilitate collaboration and information sharing within the living lab supply chain in order to improve the participation of various supply chain actors in the project.

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