Chapter 4

Stakeholders and Prototype Implementation
Exploring the New Mixed Farm Case

So far, the dynamics between actants during the development of prototypes of novelties are investigated (chapter 2, chapter 3, and intermezzo). This chapter looks at the interaction between actants during implementation efforts of prototypes. In chapter 2 we already identified that actors who want to implement a specific novelty can encounter public opposition. And in chapter 1 we argued that implementation efforts of novelties frequently involve controversies, even when implementation results in a more sustainable practice. Hendriks and Grin (2007) argue that system innovation studies insufficiently address the topic of conflicts in interests during the development and implementation of novelties. This chapter focuses on this understudied topic by analysing the overlaps of the discursive spheres of the innovation project participants and the stakeholder groups in the New Mixed Farm case. This way we address the questions 2.a, 2.b and 2.c that are posed in chapter 1: What do the interactions between innovation project participants and stakeholders within the broader network reveal about the relation between novelties and regimes during the phase of implementing prototypes? What can be concluded from the interactions between innovation project participants and stakeholders within the broader network about the role of the different actors within, and their influence on, the process of implementing prototypes? What do the experiences within the innovation project tell us about how to facilitate the process of implementing a prototype of a novelty?

After the introduction (section 4.1) and background information on implementing prototypes of new land use facilities (section 4.2), we will elaborate on the analytical framework that we used to study the New Mixed Farm case (section 4.3). In section 4.4 we provide an overview of the stakeholders involved in our case. We divided these involved actors into seven groups: the innovation project participants and six stakeholder groups. The interactions between the innovation project participants and each of the six stakeholder groups are described and analysed in section 4.5. In section 4.6 the analysis is taken a step further by

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10 In review (starting from section 4.1) as: Hoes, A.C and Regeer, B.J. (in review) Adoption of New Land Use Facilities in a Normative Diverse Society: exploring the New Mixed Farm case. In: Journal of Environmental Policy & Planning
comparing the six discourse fields. In section 4.7 we relate the findings of this chapter to broad questions that we pose in chapter 1.

4.1 Introduction

Numerous researchers and officials argue that we need to develop a more sustainable resource use to turn our agricultural sector into a more sustainable one. One strategy that supports this ambition is to transform our production methods in such a way that waste flows are diminished (Huber, 2000). In practice, such transformations entail the implementation of new land use facilities such as new types of farms (e.g. Agroparks), industrial facilities (e.g. fuel cells factories) and energy facilities (e.g. wind mills).

Insights from the field of planning, innovation and science & technology studies demonstrate that the implementation of new technologies (such as new land use facilities) by society does not happen straightforwardly and can entail controversy (Bijker, Hughes & Pinch, 1987). According to Schively (2007), since the 1980s planners, policy makers and innovators are increasingly confronted with dilemmas of inertia and resistance when aspiring to implement a new facility.

The aim of this chapter is to provide more insight in the dynamics of the implementing prototypes of new land use facilities by analysing the New Mixed Farm case. New Mixed Farm (NMF) is an envisioned farm that clusters a large scale pig farm (35,000 pigs), a large scale broiler farm (1,300,000 chickens), a slaughterhouse and a bio-energy power station in a more or less closed system. Although NMF provides a potentially more environmental friendly farm, implementation efforts were hampered due to public protest. But before we elaborate on the NMF case, we will introduce several relevant theoretical concepts and present our research design.

4.2 Implementing Prototypes of New Land Use Facilities

Agricultural land use facilities could, when implemented frequently, transform our production method. Thus, agricultural land use facilities may, in time, result in system innovations. System innovations entail changes in artefacts, infrastructure and even more importantly in behaviour (Bos & Grin, 2008; Geels, 2005). Geels and Schot (2007) observe that agricultural system innovation trajectories tend to follow a reconfiguration pathway. The reconfiguration pathway distinguishes three
system innovation phases. First actors co-create a concept for an alternative production method. This is traditionally done in a non-commercial environment. Second, several of these concepts are adopted by the agricultural sector to solve a local problem. In the third phase the implemented novelties lead to a cascade of technical, practical and cultural change, as such triggering transformation of the structure, shape (Dosi, 1982) and architecture of the agricultural sector (Geels and Schot, 2007).

Bos, Grin (2008) and Groot Koerkamp (2008) developed a method to co-create novelties; or in other words, they developed an approach to manage the first phase of the reconfiguration pathway. They conceptualised this method as the reflexive design approach. Reflexive design focuses on integrating divergent values into livestock concepts. As such, reflexive design builds on Constructive Technology Assessment (CTA) research (Schot & Rip, 1997). CTA indicates that early (upstream) engagement of stakeholders is a fitting strategy to develop technologies that are more in alignment with the diverse social needs and concerns. Although reflexive design practices resulted in husbandry concepts (i.e. first phase reconfiguration pathway) actual implementation of these concepts lags behind (i.e. the second phase of the reconfiguration pathway).

An explanation as to why the second phase of reconfiguration pathways is hindered is that implementation of novelties creates both opportunities and tensions (Elzen, Leeuwis & van Mierlo, 2008) for the socio-political context in which the novelty is to be embedded. To be more specific, we identified three important tensions. First, the outcomes of implementation are inherently uncertain (Meijer & Hekkert, 2007; Voß, Newig, Kastens, Monstadt, & Nölting, 2007) and can potentially create unforeseen negative side-effects (Grunwald, 2007; Beck, 1997; Hughes, 1987). Second, the cascade of change in institutional rules and behavioural routines will potentially harm the interests and desires of others (Collingridge, 1981). Third, the implementation of novelties entails high construction-, transition and trailing costs for the entrepreneurs and other adopters (Hoes, Beekman, Regeer & Bunders, 2011; Rogers, 2003). These strains clarify why efforts of change tend to run into resistance, inertia, lock-ins (everybody waiting for everybody else) or even result in a backlash.

Hendriks and Grin (2007) argue that many innovation and sustainability scholars have the tendency to regard ‘steering for sustainability’ as a rather uncontroversial act, in which relevant stakeholders such as entrepreneurs and interest groups are
willing to engage. They argue that emphasising ‘the cooperative role of stakeholders’ undermines and even neglects the struggles that arise when steering for sustainability. We recognise this observation and assume it is a result of the tendency of system innovation scholars to focus on the first phase of the reconfiguration pathway and therefore pay less attention to the struggles that emerge during implementation.

To gain further understanding in the second phase of the reconfiguration pathway of agricultural system innovation we will answer the following research question: What does the analysis of the New Mixed Farm case reveal about the dynamics and steering potentials of the implementation of prototypes of novelties? Answering this question contributes to addressing the questions that are introduced in the first paragraph of this chapter (2.a, 2.b and 2.c).

4.3 Discursive Spheres as Analytical Framework

It can be anticipated that resistance against implementation can be overcome if the innovation has meaning in the eyes, or put more adequately, in the frame of the effected stakeholders. Frames are an actor’s underlying structures of belief, perception, and appreciation. Furthermore, frames guide actors’ actions (Schon & Rein, 1994). Innovations are perceived as valuable by a specific actor if the offered change is comprehensible and sensible in the context of their frame (Grin & Graaf, 1996, Kupper 2007). Therefore we anticipate that alignment between the new land use facility and the frames of the stakeholder groups is essential to achieve implementation of prototypes. Since diverse stakeholders play a role in the implementation process of prototypes of new land use facilities, such as market actors, politicians and community members (Wüstenhagen, Wolsink & Bürer, 2007), it can be expected that multiple alignment between the new land use facility and the frames of the diverse stakeholder groups is needed to achieve social acceptance and implementation of prototypes.

To gain more insight in the dynamics of multiple alignment we apply Hendriks and Grin’s (2007) framework to study “the interfaces where different discursive spheres overlap” (ibid., p.338). They propose an unit of analysis that focuses on the overlap between the inner-project and its broader socio-political context. They want to counteract the tendency of innovation researchers to primarily study the inner-project and thereby downplaying the diverse and dynamic socio-political landscape in which system innovations are embedded.

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In this chapter we will study the overlaps and interactions between the inner-project and the relevant stakeholder groups within the New Mixed Farm case to shed new light on the work involved when governing for the implementation of prototypes of new land use facilities.

We specify the relevant stakeholders for this chapter as those actors that actively discuss the desirability of NMF in formal and informal platforms such as meetings, public debates, media and in interaction with inner-project participants. Some stakeholders are not taken into account as they did not actively discuss the desirability of NMF which makes it impossible to analyse discursive sphere of the overlap with the inner-project. These stakeholders include the Dutch Federation of Agricultural and Horticultural Organisations (in Dutch: 'LTO-Nederland'), advisory body of the municipality (in Dutch: ‘Dorpsraad’), milieufederatie, Dutch Fruit and Vegetable Auction Company (in Dutch: ‘Veiling Zuidoost-Nederland, ZON’) and platform Agrologitiek. Furthermore, the relation between the participating researchers, inner-project and entrepreneurs in not explored in-depts as this has already been analysed in another article (Hoes, Regeer & Bunders, 2008, chapter 3 of this thesis).

Data collection

From March 2006 until December 2008, the author of this thesis investigated the NMF case using the Interactive Action and Learning (ILA) monitoring approach (Regeer, Hoes, Amstel-Van Saane, Caron-Flinterman & Bunders, 2009). Since our evaluation approach is in line with ethnographic and grounded theory principles (ibid.) much effort was put in collecting a rich body of empirical data. As such, over thirty interviews were conducted with key stakeholders in the network. Furthermore, over fifteen project meetings and 4 public debates were attended.

In addition to this ethnographic approach, (policy) reports, internet forums (i.e. www.nieuwgemengdbedrijf.nl, www.behouddeparel.nl) and secondary analyses on the NMF case (i.e. Horlings & Hinssen, 2010; Smeets, 2009; Termeer, Breeman, Lieshout & Pot, 2009) were analysed. Feedback on our preliminary analysis was provided during three interactive sessions with inner-project participants and other stakeholders.
4.4 Introducing the New Mixed Farm Case

Smeets (2009) and Termeer, Pot, Breeman and Lieshout (2009) conceptualise New Mixed Farm (NMF) as an Agropark. The rational behind the Agropark concept is, that by clustering different types of farms with processing companies a more effective system can be created in which waste flows can be recycled, transport can be reduced and new market opportunities can be explored (Smeets, 2009). According to Grin and Staveren (2007) the Agropark concept initially appeared in 1998 in a report of the Dutch Council of Agricultural Research [NRLO]. In this report 22 innovative projects ideas are formulated; the ‘agricultural production parks’ is one of these ideas (Engelbart & de Wilt, 1998). NRLO put forward the Agropark concept to InnovationNetwork, who “develop radical new concepts in agriculture and ensures that these are put into practice” (website InnovatieNetwerk).

In 2000, researchers at Alterra Wageningen UR and Applied Plant Research Wageningen UR executed several activities that further developed the Agropark concept. During the same period of time, the idea for ‘New Mixed Farm’ appears. We already noted that it is difficult, and maybe even undoable, to specify the origin of a specific novelty. From diverse documentation we understand that in 2000 researchers of Applied Plant Research worked on the development of an Agro-Eco Park vision in the region southeast of the Netherlands (Limburg) (Praktijkonderzoek Plant & Omgeving, 2001; van Weel, 2003). And in 2000 researchers of Alterra facilitated a region dialogue meeting about the future direction of Limburg: the idea to develop an Agropark also appears in the report of this region dialogue (van Mansfeld, Pleijte, Jonge, Smit, 2003). This ambition was adopted by KnowHouse, a local intermediary organisation that mediates between entrepreneurs and research institutes.

In 2004, the national agricultural innovation programme TransForum gave financial support to KnowHouse to carry out an Agropark project in the municipality of Horst aan de Maas. The project was named New Mixed Farm (see text box 4.1 for clarification of this name). We specify KnowHouse as the inner-project participant in 2003 as they were accountable for the NMF design and implementation. For clarification, at the time of writing this chapter (2010) we consider the participating entrepreneurs to be the inner-project participants. However, since they were not engaged with NMF in 2003 we regard the entrepreneurs, in the context of this chapter, as a stakeholder group.
**Text Box 4.1: Dutch metaphor of New Mixed Farm**

The name New Mixed Farm was coined to refer to the recycling character of Agroparks. In Dutch the term 'Gemengd Bedrijf' (Mixed Farm) refers to a traditional farming approach in which both crops and livestock are produced. The manure of the livestock is used as fertilizer for the crops that are again fed to the livestock, thus creating a recycling system. In the 19th century ‘gemengde bedrijven’ were common in the Netherlands. Nowadays this farming approach is negligible in Western countries and mainly takes place in developing countries. The word New was placed before Mixed Farm to indicate a modern, innovative and highly technical farm.

**Introducing the stakeholder groups: from 2003 until 2008**

In 2004, market actors and the Ministry of Agriculture Nature and Food Quality (Ministerie van Landbouw, Natuur en Voedselkwaliteit) were introduced to the NMF concept. KnowHouse used their network of politicians and civil servants to lobby for support. Furthermore, they contacted various farmers and other entrepreneurs with the request to join the venture. Initially farmers of four different agricultural disciplines participated: a pig farmer, a poultry farmer, a mushroom grower and a greenhouse grower. Two farmers (pig framers and poultry farmer) and the director of a processing company decided to continue. In 2006, a third farmer (pig) decided to participate.

In March 2005, the involvement of the municipality of Horst aan de Maas became more active when KnowHouse initiated a task force. The role of the task force was to streamline the needed permit procedures, in particular to overcome bureaucratic hurdles. Civil servants from different departments on national, regional and local level participated in the task force. Six months later (September 2005), prominent politicians and officials (such as an alderman of the municipality) became more actively involved with the NMF project as they participated in the project’s steering committee. The steering committee was initiated by KnowHouse and functioned as the project’s council.

In November 2005, direct neighbours of the intended (NMF) site (mostly farmers) were informed face-to-face about the intentions to develop NMF during ‘round the kitchen table’ meetings that were initiated by the project coordinator (Knowhouse). A year later, November 2006, residents that lived further away from the intended sitting place were informed during a formal information meeting.
A few months later additional actor groups, such as the NGO Mileudefensie [Friends of the Earth Netherlands] entered the debate by discussing their point of view in the (mostly local) media. In September 2007 a local agricultural workgroup of the political party Socialistische Partij [Socialist Party] organised a debate meeting about NMF. More than 300 people showed up for this meeting including community members, representatives of the city council, aldermen, policy officials of the Ministry of Agriculture, representatives of the Party for the Animals, and of Friends of the Earth Netherlands. Another important party that introduced itself during this meeting was the new local action group Behoud de Parel (Save the Area Pearl). Figure 4.1 shows a chronology of the diverse actors and actor groups that participated in the debate about the desirability of NMF.

![Figure 4.1: Time-line that visualises which actor groups entered the debate about desirability of New Mixed Farm.](image)

### 4.5 Overlap New Mixed Farm with Frames Stakeholders

From our description of the chronology of involved stakeholder groups we selected the following six overlaps as most relevant to investigate (see figure 4.1):
the inner-project and the (I) Ministry of Agriculture, (II) entrepreneurs, (III) municipality, (IV) community members, (V) the city council and (VI) NGOs.

In this section we will further investigate the overlaps between the frames of the stakeholder groups and the inner-project (figure 4.1). For each of the six overlaps we will briefly introduce the frame of the stakeholder (group)s, elaborate on how they perceive New Mixed Farm (NMF) and which interactions took place between the inner-project and the regarding stakeholder group. We will analyse these discursive spheres to answer the following question: Which types of alignment strategies can we distinguish within the overlaps of the inner-project and the six stakeholder group?

Figure 4.2: Representation of six overlaps between inner-project and stakeholder groups.
Chapter 4

(I) Overlap with Ministry of Agriculture: New Mixed Farm as Policy Proposal

In the late 20th century, the Ministry of Agriculture perceived complex environmental problems within the Dutch husbandry sector such as a manure surplus, a high risk of epidemic of animal diseases and a hindrance for nature development. After the massive swine fever epidemic in 1997, a drastic policy instrument was applied: the reconstruction policy (LNV & VROM, 2002). The reconstruction policy states that farms located near nature and towns were not allowed to expand. The so-called agricultural development sites [Landbouw Ontwikkeling Gebied] were areas where farms were allowed to grow.

The Ministry of Agriculture reacted positively towards the intentions to develop NMF. Especially the processing of manure into energy was perceived as highly beneficial as it provided a potential solution for the manure surplus. In addition, NMF adhered to several governmental policies such as the reconstruction policy and the covenant ‘clean and sparing agro sector’ (in Dutch: ‘Schone en zuinige agrosectoren’)(LNV, 2008). The reconstruction policy was met since the realisation of NMF would result in the dismantling of seven farms within the restricted area’s (the participating farmers had multiple farms that were located near nature and town centres). ‘Schoon en Zuinige Agrosectoren’ is a covenant to produce more sustainable energy. A member of staff of the Ministry stated: “Well, NMF is a good initiative as it contributes to achieving our sustainable energy deliverables. It fits perfectly in the ‘Schoon en Zuinig’ agreement.”

The approval by the Dutch government manifested when the Minister of Agriculture stated (in October 2004) that NMF should be granted a special innovative status to provide conditions in which implementation efforts of NMF would be less hampered by procedural hurdles.

In September 2005, a member of staff of the Ministry of Agriculture joined the steering committee that KnowHouse had initiated. During an interview that was carried out in the context of this research, he signified that: “We want a more sustainable husbandry sector. Therefore we need initiatives such as NMF that take a first step in the direction of a more sustainable sector.”

In 2007, the Ministry’s representative of the steering committee indicated that the enthusiasm about the project NMF was declining within the Ministry. This was partly because the degree of innovativeness of NMF was questioned by several
employees of the Ministry since the technical components of NMF were already used elsewhere. In addition, the public and parliament were pressuring the Ministry to put animal welfare higher on the political agenda (de Rooij, de Lauwere, van der Ploeg, 2010). In 2006 the “Partij voor de Dieren” [Party for the Animals], a fierce opponent of the bio-industry, became a representative in the Dutch parliament. The member of staff of the Ministry elaborated that: “Four years ago, when this project initiated, animal welfare was not considered an important political issue. However, now we prefer efforts towards animal welfare.”

When the inner-project took notice of the critical questions that were raised by members of the Ministry of Agriculture, the project coordinators and entrepreneurs arranged a meeting at the Ministry. Here they presented and discussed their initiative.

To raise the animal welfare impact of the NMF design, the pig farmers decided not to castrate the pigs anymore, which is a common practice in the pig husbandry sector to prevent boars taint. A small minority of male pigs has boars taint: a phenomenon that an odour becomes evident during the cooking of the meat. New practices, such as a ‘burn test’ after butchery, make castration redundant. Castration is still common practice as it is a requirement for pig meat export.

Alignment Strategies

When considering how the Ministry of Agriculture framed the NMF proposal it becomes apparent that they linked the proposal to in force policies (e.g. reconstruction policy) and perceived problems (e.g. manure surplus). The practice that proposals are actively linked by lobbyist to policies, perceived problems and political hypes has been conceptualised by Kingdon (1984). In his study on the dynamics of agenda setting, he portrays that within the political domain numerous proposals are in competition with each other for achieving attention, appreciation and support from officials (ibid.). He argues that whether or not a proposal, such as a new land use facility, catches hold depends on the capability to couple it to identified problems, policy and/or articulated political ideas. Through the practice of coupling, a window of opportunity to enhance the acceptance of the proposal is created. Kingdon demonstrates his argument with a case in which a proposal for an urban mass transit was re-framed three times by the designers to align it with the new political trend that were articulated by the officials of the municipality.
The urban mass transit was successively framed as (a) a traffic management tool, (b) a way to reduce polluting cars and (c) a way to reduce energy dependency.

We recognise the practice of the coupling of proposals (in our case NMF) to in force policies, problems and political trends as an alignment strategy (see table 4.1, AS1). We consider alignment strategies as interventions to increase the alignment between the innovative concept and adopters, or in other words, interventions to broaden the overlap between the inner-project and stakeholders.

Another action that the inner-project took to increase alignment was involving a member of staff of the Ministry of Agriculture by inviting him for the steering committee of NMF. We label this kind of alignment strategy as recruiting hybrid actors and organising hybrid forums (AS2). Elzen, Leeuwis and van Mierlo (2008) coined the term hybrid actor to indicate actors who can be considered as both insiders and outsiders: “‘hybrid actors’ and ‘hybrid forums’ play a crucial role in bringing about forms of anchorage” (2008, p.3). Hybrid forum are platform in which insiders, outsiders and hybrid actors interactively discuss the innovation (Hendriks & Grin, 2007).

Another action to enhance alignment that we recognise so far is the adjustment that was made to the NMF concept. We specify such an alignment strategy as adjusting the design (AS3). By articulating the intention not to castrate pigs in the NMF, the entrepreneurs de-scripted an undesirable feature from the design. In table 4.1 we list the diverse types of alignment strategies that were taken to enhance the alignment between the frames of the Ministry of Agriculture and the NMF concept.

Table 4.1: Overview of alignment strategies in Ministry of Agriculture overlap.

<table>
<thead>
<tr>
<th>Alignment strategies</th>
<th>Actions in overlap with Ministry of Agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS1</td>
<td>Coupling the concept to problems, policies and/or politics.</td>
</tr>
<tr>
<td>AS2</td>
<td>Recruiting hybrid actors and organising hybrid forums</td>
</tr>
<tr>
<td>AS3</td>
<td>Adjusting the design</td>
</tr>
</tbody>
</table>
(II) Overlap with Entrepreneurs: New Mixed Farm as Enterprise

There is an ongoing trend within the Dutch agricultural sector that the number of farms is declining and at the same time continuing farms are scaling-up (LEI & CBS, 2011). During the start-up of the NMF project (end 2003), the project coordinator (who is an employee of KnowHouse) contacted farmers and other entrepreneurs. They were offered to join the venture to develop an Agropark together. Four farmers (of husbandry and horticulture) and a director of a processing company decided to investigate the opportunity further (March 2004).

Although these participating entrepreneurs were enthusiastic about the concept of Agroparks, they were also rather sceptical with regard to its feasibility. To tackle this uncertainty, a feasibility study for an Agropark on the basis of the engaged businesses was executed. The study indicated that NMF was achievable and commercially interesting. Despite this positive result, two farmers stepped out of the project (Smeets, 2009). The financial situation of the mushroom grower made new business investments for him impossible. The glasshouse grower saw cooperation with the husbandry sector as problematic due to its poor public image. As such, three entrepreneurs, a pig farmer, a poultry farmer and director of a processing company decided to continue.

When assessing the incentives of the three entrepreneurs that persisted, we see that the continuing entrepreneurs were in a business situation in which a venture such as NMF was beneficial. The two continuing farmers (pig and poultry) indicated that they were not allowed to expand their current farms, due to the reconstruction policy. This policy restricts expansion of farms that are located near nature and towns. Therefore, these farmers already had the intention to move their business. The poultry farmer illustrated: "At the moment me and my brothers have four farms that are located near nature areas. When NMF is realised we can dismantle these farms." In addition, NMF seemed more beneficial than developing a 'traditional' intensive husbandry farm. For example, processing the manure into energy was extra beneficial for the pig farmer since it provided regularity benefits: pig farmers who do not discharge manure get fiscal benefits. The third entrepreneur, who had a processing company, was interested in the development of an agricultural bio-energy plant, as he expected a growth in demand for these installations. By joining NMF, they had the opportunity to develop expertise in this field, and as such entering a new market.
In addition, for the poultry farmer, NMF was in sync with his beliefs of good agriculture. He had already sketched a clustered poultry farm in 2002 that incorporates the entire poultry production chain: from hatching until slaughtering. This farm design tackles many unsustainable issues within the poultry sector such as animal transport; a main welfare concern. In his perspective, clustering with other farms would create a more sustainable system. He stated in 2007: “Through our collaboration we create a scale that makes it affordable to incorporate a bio-power plant that provides sustainable energy, bio-filters to reduce emissions, and a slaughterhouse to deduct life animal transport.” In short, participating in NMF would make his farm design more clustered, more sustainable and more innovative. He perceived these qualities as highly valuable.

However, NMF was not in all aspects attuned with the frames of the participating businesses. For example, independence is an important principle for farmers. Schoon and Grotenhuis (2000) already noted that cooperation efforts between farmers are hindered if the cooperation entails giving up some degree of independence. In addition, the processing company was rather hesitant to participate as it was not their core business. Traditionally it is not their role to join a business venture. Their job had always been to supply technical installations for agricultural businesses.

In 2005 the entrepreneurs and KnowHouse undertook an agro-business trip to China. According to the entrepreneurs their enthusiasm for the NMF concept and their mutual trust grew during this trip. After the business trip, the initial NMF proposal was altered to create a design that aligns more to the needs, desires and values of the entrepreneurs. The project coordinator (employee KnowHouse) used the format of a business plan to facilitate the articulation of ideas and values and to streamlining these into a joined vision (Hoes, Regeer & Bunders, 2008). As such, awareness raised on the discrepancy between the policy rational that had influenced the NMF proposal and the agricultural business frame of the participation entrepreneurs. New design criteria were formulated to overcome these inconsistencies. Two important design criteria were that dependency between the participating farms had to be minimised (i.e. loose connection of elements) and that each technical component had to be applied previously in other businesses (to reduce risk). In addition, agreements were made to legally bind their relation. Simultaneously a local pig farmer joined NMF; making the total number of participating entrepreneurs four.
Alignment Strategies

To enhance alignment between the NMF concept and the frame of the entrepreneurial stakeholders, we see again that the NMF concept was coupled to perceived problems (e.g., farms were not allowed to expand), policies (tax benefit) and politics (Biofuels trend). In addition, again hybrid actors were recruited (in this instance multiple entrepreneurs) and hybrid forums were organised (e.g., business trip to China). However, these alignment strategies were insufficient to achieve adoption by the entrepreneurs. To explain this phenomenon we investigate Roger’s study on the diffusion of innovation.

Rogers (2003) states that among others, entrepreneurs are more eager to adopt when they consider the innovation to be beneficial, low in complexity and compatible with their values, practices, past experiences and needs (in other words aligns to their frame). Benefits for entrepreneurs include: an increase in profit, an increase in status, a decrease in discomfort, a saving in time and effort, and a preventative measurement towards unwanted future events.

Novelties are less easily adopted by entrepreneurs when they perceive the innovation as complex (Rogers, 2003) as it creates uncertainty about the functioning of the novelty which makes implementation rather risky. The entrepreneurs considered NMF as rather high in complexity. By executing a feasibility study, the risks, costs and benefits of the NMF concept were made tangible and as such lowering the uncertainty. We conceptualise the action of the feasibility study as the alignment strategy; lowering uncertainty by testing the validity of the concept.

The above description indicates that the NMF concept was not attuned in all aspect to the values, practices, past experiences and needs (Rogers, 2003) of the entrepreneurs; which lowers implementation aspirations. The implementation of NMF would entail collaboration and mutual dependency between the entrepreneurs. This is in disagreement with the independent working tradition that farmers highly value. By adjusting the NMF concept, mutual dependencies, and other incompatible features such as high uncertainty, were lowered. First of all the actual design was adjusted (AS4).

Furthermore not only technical changes were made but also procedural, relational and perceptual. Contracts were made to legally bind agreements concerning for
example what to do if one of the farmers wanted to retire. We name this alignment strategy as *adding agreements* (AS7). A third applied alignment strategy to adjust the concept was *adding design criteria* (AS6). Last adjustments were made on how NMF was perceived by *adding frames* (AS8), in this case a business plan that frames NMF as an enterprise.

In the entrepreneurs overlap we identify three additional types of alignment strategies. Table 4.2 summarises the alignment strategies that were taken in the overlap between the inner-project and the entrepreneurs.

Table 4.2: Overview of alignment strategies in entrepreneurs overlap.

<table>
<thead>
<tr>
<th>Alignment strategies</th>
<th>Actions in overlap with entrepreneurs</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS1</td>
<td>Couple NMF to problem that farms are not allowed to expand when located near nature or towns. Couple NMF to policy of tax benefit. Couple NMF to trend of farmers as sustainable energy producers.</td>
</tr>
<tr>
<td>AS2</td>
<td>Engaging entrepreneurs to implement NMF. Developing relation between entrepreneurs through a business trip to China.</td>
</tr>
<tr>
<td>AS3</td>
<td>Diverse technical changes made to NMF design.</td>
</tr>
<tr>
<td>AS4</td>
<td>Executing a feasibility study on NMF design.</td>
</tr>
<tr>
<td>AS5</td>
<td>Each technical element had to be applied priory. Loose connection of elements.</td>
</tr>
<tr>
<td>AS6</td>
<td>Decide on and document the degree of collaboration and independence in business plan.</td>
</tr>
<tr>
<td>AS7</td>
<td>Frame NMF in business enterprise format.</td>
</tr>
</tbody>
</table>

(III) Overlap with Municipality: New Mixed Farm as Agricultural Development Site

During the beginning of the twenties century several Agro and Food enterprises were expanding or settling within the municipality of Horst aan de Maas. For example, a large scale glasshouse initiative was build, the flower and food auction was expanding and the appointed Agricultural Development Site had to be arranged.

In 2004, the project coordinator (KnowHouse) contacted the municipality to engage them in the design process. Initially, the municipality reacted rather
indifferent to the plans. A civil servant indicated: “Come and talk with us again when the plans are more concrete.” The municipality did propose the following prerequisite: to relocate the NMF site to the Agricultural Development Site. The project complied with this request and relocated the intended farm site.

Permits were needed to implement the NMF concept. Before these permits could be requested an environmental impact assessment (in Dutch: ‘Mileueffectrapportage, MER’) had to be completed. During the environmental impact assessment the inner-project identified that the NMF concept did not fit well to in-force legislation. For example, NMF involves multiple farms; therefore the official odour border, which prohibits future construction, had to be multiplied. However, in practice the odour border is not doubled when two farms are situated on one location. Another example is that the entrepreneurs wanted to use a new improved biological air-filter that was not yet formally acknowledged as a certified airlifter. Therefore they were not allowed to take into account its air-filtering effect in the calculated emissions which had to be presented in the environmental impact assessment (Mileueffecten-rapportage, MER).

From 2005 onward the engagement of the municipality of Horst aan de Maas increased as civil servants participated in the task force and an alderman with the portfolio of agribusiness joined the steering committee. The alderman (who was a member of the Christian Democratic Party CDA) indicated during an interview that he found NMF a desirable initiative as “it would stimulate the agribusiness in the area”. He saw NMF as a showcase for which: “People from all over the world will come to see NMF and will reflect on the question of the future direction of food production”. In 2007 the Alderman stepped out of the steering committee because some residents had questioned his involvement in the NMF project and how this effected his impartial position.

KnowHouse initiated a task force in which civil servants from different departments on national, regional and local level participated. The role of the task force was to streamline the needed permit procedures, in particular to overcome bureaucratic hurdles.

In 2006, the municipality developed plans for the Agricultural Development Site. Since NMF had already articulated the intention to relocate to this site, these initiatives communicated with each other to fine tune and synchronise each other’s design.
Alignment strategies

In the third overlap we observe again similar alignment strategies as with the ministry and entrepreneur overlap. In the municipally overlap, the NMF concept was coupled to the Agricultural Development Site which the municipality had to develop. Again hybrid actors were recruited (e.g. Alderman) and a hybrid forum (AS2) was organised (e.g. task force). Also the validity of the assumed environmental benefits was tested (AS4) through an environmental impact assessment. Furthermore design criteria (AS5) were formulated by the municipality such as the planned location of NMF. The environmental impact assessment can at the same time be viewed as an agreement between the project participants and the municipality, since the entrepreneurs were bound to deliver the design that was outlined in the environmental impact assessment. In addition, a new frame was added (AS7) as the task force conceptualised NMF in legal terms to align it with in-force legislation.

Table 4.3: Overview of alignment strategies in municipality overlap.

<table>
<thead>
<tr>
<th>Alignment strategies</th>
<th>Actions in overlap with municipality</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS1 Coupling the concept to problems, policies and/or politics.</td>
<td>Couple NMF to Agricultural Development Site.</td>
</tr>
<tr>
<td>AS2 Recruiting hybrid actors and organising hybrid forums</td>
<td>Engaging alderman steering committee. Engaging civil servants through task force.</td>
</tr>
<tr>
<td>AS3 Adjusting the design</td>
<td></td>
</tr>
<tr>
<td>AS4 Lowering uncertainty by testing the validity of concept</td>
<td>Executing an environmental impact assessment.</td>
</tr>
<tr>
<td>AS5 Adding design criteria</td>
<td>Relocate farm to Agricultural Development Site.</td>
</tr>
<tr>
<td>AS6 Adding agreements</td>
<td>Environmental impact assessment.</td>
</tr>
<tr>
<td>AS7 Adding frames</td>
<td>Task force conceptualised NMF in legal terms to align with official permit format.</td>
</tr>
</tbody>
</table>

(IV) Overlap with Local Community: New Mixed Farm as Locally Unwanted Land Use

From a Dutch perspective, the area of Horst aan de Maas is relatively rural and sparsely populated. In this jurisdiction 28,500 residents life distributed over ten towns. The largest (Horst) is populated by 12,000 inhabitants.
According to the project coordinator, direct neighbours initially reacted rather indifferent to the intentions to develop NMF. Most neighbours said in 2005 during individual round the kitchen table meetings with the inner-project: “You should talk to us when you know more precisely what the implications for us are”. Most of the imminent neighbours of NMF are farmers themselves. During the round the kitchen table meetings several potential grounds for conflicts and business opportunities were indentified. For example, one neighbour had a tree plantation and therefore did not want shade on his land. The inner-project formulated new design criteria: the vegetation and building of NMF should not create shadow on the plantation of the neighbour.

In November 2006, around 125 resident of nearby towns were informed during a formal information meeting that was organised by the province of Limburg. The information meeting is a required participatory procedure to gain legal approval for the construction of large infrastructural developments. Before the meeting, a landscape architect was employed by KnowHouse to create sketches of the NMF building that fit into the surrounding environment. Figure 4.3 is a sketch of these architectural plans.

![Figure 4.3: Architectural illustration of proposed New Mixed Farm landscape design (Trzin, 2006).](image)

During the information meeting, several residents reacted rather cynical to the NMF proposal. One speaker stated: “I see that you tried to make the farm visually attractive but for me it is a meat factory”. Another resident expressed that she worried for the safety of her kids because of the increase in amount of trucks. Her kids have to use the same roads as the truck when they bike to school. An entrepreneur reacted to this by stating: “I share this concern as my kids also need
to bike those roads. I am committed to collectively develop a fitting solution for this problem”. Also long term impacts were discussed. A neighbour questioned for example: “If your company is successful, will you expand? And what implications will this have for the surroundings?” Additionally, concerns about risks were put on the table. For example, one citizen questioned whether the biogas that would be manufactured could cause a hazardous explosion. Also the fear for an outbreak of animal diseases was expressed. In sum, the community members indicated that they expected that NMF would burden the community with an increase in fine dust, traffic, and infrastructure. This would pollute the environment and harm specific features of the area such as tranquillity and open landscape. In the following months opposition grew. From the autumn of 2006 until the summer of 2008 over seventy articles appear in the printed media that discuss the topic of the (un)desirability of NMF. In addition, articles appeared that discuss the (un)desirability of Agroparks in general.

The community resistance peaked when a local general practitioner questioned the health effects of the emitted fine dust particles of NMF in a local newspaper. She referred to a report from the GGD (Municipal Health Services) in which she read that people who live nearby (up to three kilometres) husbandry farms can become ill. The local action group ‘Save the Area Pearl’ (in Dutch: ‘Behoud de Parel’) also erected. During their campaign they made and distributed the following poster (figure 4.4) that portrays kids playing outside with air masks on.

Figure 4.4: Campaign poster of Save the Area Pearl. [The text states: It is so nice to play outside in our municipality!]
In 2008 a representative of Behoud de Parel articulated during an interview that the cooperation between the municipality and NMF annoyed him. He considered the relationship as an old boy’s network, a classical recipe for unfair power play.

A sticking phenomenon is that the forcefulness of opposition differentiated per town. In Grubbenvorst (7,500 residents) resistance was leading, while in Horst opposition was less noticeable, even though both towns are located around 3 km from NMF. An explanation might be that Grubbenvorst was surrounded by other (industrial and infrastructural) developments.

After the information meeting in 2006, the project coordinator stated that she learned that the inner-project had not put enough effort in making the consequences for the community members explicit and concrete. Now, the project coordinator wanted to develop a closer relation with the residents of nearby towns. In the spring of 2007, approximately thirty community members joined an organised excursion in which they visited the operational farms (i.e. Stales) of the participating farmers and discussed the concerns and needs of residents. In October 2007 the project coordinator initiated committees of residents to open-up a deeper dialogue and to identify and tackle local concerns. Fifty families that lived nearby the agricultural development site were invited to participate in committees that would investigate the following five topics: (1) the increase of transport, (2) whether the expected effect of the air washers can be guaranteed, (3) the decrease in value of their houses and (4) of the landscape, and (5) the impact on air odour and quality. Sixty residents turned up for the introduction meeting. In the following months the community committees investigated several opportunities such as the possibility to improve local infrastructure and to cultivate air filtering vegetation. In addition the community committees tried to make the impacts of NMF explicit. For example, the project coordinator organised that several community members could visit an operational farm that has a similar air filter as NMF concept, to be able to experience the odour that NMF would most likely emit.

Alignment strategies

In contradiction to the overlaps with the Ministry, Entrepreneurs and Municipality, in the community members overlap we do not see a coupling between the NMF concept and perceived problems, policies or politics of the community members’ frame. To illustrate, when the inner-project presented their ‘master plan’ to the
community members (November 2006), initially little emphasis was put on the expected impacts for community members. The kick-off presentation explained the overall concept of NMF and paid little attention to local concerns and needs (Smeets, 2009). This observation can be considered rather surprising when one takes into account that the alignment strategies of coupling the concept to problems, policies and/or politics was rather successful in other cases.

The first action for alignment with community members were round the kitchen table meetings with neighbours. Conversations during these hybrid forums resulted in the formulation of new design criteria such as: NMF should not shadow a neighbouring plantation. The recruiting of hybrid actors and the organising of hybrid forums for residents that were not direct neighbours started rather late, namely in 2007 (after the information meeting). Collingridge (1981) argues that designers and planners are posed with a dilemma of when to involve stakeholders. Early engagement provides high steering potentials but low willingness of potential stakeholders groups to participate while late engagement entails limits to the steering potentials but entails a high eagerness of stakeholders to participate. The excursion to farms and the community committees were considered as successful interventions by the inner-project. However, one needs to take into account that only a minority of the community members participate in these hybrid forums as fierce opponents were not appealed to participate.

Schively’s review study (2007) on locally unwanted land uses (LULU) points out that community members are more willing to adopt a new land use facilities if they can identify with and trust the inner-project actors. For example, studies have shown that facilities are more easily accepted if actors from within the community construct them then when actors from outside the area construct them (ibid.). We recognise this phenomenon, for example some residents said they felt burdened with the chickens from another region.

To increase alignment, again adjustments were made to the NMF design. In 2006 an architectural design of the landscape and buildings was constructed. In 2007 and 2008 adjustments were made to this architectural design after feedback from civil servants and residents of the municipality. For example, air-filtering vegetation were included in the landscape design.

Uncertainty of the impact of NMF was again lowered by validating the concept. However, community members test the validity differently than officials. Our case
illustrates that the official data on emitted odour that were provided in the environmental impact assessment were insufficient to make the odour impact explicit for residents. By visiting and experiencing (i.e. Smelling) a farm with similar air filters, residents could make the expected odour impact of NMF tangible.

We want to note that the opposition of direct neighbours can be considered low in comparison to several other residents that lived further away from the new land use facility. This is rather surprising when one considers that the direct neighbours will be most affected by the new land use facility. A hypothesis could be that the round the kitchen table meetings were a successful approach to intercept potential opposition. Another explanation could be that most direct neighbours can be considered bi-cultural as they are also farmers themselves. They can therefore be positioned in the overlap of the community members and entrepreneurs.

Table 4.4: Overview of alignment strategies in local community overlap.

<table>
<thead>
<tr>
<th>Alignment strategies</th>
<th>Actions in overlap with community members</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS1 Coupling the concept to problems, policies and/or politics.</td>
<td></td>
</tr>
<tr>
<td>AS2 Recruiting hybrid actors and organising hybrid forums</td>
<td>Engaging direct neighbours through round the kitchen table meetings. Engaging residents through farm excursion. Engaging residents through community committees.</td>
</tr>
<tr>
<td>AS3 Adjusting the design</td>
<td>Architectural design of landscape and building. Air-filtering vegetation.</td>
</tr>
<tr>
<td>AS4 Lowering uncertainty by testing the validity of concept</td>
<td>By experiencing operational farm with similar air filter.</td>
</tr>
<tr>
<td>AS5 Adding design criteria</td>
<td>No shade on plantation of neighbour.</td>
</tr>
<tr>
<td>AS6 Adding agreements</td>
<td></td>
</tr>
<tr>
<td>AS7 Adding frames</td>
<td>Frame NMF in landscape format.</td>
</tr>
</tbody>
</table>

(V) Overlap with city council: New Mixed Farm as (Un)Sustainable Farming

In 2007, the city council of Horst aan de Maas consisted of 21 members of four political parties. To be more specific, the Christian-democratic party CDA had 9 chairs, the liberal party VVD 2 chairs, and the socialist parties PvdA and SP both
had 5 chairs. In 2008 the city council had to decide on the approval of the plans for the Agricultural Development Site. The criteria’s that were formulated in the plans fitted the NMF concept. Approval of the plans would pave the way for the permit procedure of NMF.

The city council was highly divided about the question whether or not NMF was desirable. The christian-democratic party CDA and the liberal party VVD were in favour. Traditionally the CDA is considered to be a party that support agricultural interests and the VVD a party that supports business. The Socialist Party was against NMF. During an interview a party chairman of the Socialist Party stated: “We are against the development of large scale farms such as NMF since we believe that smaller family farms are a more desirable direction for Dutch agriculture.” The Dutch labour party PvdA was doubtful whether or not they perceived NMF as (un)desirable. PvdA favoured the environmental benefits on national level and worried about the negative impacts on local level.

To assist the decision making process, the municipality commissioned an independent environmental consultant team to execute a study that assesses the sustainability of NMF in comparison to conventional intensive husbandry farms. The analysis of the consultants shows (4.5) that NMF is considered more sustainable on global, national and farm level, but not per se on local level (in this case the Agricultural Development Site).

Figure 4.5: Results sustainability scan conducted by environmental consultant.
Alignment strategies

In the fifth overlap we observe again several alignment strategies, to be more specific; the coupling with an in force policy (1), the organising of a hybrid forum (3), the testing of the validity of the concept (5) and adding agreements (7).

Table 4.5: Overview of alignment strategies in city councils overlap.

<table>
<thead>
<tr>
<th>Alignment strategies</th>
<th>Actions in overlap with City Council</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS1</td>
<td>Couple NMF to Agricultural Development Site.</td>
</tr>
<tr>
<td>AS2</td>
<td>Engaging city council through farm excursion.</td>
</tr>
<tr>
<td>AS3</td>
<td>Executing a sustainability scan.</td>
</tr>
<tr>
<td>AS4</td>
<td>City council decided that to obtain permits the farm needs to be (1) economical liable, (2) sustainable and (3) managed professionally.</td>
</tr>
<tr>
<td>AS6</td>
<td>Adding agreements</td>
</tr>
<tr>
<td>AS7</td>
<td>Adding frames</td>
</tr>
</tbody>
</table>

(VI) Overlap with NGOs: New Mixed Farm as Mega-Stable

Simultaneously to the development of the Agropark concept, resistance against intensive livestock farming was growing and consolidating. The NGO Friends of the Earth Netherlands (Milieudefensie) initiated a campaign against so-called ‘mega stables’ or ‘stock factories’ (see www.stopveefabrieken.nl). Friends of the Earth Netherlands and the Socialist Party cooperated with local opposition groups in Horst aan de Maas. They argued that NMF and the Agropark concept are an extension of intensive livestock farming; a practice they have criticised for years (Driessen, 2009, describes and analyses this phenomenon).

In October 2007, the campaign leader of Friends of the Earth Netherlands stated during a public debate about the desirability of NMF (which was attended by more than 300 community members): “Better farming, less animals! (...) We want to transform the Dutch agricultural production towards manufacturing less but more valuable products”. He elaborated during an interview: “The Netherlands has the highest density of pigs and chicks and with it the highest concentration of fine dust.
and ammoniac which are harmful for the public, animals and the environment. It is embarrassing that in this situation, bulk-producing meat factories such as NMF are supported by the government. It strengthens the unequal North – South distribution.” Furthermore a member of the Party of the Animals stated during the public debate that NMF would threaten the welfare of the animals. A few months later an animated video clip initiated by the Socialist Party appeared on You-Tube that portrayed the NMF entrepreneurs as fat, beer drinking businessmen who repress small family farms (video retrieved in December 2010 from www.youtube.com/watch?v=MyahOyDxM44).

The inner-project tried to detach the NMF proposal from the ‘mega stables’ discussion. The following text on the website of NMF illustrates a disconnection attempt: “We are not a ‘mega stable’ or ‘pig tower’ but several enterprises that cooperate with the aim to diminish waste flows and create better public and animal welfare.”

The inner-project recognised the need for a public debate on the practice that Dutch farms are increasing in scale. During an interview the project coordinator said: “10 years ago we could not have imagined the size of current husbandries. The public questions the desirability of large scale farming. Some even question if large scale farming is socially acceptable. We should have a public debate on large scale farming to be able to address the concerns. However, I think it is unfair to concentrate the debate on a single case such as NMF. These farmers are not spokesperson for a general debate on the future direction of Dutch agriculture.” To tackle this issue, KnowHouse wanted to facilitate a public debate concerning mega-stables. However, since funding was rejected the facilitated public debate was never executed.

Alignment strategies

In the NGO overlap we see a distinct manner of coupling to problems and political trends that differs from coupling practices in the other overlaps. In this overlap NMF was coupled negatively to perceived problems by the NGOs. In the NGO overlap the NMF concept was perceived as a materialisation of the problem instead of a solution to the perceived problem. To counteract this negative alignment, the inner-project took actions to de-align the NMF concept from the mega-stable discussion by stating that NMF is not a
conventional ‘mega-stable’ or ‘pig tower’. We label this de-alignment strategy as un-coupling to perceived problems (DS1).

Other cases in which opponents from outside the immediate affected area protest against implementation of new land use facilities show that often outside opponents are typically representatives of national interest groups and address broader topics of concerns (Frey & Oberholzer-Glee 1996). A possible explanation for the tendency of NGOs to get involved in local decision making is that through decentralisation the ruling concerning acceptance of new land use facilities is carried out locally. Our case illustrates that as a result of this decentralisation, local politicians and entrepreneurs are suddenly held accountable by national groups for the future direction of agriculture. To tackle this, the project coordinator tried to delegate the public debate back to the national level. We label this as a second de-alignment strategy; delegating the public debate (DS2).

Table 4.6: Overview of de-alignment strategies in NGOs overlap.

<table>
<thead>
<tr>
<th>De-alignment strategies</th>
<th>Actions in overlap with NGO’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1 Un-coupling to perceived problems</td>
<td>Communicate that NMF is not a Mega-farm.</td>
</tr>
<tr>
<td>DS2 Delegate public debate</td>
<td>Assign public debate on national level.</td>
</tr>
</tbody>
</table>

4.6 Steering for Implementation through Recurrent Re-Alignment

So far we argued that governing the implementation of new agricultural land use facilities, which could potentially contribute to lowering agricultural pollution, is a complex and enduring undertaking. Scholars are successful in co-creating agricultural concepts of novelties in which diverse values are in-scripted (which corresponds to the first phase reconfiguration pathway). However, our study indicates that this may not be sufficient to anticipate future implementation resistance. A simple explanation for this phenomenon is that some stakeholder groups, such as nearby residents, can only be recognised during the implementation phase and not during concept development. However, this does not explain the phenomenon that actors who are not directly affected by the innovation, such as national interest groups, also protest against implementation.

An additional explanation as to why implementation of prototypes entails controversies is that stakeholders are more eager to accept a vision of the future or concept of a novelty (first phase reconfiguration pathway) than accepting, approving and even applying an actual prototype of a novelty such as a land use
facility (second phase reconfiguration pathway). However, novelties are meaningless in isolation. Prototypes need to be implemented by the existing socio-technical system to be able to function. Implementation entails the creation of new linkages between artefacts, actors and the surrounding contexts (Elzen, Leeuwis & van Mierlo, 2008). New linkages are not effortlessly established since usage of, for example, new facilities can result in both valuable and destructive functions. To overcome implementation barriers, the innovations should have a sensible meaning in the frames of diverse stakeholder groups. Or in other words, multiple alignment between the innovative concept (e.g. new land use facility) and the frames of the adopters and effected actors is desirable when striving towards implementing prototypes of new land use facilities.

The inner-project participants of the New Mixed Farm case intuitively experimented with an adaptive ‘along the way’ alignment approach in which the new land use facility was frequently changed throughout the implementation process to suit the needs of the diverse stakeholder groups. We conceptualise this as a recurrent re-alignment adoption approach. To be more specific, our study reveals diverse kinds of (de)alignment strategies. On an analytical level we can cluster these (de-)alignment strategies along the following three dimensions; relational-, conceptual- and functional alignment (see table 4.7):

- relational alignment stands for developing a constructive boundary spanning network;
- conceptual alignment refers to changing the perception of the potential adopters and stakeholders concerning the innovation, and;
- functional alignment entails adjusting the design in such a way that it is perceived as more valuable.

Furthermore, alignment with the diverse stakeholder groups was achieved by involving each actor group separately. Initially political and policy actors were involved, followed by the market actors such as entrepreneurs and last community members. The success of such a homogeneous group approach to create multiple alignment is understandable when we take into consideration that actors groups view and use new technologies differently. Pinch and Bijker's (1984) study on the construction of bikes showed that especially novel technologies are framed differently by different social groups. They coined the term interpretative flexibility to highlight that novel artefacts are open to more than one interpretation. Furthermore, by developing separate homogeneous group alignment trajectories a working approach can be applied that aligns to the culture of the stakeholder
group and more attention can be paid to their specific concerns (Hoes, Regeer, Bunders, 2008).

Table 4.7: Overview of relational-, conceptual- and functional alignment strategies.

<table>
<thead>
<tr>
<th>Alignment dimensions</th>
<th>Alignment strategy</th>
</tr>
</thead>
</table>
| **Relational alignment** | Recruiting hybrid actors (AS2).  
Organising hybrid forums (AS2).  
Adding agreements (AS6).  
Delegate public debate (DS2). |
| **Conceptual alignment** | Coupling the concept to problems, policies and/or politics (AS1).  
Un-coupling to perceived problems (DS1).  
Adding frames through stories (AS7).  
Adding frames through pictures (AS7).  
Lowering uncertainty by testing the validity of concept (AS4). |
| **Functional alignment** | Adjust design by in-scripting new function (AS3).  
Adjust design by de-scripting function (AS3).  
Adding design criteria (AS5). |

4.7 Conclusion

This chapter investigated the discourse and interaction between inner-project participants and stakeholder groups in the New Mixed Farm case to shed light on the practice of alignment during the process of implementing a prototype of new land use facilities. This study strengthens the notion that stakeholders play an important role in signalling potential undesirable effects beforehand so that designers and planners can anticipate by adjusting the design accordingly. Furthermore, our study shows a dynamic and adaptive implementation process in which the concept and the various perceptions of the concept emerges and changes along the way. We conceptualise this phenomenon as recurrent re-alignment process. Recurrent re-alignment is valuable in the sense that it counteracts path dependency and assists in the construction of a more desirable facility.

Despite these benefits, steering towards recurrent re-alignment is tough when we consider that inner-project participants perceive their concept of the novelty as valuable and may therefore not be eager to open it up for alternative outside perspectives. Recognising that implementation of prototypes of land use facilities entails adjusting the concept and creating new linkages through functional-,
conceptual- and relational alignment may assist planners when managing the implementation of new land use facilities.\(^\text{11}\)

So far this chapter addressed two of the three questions that we posed above the introduction of this chapter (question 2.b and 2.c): What can be concluded from the interactions between innovation project participants and stakeholders within the broader network about the role of the different actors within, and their influence on, the process of prototyping? And, what do the experiences within the innovation project tell us about how to facilitate the process of implementing a prototype of a novelty? Less attention is paid to question 2.a: What do the interactions between innovation project participants and stakeholders within the broader network reveal about the relation between novelties and regimes during the phase of prototyping? In the paragraph below we relate the finding of this chapter to this broad research questions.

Geels and Schot (2007) make an analytical distinction between types of relations that a novelty can have with the corresponding regime: the relation is either competitive or symbiotic. When relating this perspective to the New Mixed Farm case we see that competitive and symbiotic relations between the prototype of the novelty Agropark and the current socio-technical network existed at the same time. On the one hand, New Mixed Farm provided three farmers with the opportunity to expand and improve their operational farms. Thus, a symbiotic relation emerged between the novelty Agropark and the regime. On the other side, opponents argued that the novelty Agroparks would compete and eventually replace small sized family farms. Here the novelty Agropark in a competitive relation with regime. This example shows that during the phase of implementing a prototype both competitive and symbiotic relationships between the novelty and the socio-technical network exist. This ambivalence is understandable since there is a high degree of uncertainty about the potential value of the novelty as well as about any threats to the socio-technical network the novelty may engender.

So far we looked at interactions of actants during the phase of developing and implementing a prototype. However, within the context of the agricultural sector the usage of one prototype of a novelty will not lead to a system innovation. Novelties need to be implemented and used more frequently. In the next chapter we address this topic of initial diffusion of novelties by investigating the

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\(^{11}\) From hereon additional text has been added to Hoes and Regeer (in review) to relate this chapter to the other chapters in this thesis.
interactions of initial innovators who implemented and used the first dozen (semi) Closed Greenhouses.