

The non-linear development of the Haarlemmermeer from the 1600s till the present

In schematic maps with different themes: the reclamation and parcellation of land, land use through agriculture and urbanization, and infrastructure.



The Haarlemmermeer before reclamation. J.J. Ligtenberg, 1621

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Abstract

The Haarlemmermeer is a municipality in the west of the Netherlands that has formed completely through the reclamation of the former lake of the same name. In its extensive history, we can suppose that the Haarlemmermeer has not had a linear development, in the sense that through time, it has faced many setbacks that impeded different kinds of progress to take place. Firstly, we see this in the efforts to reclaim the lake, which took over two centuries and many plans to achieve. Secondly, we see this through the harsh conditions that were present after the reclamation, where urbanization started off slowly and agriculture was made difficult. Lastly, we see it in infrastructure, where shipping, railways and the airport have all faced hurdles in attempts to grow. This paper uses a series of schematic maps to examine and understand the non-linear development of the Haarlemmermeer since the first reclamation plans of the 1600s, till the present.

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Introduction

Historically, the Dutch have faced many challenges in regards to water management. On the one hand, intensive land use – particularly through the cultivation of peat – has resulted in systematic subsidence of large parts of the Dutch landscape (Hoeksema, 2007). Additionally, storms, tides and the sea level rise in general have called for action to prevent large parts of the Netherlands to flood. In fact, over one quarter of the country currently lies below sea level (Meyer & Petersen, 2010) – and an even larger percentage is prone to flooding if we also include the possible impact of overrunning rivers.

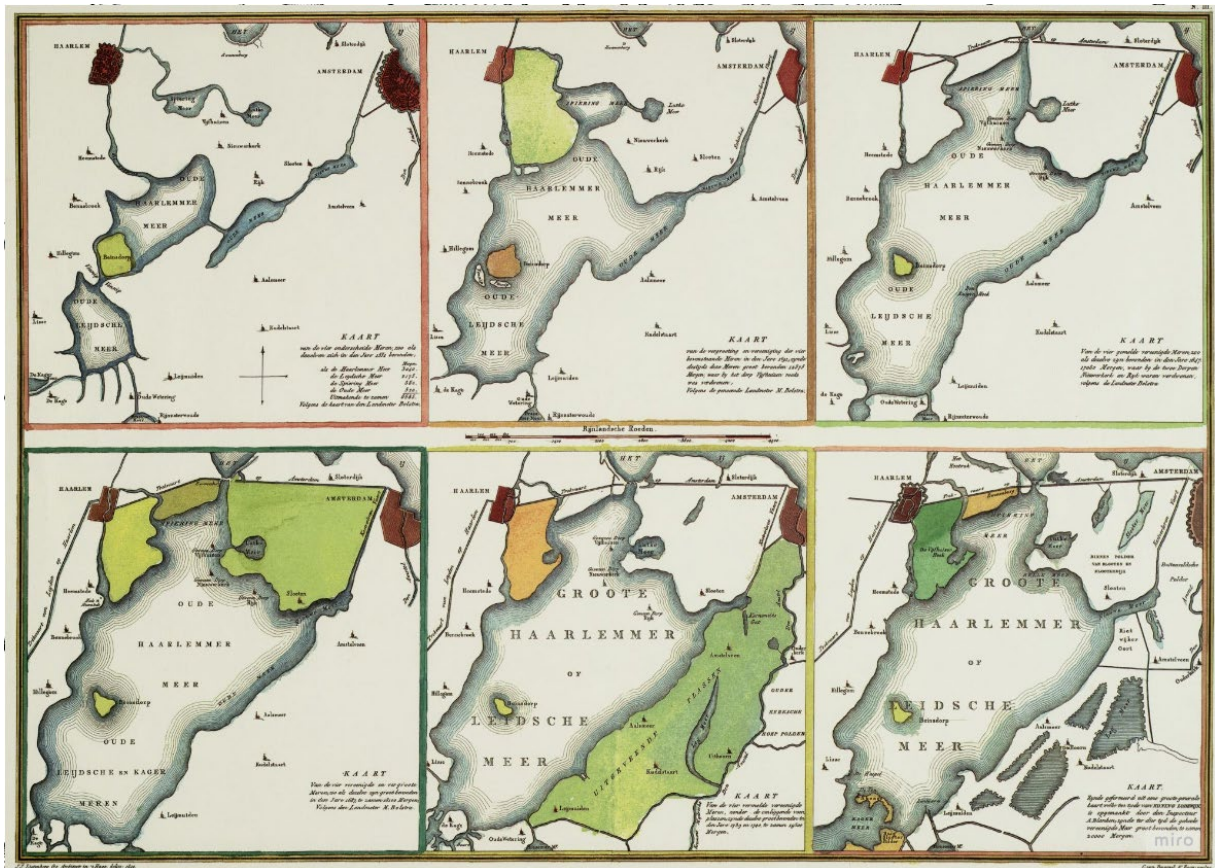
Although the Dutch must face all these challenges, they have also been famous for their efforts to protect themselves from the harms of the bodies of water surrounding them like the North and former South sea (*Zuiderzee*). Waterworks like dunes, dams, dikes, and wind (figure 1) and steam powered pumps have shaped the western Dutch landscapes in the past centuries.



1 Kinderdijk Windmills. L. Hirschegger, 2004. Source: Wikimedia Commons

One of the largest projects that has been undertaken in the Netherlands concerns the reclamation of the lake that once covered much of the area between Leiden, Amsterdam and Haarlem. The *Haarlemmermeer* (Lake Haarlem) as it was called, was finally reclaimed in 1852 after several years of extraction through steam powered water pumps.

Some plans for the reclamation of the lake are significantly older than the plan executed halfway through the 19th century: the first known stemming from the early 17th century. The initial reason to reclaim this lake was to combat the growing danger it posed for its surroundings. The *Haarlemmermeer* was nicknamed the *Waterwolf* by water engineer Jan Adriaanszoon Leeghwater (Beelen & van der Sijs, 2018) as the lake was known to ‘devour and destroy everything around it’. We can clarify this when we look at the historical development and growth of the *Haarlemmermeer*. Initially, the area that the *Haarlemmermeer* covered just before the reclamation plans were initiated consisted out of a number of smaller lakes like the *Oude Haarlemmermeer*, the *Oude Leijdsche Meer* and the *Spieringmeer* (figure 2, top left). These smaller lakes formed because parts of this area would flood due to tides and storms – at the time, there was no proper protection against the sea and rivers, and the land here had subsided strongly due to the cultivation of peat, making it vulnerable to any water at all reaching it (van der Meulen, 2000). For several centuries, more storms, river floodings and tidal workings exposed these parts and subsequently, more and more land became covered by water. Once the lake had grown to its full size, it also threatened surrounding towns and cities more and more often. During some storm surges, it would reach the gates of Leiden, Haarlem or Amsterdam and place large plots of land under water in between the lake and those cities (van der Pols & van der Bruggen, 1996).



2 Development of the Haarlemmermeer. J.J. Ligtenberg, 1819. Source: Haarlemmermeer in Kaart

In current times, the *Haarlemmermeer* has become a completely different entity. Where once a lake stood, the area has now become a thriving municipality consisting of 31 urban cores and over 150 thousand inhabitants (Gemeente Haarlemmermeer, 2022). Besides its forestry, agricultural land and urban cores, the municipality also hosts Schiphol airport – the 3rd largest airport in Europe based on air transport movements (Schiphol, 2022). Because of the presence of the airport, but also its other forms of industry and its favorable position near many other large cities and urban cores, the economy of the *Haarlemmermeer* has been named the strongest in the Netherlands for as much as 18 times since the start of this century (Metropoolregio Amsterdam, 2023).

Even with its rather short history, the *Haarlemmermeer* has grown out to become a staple municipality in the Netherlands. However, evidence suggests that this development has not come without resistance. The most obvious example is the initial reclamation of the polder. As a lake, the *Haarlemmermeer* has caused serious problems in regards to water management. However, the necessary reclamation was only completed in 1852, meaning that there was a two and a half century period in which plans for the reclamation fell through. Then, after reclamation, living conditions were extremely difficult for some time, tampering the speed of development in the newly reclaimed polder. Other aspects, like the second world war, periods of economic depression, and the Covid-19 pandemic, have negatively influenced the development of the *Haarlemmermeer* as well.

Methodology

This paper highlights moments in time that were essential to tell the story of the Haarlemmermeer – by focusing on how these *impeded* the development of the Haarlemmermeer, in an attempt at offering new perspectives. Additionally, the paper seeks to understand which aspects and/or actors may have had a negative influence of the historical development, and why this happened.

So, this paper aims to show how in some ways, the Haarlemmermeer has developed in a rather *non-linear* sense, as progress has met resistance in many forms. Because of this, the following research question has been posed:

In what ways can the development of the Haarlemmermeer be considered non-linear?

Different subquestions will be answered through the following chapters, with the goal of giving answer to the main research questions in regards to different time periods and elements. The first chapter will look at the extensive period of time in which different Dutch engineers and officials developed plans to reclaim the lake, and examine why most of these plans fell through. The second chapter looks into the first decades of the existence of the Haarlemmermeer as a polder, and question the harsh state of the land and the slow pace of urbanization until the start of the 20th century. The third chapter will evaluate the role of several types of infrastructure within the history of the Haarlemmermeer. Each chapter will feature, besides reviews of literature, sets of schematic maps that try to highlight and investigate key moments of (halted) development.

Literary basis

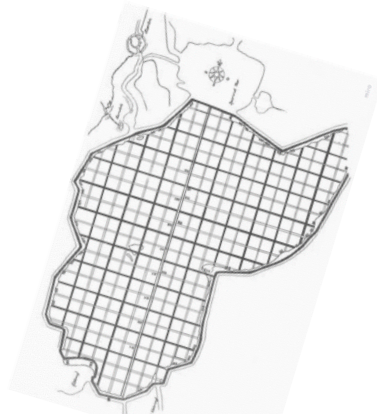
The original interest for writing this paper stems from the book *Uit Water Gewonnen* bij Wim van der Meulen. This book gives a concise historical overview of the Haarlemmermeer up until the beginning of the 21st century. However, as can be seen in the bibliography at the end of this piece, many more sources have been consulted in order to create a broad literary basis. Several first hand sources come from books that have been written by Dutch engineers from as early as the 17th century – while several modern publications have also been used. Additionally, much information has been gained from examinations of historical cartography. These sources have mostly been found online, however, their origins lie in Dutch historical archives like the *Noord-Hollands Archief*. This paper extracts information from and aims to tie many of these sources together through the uniform schematic maps that are featured throughout.

The reclamation of the Haarlemmermeer

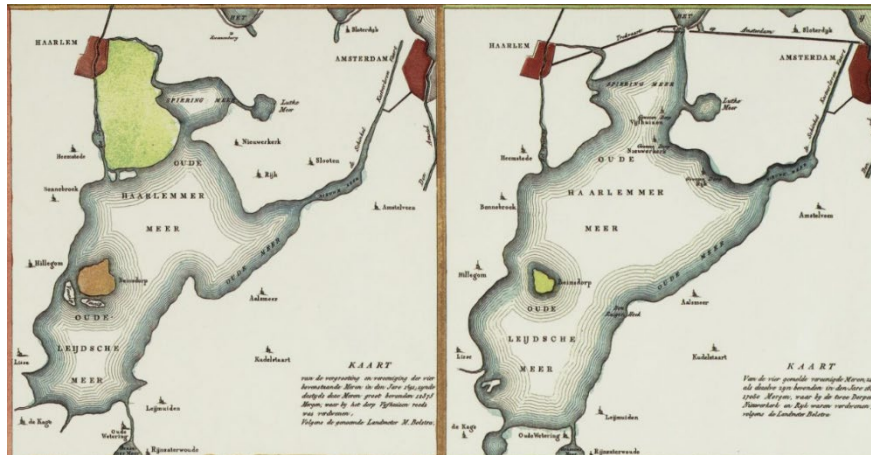
The set of maps by J.J. Ligtenberg (as already shown in figure 2) displays the growth of the Haarlemmermeer as a lake between the early 1500s and 1800s. This landscape was strongly characterized, shaped, and altered by the influence of water. Storms, tides, river floodings, all reshaped the smaller lakes that already existed here, and in time these merged into the Haarlemmermeer. The unpredictability of the bodies of water created many issues for the different settlements that arose here. In the 1500s, villages like Nieuwerkerk, Rijk and Vijfhuizen succumbed to the water and vanished after periods of storms and floodings (Van der Meulen, 2001, p. 11). Nonetheless, the lake had its uses and benefits as well (Wies, 2001). Within its water board (*Hoogheemraadschap Rijnland*), the Haarlemmermeer functioned as a *boezem* – a means of protecting the surrounding plots of land by harboring excess water. It also functioned as a shipping route, connecting cities like Leiden, Haarlem and Amsterdam to each other. Fishing took place within the lake, with fishing rights sold mainly to Leiden. Lastly, the lake served as a reservoir to use to refresh water in the large network of canals in the surrounding cities as, at the time, these canals were often basically an open sewer (Waterschap Amstel Gooi en Vecht, 2018). The early 1600s signified the start of a centuries long investigation into the reclamation of the Haarlemmermeer, often influenced by these positive and negative connotations. It would take until the mid-1800s to finally find a solution where, beneath the line, the benefits of reclaiming the Haarlemmermeer would outweigh the losses.

Gerbrant Meuss

One of the first known reasonably documented plans to reclaim the lake comes from Gerbrant Meuss, from somewhere shortly after the year 1615 (Wies, 2001). Not much is known about this plan, as there is no record of writing: just the map, as seen in figure 3, is available. The map itself shows a relatively rough outline for the reclamation. The outline resembles the outline of the combined Haarlemmermeer and Leidsche Meer at the time of conception, as can be seen in figure 4. However, Meuss estimated the total area to cover 30 thousand morgen (an old European unit of area measurement (GTB, 2024)), which is a lot larger than the Haarlemmermeer would even eventually be at its largest (Fokkema, 1955, p. 382), again confirming the lack of accuracy within this plan. In his plan, the Spieringmeer and the Kagermeer are left out of the reclamation effort, perhaps as a means of maintaining more of a *boezem* for when the lake would no longer serve this purpose. Another thing that stands out is the division of the parcellation between west and east. In the middle of the plan, there is a waterway (*Hoofdvaart*) running from south to north. This could have been intended to serve as an additional means to get water out of the polders and perhaps even create different water levels for the west and east. Again, it is impossible to know this for sure because of the lack of a written plan for this.

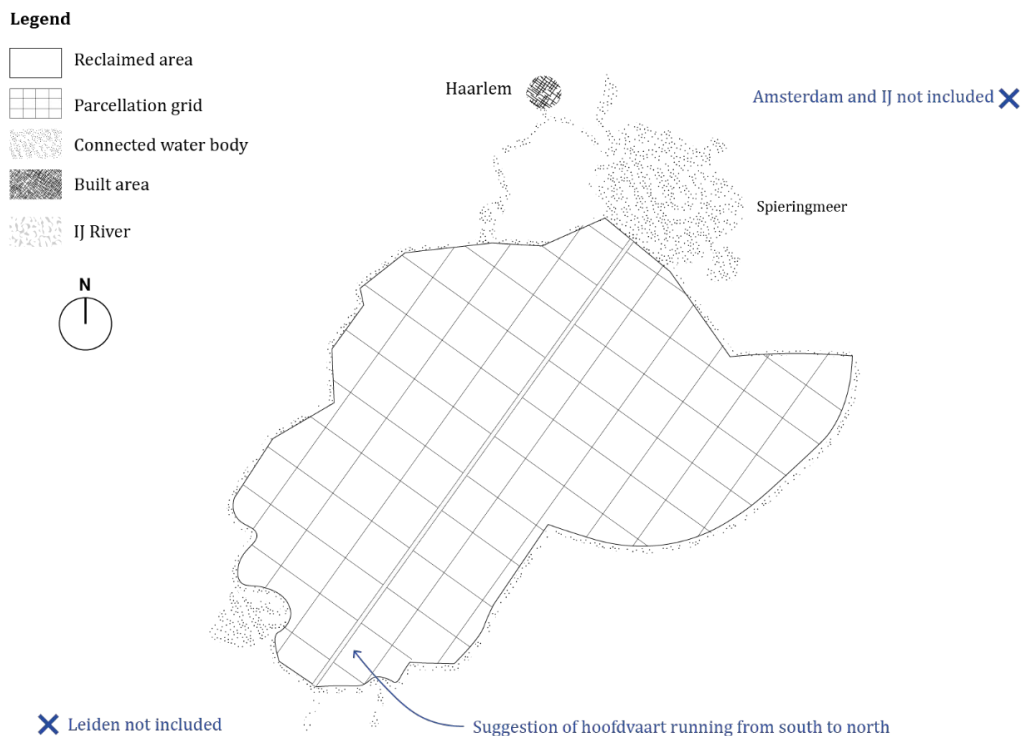


3 Meuss's reclamation plan ca. 1615. Source: *Haarlemmermeer in Kaart*



4 Approximate size and shape of the Haarlemmermeer in 1592 (left) and 1647 (right). J.J. Ligtenberg, 1819

What we are sure about is that the plan has not been executed. In 1617 the plan had been made public and a request was made to get a *staattoctrooi* (a state patent; this also gave several financial benefits for the private exploiter), but it supposedly failed as the plan had no considerations for the water board and the surrounding cities (Wies, 2001). The map that Meuss produced does indeed show little consideration for the surrounding stakeholders, and is lacking in accuracy overall. If we reduce his map (schematized in figure 5) we see for example that only the city of Haarlem was included in the mapping, whilst the cities of Leiden and Amsterdam have been left out. However, both of these cities depended on the Haarlemmermeer for shipping and fishing (Leiden had the rights to this). In the eyes of these parties, Meuss did not consider their needs and because of this the plan was ejected. The city board of Haarlem even took this one step further and announced a total boycott of requests to reclaim the Haarlemmermeer (Van der Meulen, 2000, p. 13).



5 Schematic representation of Meuss's reclamation plan. Own work.

Jan Adriaanszoon Leeghwater and Jacob Bartelszoon Veeris

The next plan comes from Jan Adriaanszoon Leeghwater. Unlike Meuss, there is a lot of documentation on the plans that Leeghwater created, which stems from the book he has written on the lake: the *Haarlemmer-Meer-Boeck*. This book contained literature on the history of the lake, other plans to reclaim it, plans that showed how other parts of the country were reclaimed, and of course his own plans (Leeghwater, 1710). The book, and his plans, have been revised numerous times. His first plan stems from 1629 (figure 6) and is still rather inaccurate. In this plan, like in that of Meuss, the outline is rather rough compared to the actual outline of the lake. His more detailed plans would only come after Jacob Bartelszoon Veeris would create his own reclamation plan in 1640.



6 Reclamation plan of Leeghwater, 1629. Source: *Haarlemmermeer in Kaart*

In 1640, Bartelszoon Veeris, created a strict reclamation plan that featured a multitude of linear elements that formed the *Ringvaart* (figure 7). Over one hundred wind mills would be used to pump out the water of the Haarlemmermeer. Again, both the Spieringmeer and Kagermeer were left out the reclamation to function as a boezem.

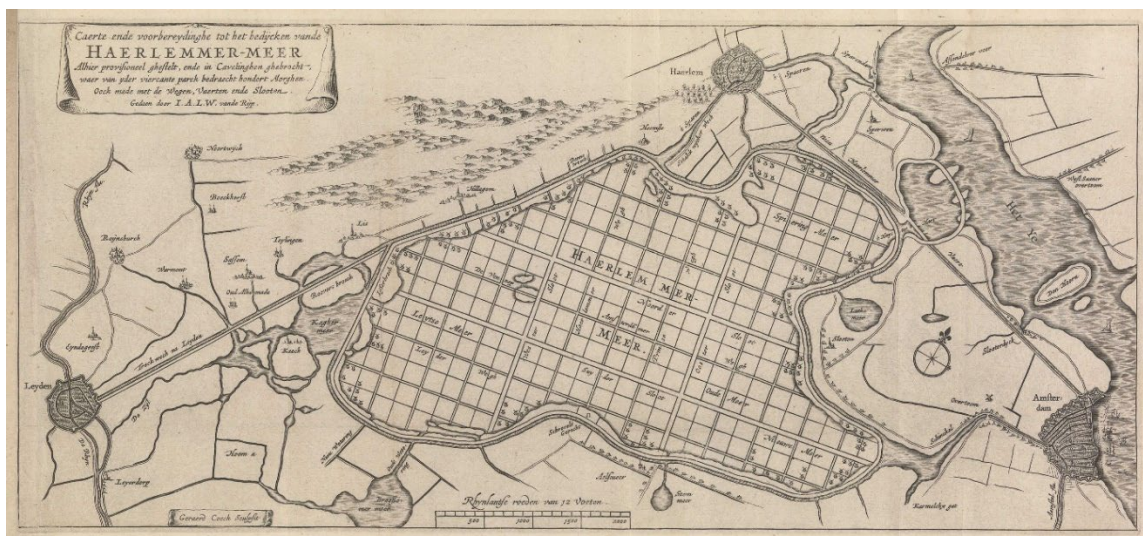


7 Reclamation plan of Bartelszoon Veeris, 1640. Source: *Haarlemmermeer in Kaart*

What is interesting about this plan is that it features a so-called *voorboezem* in the north (figure 8), which connects the *Ringvaart* and the river *IJ* (Wies, 2001). The *voorboezem* would harbor water pumped out of the Haarlemmermeer, which would then be pumped out into the river IJ – making the process of reclamation two-stepped, and allowing for enough *boezem* area to protect the reclaimed land.

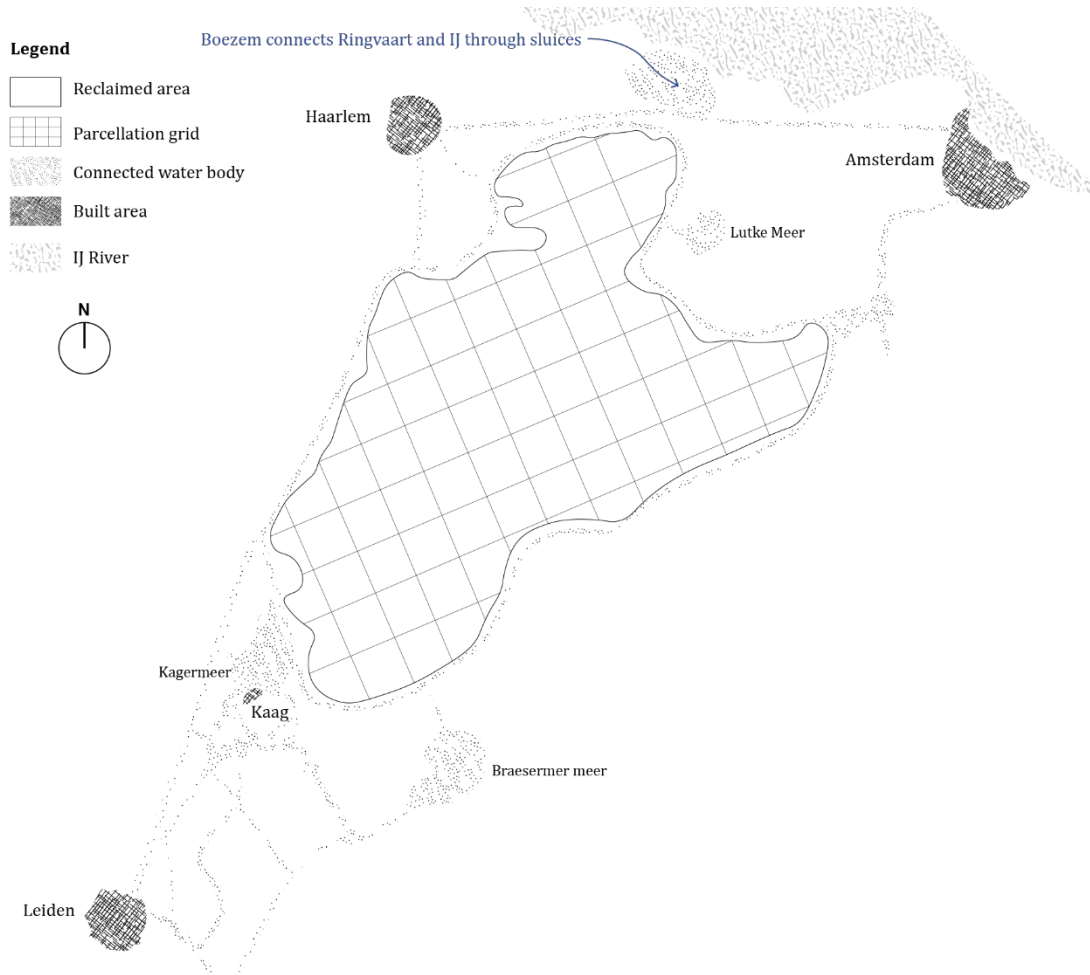


8 Schematic representation of Bartelszoon Veeris's 1640 reclamation plan. Own work.



9 Reclamation plan of Leeghwater, 1641. Source: Haarlemmermeer in Kaart

Then, in 1641, Leeghwater revised his earlier plan based on the plan of Bartelszoon Veeris, as can be seen in figure 9. Again, the *voorboezem* Bartelszoon Veeris proposed can also be seen in this plan (schematized in figure 10). It follows a similar parcellation, however, the outline of the Ringvaart is much more organic. Compared to Bartelszoon Veeris, the advantage this could have is that the cost of the expropriation of land would have been less, simply because less land would have to be expropriated.



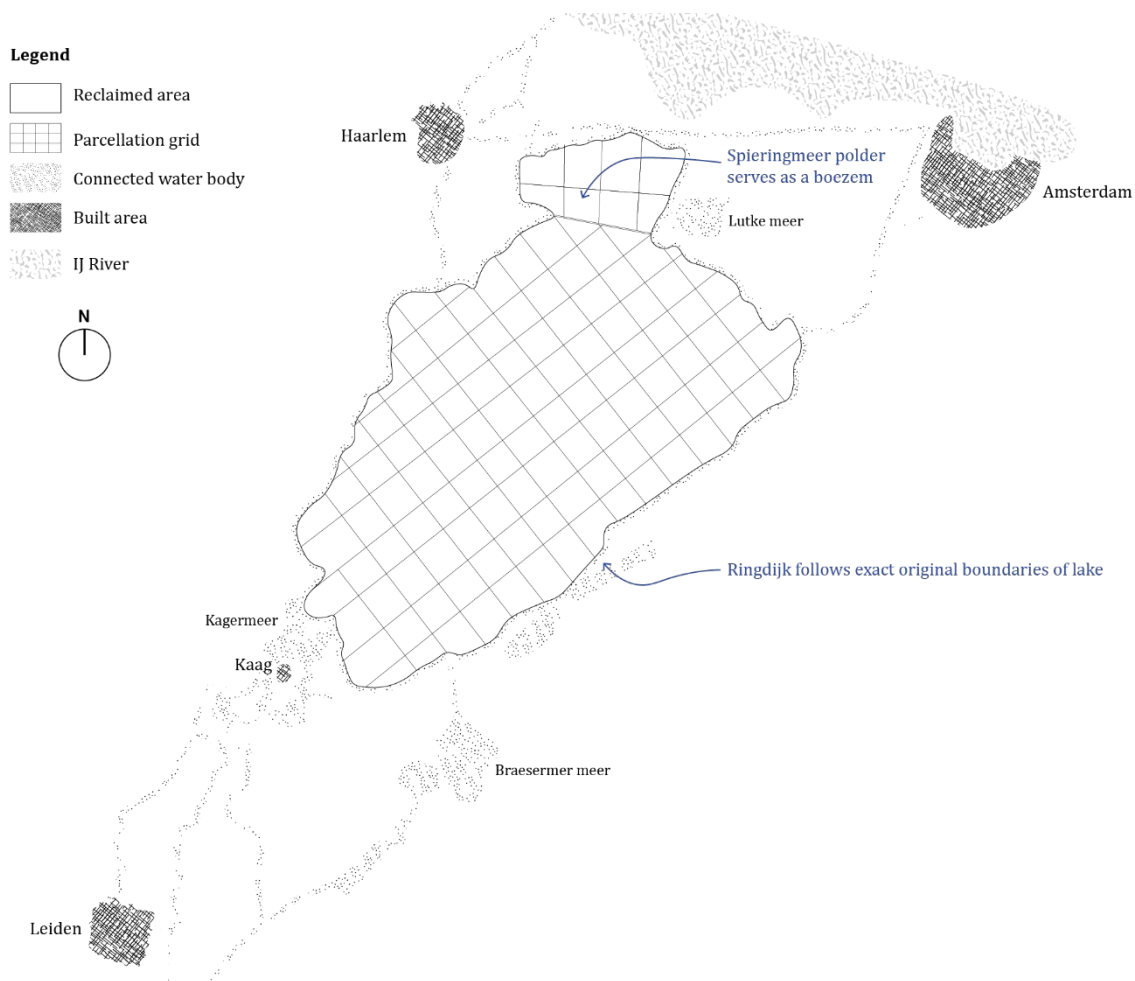
10 Schematic representation of Leeghwater's 1641 reclamation plan. Own work.

For both plans, the most important parties were the water board and the surrounding cities. We can see that these plans have more considerations for the surrounding cities than the basic plan Meuss created, by envisioning connections between Leiden, Haarlem and Amsterdam. Additionally, thought has been put into the desires of the water board of Rijnland, who would be most concerned about the harboring of excess water now that the Haarlemmermeer would no longer serve that purpose. Resistance however remained strong from the surrounding cities and this caused both plans to fail (Wies, 2001).

Cruquius, Noppen and Bolstra and Conradus Zumbag de Koesfelt

It would take over a century for new concrete plans to be formed for the reclamation of the Haarlemmermeer (Van Endegeest, 1843, p. 45). Almost simultaneously, around 1742, two new plans were produced. The first came from a group of three: Nicolaas Cruquius, Jan Noppen and Melchior Bolstra. The second from Conradus Zumbad de Koesfelt. What is different about these plans if we compare them to those from a century earlier, is that the initiative now comes from the water board of Rijnland. Whereas initially private parties had placed interest in creating plans for

The plan of De Koesfelt (figure 12) looks similar to this plan and follows the same basic principle of using a spillway near Katwijk in the southwest (Van Endegeest, 1843, p. 46), but however does differ in proposed execution. Firstly, De Koesfelt aimed at damming in all the different water bodies that ran into the Haarlemmermeer (van Lynden van Hemmen, 1821, p. 44). After this, the lake would be pumped dry and with the clay that would surface a *ringdijk* would be created (Wies, 2001). This idea would lower costs as the material for the ringdijk would come from the lake and the need to expropriate land would be limited: the dike could follow the exact boundaries of the existing lake (figure 13). In his plan, the Spieringmeer would also be included. However, this part of the polder and the larger polder would be separated by another dike, and through this, the Spieringmeerpolder could serve as a *voorboezem* (something we have already seen in earlier plans).



13 Schematic representation of De Koesfelt's 1643 reclamation plan. Own work.

Yet again however, both of these plans fell through. The plans look to be worked out more extensively than before. Also, they were connected in a stronger fashion to relevant stakeholders – in particular with the Rijnland water board, but also with neighboring land owners (regarding the expropriation) and the cities of Leiden, Haarlem and Amsterdam (all considered within the plans). Although both plans had been offered to the Staten van Holland (the government advisory body that would also handle the *staatsoctrooien*), none were accepted. At this point still, objections from important stakeholders with other needs like Leiden and Haarlem prevented the reclamation of the Haarlemmermeer from happening. Instead of a large scale reclamation, the prevention and mitigation of issues with the rising lake and water hazards consisted of smaller interventions, like the creation or strengthening of dikes (Van der Meulen, 2000, p. 21).

Frans Godert van Lynden van Hemmen

The next extensively thought out plan comes from the beginning of the 19th century. In 1821, Frans Godert van Lynden van Hemmen published a book that included plans he made for the reclamation of the Haarlemmermeer two years earlier, titled 'Verhandeling over de droogmaking van de Haarlemmer Meer'. In his book, he took into account numerous important considerations, discussing the costs, financial benefits and duration of the possible reclamation, the risk of disease, the troubles of the decreased size of the boezem, and even the views of several stakeholders in this matter (Van Lynden van Hemmen, 1821, p. 173-265). Along with his book, he published a number of maps, including one that shows his plan for the reclamation of the Haarlemmermeer (figure 14). Initially, although envisioned on the request of King Willem I, even with all these considerations Van Lijnden met resistance from two different critics (Wies, 2001). These look to have tampered the progression of the plan, although it is hard to say why exactly this happened.



14 Reclamation plan of Van Lynden van Hemmen, 1819. Source: Haarlemmermeer in Kaart

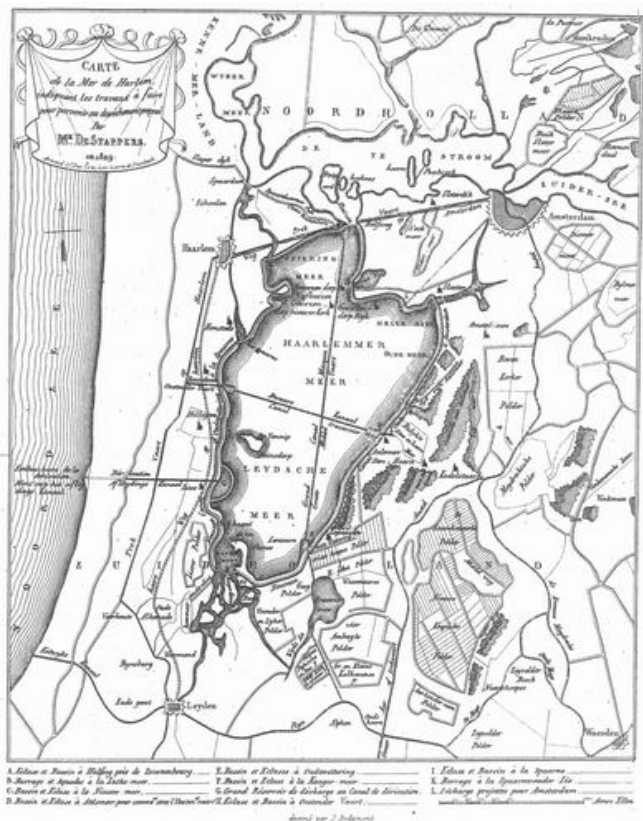
Van Lynden's plan follows an outline that is almost similar to the current outline of the Haarlemmermeer. Like in Meuss's original plan, there is a clear *Hoofdvaart* running from south to north (figure 15), functioning as an additional instrument to redirect water from inside the polder to outside. Once again, this is something that is also seen in the current configuration of the Haarlemmermeer. Furthermore, he was one of the first to envision the reclamation to happen through the use of steam pumps instead of those powered by wind mills (Van der Meulen, 2000, p. 21). Van Lynden's plan was not the plan that was executed: it would take several more decades to achieve this. It did however lay the groundwork for the eventual reclamation.



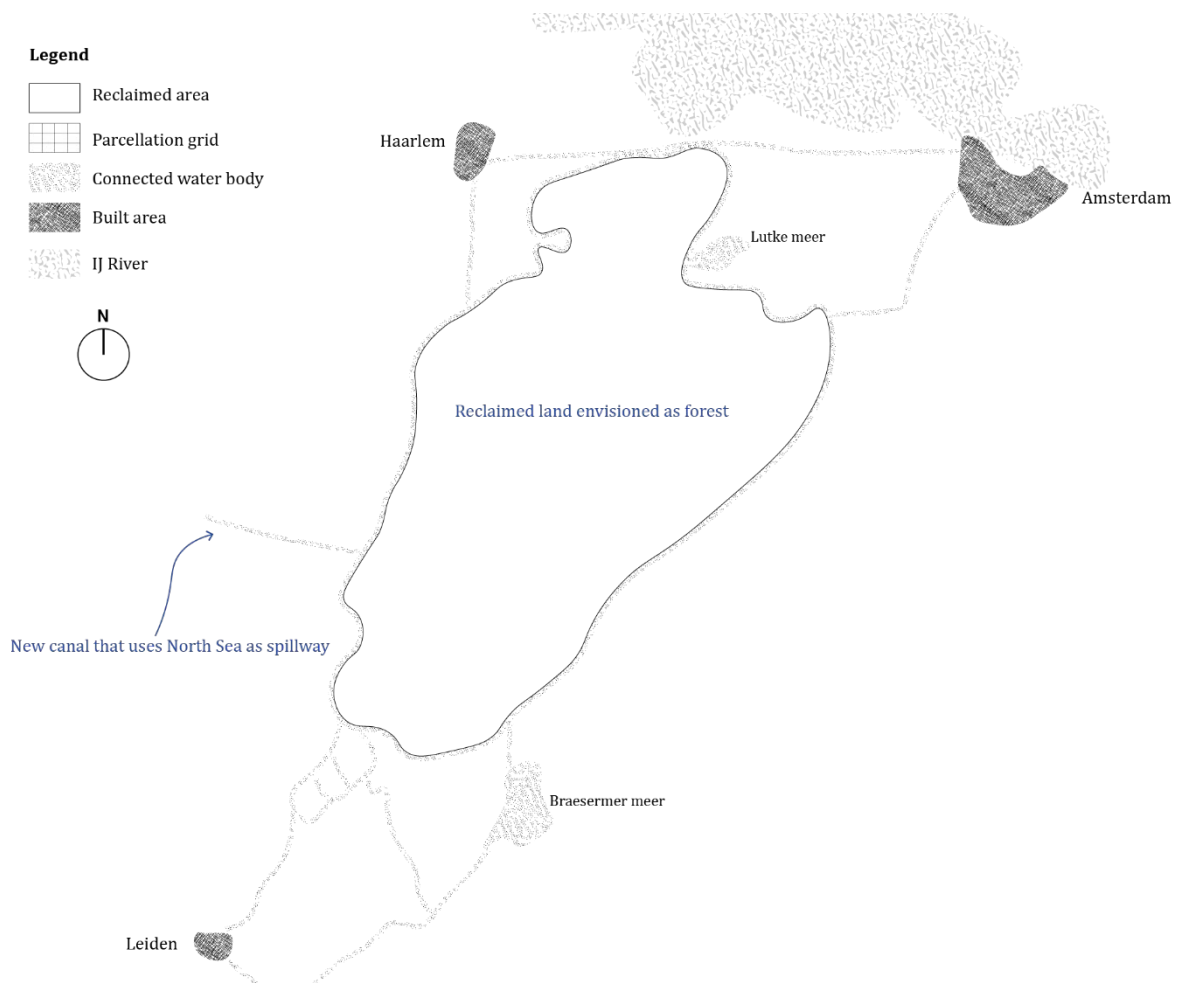
15 Schematic representation of Van Lynden van Hemmen's 1819 reclamation plan. Own work.

Alexandre de Stappers

Nonetheless, even after the plan of Van Lynden van Hemmen other ideas for the reclamation effort arose. Most interesting is that in 1829, Alexandre de Stappers created a plan (figure 16) that completely opposed the main principle of those envisioned in the two centuries before (which was to create a new polder landscape with land that could be sold and profited from immediately). Instead, he envisioned an entire forest to grow from the reclaimed land (Van der Meulen, 2000, p. 22). This forest could then be used to harvest lumber (after many decades) and yield profits that would far exceed the costs of reclaiming the land. What is also striking in this plan is the means of extracting water: de Stappers suggested to build a canal that would stretch to the North Sea (figure 17) to let the water flow out naturally.



16 Reclamation plan of De Stappers, 1829. Source: Haarlemmermeer in Kaart

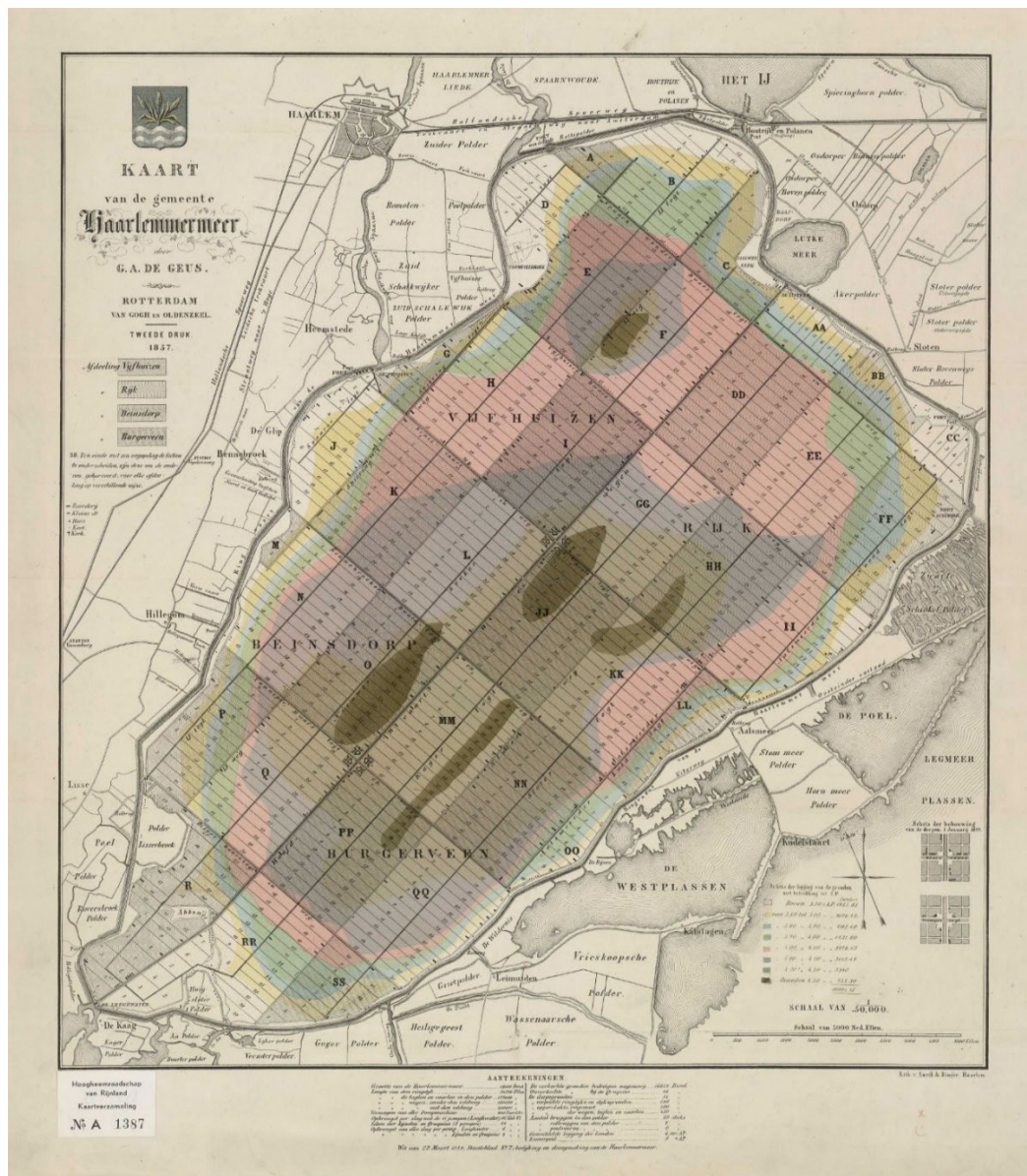


17 Schematic representation of De Stappers' 1829 reclamation plan. Own work.

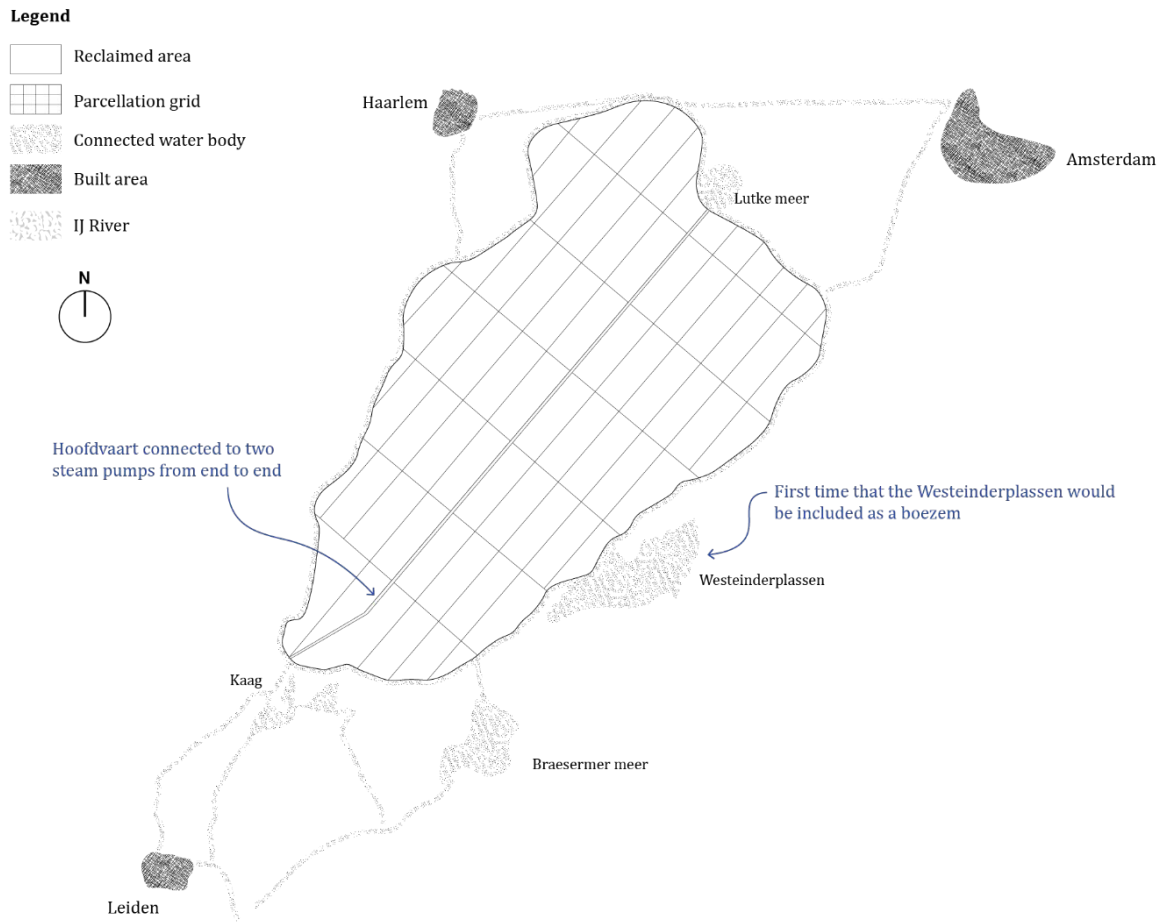
Commissie Beheer en Toezicht

Seven years after De Stappers' divergent reclamation plan, the final chapter of this centuries long tug-of-war between stakeholders and the lake itself finally started. During storms and periods of bad weather the lake became more and more problematic. As a result of several heavy storms that took place in 1836 for example, many expensive paved roads were flooded and damaged (Van der Meulen, 2000, p. 23). This came after a long period of time in which the water board of Rijnland had already called for government funding to cover the heavy costs of protecting, which would reach into the millions of Dutch Guilders (Van Endegeest, 1843, p. 40). It was reason for the government to take action on behalf of the provinces of North and South Holland (Van Endegeest, 1843, p. 57). In 1839, king Willem I signed a decree to finally reclaim the Haarlemmermeer (Wies, 2001). A group of government officials and engineers, titled the 'Commissie van Beheer en Toezicht' (Committee of management and supervision [of the reclamation of the Haarlemmermeer]) set out to work on water management, expropriation and finally the technical execution of the reclamation.

The first physical step into the execution of this plan was the digging of the *Ringvaart*, initiated in 1840. Like van Lynden van Hemmen proposed, this plan (figure 18) also made use of steam pumps. Three steam pumps would be built along the Ringvaart. It would take until 1845 for the testing of the first pump – the Leeghwater – would start, and only in 1848 the actual reclamation commenced (Van der Meulen, 2000, p. 28). The lake was reclaimed in the summer of 1852.



In the executed reclamation plan we see several resemblances to plans that had been developed earlier on. Quite logically, the Ringvaart follows the shoreline of the lake. There are connections with the three important nearby cities of Leiden, Haarlem and Amsterdam. The parcellation also follows a grid that seems similar to plans like that of Leeghwater and van Lijnden van Hemmen. It was clear that the scientists that worked on these plans were familiar with the necessities of parcellation and using *sloten* to get rid of excess water that would reemerge on reclaimed land through rain and groundwater seepage (*kwel*). Buysing, a water engineer, explains how the strict orthogonal parcellation in the Haarlemmermeer is most efficient for the dispersal of water, offers a fair organization of parcels, and makes it easier to connect parcels through both waterways and roads (Buysing, 1864, p. 492). He adds to this the complexity of the water system, naming as much as five different types of *sloten* that could be used to shape the water system of a polder. This hierarchy in *sloten* has also become visible in the Haarlemmermeer. In the Haarlemmermeer, water from the large grid of *kavelsloten* would first be transferred to the Hoofdvaart. According to Buysing, the Hoofdvaart would then serve as a *molentogt*: transferring water to the steam pumps to the south (the Leeghwater) and north (the Lijnden) of the Haarlemmermeer.



19 Schematic representation of the plan that was completed in 1852. Own work.

Synthesis

More than two centuries after the first plans for the reclamation of the Haarlemmermeer have been documented, the lake was finally reclaimed. This period of time has clearly known many problems and setbacks that impeded the quick execution of the plan. From what we have learnt from documentation, there are three major factors that have played a role in this: stakeholders, technology, and urgency. All of these factors are also in some way influenced by a financial aspect. An overview of their correlation can be seen in figure 20.

Stakeholders

With every plan that was created, there was also resistance. The most important stakeholders have been made evident. Major cities like Amsterdam, Leiden and Haarlem each had one or more reasons to object: either because of fishing rights (mainly Leiden), shipping, and water management (in the form of the replenishing) of canals. The water board of Rijnland had to make sure that there was enough *boezem*. Regional and national government would object under pressure of the major cities.

Technology

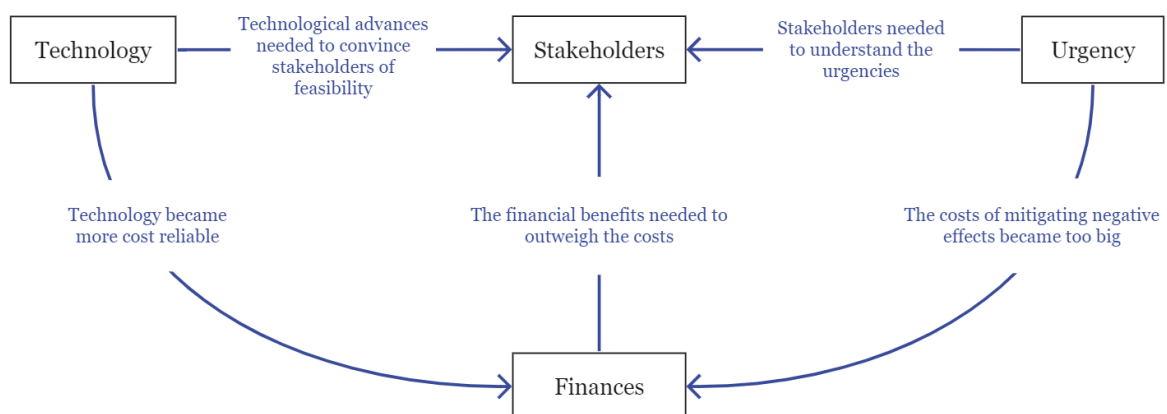
The first reclamation plans, like that of Meuss for example, were very rough. Surveying efforts at the time only yielded rough outlines and estimates of variables like the surface area of the Haarlemmermeer. It would have been hard to make concrete plans *and* convince stakeholders to fund and execute plans at this stage.

There was however knowledge in regards to one particular aspect: energy. Typical to the Dutch engineers of the time was the knowledge on wind technology, as wind energy had already been used to keep land dry for several centuries (Glick et al., 2014, p. 275). Many of the aforementioned plans would make use of wind energy, sometimes (within Leeghwater's plan for example) requiring over one hundred wind mills to be built for the plan to work. Regardless of the knowledge on the subject, this use of wind energy would still be a significant hurdle. Firstly, due to finances: this would cost lots of man hours and materials. Additionally, reliability also posed issues. It would be more difficult to get the best performance out of the extraction of water with fluctuating wind energy available – and this would also make it hard to predict how long it would take to reclaim the lake.

In the early 19th century, steam pump technology emerged and in the end, this technology was chosen as the power source for the extraction of water. Only three pumps sufficed to reclaim the entire Haarlemmermeer. Nevertheless, it still did take several years of testing *and* several years of pumping to finalize the reclamation in 1852.

Urgency

As mentioned earlier, stakeholder demands impeded the plan going through for several centuries. The stakeholders had other priorities that, in their eyes, outweighed the costs of keeping the Haarlemmermeer as it was. It was clearly known that the lake caused problems, however, the urgency to make a drastic call to reclaim the lake remained absent until the 19th century. Instead, up until then, many smaller interventions were made when problems arose. Shores were strengthened, land was dug out to harbor water, dikes were built (Van der Meulen. 2000, p. 18). These interventions required financial back-up from the water board and other governmental institutions (so, essentially from the stakeholders at the time). Once the costs started to outweigh the benefits, a call to action was made: the urgency had become high enough to sway the stakeholders and initiate the reclamation plans.



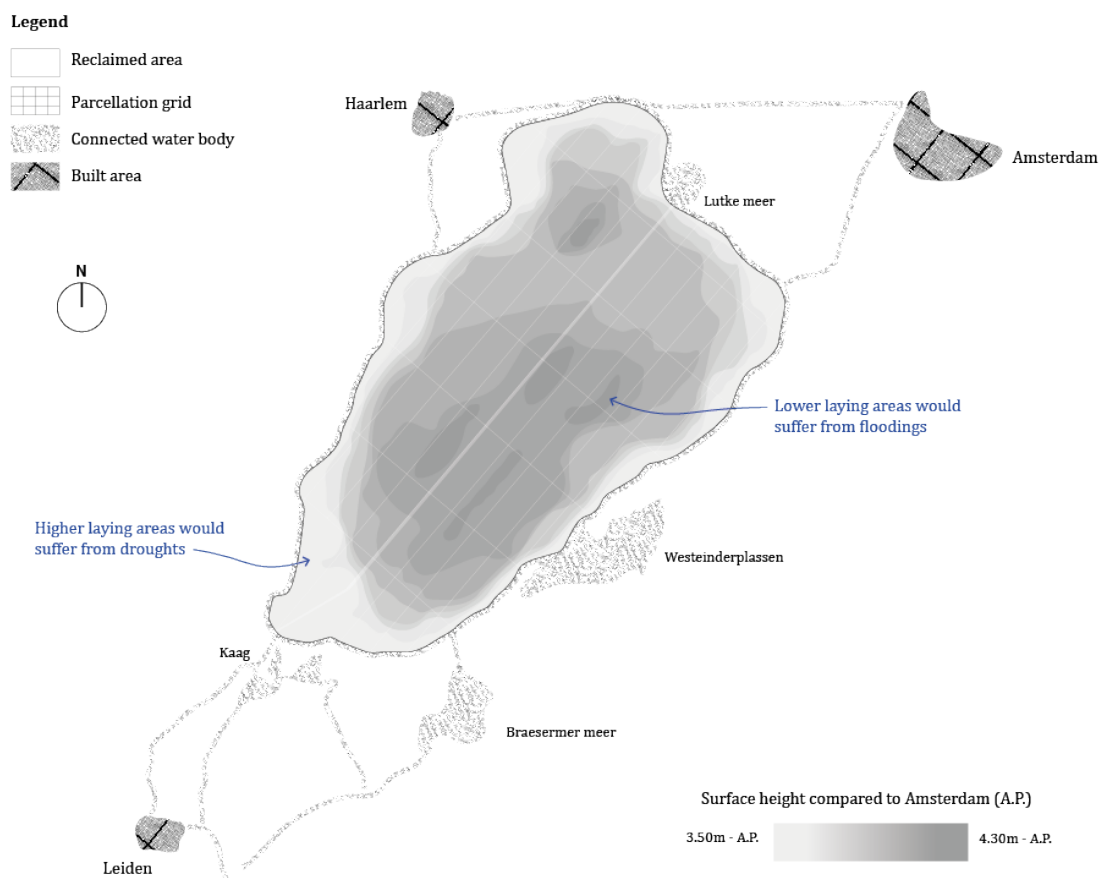
20 relationship between the factors that first impeded on but eventually led to the reclamation. Own work.

Land use and urbanization

The previous chapter has shown that the Haarlemmermeer has had a long history from even before its reclamation was finished in 1852. In fact, the 19th century was not the first era to see people live in the Haarlemmermeer. There had been settlements like Beinsdorp, Vennip, Nieuwerkerk and Rijk (Haarlemmermeer in Kaart, 2024) within the area long before. Through the centuries, these settlements were devoured as a result of the lake growing in size, disappearing completely. The reclamation would usher in a new time of habitation. However, like the execution of the reclamation itself, this would not go without setbacks. This chapter looks into the early age of the Haarlemmermeer as a polder, what was made of the land that was made available after the reclamation and how it started to urbanize.

Rough agricultural conditions after the reclamation

Figure 18 from the previous chapter shows the strong orthogonal grid structure that was imposed on the Haarlemmermeer after reclamation. It signified the base layer that would be used to build an entire new municipality on. At first hand, this base layer might appear to be completely flat. However, this was not the case. Although the parcellation of *sloten* was definitely man made, little could be done about height differences that formed naturally within the floor of the lake. After the reclamation, these differences remained. Figure 21 shows an approximation of the different surface heights around 1857.



21 Height differences within the Haarlemmermeer after the reclamation. Own work, based on G.A. de Geus's 1857 map of the municipality of the Haarlemmermeer (Haarlemmermeer in Kaart, 2024).

These height differences made agricultural practices difficult for many farmers. This has an underlying reason: in the early days of the polder, water was kept on one single level throughout the entire polder (Van der Meulen, 2000, p. 45). Consequently, in higher laying areas the water levels were too low and there would be water shortages. In lower laying areas the water levels were too high, causing flooding. In both cases harvests were affected negatively: in fact, harvests yielded only two thirds of the average of the province of Noord-Holland. Around 1857, frustrations grew between the so-called *hooglanders* (in control of the higher laying parcels) and the *laaglanders* (in control of the lower laying parcels), where the *laaglanders* were economically weakest because of the poor yields (De Nederlandse Gemalenstichting, 2002, p. 10). Throughout the first two decades of the existence of the Haarlemmermeer as a polder, there have in fact been many moments that negatively influenced agricultural conditions, e.g. through climatic conditions, water levels and the spread of diseases like malaria (De Nederlandse Gemalenstichting, 2002, p. 11, p. 15, p. 16), even forcing farmers to move to other places and countries (Noord-Hollands Archief, 2024).

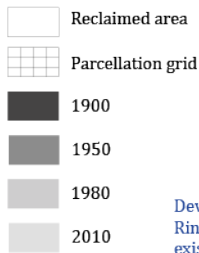
Urbanization

Meanwhile, albeit slowly, the polder started to urbanize. Initially, to cover the costs of the reclamation efforts, as much land as possible was sold and because of this, very little remained for infrastructure and urban developments (De Nederlandse Gemalenstichting, 2002, p. 7). Just 16 hectares of land were allocated for the creation of two villages: Kruisdorp and Venneperdorp. The decision to create two villages was made because originally, the polder would be split up into two municipalities. Both Kruisdorp and Venneperdorp would then become the main governing city within their respective municipality. However, the province of North-Holland objected to this split, fearing that (some of) the people of the Haarlemmermeer would be omitted from municipal services (Van der Meulen, 2000, p. 35). Three years after the reclamation, the Haarlemmermeer did finally become a municipality – and indeed, a single municipality instead of two.

Its population started of very small, with the main inhabitants being the exploiters of the farms. The two main towns of Venneperdorp and Kruisdorp eventually did grow and by the end of the 19th century these two towns formed the main urban areas of the polder, along with some ribbon like developments near already existing towns outside of the Haarlemmermeer (figure 22, upper map). Its population then is estimated to be 15 thousand (De Nederlandse Gemalenstichting, 2002, p. 28). In this time, the name of Kruisdorp was also changed to Hoofddorp, to signify its existence as most important village in the municipality (Verborgen Geschiedenis, 2024).

Only after the start of the 20th century larger scale expansions started to urbanize the polder. In fact, the population would only start to increase significantly after the second world war. Currently, the municipality has just over 160 thousand inhabitants (CBS, 2023), a ten-fold growth compared to the time of the initial settlements. Within this growth, new towns have emerged that offer an interesting nod to the extensive past of the Haarlemmermeer. This is because some of these towns, like Beinsdorp, Vijfhuizen and Abbenes (figure 22, lower map), actually already existed as settlements and/or islands from before the reclamation of the lake in 1852. Today, they have reemerged as new on the approximate places their former versions once stood.

Legend



22 Spread of urbanization in the Haarlemmermeer until 1900 (top) and until 2010 (bottom). Own work, adapted from *Atlas van de Verstedelijking van Nederland* (Rutte, R. & J.E. Abrahamse (red.), 2014).

Synthesis

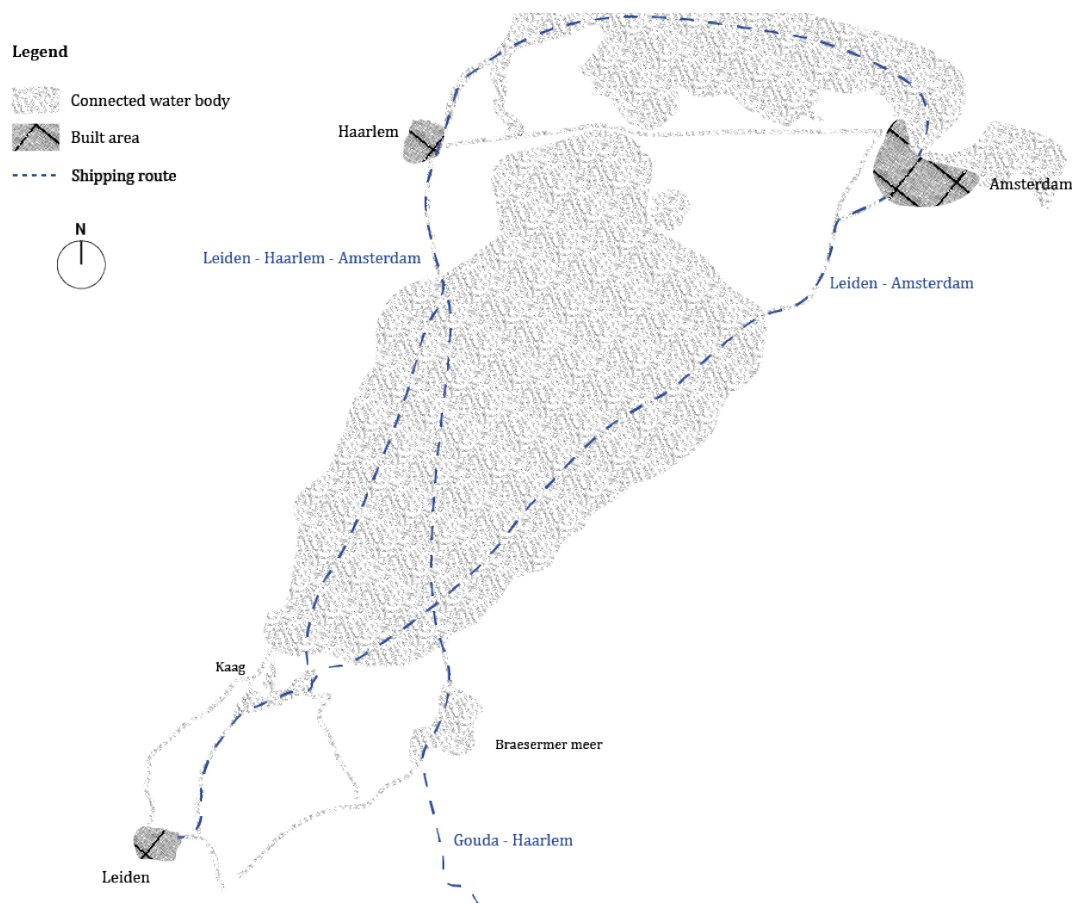
After the reclamation, the polder struggled to gain momentum and make use of the land that had become available. Farmers struggled with the harsh agricultural conditions and the limited amount of space for the towns of Kruisdorp and Venneperdorp initially limited urban growth. Only half a century after the reclamation was completed, the Haarlemmermeer became a more desirable place to inhabit.

Infrastructure

The reclamation of the Haarlemmermeer heralded a time of new infrastructural demands and developments. Firstly, because the former lake would no longer serve as a shipping route between cities like Leiden, Haarlem and Amsterdam. Secondly, because the new formed land would host new residents that needed roads to travel. Thirdly, because this newly formed land would offer the opportunity to make new - and potentially faster - land connections between the surrounding areas. This chapter covers several of these infrastructural developments, how they shifted through time and how they managed to (re)shape the Haarlemmermeer.

Shipping

As a lake within a larger network of water bodies, the Haarlemmermeer used to connect several cities through the shipping routes it was a part of. Figure 23 shows three popular routes that were used to move between cities like Leiden, Haarlem, Amsterdam and even Gouda, somewhat further out (Dolman, 2021).



23 Popular shipping routes through the Haarlemmermeer before its reclamation. Own work, based on the *Kaart met vaarroutes over het Haarlemmermeer* from 1839 (Historisch Archief Haarlemmermeer, 2024, see also Appendix A2).

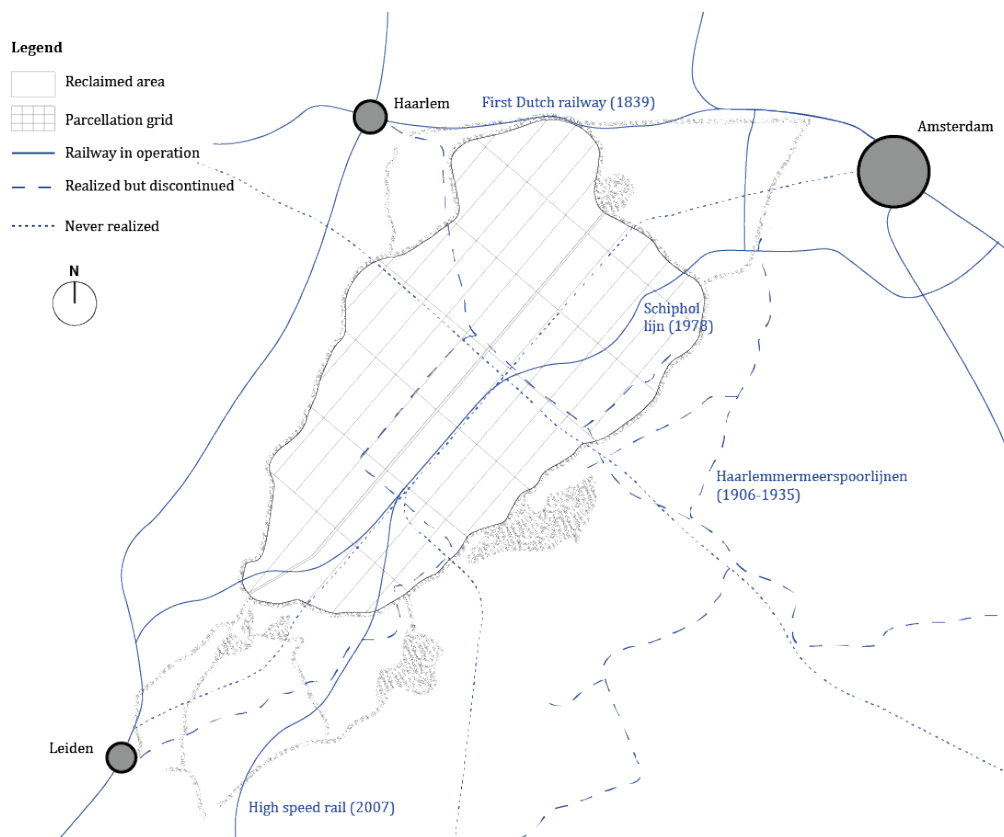
After the reclamation, shipping routes moved to the Ringvaart, as this was the new connector between the aforementioned cities. Steamboat services were introduced, and even started to rival each other. There are in fact mentions of incidents happening: deliberate collisions between rivalling steamboats would occur according to the Rijnland water board (Van der Meulen, 2000, p. 51). Nevertheless, these steamboats signified the infrastructural importance of the Haarlemmermeer as a polder and also strengthened its local economy. However, at the end of the 19th century the introduction of the railways made the steamboat services obsolete.

The railways

The first Dutch railway line opened some 15 years before the reclamation of the Haarlemmermeer was completed. The line connected Amsterdam to Haarlem initially and, later on, was extended to Leiden, The Hague and Rotterdam (ProRail, 2019). Only shortly after the reclamation, the first plans were created for the introduction of railway lines in the Haarlemmermeer itself. The Dutch railway company (HIJSM) wanted to connect Amsterdam to Leiden directly, and engineer Karel Hendrik van Brederode opted a plan to connect Haarlem with Aalsmeer through Hoofddorp (then Kruisdorp), but these initial plans all fell through (Van der Meulen, 2000, p. 52).

The next railway plans would follow in the 1880s, and would only be executed in the beginning of the 20th century. A new railway company – the Dutch Electric Railway Company (HESM) – introduced plans for the *Haarlemmermeerspoorlijnen*. These railway tracks were opened in 1912 and connected Nieuw-Vennep and Hoofddorp with Leiden, Haarlem and Aalsmeer. However, because it became clear that these railway services were not very profitable, these eventually disappeared – with the last one closing in 1935 (Van der Meulen, 2000, p. 55).

The final developments of railways in the Haarlemmermeer can be traced to the late 70s of the 20th century, with the introduction of the *Schiphollijn*. This new railway connected Schiphol airport with Amsterdam Zuid at its opening in 1978 (Infrasite, 2024). Not long after, connections were made to the north and south, creating a direct railway line from Amsterdam to Leiden and returning railway services to Nieuw-Vennep and Hoofddorp, who had last had a running train station half a century earlier. In 2007 an additional High Speed Rail line connecting Amsterdam to Rotterdam (and in extension, Antwerp and Paris) was opened, which also crosses a large part of the Haarlemmermeer from North to South (Infrasite, 2024). Figure 24 gives an overview of the extensive history of railways in the Haarlemmermeer, showing lines that were planned but not executed, executed but discontinued, and those that are still in operation.



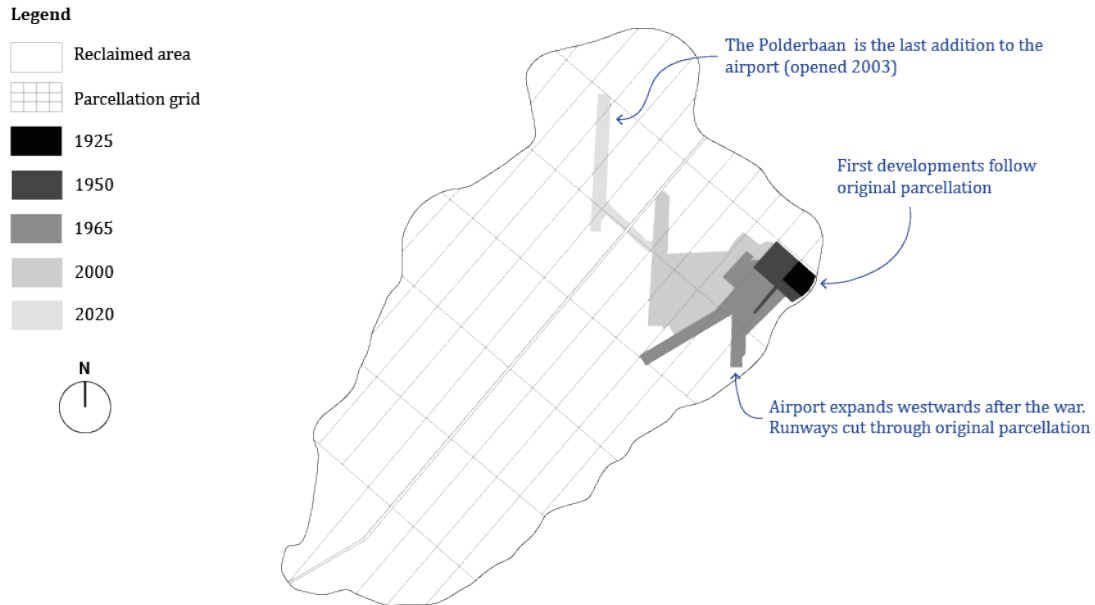
24 Railway developments in the Haarlemmermeer. Own work. Sources: see Appendix A3 – A5, ProRail (2024)

Schiphol Airport

Within the story of the Haarlemmermeer, Schiphol Airport cannot be left out. The impact of the airport cannot be understated as a result of its geographical size, and its role in the economy of the Haarlemmermeer. The airport even strongly dictates the municipality's economic cycles, as could be seen during the COVID-19 pandemic (Gemeente Haarlemmermeer, 2021). Starting as a military airport, eventually growing in size but destroyed during World War II, the history of Schiphol has been rough and, like many other things, non-linear within the Haarlemmermeer.

The airport started as a military airport on a strip of land, 12 hectares in size in 1916, on ground bought from a farmer called Knibbe by the Dutch military (Dekker, 2017). For some years it functioned solely as military airport, however, after the end of the First World War, civilian flights were slowly introduced. In 1926, the airport was sold to the municipality of Amsterdam, to prepare it for the Olympic Games of 1928 – which would be held in the capital. At this moment the airport received hardened runways, which countered the issues that arose due to the high ground water standings (Schiphol, 2024) – a known issue within the polder that we have already seen within its agricultural history. World War II signified the most difficult period Schiphol has went through. Just before the start of the war, Schiphol was one of the most modern airports in Europe. However, due to both German bombings (at the start and very end of the war) and allied bombings (during the war), the airport was left completely unusable when World War II had finally reached its end (Van der Meulen, 2000, p. 59). The airport's great renaissance occurred after the war, where government led plans rebuilt the airport and expanded it westwards, creating new terminals, stations, runways and control towers (Schiphol, 2024). Through these expansions, the airport has grown out to be the most important economic asset of the Haarlemmermeer, becoming the second largest commercial airport in Europe in 2021 (CBS, 2022). However, also in recent times, this growth has not come without struggle. Noise complaints have kept rising due to the increase of flight traffic (Het Parool, 2021 & NOS, 2024), even with the opening of the new Polderbaan, which was built to mitigate noise issues. The COVID-pandemic has also strongly affected the airports revenue, inciting enormous losses in the year following the outbreak (RTL, 2021). Currently, 4 years after the start of the pandemic, the airport has crawled back up.

Financially speaking, the importance of Schiphol Airport to the Haarlemmermeer cannot be understated. Additionally, we cannot leave out its geographical presence. Nowadays, the airport covers over 13 percent of the surface area of the Haarlemmermeer (Kadastrale Kaart & Schiphol, 2024). Figure 25 shows the geographical growth of the airport since its start as a military airport. In this, it also becomes clear how the airport interferes with the underlying parcellation of the polder. Through time, lengthy runways - positioned favorably in accordance to dominant wind directions – have cut through the polder landscape, seemingly without any recognition or appreciation of the underlying grid. This has called for the development of tunnels and bridges to maintain certain road connections, required the expropriation of many plots of (farm)land, and created many illogical pockets of land and dead-end roads in the process. Through the years, Schiphol has therefore made a lasting impact on the Haarlemmermeer.



25 Growth of Schiphol and impact on the underlying parcellation. Own work. Source: Topotijdreis.nl, 2024

Synthesis

Infrastructure was and still is extremely relevant within the Haarlemmermeer. Centuries ago the lake already functioned as an important shipping route. New shipping routes were reinstated at the moment the Ringvaart became operational. Although steamboat services fell through, new modes of transport took over, with the railways becoming particularly dominant. Once again, this fell out of grace because of economic setbacks – and soon after, the flight infrastructure would diminish as well as a result of the war. After the second World War rail and flight made a resurgence, and Schiphol Airport in particular has grown out to become a vital *and* strongly visible asset of the Haarlemmermeer.

Conclusion

This paper's aim has been to examine the development of the Haarlemmermeer, and to pinpoint those moments in which progress in this development stagnated, proposing a non-linear attribute to the growth of this Dutch municipality. The first chapter immediately showed that the initial reclamation was not simply executed without struggles. In fact, it would take many plans, engineers, resources and time (over two-and-a-half centuries), for the polder to finally be reclaimed. The second chapter shortly dove into the first decades of the Haarlemmermeer's existence as a polder, and showed how harsh agricultural conditions and slow urbanization limited the potential of the land that was made available. The third chapter looked at the role and importance of infrastructure, highlighting three different infrastructural elements: shipping, railways and Schiphol Airport. Each of these had a significance to the Haarlemmermeer, but also experienced moments of decay.

Within this paper, only a small glimpse of the history of the Haarlemmermeer has been covered. The growth of its urban cores through times, the growth of its economy, and even its culture could be examined to extreme depths, offering more elaborate insights into what made the Haarlemmermeer the region it is today. However, this paper alone already hopefully shows the main elements that shaped the region, giving a better understanding of the rough, extensive and non-linear development of the Haarlemmermeer.

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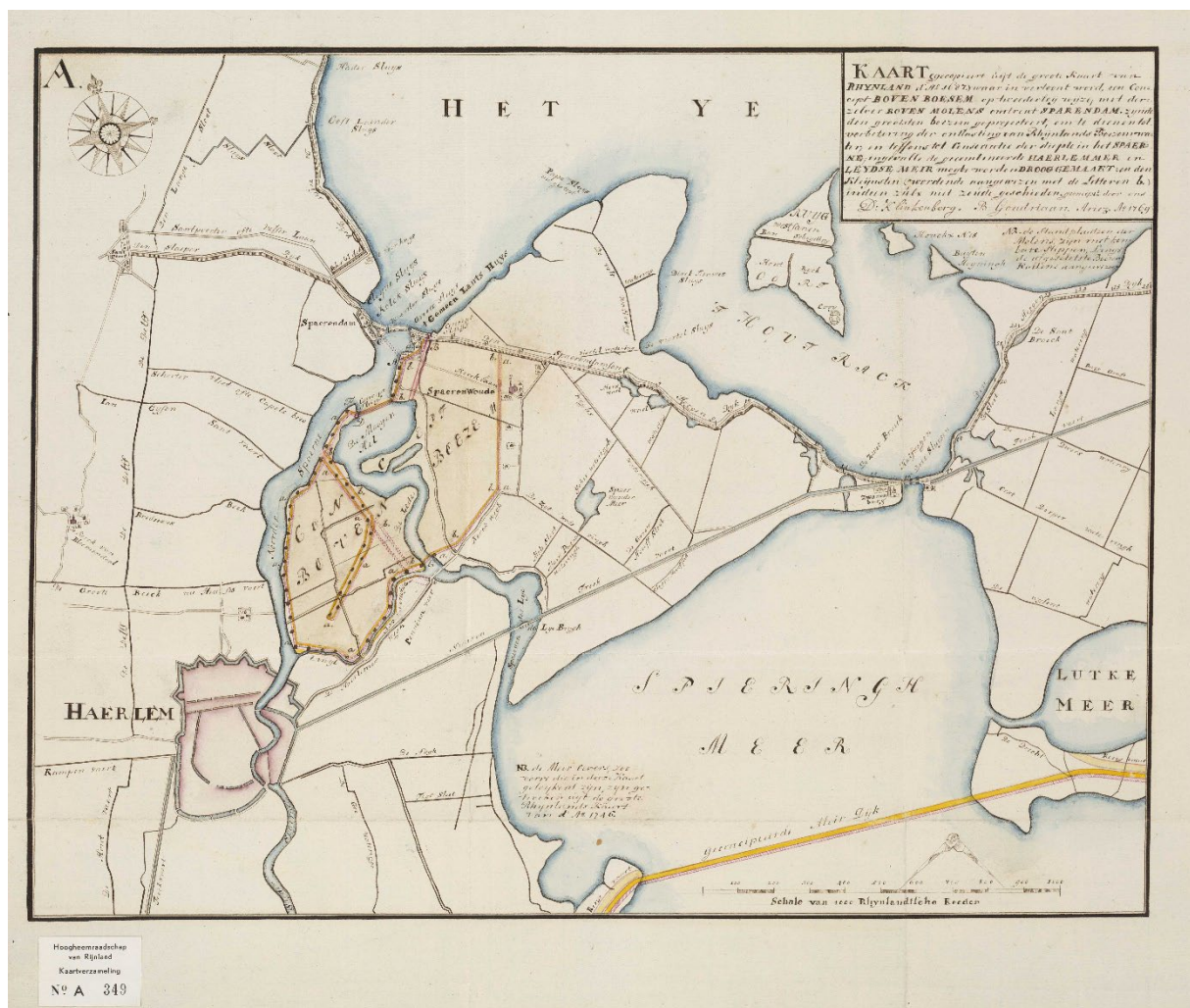
Maps and illustrations (in addition to those available in the literature above)

Atlas 1868 (https://www.atlas1868.nl/nh/kuyper_nh_haarlemmermeer.html)

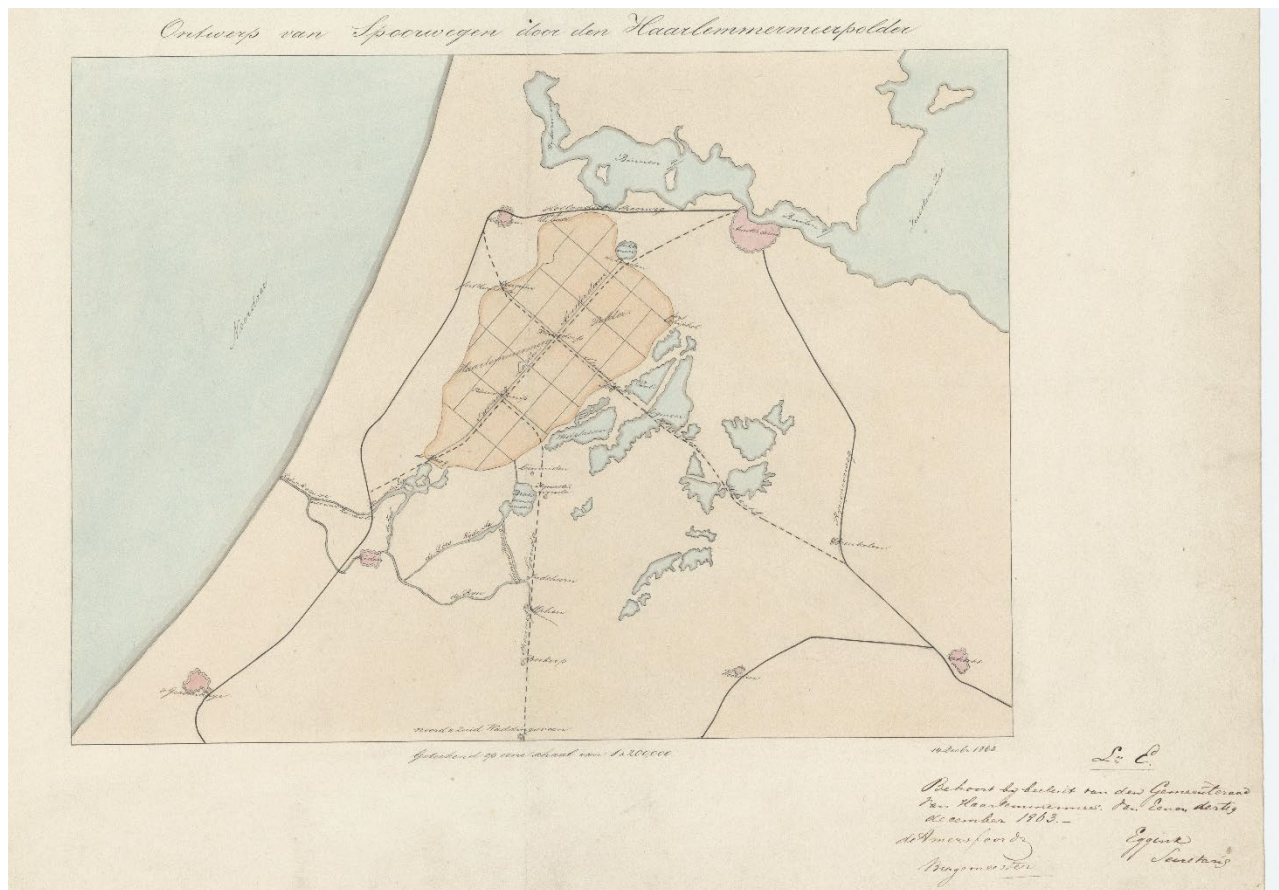
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Haarlemmermeer in Kaart (<https://www.haarlemmermeermuseum.nl/haarlemmermeer-kaart>)

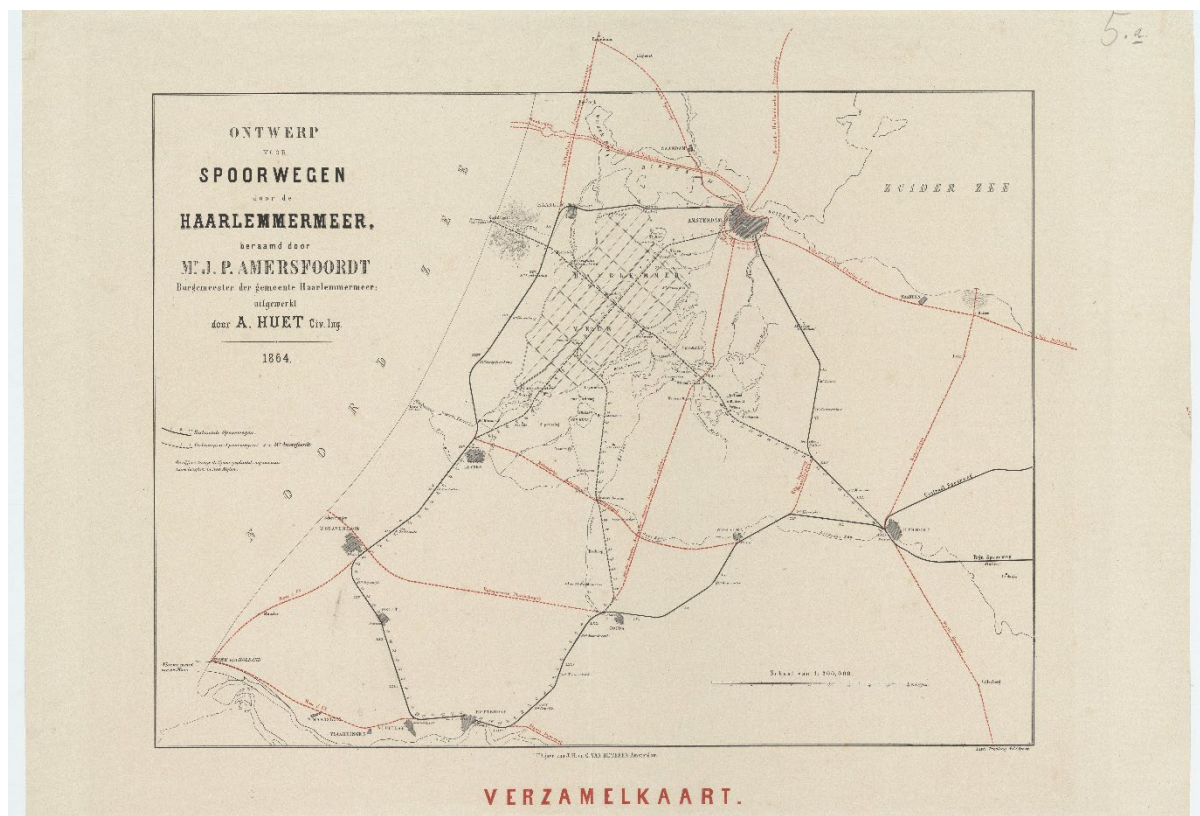
Appendix



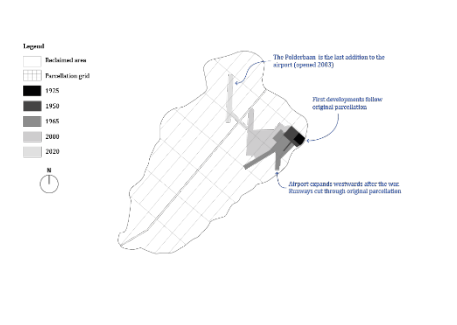
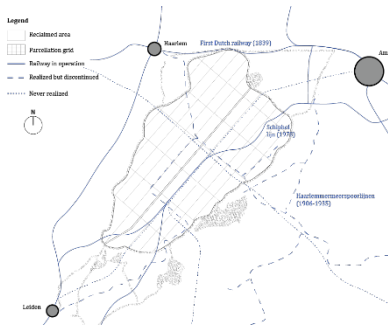
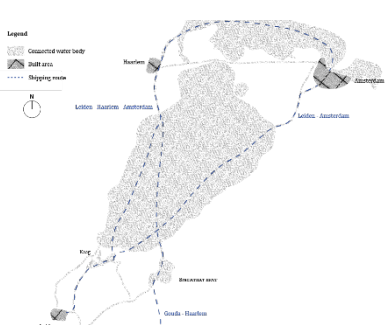
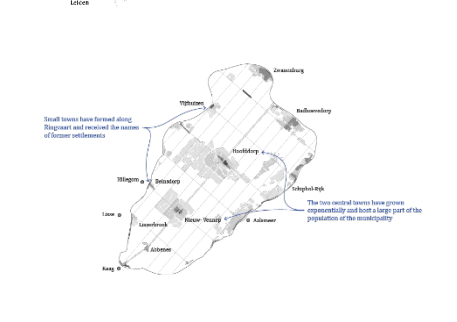
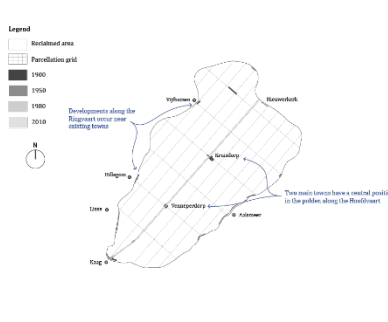
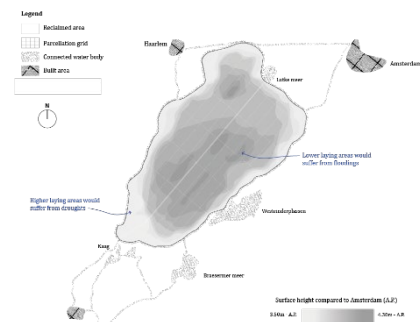
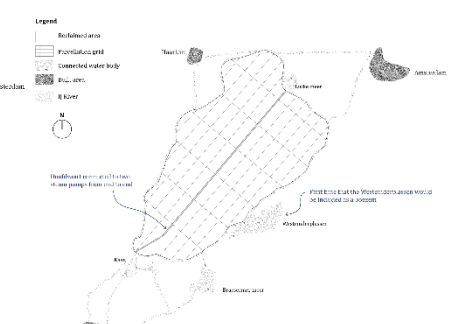
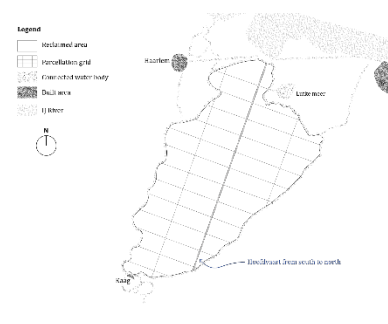
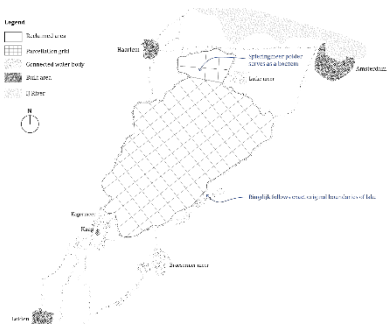
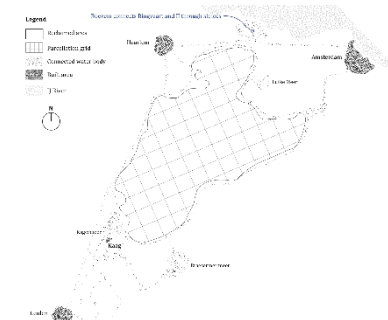
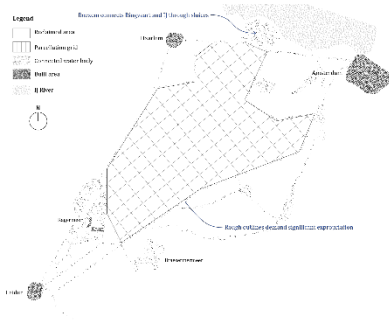
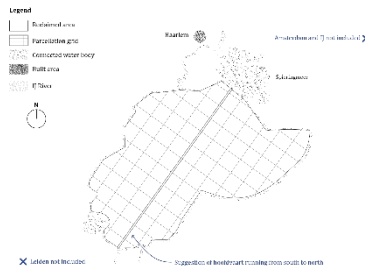
A1 Map as part of the reclamation plan of Goudriaan and Klinkenberg, investigating the potential to additional boezem area to compensate for the possible reclamation of the Haarlemmermeer. By D. Klinkenberg and B. Goudriaan, 1769.
Source: Haarlemmermeer in Kaart, 2024



A3 Preliminary railway design envisioned by J.P. Amersfoordt. Unknown, 1863. Source: Noord-Hollands Archief, 2024



A4 Further developed railway design envisioned by J.P. Amersfoordt. A. Huet, 1844. Source: Noord-Hollands Archief, 2024



A6 Overview of all schematic maps featured throughout this paper