State, property rights and sustainability of drained areas along the North Sea coast in the sixteenth-eighteenth centuries

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I. Introduction

Since the twelfth century hundreds of thousands of hectares of marshes, fens and lakes along the southern and eastern North Sea coast have been drained. The first polders were often small, usually measuring less than a hundred hectares. From the later Middle Ages, however, the enterprises became larger, often covering thousands of hectares. More and more capital was required, especially when in the sixteenth century technical progress made it possible to drain lakes, which was much more costly than embanking coastal marshes. Such large projects were financed by groups of urban or noble investors or sometimes by the state. They added a considerable area of land to the states bordering the southern North Sea. For the Netherlands alone this is estimated at 231,000 hectares for the period 1540-1815 (De Vries and Van der Woude, 1997: 29). The aim of this paper is to determine whether these large-scale projects were sustainable in the sense that landowners and farmers were able to prevent the area from flooding and to maintain a viable rural economy and society in the area as agricultural land and to investigate what role property arrangements played in the degree of sustainability.

In the early modern period, the coastal regions of the North Sea area belonged among the most productive and most highly developed agricultural regions of Europe. At first sight this does not seem surprising because the marine clay soils of the drained marshes range among some of the most fertile soils in the world. However, historiography shows that fertile soil is not a guarantee of success. Establishing a viable agricultural system in a recently drained area is not easy. Coastal areas are fragile environments and always remain liable to flooding. Even when an area was successfully drained, maintaining dikes and drains and raising the money to do so remained a heavy onerous task for landowners and farmers. In several cases they failed and had to give up the land.

In current historiography, the loss of drained land to the sea has usually been attributed to failing technology, to ecological factors like unexpectedly poor disappointing quality of the soil of the drained area or the subsidence of drained peat soils or to storm surges. But as Christopher Taylor has pointed out, social, economic and political matters are much more important. Of those factors, the economy is probably the most important. As Taylor states: ‘When agriculture is profitable, it is worth draining and reclaiming land’ (Taylor, 1999: 152, 156). But political and social factors are important too. This paper addresses the success or failure of drainage projects from the social and legal-political perspectives. When land was drained, the rights of various groups of landowners – the state, investors, landowners in adjoining areas – were involved. The way these rights were managed was crucial to the success of the enterprise. Disgruntled landowners or inhabitants of adjoining towns or villages could make the costs of drainage increase enormously by starting endless litigation or even destroying dikes or sluices. Under such circumstances the new land sometimes had to be abandoned.

The state could provide the legal framework that was a precondition for successful drainage. One of the reasons why this legal framework was required, was that the balance between the property rights of different groups affected by drainage projects could easily be disturbed and cause problems. Property rights are defined broadly here, including several kinds of rights to
dispose of land, to have access to it or to use it. At least three groups of interested owners, and in some cases even four, can be discerned:

1. The state itself. This term is also broadly defined, and it includes absolutist states like England or the Southern Netherlands, a federal state like the Dutch Republic and the numerous small principalities and territories along the southern North Sea coast. In general, the state profited from drainage because it had claims on the ‘wilderness’, based on the regalia. Drained land provided the state with more income from land tax or the sale of land in the new polder than marshes or fens did from leasing fishing or grazing rights. However, the state did not always benefit from drainage. For instance, in the border areas in the Low Countries inundated lands were used as lines of defence by both the Dutch and the Spanish government. In that case the state might prefer to ensure these lands remained flooded (De Kraker, 2002).

2. The investors in drainage. They had to be sure that their investment would be rewarded by receiving undisputed ownership of at least a substantial part of the reclaimed land. In the longer term, they were in need of an efficient water board and tax system.

3. Towns, village communities and individuals in the ‘old land’ bordering on the drained area. Their interests could be affected in several ways. The new polder could close off shipping routes to villages or towns or could impede the flowing of drainage away of excess water from the old land. Furthermore, village communities often had common rights on marshes or fenlands, which they used for fishing, gathering reeds and fuel or grazing livestock. When the land was drained they lost an important source of income for which they had to be compensated.

4. When land was drained that had in the past been occupied and cultivated, the rights of the former landowners had to be considered as well. Were their rights revived when the area was drained again and if so, did they have to share in the costs of drainage?

Only at the level of the state it was possible to find the authority to create a proper balance between the often conflicting interests of all of those groups affected by drainage projects. Of course the state itself was an interested party itself. It could profit from drainage and the more pressing its financial problems were, the less neutral its attitude would be. But only the state disposed of the legal means to arbitrate in matters of drainage and only the state could enforce its decisions in these matters. However, the degree to which the state could interfere varied between the several kingdoms and principalities and this influenced the state’s efficiency (Ciriacono, 1995: 301).

Once drainage was completed, owners and farmers faced the task of maintaining the new land. To ensure this, the dikes, sluices, canals, windmills etc. had to be maintained, which meant that the new polder was in need of an efficient board which had the right to levy a tax from all landowners and farmers to finance maintenance. Not only was the right to levy such a tax important for the maintenance of the new land, but it also was the way it was levied, and the burden was divided between several groups of landowners. The sustainability of these fragile coastal areas could only be guaranteed by an efficient taxation system that ensured that all landowners contributed on the same basis. Sustainability is defined here as the ability to prevent the new land from flooding and to establish a viable rural economy and society in the area.

This requires a taxation system that extracts the surplus from landowners and tenants in an equitable way, dividing the burden of maintenance in such a way that farming and landownership in the new land remain profitable in the long run. If, for example, groups of owners are granted exemption from polder taxes, the burden of taxation might become too heavy for the remaining owners and tenants.

In this chapter paper the issue of sustainability of drained areas will be studied from a comparative perspective, comparing the Low Countries, England and several North-West German principalities. This is not easy because there is much more literature on the Low Countries than on
Germany and there is even less on England, so the Low Countries will receive most attention. The problem is compounded by the widely differing historiographical traditions. However, there is known about all countries in the area to make an attempt at comparison worthwhile.

II. The state's claims to marshes and fens

The rights to the 'wilderness', which had formed part of the domains of the Carolingian kings, had been granted to or usurped by many of the princes along the southern North Sea coast in the Middle Ages. This wilderness included wastelands like fens, but also the rivers and all of the silted-up marshes along the coast of the principality (Gallé, 1963: 31-32). By the thirteenth century, most counts and dukes in the Low Countries and North-West Germany were considered as the owners or possessors of the foreshore and all of the silted-up land within their territory. The count of Holland had already been granted the rights to the wilderness for parts of his territory in 985 and had usurped those rights for the rest of his lands (Van der Linden, 1982: 65). Only in some of the former Frisian 'peasant republics' like Groningen, Kehdingen and Dithmarschen did the rights to marshes remained in the hands of the village communities (Knottenrus, 1992: 65-66).

There were several exceptions to this rule existed. In the county of Zeeland, for instance, marshes that were attached to the old land (aanwater), were considered as the property of the adjoining manor. Only land that had silted up detached from the old land, like a sandbank at the mouth of a river (opwater), belonged to the count (Beekman, 1905-1907: 1198-1199). In parts of Holland, too, the rights to the aanwater sometimes belonged to the adjoining seigneuries or even to individual landowners (Wouda, 2004: 287-290). Usually, however, wastelands like marshes or fens were part of the domains and those who wanted to reclaim them had to purchase them from the king or prince, or in the Dutch case from the provincial or federal government. This gave the state the opportunity to make certain that its own interests or those of third parties were not damaged by the drainage project.

In Schleswig-Holstein, the state claimed the rights to the foreshore exceptionally late, in 1612 (Allemeyer, 2006: 139). Although some examples from the late fifteenth century and the sixteenth century show that sometimes permission for drainage was requested from the duke, the general rule in this Frisian area was that the village communities adjoining the marshes had the right to drain them (Allemeyer, 2006: 139). They made use of this right, but at the beginning of the seventeenth century they did not drain enough land to satisfy the state's fiscal needs. By his 1612 decision, duke Johann Adolf hoped to attract foreign investors who would be able to raise more capital in order to drain more land that could broaden the basis of taxation in the duchy. The new system, including its terminology (a grant for drainage was called Octroy, and the Dutch word was octroy), seems to have been modelled after the Dutch example. This is hardly surprising, since Dutch engineers and investors had been active in Schleswig-Holstein since the fifteenth century.

In some territories investors even had to request permission from the government when land was reclaimed that did not belong to the domains. The reason for this was that the government wanted to make sure that the project did not harm the general interest. In the county of Zeeland this had already happened around the middle of the fourteenth century (Beekman, 1905-1907: 1199). By the early seventeenth century the practice had become common practice in Flanders, Zeeland Flanders, Brabant, Zeeland, Holland, Friesland and in North-West German principalities like Ostfriesland and Oldenburg. Investors were happy to submit to this practice. In giving the permission for drainage the state usually made provisions like exemption from taxes for several years that made drainage more lucrative. But also – if it did its work well – the state could prevent lots of problems for the investors by finding the proper balance between the rights of all...
the affected parties and by providing the new polder with an efficient organisation. How popular this state interference was, can be observed in North-West Brabant, where powerful local lords were under no obligation to apply for a patent for drainage. But from the early seventeenth century they did apply for it to the States-General of their own free will. It has even been said that in territories like Kehdingen and Dithmarschen, where the state did not have this right to interfere, drainage stagnated (Knottnerus, 1992: 66).

Apart from some small territories in North-West Germany there was one notable exception to the rule that the foreshore belonged to the regalia. England. Here silted-up lands were considered to belong to the adjoining manor. Only in the 1570's Queen Elizabeth I was advised to claim ownership of the foreshore of her manors. However, she did not succeed in enforcing these claims and at the time of her death in 1603 the issue remained undecided (Thirsk, 1992: 310-314). Because the Crown owned many manors, it was involved in most large drainage projects that were executed in England in the seventeenth century. But this involvement differed crucially from that of the states on the other shore of the North Sea. The English Crown was involved as a ‘private’ entrepreneur, while at the same time as the state’s highest authority it had to deal with the conflicts that arose as the result of these projects. As we will see, this was not a happy combination.

In the next sections I will discuss how the property rights affected by drainage were managed by various states. Section III deals with the short term: the period preceding and during draining and reclamation. In this period the state played a crucial role in balancing the interest of all the involved parties involved. In section IV the longer term will be addressed. After the new land had been settled, the state’s part became less important, although it still exerted influence. But more important was the internal organisation of the new land. Finally, section V gives an overview of the degree of sustainability of early modern drainage projects along the North Sea coast in the long term.

III. The state and drainage

In most of the Low Countries, those who wanted to drain land had to request a patent (Dutch: octrooi) from the count or duke. Originally, these patents were documents in which the prince granted some wastelands to one of his vassals for reclamation. These vassals often did not have the knowledge or capital to perform this task, so they looked for investors and technical specialists to do it for them (Beekman, 1905-1907: 1198). The count of Holland and Zeeland made drainage attractive by installing a Keizereiemand (ambacht) in the new polder, with lucrative rights, like those to fishing and fowling or to levy tithes. At least since 1361, the count also granted exemption from county taxes, usually for seven years (Beekman, 1905-1907: 1201-1205). The count of Flanders for a long time was less generous. The first time exemption from taxes was granted in Flanders was in 1487 and even after that year sometimes patents for drainage were issued which did not contain tax exemption (Soens, 2006: 441-442). This difference can still be observed after the Netherlands had been split up between the Dutch Republic and the Spanish Netherlands. In the seventeenth century, the States-General and the States of Holland and Zeeland always granted fiscal immunity to new polders for periods up to 27 years (Beekman, 1905-1907: 1214). The Archdukes Albert and Archduchess Isabella (1598-1633) and after them the King of Spain usually granted tax exemptions as well, but in some cases they did not. By granting tax exemptions the state served its own interest as well as that of the

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1 As is evidenced by several patents, for instance; National Archives, The Hague, Staten-Generaal nr. 12300 f. 132v (11 November 1609), 169 (27 April 1609) and 408v (10 May 1613).

2 See the patent for drainage of the Polder van Namen, 19 December 1612, National Archives, Raad van State nr. 2145 f.
investors. It stimulated drainage, thus contributing to an increase in the land area and of the
population, in the longer term resulting in a broadening of the fiscal base of the state.

Usually, state and investors had the same interests, so the state took good care of the
investors. Only the demands of warfare sometimes caused the interests of state and investors
to diverge. This was especially so in the border areas of the between the Northern and Southern
Netherlands in the seventeenth century. Flooded lands formed a very efficient and inexpensive
line of defence for towns and fortresses. However, these lands were often also very fertile and
interesting for investors in drainage. The States-General, which granted the patents for drainage in
the border areas of Zeeland Flanders and North Brabant, had by the beginning of the seventeenth
century a standard procedure to deal with this potential clash of interests. Each time a patent was
requested, the military authorities in the area were asked for their advice. This often resulted in the
States-General obliging the investors to make some changes to plans, for instance by changing the
line of the projected dike. Sometimes the investors were even obliged to construct fortifications in
the new polder.\(^3\) In this way, conflicts between economic and military interests could be avoided.

So we can conclude that in the Low Countries the state took good care of its own rights and
those of the investors, but what about the rights of third parties that were somehow involved?
The texts of medieval patents for drainage projects do not contain many references to this kind
of issues. However, as county and central bureaucracy became more efficient from the later
Middle Ages, patents contained more and more clauses concerning the general interest and the
interests of adjoining towns, polders and landowners. Patents for the drainage of lakes
(droogmakerij) in the county of Holland always contained a clause obliging the investors to give
contentment (satisfaction) to villages, towns and water boards as far as to the extent that the removal
of excess water, shipping, roads and bridges were affected by the drainage project (Beekman,
1905-1907: 1221). Usually, it was left to the parties concerned to reach an agreement about the
required arrangements. It was only when very important interests were concerned, that the
States of Holland intervened by making specific clauses in the patent. The standard
clause about contentment was certainly not a dead letter. In 1607/08 the investors in the drainage of
the enormous Lake Beemster in North Holland needed several months of serious negotiations to
reach agreements with villages, towns and water boards about the way their project would be
implemented (Borger, 2004: 81-90). Of course this was also in the investors’ own interest. If they
did not satisfy the demands of their neighbours, they ran the risk of long-drawn-out and very
costly litigation.

Whereas the States of Holland left these arrangements mostly to the parties concerned, in
the same period the States-General followed a somewhat different policy: it issued much more
detailed patents (Van Cruyningen, 2005/2006: 129). This was probably the result of the fact
that the States-General in many cases asked for advice about the project from the local authorities.
Often the investors were compelled to construct canals or sluices that were meant to
serve adjoining areas or towns. In 1637, for instance, a consortium that wanted to reclaim a polder
near the town of Oostburg in Zeeland Flanders had to build a sluice to ensure that ships would
still be able to reach Oostburg.\(^4\) This may have cost the investors some money, but it also
 guaranteed them that no costly conflicts with the town would arise.

Especially in the South-Western Netherlands, many thousands of hectares of land had been
flooded during the fourteenth, fifteenth and sixteenth centuries. This had been caused by
violent heavy storms or by the military inundations of the 1580’s. Around 1600 these flooded lands

\(^3\) National Archives, Staten-General nr. 4930, patent for drainage of Henricuspolder, 21 March 1615.
\(^4\) Zeeland Archives, Middelburg, Handschriftenverzameling nr. 1405/d, patent for drainage of Henricuspolder,
15 July 1637.
had silted up and had become potentially very fertile land, so many people were interested in reclaiming them. But how to be dealt with were the heirs of the former owners of the flooded lands to be dealt with? In Holland inundated land that was not re-embanked reverted to the count, or from the end of the sixteenth century, to his successor, the States of Holland. In Zeeland this land was also claimed by the count or by the lord of the adjoining manor, if it was not re-embanked within a year and a day (Beekman, 1905-1907: 29-30). So here the situation was clear. When the investors received their patent for drainage, they would not be troubled bothered by claims from heirs of former landowners.

In Flanders, the situation was more complicated. Here, the rights of former landowners remained intact. This could cause conflicts between investors and the heirs of former owners. Worse still, these conflicts could not be solved easily because after several decades it was difficult to reconstruct who had owned what in the past. The patterns of past ownership. The States-General tried to solve this problem by adding a special clause to each patent for drainage of flooded land in the part of Flanders under its jurisdiction. The drainage consortium had to publish its plans in several towns in the Low Countries. Those who thought they could claim land in the new polder had to make their claims known to the consortium within six months. After that, they had another six months to produce sufficient evidence. If their claim was accepted, they received the area of land they had claimed, and they had to pay for the cost of draining their land plus ten per cent interest (Beekman, 1905-1907: 1212). The ‘vacant lands’ for which no substantiated claims had been made, became the property of the investors in drainage. A comparable procedure existed in the Southern Netherlands at least since the first half of the sixteenth century (Fockema Andreae, 1950: 22; Korthals Altes, 1925b: 157). Very probably the States-General had been inspired by these Flemish arrangements.

In general, this arrangement seems to have functioned very well. Often the only claimants who could produce sufficient evidence of their rights were institutions like abbeys or hospitals and usually they were prepared to sell to the investors. In many cases they had already sold their lands to the investors before they had requested a patent for drainage. By 1650, however, the system seems to have functioned less smoothly. According to an address from the drainage consortium of Bewestereede Polder in Zeeland Flanders, many people made unjustified claims, based on little or no evidence. In the case of their project the total area that was claimed was larger than the whole polder they were planning to drain. In such cases the States-General appointed Delegated Judges who had to arbitrate. According to the consortium, the claimants just speculated that their claims would be accepted by these judges. If this did not happen, nothing was lost and if they succeeded, they acquired ownership of drained land without having had to share in the risks of the enterprise. Afterwards, of course, afterwards they had to pay their share of the costs plus interest, but normally the value of the acquired land was much higher than that. The States-General reacted to this complaint by deciding to raise the interest rate to 12 per cent, plus a sum of just over one guilder per hectare to compensate for the costs of the Delegated Judges. Still, this does not seem to have deterred people from taking a gamble by making dubious claims. Delegated Judges were often appointed to settle conflicts about ownership of land in new polders in Zeeland Flanders in the 1650s. However, it seems that once they had given their verdict, the parties accepted it because there are no examples of litigation afterwards.

There was one problem the authorities in the Low Countries did not have to worry about. No commons existed in the marshes and fens. Fishing and fowling took place there and shepherd herders let their herds graze their livestock in the marshes, but they had leased the right to do so from the federal or provincial government. When the government decided to issue a
Only the Archdukes Albert and Isabella (1598-1633) in the Southern Netherlands sometimes participated in drainage projects themselves. See Korthals Altes, 1925b.

Generally speaking, the way in which property rights of wastelands were managed in both the Northern and Southern Netherlands contributed to the success of drainage projects. Ownership was clear. Usually the state or some smaller territorial unit was owner of marshes or fens. Commons that might have complicated drainage did not exist. All rights of use or access to wastelands depended on the state. When individuals could make some claim to marshland because their ancestors had once owned it, procedures existed to deal with that. When necessary, the States General helped by appointing judges who gave everyone his share. When drainage was completed, property relations in the new land were clear and uncontested. This was an important precondition for investment and development of agriculture in the polder.

The fact that the Low Countries, both North and South, had a relatively efficient bureaucracy that had several generations of experience dealing with patents for drainage, contributed to the efficient way these projects were handled. That the verdicts of this bureaucracy were in most cases accepted by all parties may be ascribed to the Dutch habit of hearing everyone whose interests were somehow affected. This may have made the decision-making process slower, but it contributed to acceptance of the outcome. This is not to say that everything always went smoothly. Every scholar of the history of water management in the Low Countries knows that the world of polders and water boards was rife with conflict. But in general property rights were dealt with fairly and efficiently during the transition from wasteland to polder.

In the case of the Dutch Republic, its archaic political system, demanding intensive negotiations between federal, provincial and local government on decision-making, contributed to the successful management of all rights and interests affected by drainage. All parties had to be heard and account had to be taken of their interests. This made decision-making slow, but in the end it was efficient because the chance of obstruction or costly litigation was very much reduced. The methods of modern absolutist states discussed in the next parts of this section may have been quicker, but they caused more resistance and often greater costs for the entrepreneurs.

German historiography on drainage projects is less abundant than that of the Low Countries. Yet it is possible to produce a sketch of the way some North-West German principalities dealt with drainage and property rights. The county of Ostfriesland followed the Low Countries model. This is not surprising. Ostfriesland borders on the Netherlands and at least until 1744, when it became a part of Prussia, it had close political, economic, and cultural ties with the Dutch Republic. Here the state granted patents for drainage to private investors following procedures like those in the Low Countries (Uphoff, 1995: 53-54; Knotterus, 2005: 165). More to the east, in principalities like Harlingerland, Jever and Oldenburg, the situation was somewhat different. Here the role of the state was much more prominent. In the Low Countries the state left drainage to private initiative and limited itself to regulating these projects through the patent procedure. Only Archduke Albert and Archduchess Isabella in the Southern Netherlands sometimes participated in drainage projects themselves (Korthals Altes, 1925b). In the German

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* Only the Archdukes Albert and Isabella (1598-1633) in the Southern Netherlands sometimes participated in drainage projects themselves. See Korthals Altes, 1925b.
territories absolutism was developed more strongly and therefore the state exerted more influence. A clear example is the county of Oldenburg. Here drainage projects were executed by the state in order to improve the fiscal basis of the absolutist state by increasing the taxable land area and the number of inhabitants. In this spirit count Johann of Oldenburg executed fifteen large-scale drainage projects between 1574 and 1596 (Knollmann and Bauer, 1995: 47).

Oldenburg had intended to finance these operations from the receipts of a toll on the river Weser, but these were not sufficient so the projects had to be financed with borrowed money (Knollmann and Bauer, 1995: 48). It was possible to reduce labour costs by using Zwangsrekrutierung (forced recruitment), which meant that peasants from the area were forced to do most of the work. This, however, had very negative effects for the local economy, because dikes had to be constructed in spring and summer, when peasants ought to be sowing and harvesting. Another negative effect of Zwangsrekrutierung was that the labour force was not motivated and the dikes might not be ready in time. So in Oldenburg this method was not used for the construction of new dikes (Uphoff, 1995: 51). Lack of capital forced count Anton Günther of Oldenburg in the 1650's to leave drainage to local and Dutch investors. The contracts between the count and the investors show similarities with the patents from the Low Countries. In 1658, for example, a group of six local investors made an agreement with the count to drain a polder of 118 hectares. Their efforts would be rewarded with ownership of the land and exemption from tithes, but from 1660 they would have to pay a land tax to the count (Tenge, 1999: 67). The Dutchman Anthony Studler van Zurck who in 1649 made an agreement with the count to drain the large polder of Schweiburg was to receive ownership of the land, exemption from taxes and civil jurisdiction over the new polder (Tenge, 2003: 82).

The Low Countries' model was very clearly followed in Schleswig-Holstein, where Dutch entrepreneurs were attracted to drain new land and to repair damage done to the coastal islands by the storm surge of 1634. From 1612, investors were granted exemptions from taxes for ten to fifteen years, hunting and fishing rights and jurisdiction over the new land (Allemeyer, 2006: 141). The consortium of Dutch investors that was granted a patent to re-embank the island of Nordstrand in 1652 would become owners of the drained land plus the foreshore of the island, and did not have to pay land tax for fourteen years (Müller and Fischer, 1936: 27). The inhabitants of the island that had been flooded in 1634 were treated harshly; they lost all of their property rights without compensation (Müller and Fischer, 1936: 14, 27). This treatment was cruel but efficient. Property relations were clear, which made the project attractive for investors, and the island was re-embanked and drained successfully. However, it will not come as a surprise that the relations between the Dutch investors and the local population were strained, to put it mildly, and not just on Nordstrand (Allemeyer, 1995: 152-153).

Like in the Low Countries, the states in North-West Germany could base such measures on their rights to the foreshore and wastelands (Uphoff, 1995: 51; Knollmann and Bauer, 1995: 76). It was only in the former 'peasant republics' of Kehdingen and Dithmarschen, where this was not the case, that peasant resistance prevented the draining of these lands (Knoetnerus, 1992: 66). The contents of the patents the German princes issued showed strong resemblances with closely resembled those of Low Countries. This raises the question whether they had been inspired by Dutch examples. Since German princes attracted Dutch entrepreneurs and engineers from the late sixteenth century it seems logical that this indeed was so, and some authors have answered the question in the affirmative (Knollnerus, 2005: 165-166).

In spite of some regional variations, by the first half of the seventeenth century most states on the eastern shore of the North Sea dealt with drainage in the same way, which may have
spread eastwards from the Low Countries, and they did so quite efficiently. In England, the situation was different. Several important drainage projects were executed here during the first half of the seventeenth century, but it is difficult to discern something like anything close to a coherent government policy concerning drainage. This is not to say that no important initiatives were taken. The General Draining Act of 1600 made it possible to attract investors for large drainage projects by creating the opportunity to grant a substantial part of the drained land to the ‘undertaker’ and his ‘adventurers’ (Taylor, 1999: 147). It is very likely that this Act was inspired by the example of the drainage companies of the Low Countries. But mostly the English Crown was involved in drainage as a private entrepreneur, which had to deal with the rights of other landowners in the area and with those of the commoners. Property relations in the English marsh and fen districts were much more complicated than on the continent. The state could not freely dispose of the fen areas as the states on the continent did; it had to take into account the rights of landlords and commoners, which made drainage an extremely complicated affair. It also complicated the implementation of the General Draining Act, because the grant of land to the adventurers meant that landowners and commoners had to be partly dispossessed. Naturally, this was not accepted without resistance.

In the Low Countries and Germany the state or some smaller territorial unit could dispose of the marshes and fens situated within its area. Commons hardly existed. There were very few commons and the state or lord could overrule private landowners. In England the state was not in such a strong position. When it engaged in drainage projects in the first half of the seventeenth century to increase the income from its estates it had to do so as a private landowner and it had to negotiate with other landowners and commoners, or force them to cooperate (Hoyle, 1992: 377). It did not really succeed in doing so. The large drainage projects the Crown was involved in from the 1620’s ended in disappointments due to the successful resistance of other landowners and commoners.

In English historiography most attention has been paid to the drainage of the c. 300,000 acres (120,000 hectares) of the Great or Bedford Level of the Fenlands to the north of Cambridge between 1630 and 1653 (Harris, 1953; Darby, 1956). Here I would like to discuss another project, the draining of Hatfield Chase and the Isle of Axholme, a fen area on the border of Yorkshire and Lincolnshire. In 1626 King Charles I reached an agreement with the Dutch engineer Cornelius Vermuyden to drain this area. In return for his efforts, Vermuyden would receive one-third of the 77,000 acres of drained land (Hoyle, 1992: 382). Vermuyden, the ‘undertaker’ of the project, raised capital for the operation by selling shares in parts of his third of the land to Dutch investors. According to Sir William Dugdale, who first told the story of this project, the area was successfully drained within five years. The village of Sandtoft was founded and the 24,500 acres allotted to the adventurers were cultivated by 200 families, most of them French Protestants (Dugdale, 1772: 145).

If we can believe Dugdale, all went well until 1642. Then a group of local lords and commoners, making use of the political unrest in the country, started to destroy fences, crops and houses. Later part of the drained area was inundated and in 1650 the village of Sandtoft was destroyed. As a result of these actions, the costs of the participants rose enormously. Until completion of drainage they had spent some 56,000 pounds, and by 1645 they claimed they had already spent about 200,000 pounds (Dugdale, 1772: 145-147). According to Dugdale, an initially successful project ended in financial catastrophe because of the resistance of the commoners. But Dugdale has painted a very rosy picture of the period until 1642. He ignored the technical mistakes made by Vermuyden and the quarrels between the undertaker and the Dutch investors.

7 Of the eighteen original participants at least fourteen were Dutch. See Korthals Altes, 1925a, 70.
over the financial aspects of the affair (Korthals Altes, 1925a). But he was right in assuming that the conflict between the participants and the commoners was the cause of the disastrous end of the project.

To the Crown, investors and engineers, the fens were unproductive wastelands that had to be improved. But the commoners, who had rights of usage of the fens, viewed these lands differently. The area provided them with fish, fowl, reeds and fuel and they grazed their sheep and cattle in the fens. Areas like these were attractive for smallholders, who could make a living from exploiting the diversity of resources the commons in the fens offered them. The loss of up to two-thirds of their commons often put an end to their accustomed way of living. Drainage could mean the destruction of the local economy (Thirsk, 1967: 38-40; Hoyle, 1992: 354-355). Of course the improvers thought this was replaced by something better, but one cannot blame those who were dispossessed from disagreeing with that view.

The rights of the commoners and those of the owners of land on the dry islands within Hatfield Chase had not been ignored. The King had appointed commissioners who had to reach agreements with landlords and commoners about their rights. They were to be compensated in money or land for their losses. With the commoners of several manors agreements were reached, but others were just summoned to hear what had been allotted to them. For the commoners of Epworth Manor, for example, this meant that they were deprived of 7,400 of their 13,400 acres of commons without having had any chance to defend their interests (Dugdale, 1772: 144; Korthals Altes, 1925a: 111). It is not surprising that it was exactly the commoners of this manor who were among the most fierce opponents of the drainage plans. Of course, the investors reasoned that they were compensated for this loss by the improvement of the land because the remaining land owned by the commoners possessed was improved considerably as a result of drainage. But to the commoners it meant the loss of a large part of their means of living and the destruction of an economy that had guaranteed them subsistence.

Basically, both here and in the East Anglian Fenland, two different views of the environment and the economy clashed. To the commoners and local landowners, the fens formed the indispensable basis of a successful subsistence economy of smallholders based upon stock raising, dairying, fishing and fowling (Thirsk, 1953; Spufford, 1974: 128, 133-134). To the Crown and the investors the fens were wastelands that had to be improved to make them suitable for commercial arable farming. Their attempts to destroy a well-established, successful farming system naturally met with fierce resistance from the villagers who had a strong sense of community and self-government caused by the high level of considerable organisation demanded for the management of the common fens (Spufford, 1974: 122).

But why did such conflicts seldom arise on the continent where villagers also lost valuable resources by drainage? We should take into consideration that English fen villages were stable inland communities that enjoyed common rights to the fens for generations. Coastal villages on the eastern shore of the North Sea seldom had common rights and were accustomed to periodic change. The villagers here were used to the fact that once in every one or two generations marshland was drained and their environment was thoroughly changed. They not only adapted to these changes but often even caused them, as in Schleswig-Holstein and other Frisian areas where village communities drained marshes themselves. This may also explain why in England in the seventeenth century authors tried to provide drainage and reclamation with an ideological underpinning by declaring it a work of God (Lord, 1996). In the Low Countries, for example, very little literature hardly existed was written on the subject, and it was not considered necessary to convince the population
But there were other factors that contributed to the problems of the drainers of Hatfield Chase. One of them was that Vermuyden’s design was far from flawless. He did manage to drain the area, but by doing so he caused flooding of the land of several adjoining villages. The construction of a dam and insufficient capacity of the basin for excess water created by Vermuyden had disastrous consequences. One of the villages that were hit was Epworth, where the inhabitants were already dissatisfied because of the loss of most of their commons (Korthals Altes, 1925a: 34-36). Contrary to what Dugdale suggested, the resistance of the commoners against drainage did not begin in 1642, but was already in place in 1628 (Korthals Altes, 1925a: 53, 106). The violence committed by the commoners in the years 1628-1630 had clearly been triggered by the flooding caused by Vermuyden’s drainage scheme. In 1633, a court upheld the complaint of the villagers by forcing Vermuyden to dig a new canal, the Dutch River, which cost him and his adventurers another 33,000 pounds (Korthals Altes, 1925a: 109).

Many problems might have been overcome if the commoners and other affected parties had been given an opportunity to participate in the decision-making process, as happened in the Low Countries. If they could have done so, a better balance between the interests of all involved parties might have prevented much bitterness and violence. As it was, only the rights of the King and the investors were respected; Vermuyden was given as much freedom as possible to ensure the financial success of the undertaking (Harris, 1953: 44). The way in which he used this freedom was the cause of much of the conflicts. One cannot really blame the English Crown for this, because it could not profit from centuries of experience in drainage matters like the authorities of the Low Countries. After all, the draining of Hatfield Chase was the first project on this scale in England. But Vermuyden should have known better. However, even Korthals Altes, whose book about Vermuyden is rather hagiographic, had to admit that his hero—in spite of all his excellent qualities—was very good at making enemies (Korthals Altes, 1925a: 106). But the basic problem was that, as Darby said about the drainage of the Fens, Vermuyden ‘laboured before a host of conflicting rights’ (Darby, 1956: 70). Complicated property relations made drainage in England an even riskier enterprise than on the continent. This did not change in the next two centuries. After the problematic projects in Hatfield Chase and the Fens, the English state lost its interest in drainage and left it to private initiative. However, since the state did not provide a stable legal framework, private entrepreneurs were always confronted with the same problems and conflicts about property rights (Gritt, 2008: 2).

IV. Administration and taxation in drained areas

In the 1570s the Dutch estate agent, engineer and dike revive Andries Vierlingh wrote in his Tractaet van dyckagie (Treatise of drainage) about the risks incurred by those who invested their capital in drainage. When the land was finally embanked and drained, the danger was still not over. The dikes might break, the soil might be infertile, worms might eat the crops, good tenants were hard to find, because only ‘scum and rascals’ wanted to farm in new land, etc. (Vierlingh, 1920: 117-119). Because of these dangers he advises people not to involve themselves in drainage and then rather inconsistently continues to write several hundreds of pages on how to do it.

Vierlingh was right about the risks, but in spite of them profits on investment in the draining of land could be enormous, both when the new land was sold and when it was leased to tenants (Van Cruyningen, 2005/2006: 133-134). Several clauses in drainage patents contributed to this, especially those on exemption from paying taxes.
assisted landowners and pioneers in the new land in getting through the extremely difficult first few years. In the long run, it was important for the polder to have an efficient board that could levy taxes to maintain the dikes and drains and could spread the costs of maintenance in a reasonable way equitably over landowners and tenants.

Medieval patents for drainage in Holland and Zeeland usually created a seigneurie (ambacht) in the new polder. The lord of this seigneurie had the right to appoint officials to oversee the maintenance of the dikes. The very large drainage project of Zwijndrechtse Waard in South Holland (drained 1331/32) was divided into sixteen seigneuries, one for each participant in the project. In other cases the new land became part of an existing seigneurie. In all of these cases jurisdiction and water management were administered by the manors of the seigneurie (Beekman, 1905-1907: 1201-1210). From c. 1600 hardly any new manors were created. New polders were added to existing manors, but the maintenance of the dikes and drains was detached from the seigneurial court. New polders had their own independent boards. Seventeenth-century patents stipulated that the investment consortium could appoint a board presided over by a dike reeve. This board had the right to proclaim regulations on the maintenance of dikes, sluices, etc. in the polder and to levy a tax from the landowners. When a landowner did not pay his tax, the board could confiscate and sell his land (Beekman, 1905-1907: 1212-1213).

The organisation of water boards as described in the previous paragraph was first introduced in Flanders at the end of the thirteenth century. Flemish wateringen as they were called, levied a tax on the landowners within their jurisdiction, which they used to pay for the payment of maintenance works that were executed by day labourers or contractors (Soens, 2005-2006: 37-38). This form of water management by a specialised board, financed by a uniform land tax, was called gemeenmaking in Dutch and Kommunierung in German. Both terms indicate that the responsibility for maintenance of the dikes rested with the community of landowners, not with individual owners. It could be translated as communalization of water management. This was far from common in the Middle Ages. In the Northern Netherlands and North-West Germany the system of voorhoefslaging or in German Pfanddeichung or Kabeldeichung prevailed. This meant that maintenance was performed by the individual landowners in a polder or village, who each had a portion of dike allotted to them for which they were responsible (Beekman, 1905-1907: 821). The only thing the water board did was inspect the work the landowners had done.

Gemeenmaking was a more efficient system than voorhoefslaging. In the latter system maintenance depended on individual landowners, whose efforts were dependent on the economic situation. When the situation was unfavourable times were hard, landowners tended to neglect their task or even abandoned their plot altogether. Also the burden was often spread unevenly over the owners. Some lands were even exempt from contribution to dike maintenance. A uniform tax for all landowners levied by a water board that was itself responsible for maintenance guaranteed more continuity and uniform quality of work. Although gemeenmaking was not perfect (Soens, this volume), it was more efficient and also more just, because all landowners paid the same tax, based upon the same standards, only differing in relation to the size of their estate. But it took a very long time before other areas adopted the Flemish system. On the island of Walcheren and Putten, only a few kilometres not far from Flanders, gemeenmaking was gradually introduced from the second quarter of the sixteenth century, more than two hundred years later than in Flanders (Gallé, 1963: 155; Van der Gouw, 1967: 123). Elsewhere in the Dutch Republic it was introduced in the late sixteenth century or even later (Beekman, 1905-1907: 668).

8 Verhoefslaging literally means to divide (slaan) the maintenance of portions of the dikes over between the farmsteads (hoeven) in the area.
The old system of *verhoefslaging* was useful in an economy in which money was scarce. The new system fitted better in a rural economy given over dedicated to commercial farming where it was more efficient to use labour for better cultivation of the land than for dike maintenance. When we look at it this way, it becomes clear why Flanders was the first to introduce the new system. In the Middle Ages this county was the most highly developed part of the Low Countries and its agriculture was already commercial in the thirteenth century. *More to* further the north, agriculture was commercialised from the end of the Middle Ages, so it is not surprising that *gemeenmaking* was introduced here in the sixteenth century.

At present, we know very little about the pace at which *gemeenmaking* was adopted in the Low Countries outside of Flanders. There are only some occasional references that indicate it started in the second half of the sixteenth century. As far as we know, water management was organised on a communal basis in all new polders from the beginning of the seventeenth century. Most references concern communalization of dike maintenance on the old land, where vested interests and conservative courts often opposed the introduction of the new system for decades (Van Tielhof and Van Dam, 2006: 150). Such conservatism was probably not easily found in new polders, and we know that at least in the seventeenth century all new polders practised communal dike and water maintenance. But we do not know when this was first introduced in a new polder. The oldest example known in the South-West of the Netherlands is the polder of Nieuw Beijerland, drained in 1582 (Baars, 1973: 35). It seems likely that most polders from the sixteenth century and later adopted this system, because they were usually drained by companies who already used a similar system to divide the costs of drainage over between the participants (Van Cruyningen, 2005/2006: 130-132). It would be very useful to have a timetable that could tell us where and when *gemeenmaking* was introduced. Then we might perceive how it spread across the Low Countries.

What we do know is that communalization of water management had reached the German county of Ostfriesland in the early seventeenth century (Knottnerus, 1992: 67). However, for a long time it did not spread further eastward. In Oldenburg Pfanddeichung was only gradually abolished in the eighteenth century. In this principality the problems were worsened by the fact that many landowners were exempt from contributing to dike maintenance. The count, people who had bought land from the count, civil servants and clergymen did not have to contribute, and by the seventeenth century many wealthy farmers had also freed their land from contributing to dike maintenance by bribing officials. In 1634, in the area of Butjadingen, one fourth a quarter of the land was exempt not share from the burden of dike maintenance (Norden, 1984: 222). The remaining owners, often the poorer peasants, had to carry the whole burden.

Despite protests from the population and decreasing quality of dike maintenance, the county of Oldenburg did not succeed in changing the system. Those owners who had acquired exemption defended their rights successfully. In 1681, when Oldenburg had come under Danish rule, the new administration succeeded partially in introducing a new regulation. It installed a dike reeve to oversee maintenance and a Deichkasse (dike fund) to which all owners from the area had to pay a yearly tax to maintain sluices and repair particularly vulnerable parts of dikes. The Danes did not succeed in introducing complete communalization of water management, but at least part of the maintenance became independent from the exertions of individual landowners. Later, between 1752 and 1762, the system was introduced in several districts, but it took until 1855 to provide the whole of the coastal area of Oldenburg with an efficient and uniform taxation system for water management (Norden, 1984: 223-225). Landowners stubbornly resisted what they perceived as an infringement of their property rights and the state was not able to break this resistance. Even the fact that in 1681 the...
Danish administration was willing to give up its own privileges could not convince other landowners to do the same.

In Schleswig-Holstein, communalization of dike and water management was the norm in most of the so-called oktroyierten Köge (patented polders) that had been embanked since 1612 with permission from the duke. Like in the Low Countries, it was logical to introduce this system of financing dike maintenance in new polders because initial drainage had been financed by companies that distributed the costs between the investors in the same way (Allemeyer, 2006: 142). Attempts by the duke in the first half of the seventeenth century to introduce the system in all of the coastal areas failed. The local population resisted because they preferred contribution in kind (labour) over monetary contribution, which they considered a heavy burden (Allemeyer, 2006: 129-132). This seems to indicate that farming in Schleswig-Holstein was less commercialised than in the Low Countries. Kommunadeichung was only introduced in Schleswig-Holstein in 1803. The old system of Kabeldeichung seems to have functioned here better than in Oldenburg, because exemption was seldom allowed (Allemeyer, 2006: 118, 128).

In England, communal maintenance of dikes and drains was already in place in Romney Marsh in the thirteenth century. There, twenty-four ‘sworn men’ were responsible for maintaining dikes and drains and could levy a tax to finance the repairs (Cook and Williamson, 1999: 7-8). However, this principle was not generally applied. In 1622 Joost Croppenburgh, a Dutchman living in London, and a relative of Vermuyden, reached an agreement with the main landowners of Canvey Island (Harris, 1953: 39). He was to embank this island in the Thames estuary to protect it from further encroachment of the sea. In return, he would receive one-third of the lands recovered, the ‘Third Acre Lands’ as they were called. With support from Dutch investors he succeeded in doing so, but then the problems began. The original landowners were of the opinion that the maintenance of the new embankment would have to be paid for by the owners of the Third Acre Lands and they refused to contribute themselves. Left to pay for all the expenses, the Dutch investors gradually abandoned their land on the island and the embankment fell into disrepair.9

In Hatfield Chase all did not go well either. A Commission of Sewers that had been installed to oversee maintenance of the drains had great trouble in collecting the tax from which repairs had to be financed. This was caused by irresponsible behaviour from both Vermuyden and the King. Vermuyden had made the mistake of selling shares in his land ‘free from lock, dam, scotts, water dues and other charges’ (Korthals Altes, 1925a: 82). The purchasers of these lands refused to pay tax, basing themselves on refusal on this clause in the deed. The Commission could then impound and sell their land, but it was sometimes prevented from doing so by Charles I. When the lands of people like John Gibbon and Sir Filibert Vernatti, two of the principal investors in Hatfield Chase and favourites of the King, were impounded, the King ordered the Commission to withdraw its decision (Korthals Altes, 1925a: 124). Together, between 1628 and 1637, Vermuyden and the King between 1628 and 1637 created a financial chaos in Hatfield Chase that lead to the ruin of several of the original investors.

It will not come as any surprise that after experiences like those in Hatfield Chase and Canvey Island, the Dutch lost their interest in drainage in England. They first lost trust in Vermuyden, with whom they refused to cooperate in 1630 in the drainage of the Great Level of the Fens. Because of this Vermuyden was replaced as undertaker, but even then no Dutch investors dared to participate in the enterprise (Knittl, 2007: 29-30). In this case organisation and financing of maintenance were well guaranteed. Arrangements made in 1649 were tacitly

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confirmed by the General Drainage Act of 1663, which installed the Corporation of the Bedford Level. This corporation had a board that was newly elected annually by all landowners with more than 100 acres, a professional staff, and it could levy a tax on owners of drained land within the level (Darby, 1956: 78). Although it was confronted with tremendous problems, the Corporation of the Bedford Level served the interests of the area and its landowners until the twentieth century.

V. Sustainability of drained areas

How sustainable were the drained areas along the North Sea coast? To determine that, this section gives a broad overview of the success and failure of drainage projects, this time beginning on the western shore. At first sight, the reclamation of marshes and fens in England of the early modern period does not seem to have resulted in the creation of sustainable agricultural land. On Canvey Island, the sea wall was left to deteriorate after 1623 because of the failure to install an efficient taxation system to maintain it. This was only remedied after devastating floods in 1791 had threatened to destroy the whole island. Joan Thirsk pronounced a clear verdict on the draining of fenlands some forty years ago: ‘Most of the drainage projects of this period failed in the end, and none produced any fundamental change in the economy of the region’. Much later, the former fen areas were to become Lincolnshire’s richest arable regions, but that was not to Vermuyden’s merit (Thirsk, 1967: 40; idem, 1953: 28). All of this seems to confirm the thesis of this chapter paper about on the importance of the arrangements of property rights for the success of drainage projects. But we have to be careful. In 1992, Richard Hoyle remarked that English historians of drainage projects have been more concerned with the disorder they provoked than with the degree of success of these attempts at improvement (Hoyle, 1992: 353). And recently, Tom Williamson was clearly more positive about the draining of the East Anglian Fens than Joan Thirsk. He stated that ‘the achievement of Vermuyden and his fellow countrymen was a great one’. He does not deny that problems existed with the drainage works and that large tracts of the Fens remained in common grazing. But some of the land was exploited as arable, and pasture was less liable to inundation (Williamson, 2005: 111-112).

Hatfield Chase offers some interesting evidence. There is no doubt that this project resulted in financial disaster for the original investors. But technically the record was better; the area was successfully drained. This success should not be overestimated. In 1631 one of the Dutch adventurers complained that of his 600 acres only 30 were in use as arable (Korthals Altes, 1925a: 80). But that Vermuyden and his adventurers did have some degree of success is proved by the fact that the resistance of the commoners continued until about 1720 (Korthals Altes, 1925a: 116). Had drainage not been successful, there would have been no reason for the commoners to continue their struggle for almost a century. However, it has to be admitted that the heyday of arable agriculture in the fens only came after the introduction of steam pumps in the nineteenth century (Williamson, 2005: 115-116). Until that time, sustainability in these areas was problematic.

The way property rights were managed in North-West German principalities like Oldenburg did have negative consequences for the sustainability of the land. Butjadingen, an area in Oldenburg consisting of late medieval and early modern polders, was on the brink of economic collapse by 1680. This was caused by a series of no less than fourteen devastating floods during the seventeenth century alone (Norden, 1984: 212, 223; Allemeyer, 2006: 121). Of course, all low-lying coastal areas are liable to flooding, but a comparable area like the South-Western Netherlands experienced in the seventeenth century only one flood with such disastrous effects, in 1682. That a relationship did exist between this recurrent flooding and the ways in which different categories of landowners were treated and dike
maintenance was financed, became clear after the reformation of water management by the Danish administration in the 1680s. In the 150 years after this reformation only two floods hit Butjadingen, in 1717 and 1825, and these two floods wreaked havoc in many areas along the southern North Sea coast, not just in Butjadingen (Norden, 1984: 226).

In the South-Western Low Countries most land that had been drained since the fifteenth century has remained dry until the present day, although sometimes not without interruptions. In the fifteenth and sixteenth centuries, the area was severely hit by several storm surges (for example in 1404, 1421, 1530, 1550, 1552). After the All Saints’ Day flood of 1570, however, natural disasters no longer caused much damage anymore. Much more damage was caused by the military inundations in the border area of Zeeland Flanders by the Dutch in the 1580s (De Kraker, 1997: 129-144). But around 1660 most of this damage had been repaired and even most of the land that had been lost in the late medieval floods was cultivated again. The only major disaster that hit this area in the seventeenth century was the storm surge of January 1682, but it is surprising how fast the damage done by this storm was repaired. Western Zeeland Flanders for example, an area of some 20,000 hectares that had been almost entirely submerged, was drained again within a year. Only some small marginal polders remained flooded or were only partially drained anew.

In general, then, the drained land in the South-Western Netherlands proved to be sustainable. But there were exceptions. Polders on especially threatened parts of the coast often were not able to cope with the task of maintaining their dikes. The costs sometimes exceeded the yield of the land. This was not just a marginal problem. If these polders were submerged, the adjoining polders in their turn would run the same risk and a chain reaction might set off that could threaten the whole area. The endangered polders tried to get subsidies from more inland situated polders situated further inland with the argument that those polders latter were indirectly protected by the threatened dike. This of course was a valid argument, but it seldom convinced the boards of those other polders, who were happy to let other the seaward polders bear the whole burden of maintenance. This free-rider problem also occurred on the German coast (Norden, 1984: 225). In 1791 the Provincial States of Zeeland solved the problem of the so-called ‘calamitous’ polders by introducing a subsidy system. Comparable arrangements were introduced in Schleswig-Holstein in 1803 and in Oldenburg in 1855 (Schorer, 1897; Norden, 1984: 226; Allemeyer, 2006: 135). It had taken decades and in some cases even centuries to break the resistance of inland polders against such arrangements. In spite of their apparent fertility and prosperity, the polder areas along the North Sea remained fragile. Only by spreading the costs of dike maintenance over the whole polder area could the polders directly bordering the sea be maintained.

VI. Conclusion

This paper has demonstrated that the arrangement of property rights was crucial in two ways for a successful ecological transformation from wetland to sustainable farmland. In the first place, property rights had to be clear prior to draining, guaranteeing that the entrepreneurs could execute their projects without endless conflicts and litigation. On most of the eastern North Sea coast this could be achieved because the state or some regional lord had successfully claimed the rights to silted-up land, which enabled him to grant uncontested property rights to investors in drainage. In England, however, property rights to wetlands were much more complex and the conflicts arising between investors and commoners were probably the most important cause

10 Zeeland Archives, Middelburg, Vrije van Sluis nr. 498, 31 January 1682.
Prosperous agricultural regions. This was the result of private investment and state intervention. An observer who surveyed the polders and fenlands on both shores of the southern North Sea in the nineteenth century would probably have concluded they were fertile and prosperous agricultural regions. This was the result of private investment and state intervention.

In the second place, after completion of drainage a system was required that divided the costs of maintenance of dikes and drains in an equitable and uniform way between all landowners in the newly drained land. The most efficient system was communalization or gemenmaking of water management, which had already been introduced in Flanders in the thirteenth century. In this system all landowners paid an equal land tax, which was levied by a water board. This board was responsible for maintenance and employed technicians and contractors to implement the work required.

Older systems, in which each individual landowner was responsible for maintenance of a part of the dike, were less efficient. This was especially so when large groups of landowners had managed to become exempt from ‘dike duty’, leaving the rest of often less wealthy landowners to carry the burden of maintenance. It could result in insufficient maintenance of dikes and drains and decreasing profitability of farming. In German Buitjadingen it almost led to collapse of the regional economy, which might have resulted in flooding of the whole area. Equal fiscal treatment of landowners was an important condition for sustainability of these fragile drained wetlands.

The state created institutions that were beneficial for the investors in drainage projects. This is not surprising, because both the state and the investors profited from drainage. Investors made profits by selling or leasing the new land, and the state’s tax income was increased. So the state primarily served the interests of the ‘adventurers’. The interests of other affected parties were treated less well. It was only in the Low Countries that procedures were in place that made it possible to take the interests of others into account. Indirectly, investors in the Low Countries also profited from this, because there was less costly litigation by adjoining towns, villages or landowners. However, the state’s role may have been important, but its power was limited. Local and regional social structures influenced the state’s effectiveness. In Oldenburg, the resistance of privileged landowners to a more fair and uniform taxation system that would have guaranteed better dike maintenance was successful. In the English fenlands smallholders, often supported by local landlords, managed to obstruct large-scale drainage schemes. To the existing stable communities of smallholders, drainage meant the destruction of a viable local economy. Thus, the failure of fen drainage was not only caused by the failure of the English state in managing property rights, but also by the ecological and economical differences between central function ‘wastelands’ had in the fenland economy, whereas the continental marshland economies these lands only were merely a source of some additional income and marshes.

Another conclusion of this chapter is that the Dutch Republic with its archaic confederal political system was more successful in managing the complex of rights and interests surrounding drainage than modern absolutist states like England or Oldenburg. Partly to some extent, this was caused of course by the fact that the Dutch had centuries of experience with drainage. However, the archaic political system was also a cause of the Dutch success. This system required intensive negotiations between federal, provincial and local authorities, thus guaranteeing that all interested parties were heard and limiting the risks of obstruction and litigation. In the complicated world of water management, where conflict was always rife with conflict, this slow and old-fashioned way of decision-making was in the end more efficient than the methods of the modern bureaucracy of the absolutist state.
But the history of the early modern drainage projects shows that state, investors, and not least the farmers in the new land, had had a narrow escape. The marsh areas on the eastern North Sea coast had been constantly threatened by conflicts over financing the maintenance of dikes and the English fen areas only became prosperous farming regions in the nineteenth century after the introduction of steam pumps. The institutions that had been created were sufficient to maintain their fragile environment, but only just.
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