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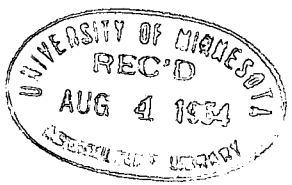
Land Settlement: The Making of New Farms



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LAND SETTLEMENT IN THE NETHERLANDS

I. *Introduction and summary*

LAND settlement, which may be defined for the purpose of this paper as the occupation of land to be used for agriculture, has been going on for many centuries in the Netherlands. The consequence of this long-term development is that in several regions the layout and size of farms are not suitable for present technical and economic requirements. Consolidation of farms and, in some cases, resettlement in other regions of those farmers whose land has been used to increase the size of surrounding small farms, are ways in which unsatisfactory situations may be improved. But these measures are outside the scope of this paper, the purpose of which is to direct attention to the question of bringing into agricultural use areas which previously were not so used. This urge to create new land settlements can be explained by the following considerations.

The Netherlands is a densely populated country with a relatively fast-growing population. The total number of inhabitants increased from about 4,500,000 in 1900 to roughly 10,300,000 in 1952. The area of the country is about 33,000 sq. km., of which 24,000 sq. km. are used for agriculture. Consequently, population density is high: 313 persons a sq. km. or 810 a sq. mile. The annual increase of population during the period 1947–52 has averaged about 157,000, or roughly about 1·5 per cent.

The many needs of this dense, still increasing population give rise to stiff competition between different land uses. Modern views on housing render it necessary to increase the area reserved for urban growth so as to provide space for houses, sports fields, and pleasure grounds. Increasing needs of traffic give rise to the need for new highways, canals, and aerodromes. Changing social circumstances and growing urban population call for more recreation areas and natural reserves in rural surroundings.

These necessary provisions mean that much land at present used for agriculture has to give way to some other use in the near future. In the years since the war this has happened to between 3,000 and 4,000 ha. per annum.[1] For the farmers occupying these lands, the

[1] 1 ha. = 2·47 acres.

process has been very painful, as often they had no opportunity of finding another farm elsewhere.

Land and farms are in great demand. Many farms are small and do not provide enough work for the families living on them. Furthermore, during the depression of the 1930's and the subsequent war, it was not possible for many farmers' sons to secure jobs in non-agricultural occupations. Many still remain on their fathers' farms and try to buy or rent farms elsewhere, thus increasing the demand for agricultural land.

The fast-growing population needs more food and more opportunities for jobs. Investments are to be made to provide more employment, especially in manufacturing industry but also in other sectors of economic life. The difficult payments position (especially with regard to hard currency countries) and the uncertainty in international relationships make it necessary to increase food production as much as possible, because a considerable amount of food has to be imported.

One of the most important means to reach these goals is the reclamation of land. Extension of the agricultural area can—at least temporarily and to a small extent—diminish the man-to-land ratio in agriculture. New employment possibilities are created by it, partly temporary, partly permanent, and the home-grown food supply is increased.

The possibilities of land reclamation have recently been surveyed.

The total area of waste land was about 225,000 ha. in 1940. Since then 20,000 ha. have been reclaimed. It has been estimated that an area of about 40 or 50,000 ha. is still suitable for future reclamation. The remainder is to be reserved for other land uses, such as military drill grounds, recreational lands, nature reserves or dunes for natural sea defences. The greater part of this area is scattered in many fields, especially in the regions of sandy soils. After reclamation these plots are as a rule attached to surrounding farms. There are a few areas of moorland, for the most part owned by municipalities and other landlords, which could be reclaimed for farming, and an area of peat moors from which the peat has not yet been removed. But the total number of farms which could be founded on such lands is small.

Another possibility is the reclamation of land from the sea. In the Zuiderzee (nowadays called Yssellake) two polders have been reclaimed already, with a total area of about 68,000 ha. Furthermore, it is planned to construct another two polders covering about 152,000 ha.

Possibilities are being studied of impoldering areas in the estuaries

of the rivers Scheldt, Rhine, and Meuse, and in those parts of the North Sea which are enclosed between the Frisian islands and the mainland. It has been estimated that in the present stage of technical knowledge and equipment a total area of about 120,000 ha. could here be reclaimed, if necessary within fifty years. Thus the total land surface which could be reclaimed amounts to 325,000 ha., of which almost 90 per cent. could be used for agriculture.

On the other hand, the space set aside for non-agricultural use will have to be increased if the needs of the growing population are to be catered for. If the population really increases to 12 or 13 million, as has been estimated by statisticians (from 9 million in 1940) it will be necessary to increase the non-agricultural area by about 140,000 ha., which means that the net increase in the area used for agriculture can be barely 200,000 ha.

Reclamation of waste lands and of land from sea form the only possibilities for land settlement.

II. *Reclamation of waste land*

(*a*) *Reclamation by private enterprise.* About 47 per cent. of the land area in the Netherlands consists of sandy soils with a low natural fertility.[1] These soils are situated mainly in the eastern and southern parts of the country. In the past the main problem has been to produce as much manure as possible to increase their fertility. Reclamation went on very slowly, partly for lack of capital, but mostly because of scarcity of manure.

The total area of waste land in 1833 was about 900,000 ha., or 30 per cent. of the total land area. At the beginning of last century, during the depression after the Napoleonic wars, some attempts were made to settle unemployed people from the larger towns on land reclaimed by philanthropic societies. These attempts were successful up to a point but they covered only a small area.

Many plots were reclaimed by farmers in order to increase the size of their holdings. A first necessity was the supply of manure. The use of city refuse was a great help in those regions where it could be procured. This happend to be the case in the province of Groningen, in the north-east of the country, where a very extensive peat moor existed, the top layers of which were gradually removed and used for fuel. The peat was transported in barges, the return freights consisting of city refuse from Groningen town and other towns. This was used to

[1] See Fig. 1.

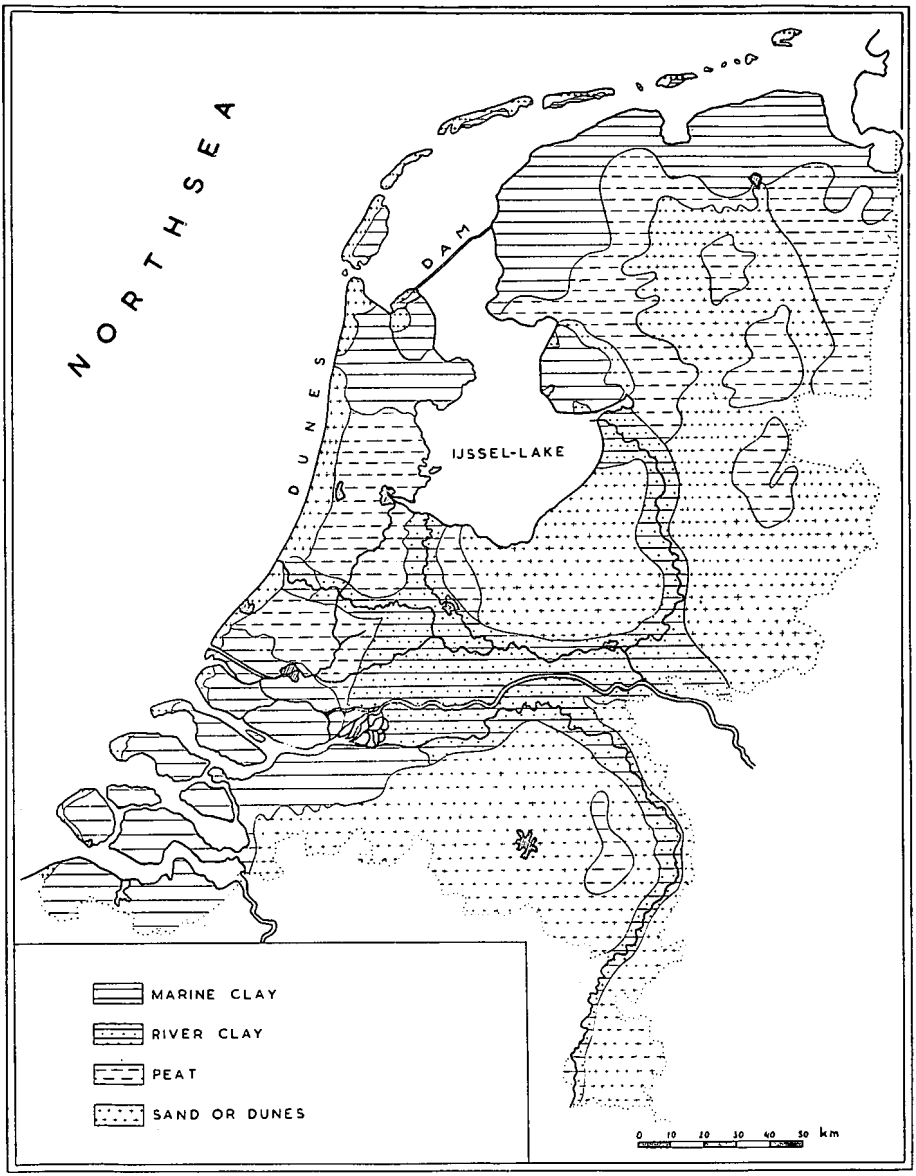

FIG. 1. Soil map of the Netherlands (schematized).
(*Source*: J. van Veen, *Dredge, drain, reclaim*, p. 17.)

fertilize the land from which most of the peat had been removed. The farms thus formed had a size of about 20 or 30 ha. each, with a narrow, drawn-out shape. The settlers on these farms came mostly from other regions.

But on the sandy soils the reclaimed fields were mostly attached to existing farms, as they could provide a certain amount of manure. In those circumstances the reclamation was done by the farmers and their families. On the sandy soils the farms as a rule were small, and the work of reclamation provided labour opportunities for the members of the family. In some regions it was customary to divide a farm between the heirs after the death of the owner. If there were enough waste land adjacent such new farms could be extended again by reclamation when the grandchildren grew up. This was a slow, but effective process. Many farmers either possessed waste land or could buy it at low prices.

Likewise, several landlords in possession of waste lands made extensive reclamations during the nineteenth century. Between 1833 and 1900 about 300,000 ha. were reclaimed in these ways.

The introduction of artificial fertilizers fundamentally changed the reclamation possibilities of sandy soils. The limiting factor of chemical poverty inherent in these soils could now be removed. It was no longer necessary to keep extensive moors in being solely to provide scanty food for flocks of sheep which previously had to be kept for supplementing the farmyard manure for the arable land. Experience taught that heavy applications of artificial fertilizers, combined with much smaller amounts of farmyard manure, could produce excellent harvests on reclaimed moorlands and peat soils.

In the beginning of the twentieth century the area of land which was reclaimed annually increased considerably. Farming became more profitable than during the depression years of the eighties and nineties. Moors could be bought for low prices, and the new possibilities offered by artificial fertilizers became more and more known. Before the First World War many companies were founded which bought considerable areas of waste land, reclaimed them, and formed large farms.

The farmers' efforts can be divided into two types: first, reclamation to increase the size of a farm and, second, the founding of new farms, often of a small size.

As already said, the work on these reclamations was carried out in many cases by the farmers themselves and by their families, whereas

the Agricultural Advisory Service (founded in 1890) and the Moor Society[1] (a non-profit organization founded in 1886) gave advice and counsel with regard to the best method of reclaiming land.

Many landlords either leased part of their waste lands for a specified number of years free of rent to farmers who might reclaim them, or started to reclaim the land themselves. Sometimes they leased these lands as land without buildings, but sometimes they put buildings on them and leased them as farms.

According to available statistics, which are not always reliable but nevertheless indicate a certain trend, the total area of waste land in 1833 was about 906,000 ha.; in 1940 it had diminished to 226,000 ha., a decrease of 680,000 ha. in 107 years.

The average annual decrease between 1833 and 1900 and during subsequent decades was as follows:

1833–1900:	4,700	ha.	per annum
1900–1910:	4,800	,,	,,
1910–1920:	6,100	,,	,,
1920–1930:	10,300	,,	,,
1930–1940:	13,400	,,	,,
1940–1950:	1,500	,,	,,

Part of this decrease of waste land has to be attributed to afforestation. This was carried out by private persons in the nineteenth century, and since then by the government as well.

From a financial viewpoint not all reclamation has been successful. The least risk was run by those farmers who slowly increased their farms. Losses and set-backs suffered on the newly reclaimed lands could be met with the returns of the original farm. Several farmers and landlords, however, who founded farms on new agricultural land suffered heavy losses. It depended partly on the time when reclamation was carried out. Heavy losses were suffered mainly on the investments in those new farms which came into being during the first ten years after the First World War, particularly during the depression of the thirties. Labour costs and building costs had increased considerably in relation to the pre-war period, and sometimes a tendency existed to over-invest in buildings. When the value of farms decreased tremendously during the depression, several owners of new farms could not pay interest and redemption on their mortgages and had to sell out.

[1] Dutch: *Heidemaatschappij*.

(*b*) *Influence of the state on reclamation in sandy regions.* The influence of the state on reclamation in the nineteenth century was mostly indirect. Reclaimers of waste land could get relief from land tax for newly reclaimed agricultural land for a specified number of years. As the tax was not heavy, this was not an important form of help. The government itself did not reclaim but left it to private enterprise. It sold some public waste lands to private persons who wanted to reclaim. Another form of indirect help was the passing of laws facilitating division of waste land held in common possession, and the abolition of tithes.

In the beginning of the twentieth century, however, the attitude of the government changed. Before the First World War it began to stimulate afforestation of waste lands and shifting sands in possession of municipalities. It bought an area of shifting sands in the middle of the country and afforested it and also parts of the dunes which were public domain.

During the First World War the government started to stimulate reclamation by the municipalities to make them provide work for the unemployed, and in 1922 the government began to subsidize the improvement and reclamation of agricultural land if use was made of unemployed workers. During the depression of the thirties the system was greatly extended, and every project which aimed at improving the quality of the land or at reclaiming waste land was subsidized henceforth if unemployed workers were used. The costs of the projects which exceeded the increase in value of the land were borne by the government. This method stimulated activity, as can be seen in the table which shows the decrease of waste land. Many new farms came into being and several existing farms were extended in size.

From 1933 to 1939 between 50,000 and 70,000 unemployed persons were engaged in activities which were subsidized by the government. Not all of them were employed in reclamation, of course, as improvement of roads and of agricultural land of low productivity and afforestation were also subsidized.

During the last war all reclamation was stopped after 1942; since 1947, however, a new start has been made. Today, as before the war, reclamation is subsidized if carried out by hand. This is considered to be the best way to counter a certain structural unemployment in the agricultural sector. Now that most waste lands have been put into production, attention is focused more and more on increasing the returns of lands of low productivity by means of reallocation, building

of roads, controlling the water-level in ditches, canals, and rivers (which are improved if necessary) and of removing bad layers in the soil profile.

Apart from the stimulation of reclamation by subsidies, the state itself began to reclaim. Soon after the First World War a law was passed which enabled the government to buy or expropriate waste lands or bad lands and reclaim them for the purpose of increasing agricultural production. In the north-east of the country an area of about 20,000 ha. was acquired by the government in this way. In other parts of the country, too, some lands were acquired, but their acreage was much less.

Of the 20,000 ha., about 4,000 have been sold again after reclamation; 250 farms have been established on an area of 5,000 ha. which have been leased; about 1,500 ha. have been leased as land without buildings, and on 9,500 ha. reclamation is still going on. The tenants were selected very carefully, attention being paid to their abilities and their social circumstances.

After the war new areas were acquired which will also be reclaimed. But since there are scarcely any more waste lands for which as yet no plan of reclamation or future use has been made, attention is now turned to agricultural lands of low productivity.

Several municipalities in the south of the country used to possess a vast acreage of waste land, but much of it was sold to private persons or societies during the nineteenth century. As a consequence the best of the waste lands were sold. During the last decades of the nineteenth century and in this century the policy of the municipalities changed. They themselves began to reclaim with the technical help of the Moor Society and, since 1907, with increasing financial assistance from the state. Several municipalities worked out a general plan of development in which the course of roads, the size of farms, and the founding of new villages were planned. The future farm-holders are always selected carefully, preference being given to inhabitants of the municipalities.

(*c*) *Conclusion.* Available statistics do not permit a close view of what has been going on. It is not possible to state exactly how many farms came into being through reclamation, what size they are, and how much existing farms were increased in acreage by reclaiming. This is due to the circumstance that much of the reclaiming work went on without any fuss, especially the reclamation carried out by small farmers in the beginning of this century.

In 1948, however, an extensive inquiry was made in thirteen municipalities in the sandy regions, comprising 8 per cent. of the total farm holdings and 8 per cent. of the farm land in these regions. The total number of farms was about 9,300, comprising an area of 75,000 ha. Of this area, 7 per cent. was reclaimed between 1900 and 1910 and 30 per cent. between 1910 and 1948. More than one-third of the agricultural land in these municipalities has been in use for less than fifty years.

For the individual farms the situation was as follows: 39 per cent. had no land which had been reclaimed after 1900; 29 per cent. had less than 50 per cent. of their land reclaimed after 1900; 15 per cent. had more than 50 per cent. reclaimed land; and 17 per cent. had reclaimed land only.

For the whole region of the sandy soils the following statement can be made. In 1910 the number of farms with an area larger than 1 ha. was 104,000 comprising 663,000 ha. (round numbers). The average size of farm was 6·4 ha.

By 1947 the number of farms had increased to 124,000 and the cultivated area amounted to 987,000 ha. The average size had increased to 8 ha. The increase in land area is due mainly to reclamation, whereas increase in the number of farms is caused partly by dividing farms among the heirs after the deaths of their owners.

As a general rule it can be said that before the First World War private enterprise had free scope in reclaiming land. The result was not wholly satisfactory. Many farms were founded that were too small, especially between 1900 and 1914. In other cases the size of farms was increased by adding new land, with the result that the plots belonging to a farm are often dispersed over rather wide areas. The technique of reclamation has been developed considerably during the past fifty years, which means that some early reclamations do not meet present standards.

Nowadays, care is taken that the technical quality of reclamation carried out either by private persons or by public authorities is as high as possible. Subsidization and careful planning are used to attain this goal.

Since the area of waste land still suitable for reclamation is very limited, attention is turned more to improving productivity of present agricultural land, which is done by consolidation of farms, improvement of roads, canals, and ditches, and removal of bad layers in the soil profile.

III. *Reclamation of land from areas covered by water*

There are two different methods of reclaiming land from areas subject to flooding or permanently covered by water.

In some places the sea deposits silt along the coast. Gradually the level of these deposits grows higher and higher, they become covered with vegetation, and finally lie above the level of average high tide. These deposits as a rule are very fertile and people have readily used them for agriculture. But they had to be protected against high floods during storms. This was done by constructing dikes round them (earthen walls, reinforced with basalt blocks at the outside of their bases and covered with grass). The superfluous water was carried off by means of ditches, canals, and sluices in the dikes, which could be opened during low tide and closed at high tide.

The protection of land by dikes against flooding by the sea probably started before A.D. 1000. The first dikes were low and weak, offering only small resistance against the fury of the sea, but gradually their construction became stronger.

These areas of land surrounded by dikes, in which the level of the water can be controlled, are called polders, and the process is known as *bedijking* (to be surrounded with dikes), and the areas thus affected may be known also under the latter name.

Another method of reclaiming land became possible after the invention of the windmill, probably at the beginning of the fourteenth century, by which superfluous water could be removed. In the western parts of the Netherlands a great many shallow lakes existed, and it became technically possible to drain the water from them and to make the land suitable for agriculture. If a lake was to be pumped dry, the first step was to dig a canal along its borders and construct a dike in the lake alongside the canal. This canal was necessary to carry away the water which was pumped out of the lake. Windmills were erected and the lake pumped dry, the polder which came into being in these circumstances being called a *droogmakerij* (reclaimed lake). The *bedijking* and the *droogmakerij* are both surrounded by dikes, the main difference between them being in the level of the land in relation to the level of the water. In the first case it is above the average water-level, whereas in the *droogmakerij* it is as a rule much below it. In both, the term 'polder' is used.

The total area which has been reclaimed in this manner in the course of ages can be divided as follows: reclamation from the sea

(*bedijkingen*) since A.D. 1250, 350,000 ha.; reclamation from lakes (*droogmakerijen*) since ± A.D. 1500, 200,000 ha.; the total thus amounting to approximately 550,000 ha.

On the other hand, a considerable area has been lost to the sea or has become covered by water as a result of peat-digging in the lower parts of the country. This area is about 500,000 ha., but the main part of this has been reclaimed again and is of better quality than it was before it was lost. The net increase in the land area after this prolonged struggle against the water has been about 50,000 ha. up to the present.

The process is still going on. In earlier times it was usually done by private persons. From the seventeenth century well into the nineteenth many lakes were reclaimed by merchants who invested their profits in land. The government gave consent to this work subject to stipulations about the rights and obligations of the entrepeneurs who did it. The farms in these polders as a rule are of efficient size and their plots are not scattered.

In this century, however, the state has taken on more responsibility. In 1918 a law was passed by parliament to shut off the Zuiderzee from the North Sea and to reclaim four polders from it with a total area of about 220,000 ha. The state carried out this project because it had been assumed that private initiative could not tackle the heavy financial burden which it entailed.

The object of the Zuiderzee project is:

1st to increase the agricultural area;

2nd to create a fresh-water reservoir in the middle of the country which can provide for the increasing needs of the surrounding parts of the country;

3rd to shorten the length of the sea defences.

The enclosing dam was ready in 1930, the first polder, called *Wieringermeerpolder*, covering an area of 18,000 ha., was surrounded by dikes and pumped dry in 1932.

Then began the settlement of the new polders, an undertaking which gave rise to the further development of interesting ideas. The task of the government was not considered to be ended after the dikes had been constructed and the polder pumped dry. It was decided that the state should also shoulder the burden of constructing roads and canals, of reclaiming the land and constructing the farm buildings. A considerable amount of research was spent in providing answers to questions such as those concerned with the courses of roads and canals,

the best situations for the villages, the sizes and layout of farms, the construction of farm buildings, and the selection of farmers. An extensive soil survey was made so as to enable the farmers to know the characteristics of the soil they would have to deal with. Much attention was paid to the question whether the farmers should buy or rent their farms. It was decided that all farms should be leased. The reasons for this were several. At the time the first farms were ready in 1934, in the midst of the depression, sale values were low, and it was to be expected that in the future they would rise again. The cost of these farms was about f.5,000 a ha. whereas the sale value of comparable farms elsewhere could be put at about f.2,000 or f.2,500 a ha. If the government were to sell the farms, only the well-to-do would have a chance, whereas by leasing many more would be able to take one. Moreover, in this way the government retained more control and could prevent undesirable developments.

According to these principles, the *Wieringermeerpolder* became fully settled in the years between 1934 and 1941. Much attention was paid to the selection of the farmers. They had to be efficient, capable of making a contribution to the social life in the polder which had yet to be developed, and able to meet certain financial requirements. This general line was slightly modified in four respects. Some overseers who had helped with the reclamation of the land were given a right of preference to rent farms. Agricultural workers who had helped and were capable, were given a right of preference for small mixed farms. Some farmers, whose farms had been expropriated during the war to increase adjacent aerodromes, got farms in the new polder. And finally, an area of about 450 ha. was leased to horticulturists on the adjacent mainland to increase their small holdings. In total, about 500 farms came into being in this polder, varying in size from about 7 to 100 ha. About 65 per cent. of the farms range from 7·5 to 50 ha.

The second polder, called *Noordoostpolder*, was pumped dry in the autumn of 1942. Its area is about 48,000 ha. It is planned there to create about 1,670 farms. So far, nearly all the land has been reclaimed and the construction of farm buildings is in full swing. Already approximately one-third of the planned total number of farms has been leased. A very careful selection of future farmers is being made. The financial requirements they have to meet have increased with changes in the price level.

Two important differences from the settlement policy of the first polder are to be noted. First, the men who had worked for two years

prior to 1 August 1950 in the polder, the so-called pioneers, were given rights of preference. About 350 farms have been allotted to them. Second, 118 farms have been assigned to farmers from the island of Walcheren. This island was inundated during the last year of the war and, after closing the gaps in the dikes, it was decided to improve the existing situation of the farmers in the island by increasing the size of the many small farms. This meant that some farmers had to migrate. An area of 3,000 ha. in the new polder was reserved for this purpose. The remainder of the polder will be settled by farmers who will have to submit to a close examination of their abilities as farmers, of their social fitness to become inhabitants of the new, as yet undeveloped, polder, and of their financial standing. As in the first polder, care is being taken that persons of different religious persuasion are settled in the new polder. It is realized that the Zuiderzee reclamations are a national affair and that with the fierce competition to rent farms in the new polders every group in the population must have the same chance.

At the moment, the dike of a third polder is being constructed. This polder originally was planned to be the greatest of the four Zuiderzee polders, its area being about 90,000 ha. The capacity of the reclamation organization, however, which has to bring into cultivation the land which has become dry, is only 8,000 ha. a year. So it would take about twelve years before the last part of the polder could be brought into cultivation. This means a considerable loss of interest on the capital laid out for the construction of dikes. It was decided therefore to cut this polder into two by constructing a dike to divide the area into halves. First the dikes around the eastern half will be constructed and as soon as they are finished the dikes around the western half will follow. Employing this method, the reclamation of the eastern half will take from five to six years and at the end of that period the dikes surrounding the western part of the polder will be completed, thus enabling reclamation activities to go on. It is estimated that the dikes around the first half of the eastern polder will be completed in 1956.

Recently a lively discussion has begun on the method of settlement. Up till now the prevailing tendency has been to select the farmers according to personal and financial qualifications. In this way the new polders can become highly productive with a prosperous farming population. However, in several parts of the country many farms are too small to be efficient; they do not provide enough productive

employment for the farm family. Therefore, the idea has been mooted of using the new polders to improve the situation. The proposal is that farmers from these regions are to be settled in the new polders and their farms in the 'old land' used to increase the size of surrounding small farms. This could be combined with a consolidation scheme to improve the layout of the farms.

The practical difficulties of the scheme are many. It is to be doubted whether the necessary number of farmers want to migrate, and if not whether coercion can be used. If parliament should so decide, which farmers are to be compelled to move? Probably, many of them have small farms and it is doubtful whether their managerial capacities would be sufficient to meet the demands of the larger farms which they would get in the new polder. If this second policy were adopted then the size of the farms in the new polders would have to be smaller and probably more uniform than they would if the other basis were retained. The farmers from the sandy regions would have difficulties with the management of the soil in the polders, which is predominantly clay or sandy clay. It may be doubted whether the average efficiency of the farmers from the regions which are to be improved would be as high as that of the farmers who are selected according to their abilities.

The crucial question is: will the national welfare be served better by a settlement policy which aims at a maximum of efficiency and productivity in the new polders, or by using the polders for improving the status of the many farmers with small farms and often too small incomes? This question cannot be answered objectively, because the answer depends on moral beliefs and social ideals.

The farmers' unions want a combination of these two policies. They want to reserve 20 per cent. of the farms for the settlement of those who have lost their farms unexpectedly either by expropriation or by the fact that their lease is not extended. Another 50 per cent. they want reserved for improving the situation on the old land, leaving 30 per cent. to be settled by farmers who are selected according to ability. Up to now, however, no decision has been taken by parliament.

IV. *Plans for the future*

Future reclamation on any significant scale can be made only on land gained from the sea, as the area of waste land suitable for this purpose is very limited. Several technical reasons render it necessary

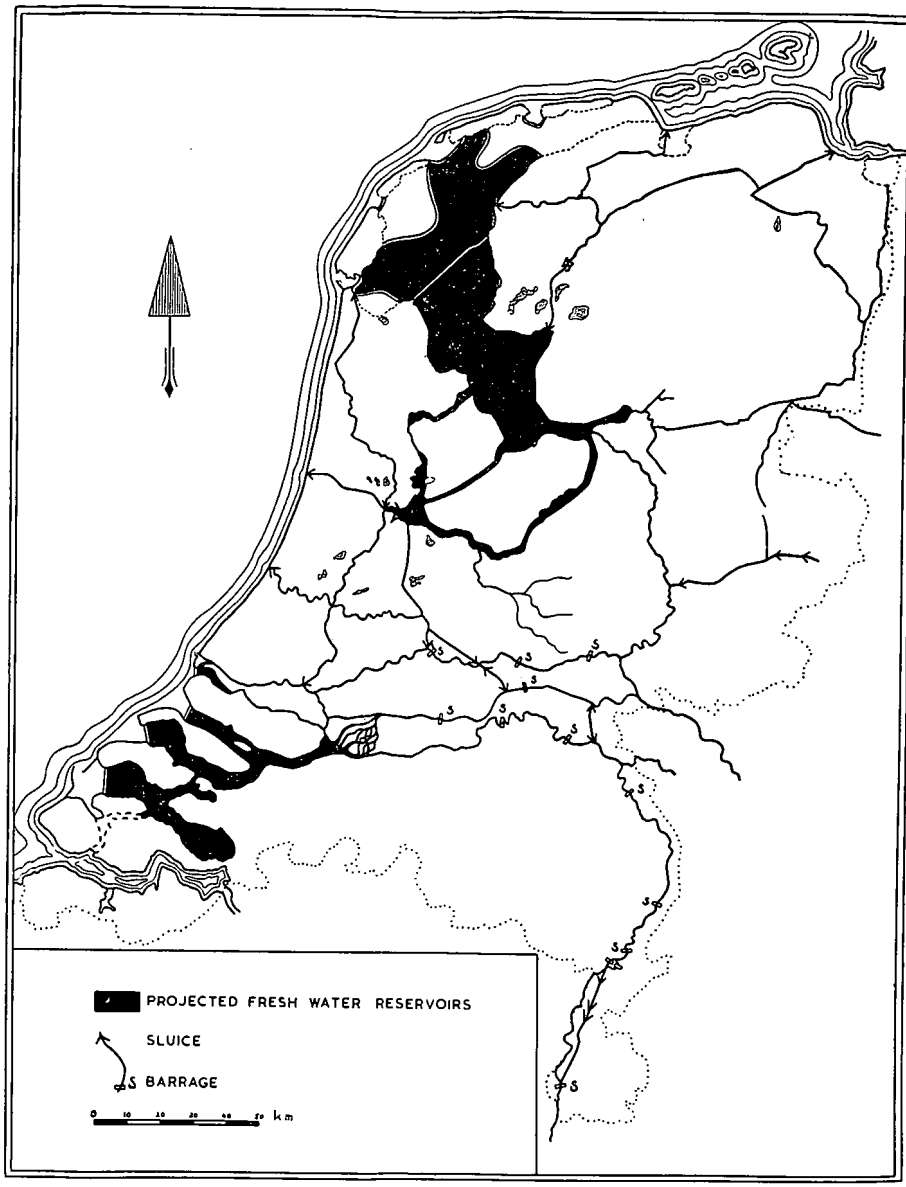

FIG. 2. Projects for the future.

(*Source*: J. Th. Thysse, 'De zoetwatervoorraden in Nederland', *Landbouwkundig Tijdschrift*, 63 (1951), p. 680.)

to increase the area separated from the sea by dikes. The total length of the sea defences could be diminished by this procedure while new polders could be constructed in the enclosed areas.

The disastrous flooding which befell the low-lying south-western part of the country during the gale of 1 February 1953 caused a shocking loss of life and serious damage to property and the productive quality of the land. An effect of this disaster was that it gave rise to an intensified study of plans to close the sea-inlets in the south-west with heavy dikes, except for the harbour entrances to Antwerp and Rotterdam. Also, plans are being studied to connect the islands in the north of the country with each other and with the mainland by means of dikes and to impolder part of the enclosed area (see Fig. 2).

These plans would have several favourable consequences if they could be carried out. In the first place, the total length of the sea defences would be cut drastically. The risk of bursting of the dikes and the costs of upkeep would be diminished. A second advantage would be the possibility of forcing back the salt water towards the sea. This is important because under present conditions brackish water gradually forces its way into estuaries, rivers, canals, and ditches. This gives rise to the danger in some regions that the soil will become salted and agricultural production heavily handicapped. A third advantage would be that in the enclosed area extensive fresh-water lakes could be formed. Their water combined with the water of the river Rhine could be used to provide for the needs of agriculture in the sandy regions in the eastern part of the country and to repress the intruding brackish water. Besides this, new polders could be reclaimed in the enclosed areas. The size of these polders has not yet been fixed; estimates are that an area of about 120,000 ha. could be reclaimed if these plans were to be carried out.

A difficulty would be that during north-westerly gales the water of the North Sea would rise higher along the coast because of being prevented from flowing inland. This would make it necessary to increase the strength and height of existing sea defences.

These plans are still very vague, but they have commanded increasing attention recently. A great deal of research has to be carried out to gauge the technical possibilities and consequences.

Apart from technical aspects a decision on these projects is very important from an economic viewpoint. Their magnitude and the development of the ideas concerning the part the state should play has led to the generally accepted point of view that such projects are

a responsibility of the state. This means that social economic profits have to be weighed against social economic costs.

If the costs of the first Zuiderzee polder, completed in 1941, are figured out per ha., it appears that they were about twice as high as the sale value of the farms. In the second polder they were about three or four times as high. This was partly a consequence of the measure which fixed the maximum sale prices at the level of 9 May 1940. Since that date no increase of prices for land has been allowed. Nevertheless, even if the sale prices were allowed to rise, it is to be expected that the cost of the newly won land would be much higher than its market price.

The projects involve heavy investments of which the repercussions have to be gauged carefully. For example, the damage to the productivity of agriculture if the process of salt intrusion continues has to be assessed. The risk of dike bursts will be diminished if sea defences are shortened, though the risk cannot be calculated accurately.

The timing of carrying out the plans is important with regard to the phase of the trade cycle. In times of depression the influence of these investments may assist in attaining recovery, whereas during more buoyant times the inflationary pressure may be increased.

The execution of the projects would take a considerable time, probably between 50 and 100 years, and as several parts of the plans are independent, it would be possible to speed up the work during depressions and slow it down during inflationary periods.

The method of financing is important. In all sectors of economic life investment has to be made to provide employment for the rapidly increasing population, and these projects would have to be financed in such ways as not to impair investment in other sectors.

At the moment, technical and economic specialists are studying these problems, and only when the results of their studies are known can a rational decision be made.

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