

A CENTURY OF SURVEYORS' INVOLVEMENT IN LAND CONSOLIDATION IN THE NETHERLANDS

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ABSTRACT

In 1916 the first land consolidation took place in the Netherlands: the project 'Ballumer Mieden' on the island Ameland. Land consolidation legislation did not exist yet, so the re-allotment was purely on a voluntary basis. The project was small and comprised 190 hectares only, but the 119 landowners/farmers owned a total of 3600 different parcels! Land surveyor Klompe of the Dutch Kadaster was successful in consolidating the 3600 parcels into 219 parcels.

This is the start of a century of land surveyors' involvement in land consolidation. This paper distinguishes 4 different periods, the one of 1916-1938 (related to two successive land consolidation acts of 1924 and 1938), the one of 1938-1985 (related to the act of 1954), the period 1986-2007 (related to the act of 1985), and the period 2007-to date (related to the act of 2007 and anticipating a new act expected to be in force in 2021).

The differences between all those successive acts concern in the first place the ever broadening of the scope of land consolidation, namely from merely agricultural towards integrated and regional, and in the second place a continuing refinement of instrumental options.

Now a century passed by, and the question arises whether there is a future for land consolidation, even when embedded in a broader regional and integrated rural development. The current governmental preference is small scale land re-allotment projects on a purely voluntary basis, guided by a land surveyor, similar to 1916 and expropriation when required by the general interest. So, in a sense, we are back to where we began.

However, since a few years the cabinets' goals are biodiversity, reduction of emissions of carbon dioxide, phosphate and nitrogen, to stop peat-soil setting, energy transition and climate change. all require a fundamental rethinking on how to organise the spatial functions of the rural and urban landscape. The challenge is how to make use of the lessons learnt in the past by applying them in future land consolidation projects.

This paper deals with the issues from the perspective of land surveyors, addressing their commitment during this century of land consolidation. The background of this paper is an extensive report (in Dutch) on the matter, published by De Hollandse Cirkel, the Dutch association for the history of the geodesy.

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1. INTRODUCTION

A hundred years ago, life was not that good in the countryside. Fragmented landownership, poor housing, flooding, badly passable sandy roads, and feudal circumstances: farmers' living was hard, production results meagre, and food was expensive.

Especially on remote peatlands and secluded sandy soils, people those days lived sometimes in mud huts, being slave of the landlord. Poverty existed. Numerous economic research reports show that in first part of the previous century income parity left much to be desired, wages stayed behind with the rise of productivity, and rural incomes did not match the grow of the national income. Structural obstacles occurred, such as work occupation rates, the area surface structure, and the business structure (a majority of smallholdings, especially in regions with sandy soils).

Fortunately meanwhile our society became so prosperous, that both government and farmers could invest heavily in the development of the then poor rural areas. That resulted not only in the existence of a viable agricultural business activity which contributes substantially to the national economy and provides the population of plenty and cheap daily food, but also it resulted in a situation where the living in the countryside is as good as in the urban areas: good and affordable housing, efficient commercial buildings, good road infrastructure, good water management, and available societal facilities as e.g. education and health care, which never are too far away.

The application of the land consolidation instrument channelled these public and private investments to the agricultural regions. During the heyday of land consolidation, hundreds of thousands of hectares were subject to consolidation.

Organisations, which aim at protection of nature and landscape, criticize the effects of land consolidation projects on the environment: their judgement is seldom positive. Not wrongly: although after the entry in force of the Land Development Act 1985 a lot more attention could be given to the interests of nature and landscape, land consolidation projects under previous acts (many under the Act of 1954) were not very receptive for other interests than the agricultural one. Actually these just had to give way...

Later, land consolidation acts broadened the scope of land consolidation substantially (also the names changed accordingly, namely from 'land consolidation' act to 'regional development' act), but when time passed by, it became clear that after a century, land consolidation would lose its special status as a planning instrument for the rural areas and would be incorporated into general environment and planning legislation as just one of the

instruments available. Likely this general Environment and Planning Act will come into force in 2021.

One of the professionals involved in the application of the land consolidation instrument has been the land surveyor. He (sometimes also a 'she') played an important role in all land consolidation projects. Firstly as the official who took care that everybody's land rights and other rights were guaranteed during the whole process, by a reliable registration and data management of all land rights, land lease rights and other relevant real rights, and secondly as the one who designed the new structure of land parcels as presented in the Re-allotment Plan, and as a caretaker that all inhabitants in the project area could occupy new parcels in a fair and trustworthy manner. So the land surveyor not only had to operate in a fair way with integrity, but also in an creative mood to design the new allotment in dialogue with right-holders and taking into account other interests (such as environmental issues). This sometimes required pretty complicated constructions, in which many farmers were involved.

How that may be, land surveyors played their important role in these projects, utilizing fully their professional skills and their professional 'toolbox'. Although times are changing, we believe and are convinced that also in the future the society will need and use the land surveyors' skills, tools and experience.

2. FROM VOLUNTARY LAND CONSOLIDATION TO LEGAL LAND CONSOLIDATION 1916-1938

The first land consolidation project took place in 1916. That was the project 'The Ballumer Mieden' on the island of Ameland. There was no act yet, so the re-allotment process was done on a voluntary basis. The block was small, about 190 ha, but the 119 owners together owned 3600 plots. The initiative for the project was taken by Heidemij, which then was a semi-governmental company involved in land improvement (today Arcadis Ltd) and the president of the local water management board Theo van Welderen baron Rengers. Surveyor Hendrik Jan Klompe of the Kadaster (the Dutch name for the Cadastre, Land Registry and Mapping Agency) set to work and managed to reduce the number of plots to 219. In the following picture the situation before and after land consolidation is shown.

Het begin: Ameland 1916



Van 3600 naar 219 percelen (190 ha)

In the 1920s, the Netherlands became aware that the agricultural farm structure had to be radically adjusted in order to achieve more efficient and efficient business operations. After much social and parliamentary debate, this led in 1924 to the first Land Consolidation Act.

At that time, in Germany, the instrument ‘Flurbereinigung’ was already being applied successfully, which was reason for the Minister of Agriculture in the Netherlands to ask the Kadaster in the run-up to the new Act, to see if lessons could be learned from the German experiences. It was not a coincidence that the Minister made this request to the Kadaster. Earlier, the Professional Association for Cadastre and Land Surveying (‘Vereeniging voor Kadaster en Landmeetkunde’) urged in 1899 in a thorough report for the introduction of a land consolidation instrument. In this report, the Association also took the position that a land surveyor of the Kadaster should be added to every local land consolidation commission, which was intended to take responsibility for the execution of a land consolidation project.

This proposition was accepted in the Parliament and by consequence included into the Act in 1924. The then chief of the Kadaster asked land surveyor Jacob Gorter to go to Germany for half a year, together with a colleague land surveyor Otto Jan Jonas.

Their detailed findings were later elaborated into a set of practical rules, which formed the basis for the Manual ‘Land Consolidation Activities’: a handbook that was used as a guideline by all cadastral land consolidation employees for many years. When the Land Consolidation Act 1924 came into force, Gorter and Jonas were subsequently entrusted from the Kadaster with the implementation of the first legal land consolidation projects.

The main features of the 1924 Land Consolidation Act were as follows.

In the first place, it was important to clarify the objective of the land consolidation project: how to improve the agricultural situation in this specific project. At that time, and unlike later, other objectives (such as improving nature and landscape) were not included. Furthermore, the government did not wish to take the initiative for land consolidation all by itself. It was believed that the interest for land consolidation should come from the region, bearing in mind that the cooperation of inhabitants would then be greater. In any case, an application had to be made by 25% of the owners (art. 14).

Subsequently, the Act stated that it would not be the government to decide on the execution of a land consolidation. This had to be done by a voting, whereby the intended land consolidation project would take place if (a) at least half of the owners were in favour and (b) these owners represented at least half of the surface area put to the vote, so a 'double' majority (art. 23). Those who stayed at home were expected to vote in favour.

Noticeably, the only expert to be added to the local land consolidation commission was a land surveyor, who therefore specifically was mentioned in this Act. In practice, it was indeed the surveyor, who, together with the local commission, carried out the land consolidation project, supported by the land improvement company Heidemij.

However, as a result of the necessary double majority in the voting and the absence of a subsidy scheme, very few land consolidations were carried out. In the period 1924-1940, 48 projects were executed. 155 projects were requested, but they were either rejected (more votes against) or did not meet the requirements to be voted at all.

To promote the going through of land consolidation projects, the existing Act was adapted: the Land Consolidation Act 1938. Under this Act, only 20% of the owners were required to apply for land consolidation and not 25%. Farmer organizations could also request, on behalf of their members. The voting requirements also changed. Land consolidation might take place when at least half of the owners were in favour or when a minority of owners with at least half of the agreed area was in favour, so a 'single' majority. Those who stayed at home however were still considered to have voted in favour. The right of leasehold was also discussed in the 1938 Act. A shortcoming of the Act of 1924, which paid no attention to leasehold at all, was attempted to be repaired a bit by including an article 19 saying that the situation of land use (thus leasehold) should also play a role in the re-allotment process. How this had to be done remained unclear. Adequate regulation was not introduced until the next Act of 1954.

In the Act of 1938, also a new Government Service for Technical Agricultural Services ('Cultuurtechnische Dienst') had been introduced, being responsible for policy and agricultural technical support. As a result, the surveyor's role changed significantly. Before, he interfered with almost everything and from 1938 this was limited in particular to the correct handling of the land rights (the input and the re-allocation) of the right holders, including drawing up the allocation plan and the list of financial arrangements.

As the procedure description above showed, after a positive vote, it was first of all necessary to establish properly what the initial situation was: who are the entitled parties,

what exchange value do the lots have, and what about old and new roads and waterways? The land surveyor was mainly involved in the first two. Thus, a register of right holders was prescribed in the Act. The importance of such a register was great: those who were registered were part of the re-allocation, those who were not registered did not participate at all. The Act also said that the new legal status as it would apply after registration of the re-allocation deed was 'title-purifying' (see below). That is why the local commission had to submit the register for public inspection, after which a three-stage objection procedure was prescribed: first an objection process before the local commission, secondly in case of no agreement before the examining magistrate, and thirdly, in case of a continued disagreement before the multiple chamber of the district court.

The second part of determining the initial situation involved the estimation of the value of the existing lots. It was not about the economic value but about the agricultural production value.

At that time, the cadastral maps at that time still originated from the starting period of the Kadaster, namely around 1832. They were solid maps on special paper, but they were used every day to make updates where the expired parcel boundaries were deleted (with a sharp knife these borders were carefully scratched away and smoothed into the structure of the paper) and the new ones were mapped. This of course did not benefit the quality, not to mention stretch and shrinkage due to climatic conditions at the office. For this reason, the land surveyor usually in land consolidation projects took the opportunity to realise new maps of the area, a so-called 're-survey', after which the new maps would show the allocation of the lots so that with the 'title purification' of the re-allocation deed, a new set of cadastral maps also started functioning.

In the Manual (the guiding handbook), a number of recommendations were made for drawing up the 'Plan of Distribution'. In later regulations, this was called the Re-allocation Plan. On the basis of the information from the so called 'wishing sessions' (where owners could make clear which land they wished to be exchanged) and the general rules, it was possible to draw a first design of the re-allocation of the new lots both in the areas which were wished too much (there was a shortage of space) and those in the areas that were wished too little (there was space left). This, of course, was done in close consultation with the members of the local commission, as -legally speaking- it was their plan.

When the 'Plan of Distribution' was ready and had been determined by the local commission, the location and size of the lots were calculated exactly, after which the new lots were given their new numbers (leading to the Re-allocation Plan, art 56 Land Consolidation Act 1924). After this, the figures for the setting out and survey of the new plot boundaries could be calculated, after which the survey could take place in the field. This was usually done before the public inspection of the Re-allocation Plan so that the right holders in the field could already gain insight into the location of the new borders.

Just like the register of right holders and the valuation of the plots, the 'Re-allocation Plan' required an orderly public inspection and objection round. Simultaneously together with the 'Re-allocation Plan', a list was presented with the amounts the participants had to pay: for each owner namely, it had to be determined which amount should be paid to cover the

costs of the land consolidation project. As there was no subsidy regulation then, these were fairly large amounts.

After the objection procedure had been processed, a re-allocation deed was drawn up and executed by a notary-public, assigned to the legal district where the project was located. Subsequently, this deed was entered in the public registers. Because of the principle of original legal acquisition (the 'purifying of titles'), this created a completely new legal and cadastral situation, a deviation from the causality rule which always rules a deed-registration system.

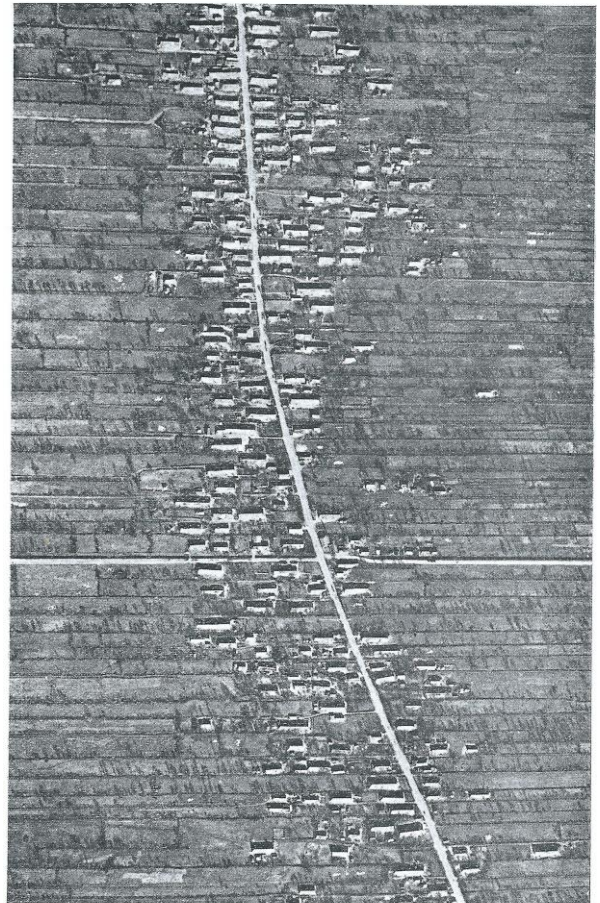
It was an enormous challenge for the land surveyor to properly perform all these activities. As mentioned above, he also had to work with cadastral data which were often incomplete at the time and sometimes did not correspond with the situation in the field.

Jacob Gorter started his land consolidation work with enthusiasm in, among others, the land consolidations Nieuwleusen (1216 hectares), De Bleeken (municipality of Heesch, 170 ha), Wanroysche Peel (1000 ha), Exloërveen (480 ha), Staphorst (1820 ha), Urk (60 ha) and the Eemnesser Polders. Many other land consolidations with comparable surface areas and problems have been carried out, especially in the eastern part of the country, where the allotment problems (large fragmentation of land) were the most distressing. This meant work for 4 surveyors and 3 cartographers. The average duration of land consolidation project was 2.5 years, a total of about 2000 hectares per year were being processed and every year, about 850 hectares were completed.

Of these land consolidation projects, 'Staphorst', with a size of approximately 1,820 ha, was the most complicated and laborious. There was a very poor parcel allotment with lots of different owners located one behind the other, only a few tens of meters wide, kilometres of depth and of deteriorating quality. The accompanying photos illustrate this. Thanks to the execution of the land consolidation, where the efforts of Jacob Gorter



Oude Staphorster boerderijen



Luchtfoto Staphorst-Rouveen.

were highly appreciated, it was then arranged that a new state highway could be realized through the building section of the municipality and a spectacular reduction in the number of parcels had been achieved.

3. BOOMING LAND CONSOLIDATION 1938-1985

Under the successive Acts of 1924 and 1938, mainly administrative consolidations were carried out (the plots as they existed were exchanged, without land improvements), with a corresponding limited change of roads and ditches. Under the new Act of 1954, land consolidation became much more focused on a drastically improvement the entire agricultural business structure of an area, thus including water management and technical agricultural land improvements.

After the Second World War, the Ministry of Agriculture's policy gave budgetary space to about 30-40,000 hectares per year of new land consolidation projects. Since the projects had a duration of several years, the number of hectares in execution rose from more than 100,000 in 1954 to more than 600,000 in 1984.

For the land surveyors and for the Kadaster, the boom in land consolidation meant much new and extra work. For large areas, the work had to be organized on a project basis and project steps carried out within as short as possible time. The Kadaster therefore ensured a tight organization of the work with a lot of extra manpower in a few land consolidation agencies. These were now set up all over the country. In addition, it required strict coordination of the land administration in the consolidation projects and those in the 'normal' Land Registry and Cadastre Service, in order to have the least possible negative impact on the country's citizens.

So there was a new Land Consolidation Act, in 1954. This offered significantly wider design options. Important here, was what quickly became known informally as the 'Article 13 lands'. A new Article 13 stipulated namely that for general purposes, a maximum of 5% of the land in the land consolidation project could be allocated. That 'loss' had to be fairly carried by the joint owners in the project.

In summary, the new Land Consolidation Act 1954 had the following changes compared to the 1938 Act:

- A maximum of 5% of the land could be designated for public benefit purposes.
- The Re-allocation Plan and the List of Financial Settlements were split.
- A Landscape Plan was introduced, for preservation and development of areas with landscape value.
- Tenant farmers (leaseholders) were now identified as stakeholders. A lease register (inventory of lease contracts) was introduced and each leaseholder was entitled to a proportional share of lease in the new situation. Lease ratios could be changed and forced change of leasehold (the imposition of a lease of land) was introduced.
- The expenses to be paid could be repaid over a period of 30 years at 5% interest and repayment as a land rent.

- In the original draft act of the 1954 Act, the principle of payment by surface area was maintained. Only during the discussion in Parliament, the government did come up with the proposal to estimate the changes in agricultural production value (fertility etc.) and the other costs to be paid in ratio of each right holders' benefit.

The latter point implied that the amount to be paid, called the 'land consolidation rent', was fixed by determining how each right holder benefitted of the land consolidation project. That was called the 'second valuation'. The local land consolidation commission applied a point scale system (bands) for this, whereby farmers who benefited greatly from land consolidation by for example concentrating land, shorter distances from the plots to the company buildings, better water management, had to pay more than farmers who benefited less.

The Act of 1954 also comprised a possibility to make small individual surpluses in the allocation design using available free land (informally called 'hectares of the land surveyor', which lands were purchased in advance by the local land consolidation commission). The land surveyor was thus able to extend allocated plots a bit to match existing natural borders. This made it possible to save on agricultural technical engineering work, for example filling old ditches and digging new ones. But above all, it was possible to safeguard landscape elements such as wooded banks, canals and unpaved roads. The amount of those 'land surveyor hectares' normally averaged about 2% of the surface area of the land consolidation project.

The objective of the Act of 1954 continued to focus on the agricultural sector. Article 2 stated that 'the land consolidation is effected by virtue of an agreement and by virtue of the Act to promote the interests of agriculture, horticulture, forestry or livestock farming'. It also emerged from Article 13: the public utility purposes for which Article 13 lots were made available should of course be in 'accordance with the purpose of the land consolidation'.

The fact that the tenants' position was also regulated under the 1954 Act was a great improvement. Under the previous Acts, the tenant was hardly mentioned, if at all, but now lease had its own chapter. From now on, tenants were entitled to a proportional part of the allocation on lease, and this could be claimed in court if necessary. The tenant's position therefore began to resemble that of the owner. What was still missing was: voting rights. That only came with a legislative change in 1975.

During this period, four technical developments were of great importance to the surveyor's work. Firstly, the use of photogrammetric material, secondly the automation, thirdly the availability of large-scale map material (analogue and digital: the large scale base map of the Netherlands 1:500 to 1:2,000), and fourthly, the availability of soil maps.

When it concerns automation, initially, all administrative cadastral land consolidation activities were automated. Step by step following the procedure, so from setting up the voting administration to drawing up the deed of allocation and processing the list of financial registers in the national cadastral land registry. After that, the cartographic activities were also placed in an automated system, and then, in the 1980's, both together in an integrated administrative and cartographic system. In addition, developments in the market were continuously monitored and newer and better software was used.

The size of the workforce grew accordingly, from 168 in 1950 to 628 staff in 1975.

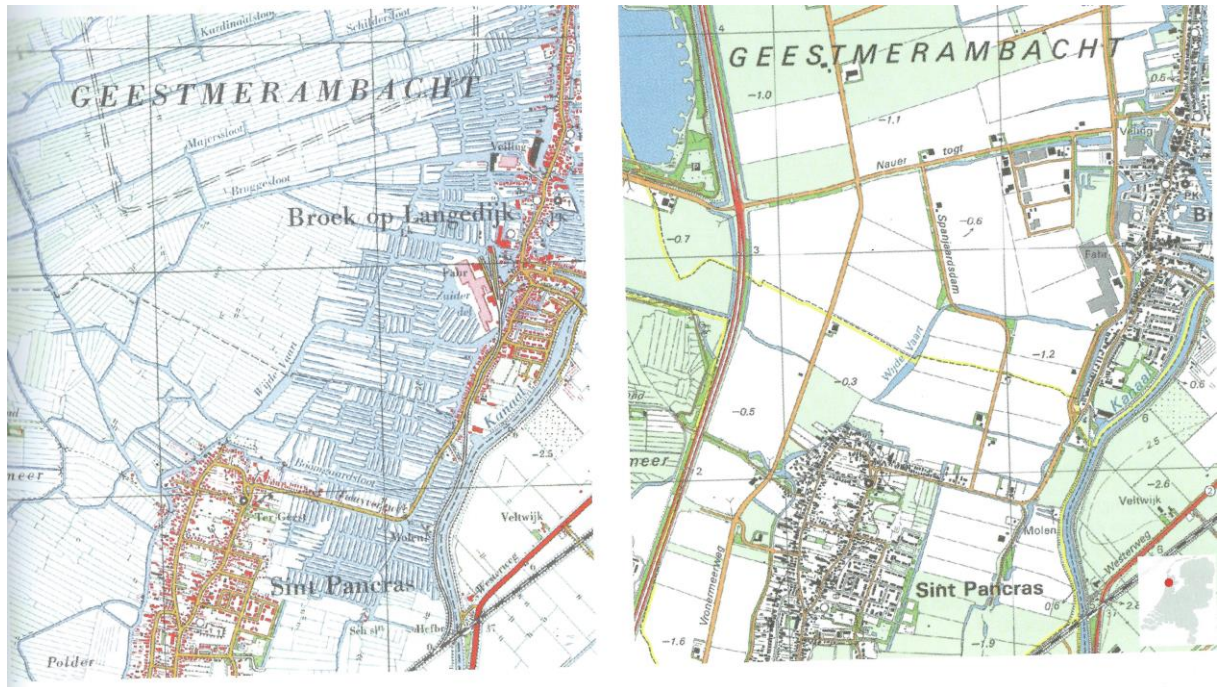
The division of labour was as follows.

- The land surveyor-expert: responsible for the project approach and management;
- The technical officer: responsible for the daily execution. He (there were hardly women executing this job) was often the daily representative of the Kadaster in the land consolidation project and had much contact with the right holders about their land rights and their allocation wishes.
- The operational land surveyor in the field, charged with all survey activities such as setting out and the survey of new boundaries, roads and watercourses and assistant to, for example, the valuation of the plots.
- Other land surveyors charged with carrying out simpler survey work in the field.
- Surveying assistants, who assisted field surveyors.
- The cartographers in the office, who made sure that good cadastral maps were made of both the initial and the final situation. They also assisted in making the Re-allocation Plan. This was quite a job in the days before automation. Every time a change occurred, the drawing, colouring and calculating work had to be done again.
- The administrative employees at the office who ensured that all right holders' rights, their allocation wishes and the future situation were properly recorded. They provided the correct data of the re-allocation situation (new plots, rights, area, etc.) so that the notary who had to pass the Re-allotment Deed had as little work as possible.

As mentioned, many land consolidation projects were carried out during this period, many of which were large in size. The largest land consolidation that has ever been carried out, was the 'Alblasserwaard' (voting 1965), with had a size of 22,400 ha, comprised 7,000 owners and 2,000 tenants and had a budget of 83 million Dutch guilders (€ 38 million). More than new 100 farm relocations have been built (one of the new farms is shown in the photo), many new roads and waterways have been realized, the number of parcels has been reduced considerably and the Kadaster has invested in the approximately 24 calendar-years that the project has lasted a total of approximately 224 man-years.



Another spectacular project was the land consolidation project 'Geestmerambacht' with an area of 6,110 ha. Here the area changed from a sailing area into a driving area. The changes made here were impressive. As a result of the filling of ditches, the construction of roads, the improvement of water management and the re-allotment, the possibilities for efficient farming improved considerably. The two pictures show the situation before and after land consolidation. It is clear that the amount of water area has reduced considerably. This transformation also meant a lot for the villages in the block. These were all islands in the



past and the only way to get to the houses was by boat (flat barges) or on foot or by bicycle over a bridge and then over the narrow path. These were also major challenges for land surveyors. Not only in terms of survey work (often by boat), but also in terms of the many necessary consultations with the farmers about the exchange of land and relocations to new farms. This project is an example of a complete overhaul of a landscape, and most likely would be an open air museum today.

4. FROM LAND CONSOLIDATION TOWARDS RURAL LAND DEVELOPMENT 1985-2007

Land consolidations had boomed under the Land Consolidation Act 1954. But the limited objective began to pinch in society. How could the agricultural objective be so dominant? No, there was social resistance to this monopoly. Interests of nature and landscape, or recreation were also considered as being important. The objective of the Land Consolidation Act 1954 was - as we saw earlier - that 'land consolidation was done to promote the interests of agriculture, horticulture and forestry or livestock farming'. Admittedly, Minister Sicco Mansholt of Agriculture had stated at the time of the Parliamentary discussions, that other interests could also be served, but only if they 'corresponded to the agricultural objective'. It was increasingly felt in society that the rural area had to fulfil all the functions that society wanted to give it, not just the agricultural one

This idea was not strange to land surveyors. In 1968, an extensive report by leading experts was published in the Journal for Cadastre and Land Surveying, entitled 'Evaluation of the Land Consolidation Act 1954' ('Balans Ruilverkavelingswet'). This report made clear that in addition to all kinds of technical improvements, it was in particular the objective that had to be expanded.

From an administrative point of view, the government developed a series of national memo's that shaped the new views, resulting in a new Land Development Act in 1985. The basic principle of this Act was that 'land development aims to improving the layout of the rural area in accordance with the functions of that area, such as these have been indicated in the context of general spatial planning', and for the sake of clarity it was added that land development might include 'measures and facilities for (among others) agriculture, horticulture and forestry, nature and landscape, infrastructure, outdoor recreation and cultural history'. Well, it couldn't be wider, isn't?

Was this the end of the traditional land consolidation? No, but other forms were added: the 'rural land redevelopment', the 'adaptation land consolidation', and the 'land re-allotment by agreement'.

The 'rural land redevelopment' was intended for areas where a multitude of functions applied. The 'adaptation land consolidation' was mainly created in order to be able to avoid disruption of the agricultural business structure as a consequence of infrastructural changes by applying the exchange mechanism. 'Land re-allotment by agreement' was also included in the previous acts, but was then called land consolidation agreement, a voluntary land exchange. The 'traditional' agricultural land consolidation was still possible, but was limited to areas where hardly any other interests played a role outside the agricultural objective. The National Structure Plan Rural Land Development would indicate where rural land redevelopment, and where the other forms should take place. Since the rural land redevelopment had a broad design objective, the Provinces would decide on implementation, and not - as with the traditional land consolidation - the right holders via the voting procedure.

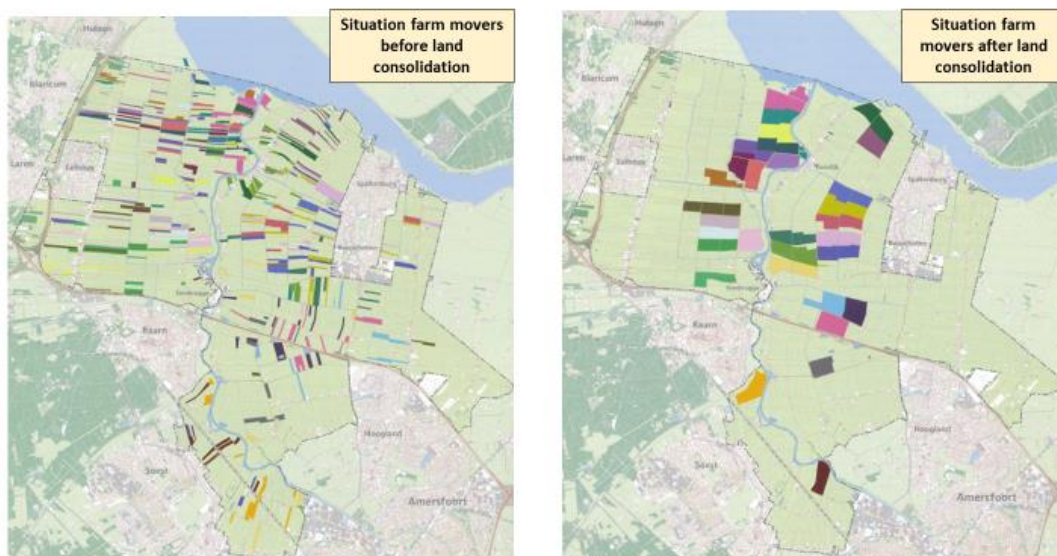
More than 100 projects were in execution in the period 1999-2006. 1990 even recorded 150 projects with a total area of 900,000 ha. Preparation and execution took an average of 27 years. Society was becoming increasingly unsatisfied with the long project duration: 'we have the feeling that we are executing the activities for the next generation and not longer for ourselves', farmers used to say.

Until then, only small landscape elements were safeguarded, here or there within the land consolidation area, or sometimes they were newly constructed (and then purchased by State Forestry or private nature associations), but only on those places where it did not 'harm' agriculture. But in the rest of the project area land consolidation was executed the old-fashioned way with limited attention to the landscape. The land surveyor engineer Kor Mulder, who worked in the Kadaster-office in the Province of Drenthe, devised a method to preserve the old landscape elements as much as possible and to place the new plot-borders on existing plot-borders (being 'landscape elements') as much as possible. This required a little more free land, which had to be purchased additionally. In the past, the value of the re-allocation had to be precisely equal to that of the input situation and to make it match the shifting natural boundaries was necessary, so the removal of the old ditches and wooded banks and the making of new ones may be just a few meters further away. With more free land available, small surplus allocation was possible, making it achievable to coincidence the new borders with the old landscape elements much more than previously. This mainly concerned in first instance the outside borders of the new lots.

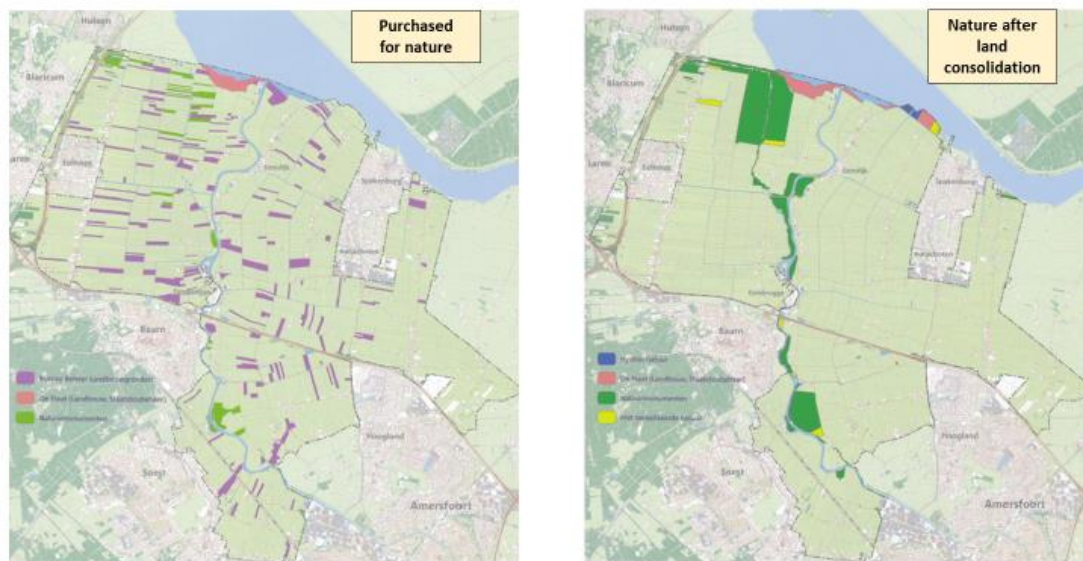
However, the land surveyor should also maintain the inside division of plots as much as possible, depending on the desired use plots. Mulder wrote about this in the publication "Sliding within the landscape", which was published in 1992 together with the Foundation for Nature and Environment ('Natuur en Milieu') and the Association for Nature Monuments ('Vereniging voor Natuurmonumenten'). The research question was the following: 'How does the allotment look like after a land development project, when the existing topography is maintained as much as possible during the re-allocation process?' Due to the great interest, this publication had a circulation of 2500 and was widely distributed both inside and outside the Kadaster.

The introduction of the Land Development Act in 1985 meant quite a bit for the services involved. For example, the Government Service for Technical Agricultural Service ('Cultuurtechnische Dienst') continued under the name of Government Service or Land and Water Management ('Landinrichtingsdienst') and later (in 1997) as Government Service for Rural Development ('Dienst Landelijk Gebied', DLG). The division of roles between this Service and the Kadaster also changed. Because the Government Service manifested itself as the manager of the land consolidation and the Kadaster had to carry out the activities on the basis of tenders to DLG, the cooperation between the two organisations deteriorated a bit. Of course that improved later again.

A good example of a land development project that was carried out during this period is the project 'Eemland', with a size of almost 8,000 ha. The allotment structure was poor in this area, when the project was taken in execution in 1988. The farms were located in the village ribbons, the average farm size was low (approx. 15 ha) and the plots were on an average of 2 km away from the farmsbuildings. After much public debate, which lasted several years, a plan was agreed that would involve 49 farm relocations to 'empty' rural areas, which would significantly improve allotment, but also achieved good results in terms of recreational and nature and landscape facilities. The images clearly indicate, firstly to what



extent the allotment (for the farm movers) has improved, and secondly the areas that have been realised for nature and landscape.



5. FROM RURAL LAND DEVELOPMENT TOWARDS INTEGRATED REGIONAL DEVELOPMENT 2007 – to date

The development towards a broader land consolidation was not at its end. The national spatial policy memo's leading to a new rural development act with a wide scope, were adopted in the beginning of the new century: a national Memo Spatial Goals (2004) and a memo Agenda Vital Countryside (2004). It could not have been broader: the Agenda dedicated attention to nature, landscape, agriculture, social-economic revitalisation, environment, water, and the reconstruction of sandy soil areas. Although both Memo's comprised many governmental aspects, such as the setting of an overall investment-budget for the rural area (combining the budgets that previously were set by a variety of ministries separately), also much was said about the instruments for rural development.

After the turn of the century, the central government wished to provide a single rural investment budget to the Provinces guided by intergovernmental agreements, and together with this provision a decentralisation of the responsibility for nature and landscape from the central to the provincial level. Moreover, the government said the land consolidation instrument needed reform, by broaden the scope even further, and simplify and speed up the land consolidation processes. The more liberal policy character of the consecutive Dutch cabinets encouraged more bottom up initiatives with as less as possible government interference.

All this was included in the Act that would replace the existing Rural Development Act of 1985, namely the Regional Development Act, which came into force on 1st January 2007. The new Act also arranged for the setting of the investment-budget and for the decentralisation of responsibilities. In 2014, also the investment budget itself would be decentralised and deleted from the Act.

What was left, were new land consolidation instruments. The old act comprised 4 different options, the new act only 2: 'the land consolidation related all functions given to the area by spatial planning', and the 'land consolidation by voluntary private agreement'. The general 'redevelopment' and the 'agricultural land consolidation' were abolished. The land consolidation for purely agricultural reasons was over and out. The Provincial Executive Council was assigned the responsibility to decide whether or not a land development project was needed in a particular area.

Now the objective was completely related to the general interest, the voting procedure was abolished. Moreover the procedure to request for a land consolidation was cancelled. The 'List of Owners and Leasers' and the 'Reallocation Plan' were merged into an 'Exchange Plan'. The local Land Consolidation Commission ceased to exist, the Provincial Council had to decide how a land consolidation project should be managed. What also was cancelled, is the instrument of the 'land rent', farmers had to pay as their share in the costs, the government did not want to pre-finance projects any more.

It was clear that the Provincial authorities now became fully responsible for land development. They would decide whether or not to apply the land consolidation instrument. But practice shows that in real life the preference of the authorities is not to embrace land consolidation options: they are expected to be 'too complicated', 'too expensive', and 'take too long'... no, the preference goes to voluntary small scale cheap exchange of lots by private agreement, projects of at most a few hundred hectares area. When important general interest would be at stake, the authorities tend to apply voluntary purchase or expropriation, expected to take much shorter time than a fully-fledged land consolidation.

The Rural Development Act of 2007, will be succeeded by a still broader Environment and Planning Act, comprising all existing acts and regulation concerning spatial planning: an ambitious project as the number of existing rules is many. This act is not in force yet (expected in 2021), thus is still a 'bill'. When the legislative process started, in 2014, the government announced that all legal executive instruments regarding land and land policy should find a place in the new act.

In surveyors circles there was fear that the land consolidation instrument would cease to exist, but an official evaluation report of the Rural Development Act by University of Wageningen institutes 'Alterra' and 'Agrarian Law' concluded that -however the authorities' enthusiasm for land consolidation was waning- the instrument as such was fully worth to be remained in the new Act. Both institutes expected that in the future, when new political challenges would require integral regional development, the instrument could not be missed. And by the way, the instrument functioned well, they concluded, so why abolish it? Luckily the government was receptive for the message and acted accordingly.

Meanwhile the new Act had been adopted and gazetted (State Gazette 2016/156) and the general understanding is that it will come into force in 2021, comprising additional regulations for -amongst others- land consolidation.

Worth noting is that also urban land readjustment is included in the new act. That means that adjacent to the voluntary rural land consolidation now the variant of consolidation of urban areas becomes legally possible. This is a new phenomenon. The urban land readjustment should also take place on a voluntary basis, and should make urban re-allotment easier. Currently a lot of individual deeds are required to legally arrange the exchange of parcels, when there are several urban land owners involved. The new regulation allows for combining all these separate deeds into one overall notarial deed: an urban land readjustment notarial agreement. And when general interests are at stake, the authorities can apply expropriation in case of an unwilling participant. The new procedure will be possible after the Environment and Planning Act comes into force.

6. THE ROLE OF LAND SURVEYORS IN LAND CONSOLIDATION AND TOOLS

The everlasting role of land surveyors in land consolidation can be described briefly as follows.

- The guardian of the land rights of all involved right holders. He (sometimes ‘she’) is responsible for the registration per existing land lot of all associated land rights and right holders and he takes care that right holders (mainly owners and leaseholders) are participating in all relevant steps in the procedure. In particular during the legal procedure of complaints and objections he has to advise the courts on how the local land consolidation commission dealt with people’s land rights and whether this was done accordingly to the principles of the Act and of ethic integrity.
- He has to act as the independent expert who stands above all parties, which is another role compared with other experts who normally represent a certain interest, such as agriculture, nature, landscape, water, roads etc. Experience shows that it happens regularly that the local land consolidation commission is put under pressure to make certain decisions on how to allocate lots and to decide on which farmer is allowed to displace his farm and built an new one (with state subsidy). At such moments it is important that the local commission can rely on the land surveyor who independently from everyone’s interest can advise, and is able to explain parties what is fair and best, based on his expertise, cadastral data and toolbox.
- He acts as the architect of the re-allotment, based on objective criteria. In the first land consolidations hundred years ago, the projects were small in surface area and well to oversee, and the land surveyor could make the design based on logical thinking and on good calculations. Later, the Kadaster developed together with the University of Delft software that assisted the processes. Various re-allotment alternatives might be calculated and discussed with the local commission and with relevant right holders. It became also more common to dedicate attention to environmental issues, such as the conservation of nature areas and of landscape elements and the creation of completely new ones. The land surveyor proposes how the new boundaries would run, and whether

-for example- a row of trees could be preserved. To do all this, the land surveyor has to master not only new technologies, but also to be skilled in handling emotional feelings of right holders, in case they are not really willing to accept those solutions.

- He acts as a kind of broker to identify the location of lands to be acquired by the local land consolidation commission, in order to facilitate a good and smooth re-allotment. When, for a displacement of farms from a crowded part of the area to a less crowded part land was needed, the land surveyor had to find the best candidates for displacement and to make land and money available.

When it regards the formal aspect of the position of the land surveyor, this was well regulated in the consecutive Acts, which comprised an article stating that every land consolidation project must be associated with a land surveyor of the Kadaster. In the Acts of 1924, 1938, 1954 and 1985 this was explicitly compulsory. Under the act of 2007 and the one to come, the obligation is translated in a more general phrase, namely that for every new project there should be a consultation with the executive board of the Kadaster in order to agree on the input of its land surveyors.

Regarding the IT-tools, previously the Kadaster developed all information systems in-house. After -say- 1995, one could observe an enormous grow of commercial software, with the GIS-industry providing for excellent systems. Increasingly, land surveyors use home-made applications based on available commercial GIS-packages.

The result is that meanwhile not only the registration and administration in a project is fully automated, but that the difficult design process of the Re-allotment Plan is IT-supported; also is the updating of the national land registers and cadastre based on the input of the re-allotment.

With the IT-developments going on, the GIS functionality gets more advanced time and again, so that during the whole land consolidation process the involved land owners and other right holders can participate using modern GIS-tools such as portals and applications all by themselves and from home.....

New IT apps, such as facilitating the use of cadastral data for all kind of applications becomes reality. A sample: maps with analyses of the real estate market (for starters, for the elderly for health care), energy data linked to the characteristic of houses, real estate value developments, address coordinates for car navigation systems, participation of land owners in a variety of municipal tasks by using own pictures or measurements, mortgage analyses, and of course multiple analyses of land ownership structures to forecast the effect of a voluntary land consolidation, whether in the rural or the urban area.

What comes associated with these developments, is that today one could hardly speak about 'land surveyors': yes, there are still quite a few in the Kadaster, but in particular to perform the survey of boundaries of land and to maintain cadastral and topographic maps. The employees, working for the variety of different kinds of land development, are birds of many plumage: economists, agriculturalists, GIS-specialists, ecologists, sociologists, spatial planners and so on.

As said earlier, one might observe that the number of traditional land consolidation projects is diminishing. In 2014 still 23 projects with a surface area of about 133,000 hectares were

in progress. Currently, just 2 new projects were brought on the list, ‘Schoonebeek’ and ‘Franekeradeel-Harlingen’.

One of the projects executed in the period, was ‘Olst-Wesepe’: 4073 hectares and 88 farmers. It is mentioned here to show that with the new legal options, the process can go fast. With the farmers directly participating in the development of the re-allotment plan, legal procedures of complaint and objections were avoided: in 4 years the work was done.

7. THE FUTURE OF LAND CONSOLIDATION

It appears that after a century of land consolidation the situation of 1916 occurs again. Like then, the government prefers voluntary small scale land re-allotments; just like then, the land surveyor is the only associated expert who is in charge. The question is whether the land consolidation instrument is doomed to continue on the back burner of small voluntary re-allotment projects?

Has the organised development of the rural area future? Our answer is clearly yes! Because: the future-proof development of the rural area is one of the four priorities of the new National Strategy for Spatial Planning and the Environment (‘NOVI’), which currently is under development by the national government. Previously the Structure Vision for Infrastructure and Spatial Planning gave a direction to the national planning, now it will be the National Strategy, as required by the new coming Act. The Act stipulates that there should be one overall vision for the environment.

The strategy which is developed in the drafts of the National Strategy, says that it aims at a new perspective for the Dutch agricultural business sector, to become a leader for sustainable circular agriculture. A challenging revenue-model should be combined with a minimal effect on the environment of air, soil and water.

This is expected to contribute positively to biodiversity. Subsidence of the soil must be tackled. Increase of water level is necessary in certain peatland areas. The crisis in housing construction should be solved. Energy transition, together with the associated questions of spatial consequences of solar parks, high tech windmills, energy infrastructure, requires solution. De underlying data are impressive: 270,000 hectares of peatland, need for 541,000 to 810,000 new houses requiring at least another 20,000 hectares, 4135 pig farms, 11,963 dairy farms, 11,000 arable farms who all need to cooperate.....

The draft National Strategy stipulates that ‘soil exploitation must be in good balance, and it is needed to look again to the allocation of spatial functions in the rural area, not seen from a dominant agricultural perspective as in the past with the traditional land consolidation, but seen from all societal desires and demands for the rural area’.

Meanwhile it has become clear that within all these ‘desires and demands’ priorities are set, such as the reduction of carbon dioxide, phosphate and nitrogen. In its understanding of ‘land consolidation’ the government apparently still assumes the old fashioned land consolidation as from the act of 1954, we believe. In cases where the government has to dispose of land, to serve the general interest, its preference is to deal with private right

holders on a basis of free will in order to acquire agreement. In case this agreement does not come about, and an interference in private rights is necessary, other instruments from the Environment and Planning Act can be applied, such as expropriation and pre-emptive rights, the government proposes.

The policy memo ‘Vision on Agriculture, Nature and Food: Valuable and Connected’ (September 2018) of the minister of Agriculture, Nature and Food Quality however shows a more enlightened opinion, stating that should be investigated whether a ‘land consolidation new style’ is needed to realise the new division of spatial functions. In our view, the minister has a better understanding than the cabinet that existing ownership and lease arrangements can seriously stand in the way of a government, wishing to ‘rearrange spatial functions’.

8. CONCLUSIONS

A century of land consolidation, and century of commitment of land surveyors, even though they were called later ‘engineer of the Kadaster’, or ‘project leader’. The project leaders of today are rarely land surveyors, but professionals from a variety of disciplines. The remarkable thing here is that in 1916 the land surveyor started to work alone in the first land consolidation, the voluntary land re-allotment ‘Ballummer Mieden’. The company Heidemij took care of the necessary field work. Later, when soil improvement, water management, road construction, farm displacement, became important and possible, the Government Service for Technical Agricultural Service (‘Cultuurtechnische Dienst’) was founded (later called the Government Service for Land and Water Management, later again the Government Service for Rural Development), was designated to be the first representative of the Minister of Agriculture, and by consequence was responsible for the execution of the central policy and the budget. The Kadasters’ dominant role changed to a contribution, by taking responsibility for most procedural steps and the new allotment design. Under the current Regional Development Act (2007), the Government Service has been abolished and the governmental responsibility has been divested to the Provinces, and the land surveyor is again the only one mentioned in the Act. With the new Environment and Planning Act in development, the involvement of the land surveyor of the Kadaster is said to be ‘indispensable, because of legal security, expertise and tools’, as was said in the Parliament. At the same it appears that large scale improvement of the rural countryside is over: the challenge is voluntary re-allotment, in a ‘smart way’ in order to improve the situation for all those involved. Actually not much different from 1916! But the aims of the cabinet are huge, and we believe that an organised rearrangement of spatial functions in the rural and urban area can hardly be missed.....

Can we draw lessons from 100 years of land consolidation?

- The government at its level might have administrative and policy aims about the development of the rural areas, but it is always necessary to understand that it is the owners and leaseholders who have the right to dispose of the land and decide what to do with it. Of course the government can impose negative use restrictions, thus can prohibit what is not allowed, but the government can never impose a positive measure.

When the government wants a house to be built, it cannot force the landowner to do so: it has either to buy the land, or to expropriate. Such is the law. When the government wishes to maintain or realise certain spatial functions in the rural area, the government needs a legal instrument to arrange the involvement and agreement of the right holders. During a hundred years, in particular land consolidation has proven once and again that it can do so. The only alternative is expropriation. Therefore it is wise that under the new to come Environment and Planning Act a special chapter will be dedicated to land consolidation.

- The negative connotation of the word ‘land consolidation’ has to do with the valuable landscapes which were lost in the past, especially during the first generation of large scale land consolidation projects. This is coming back in the cabinet’s policy memo on the National Strategy for Spatial Planning and the Environment (‘NOVI’), when it says that the government has to embrace all spatial functions of the rural area, and not ‘only the dominant agricultural objective such as in land consolidation....’ However, after the broadening of the goals of land consolidation as comprised in the successive legislation, much good things have been achieved. In later land consolidation projects important values of nature and landscape are being conserved and created. In the rural areas a clear and sustainable structure of spatial functions has been realised, resulting in a separation of functions so that on one hand farmers can maintain and develop their businesses, and on the other hand an interesting and valuable landscape has been safeguarded, which - by the way- can be enjoyed by the population because of the development of many leisure facilities. An example is the earlier mentioned ‘Eemland’ project, where a substantial amount of land was acquired by the land consolidation commission in order to conserve and create valuable nature and landscape. The realisation of such improvements can hardly be achieved outside the legal framework of a land consolidation project.
- Worth noting is, for example, that about 80% of the national network for nature (which has to connect major nature conservation areas nationwide) has been realised by land consolidation. There, under the land consolidation legislation, it is much easier to realise such networks than outside, when expropriation is necessary to get the ownership of the last pieces of designated lands.
- When areas without and with land consolidation are compared it is noticeable that the chaotic scattering of nature and landscape is much bigger in case of ‘without’.
- One of the critical success factors has been the major facilities for participation. Not only in the National Land Consolidation Commission (later National Land Development Commission, which guided land consolidation on behalf of the cabinet), all parties were involved and decision were prepared in joint consultation, the same was very true for the local land consolidation commission, which lead the project: a representation of farmers, leaseholders, municipalities, water boards, civil servants jointly discussed the progress and prepared the decisions of the commission. In the coming Environmental and Planning Act a major objective is safeguarding participation: well, in land consolidation this had been the starting point since 1916....
- When it regards such sensitive and potentially emotional matters as exchange of land rights, not only correct and reliable data are prerequisite, but also an independent official, who aims at dealing with all right holders in a fair and objective way and who is skilled in leading the re-allotment processes to a good end. This role has been played by the land surveyor the last century with enthusiasm and with verve. When rural (and

urban) development and improvement processes in the future will further be at stake, such an expert will remain necessary. Fortunately this has been fully acknowledged in the coming Act: ‘the assistance of the Kadaster (the land surveyor) is indispensable’.

Although the legislation of land consolidation and rural land development substantially has been adapted over the years, and the societal circumstances drastically have been changed, there will be a need for experts who, with knowledge and experience and a well filled toolbox, can contribute to the development of rural and urban areas. In any case with voluntary re-allotments, but most likely again with something at a larger scale. To connect with contemporary language: a ‘land surveyor 2.0’?

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