

# Land Consolidation in Scandinavian Countries

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**Abstract**— The land consolidation involves complex legal and technical actions carried out in order to optimize the size and organization of land plots. It is these provisions have aroused the vehement reaction, the opposition believes that by completing admission would prejudice the rights of landowners forced them to strengthen the legal and administrative measures. At the same time, the authors and supporters of the project say that the accusations are groundless, because under the proposed text establishes the right owner to give up land consolidation at any time, even if they started building measures.

The advantages of merging include considerable increase in useful time worked in agricultural areas, increased productivity due allowance optimal natural resources; productivity will lead to increase profits for farmers.

The join objects differ from country to country is different and restrictions, regulations, and many other aspects of cadastral systems. In many countries with advanced cadastral systems, including the Scandinavian, anyone can buy property without any restrictions. In this paper the problem is mirrored land consolidation in the Scandinavian countries, namely Finland, Norway and Sweden.

It is analyzed evolution, important primary purpose, procedures and results as a result of land consolidation. The same work is analyzed legislation which is based consolidation process, which is the participants, what effects brought financial consolidation and implementation of many projects that were in opposition to the authorities initiating reactions unhappy.

**Keywords**— Land, cadaster, topography, surface area, cartography, Finland, Norway, Sweden.

## I. INTRODUCTION

Many surveyors involved in land consolidation projects at technical and managerial. The structure of the objectives, procedures and means constituting land consolidation is subject to major changes in accordance with changes in the real life environment. Also appear on the legislative changes, regulations and structures involved in public administration.

The traditionally, land consolidation is used as a tool to improve the trade structure of farms by strengthening agricultural parcels fragments. When it became clear in the past that the free market land will not solve the problem of fragmented land consolidation, many countries have focused on drafting regulations for land consolidation.

These regulations have provided the necessary mechanism plots with an area exactly in a coordinated way.

The common characteristics of these projects in many countries are that they consist of:

1. a set of decision-making processes that integrate both the interests of the government as well as the simple farmers;
2. The procedure of redistributing land rights resulting from the re-division of plots;
3. The procedure for the provision of engineering works in agriculture to improve the transport and supply of water;
4. A system through which funding costs are shared between the government and farmers;
5. Organization in draft form. Implementation of such a project requires first of all a database, a Geo-Information System and Technology to carry out these works.

Typically, data is created during the development plan they set boundaries repackaging and new field after approval of the plan by the owners.

There are two primary alternatives for execution of land consolidation procedure "cadastral topographic model" and "popular committee".

In "The cadastral topographic" authority in charge of land consolidation procedure called a supervisor to conduct cadastral project. The supervisor may be assisted in deciding a term appointed by the municipalities.

In "Model Committee" basic responsibility belongs to a committee. Topography has an important role as a consultant.

The land consolidation has turned into a tool for rural development by including many more development objectives than special agriculture. The maximum success factor in land consolidation in the future is to develop simplified procedures that will cost less and will take place in a shorter time. This will ensure the shrinking size of projects, using existing databases and modern information technologies, combining and conducting in parallel different stages of the process of land consolidation, minimizing waiting times between different stages, tasks and processes, as by omission is delayed consolidation projects.

An example would be special procedures flexible land consolidation concerning one type of land that had the same destination.

Such redistribution of land such as strengthening areas lots of wine and water areas in Germany, or strengthening forests in Sweden.

So recommendations for the future might be:

- The strengthening remains necessary for agricultural parcels, land consolidation may reduce fragmentation of parcels can support the improvement of infrastructure and improving living standards;
- The land consolidation tools require you to include many other fields;
- The land consolidation should form part of rural and urban development;
- The experts involved in land consolidation should be better prepared to analyze various situations and be prepared to apply specific procedures in each case;

- In funding land consolidation projects should involve state resources;
- The land consolidation authorities should work closely with universities to be able to always improve quality of services provided by Implementation of innovations in the field.

#### *Land Consolidation in Finland*

In different countries and in different languages the term "land consolidation" can be understood and essentially distinct, depending on the language, history, culture and etymology of each country and language.

For example, in the German expression Flurbereinigung equivalent in English the term consolidation of the soil, has a different meaning, namely, in variant English, the land consolidation means, uniting or combining plots, while in the German term Flurbereinigung sense of: transforming forests in pasture. While the phrase "land consolidation" and we gained new meanings, interpretations. In Finnish land consolidation is translated, generally, the term "uusjako" which is the sense of creating a new plot of land in cadastral parcels.

#### *History-Land Consolidation in Finland*

The organization of cadastral parcels in Finland is the work product of hundreds of years, first systematization in this (called in Finnish: sarkajako) took place in the fourteenth century, the purpose of collection of tax levied by the king at that time Finland was still part in Sweden.

The Law of 1920 and the withdrawal fugitives Karelia in 1940 is to promote the formation of small family farms.

The farm size increased until 1995, and after Finnish EU accession will continue to grow the size of 1-2 hectares each year. This change has forced farmers to purchase all lands wherever possible processed. New lands were often bought separately and even the location of large and small distances.

In some municipalities Finnish Notwithstanding that enjoyed increases farms, land dimensions were disproportionate.

For example, the City of Pori, a city in Finland, the dimensions mean for a lot of land in 2002 it was 2.39 ha and 2.34 ha in 2005. The total current area of the lot is 10900 ha processed.

The first cartographic map and the first activity aimed at improving the economic agriculture occurred in the seventeenth century (isojako). Strengthening the earth, itself, the form that we know it today, began in the mid nineteenth century (known in Finnish: uusjako). During the twentieth century developed land consolidation evolves to incorporate connections, having high tangent rural development.

The next step in the development of land consolidation was undertaken, later, in 1997, when Finnish cadaster legislation was completely renewed.

The new act includes numerous cadaster the instruments on territorial arrangements. It is now possible to carry out land consolidation, to promote land use for all kinds of purposes, not only for agriculture and forestry.

In recent years the National Land Survey (national land survey) in Finland has developed the process and legislation

on land consolidation, relying on customer needs and interest groups.

Starting in 1750 the government adopted and forced land owners to care for effective land consolidation. Consolidation of land often clashed with the opposition, but after accepting this law, land owners remained quite satisfied with the results.

#### *Legislation*

From 1952 Act of dividing the Real Estate Training 1997 law on land consolidation in Finland they sat the same. Damages for land consolidation were as follows: revenues must cover all expenses, and land parceling must be as effective, wide range of use. The main legislative building damage not envisages supporting landowners. Land owners were forced, only in the event that they were against.

The damages for mandatory participation - is what must to be important for land reorganization. The main decisions were taken by the inspector of land and two experts who were selected by local public bodies. Senior Manager of the Office Tracking (survey office) chooses inspectoral. If landowners do not agree with the decision inspector and experts, they can appeal to the Land Court. In strengthening Finnish land owners choose their own "owners committee".

Usually 3-8 allowed the owners to join the committee, which function as control and consulting.

#### *Previous Land Consolidation Procedure*

During the 1980s and 1990s landed inspectors were performing strengthening land as in previous decades. At the request of a single owner land consolidation procedure take place throughout the sector, including 500 owners.

On receipt of the building inspector and the two experts were waiting for permission from the Central Office about starting the consolidation.

#### *Analysis Inspector Emphasis on Owner's Opinion*

The Land consolidation often has considerable dimensions. Sometimes land consolidation and sizes could reach 10 000 ha and included in work or everything up to the limit established boundaries. The biggest error that happened on the old procedure is the lack of negotiations.

The Real Estate Training discussions and meetings not recognized as a tool for land consolidation and principles governing the processes - were missing. During 1980 and 1990 several projects land consolidation took place in Finland, which suffered in the collision with several opposition owners.

The new method of land consolidation

The Inspectors often clashed with opposition from landowners, namely because of this land consolidation is sometimes prolonged for a period of 10 years. At the end of the 90 National Land Survey trust common it was that reinforcements are coming to an end.

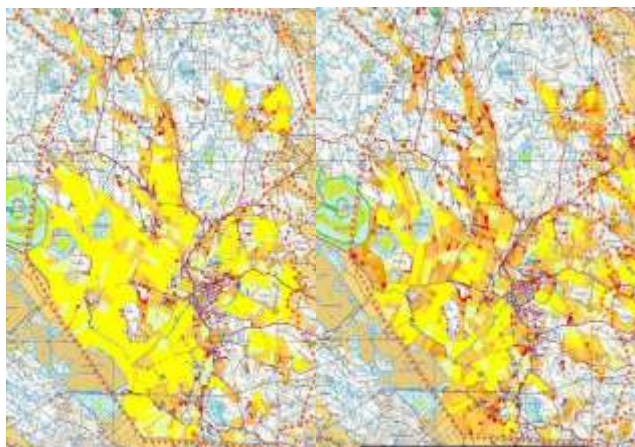
The discussions were focused on improving vision and programming owners consolidation. The proposal was accepted only if land consolidation will occupy more than 10 years. During the period between 1997 and 2002 in Ostrobothnia Teritorial Office began implementation of several projects on new methods of consolidation were called Consolidation light land or land-based client.

The new procedure of consolidation has evolved due this project development. In 2002 they were also discussed new principles of consolidation and emphasized the importance of land consolidation. Meanwhile, the Administration prepared new land consolidation strategy, planned it for a period 2002 - 2006. Vaino Ylikangas was one of the most essential strategies in this program.

Now the emphasis was put on supporting landowners and obtains maximum profit and confidence. Following the approval of this plan, highest priority was obtained by consolidating farmland. From the beginning the new leadership principles have changed the practice of land consolidation. Now evaluate the need for consolidation can be started only at the request of the owner.

The Cadastral Office could conduct assessments without consent or request of the owner. Namely the need to strengthen evaluation served as the first step in building the new procedure. Before building the necessity for, and includes the first consolidation plan. The possibilities are evaluated using GPS photos, land registers and registers of agrarian administration. Owners estimate is presented in charts and figures that include characteristics of each subdivision. At the detailed presentation stage is excluded because experts dealing with planning does not meet personal goals of each owner and, therefore, can collide with crucial mistakes.

The essence of this stage is to convince the owner of the possibilities and importance of land consolidation. Landowners they have just maps and drawings. The purpose of this step is to provide image landowners what they could mean for land consolidation and what possibilities they create for them.



Maps presented have been prepared in connection with the need to consolidate land in Satakunta region, municipality Kiukainen village Panel. Large plots are shown in yellow and small red. On the left is shown the situation before consolidation, respectively, in the right situation after consolidation (scale 1: 130 000).

The National Land Survey of Finland is a government agency responsible for the redevelopment of land that is under the Ministry of Agriculture and Forestry in Finland. The

National Land Survey of Finland is also responsible for land registration system and to carry maps and cartographic plans.

The National Land Survey of Finland systematically improves quality of its services and products for the customers' expectations. Quality management is based on the ISO9000: 2000 quality standard and the EFQM model. The main effort is directed towards the development of core processes. These objectives are then used to guide the processes and teams. Thus, Finland has introduced a new process of land consolidation. Its features are: examining the needs and expectation of further conditions, more power to the owners, using cadastral and topographic database faster and cheaper compared to the old one.

All activities of public authorities are analyzed in terms of results. Before being funded project is analyzed in terms of cost-benefit.

The Public-private partnership (PPP) is in continuous development to achieve more efficiency. In the redevelopment of land there is a need for certain data, such as limit data, survey data etc.

In recent years the National Study Field Finland has developed good technical eligibility criteria for using existing data, using the latest tools. Using these new tools appears as a stringent requirement.

The developing legislation and other directives derived from experience in practice is a continuous task of dynamic companies. Supervision of national land in Finland the National Land Survey of Finland, used annually in its activities rearrangement-building earth people whose age reaches 80 years; they represent about 4% of the total workforce in National research land Finland - The National Land Survey of Finland. It is estimated that the number will increase to approx. 6%. Total costs including labor, travel expenses, drainage works amount to approximately € 6.5 million annually. Around 1.9 million € are obtained from clients. The rest remains as a grant from the state. Funding is also possible for the EU. In areas fragmented state finances about 75% of the costs of building land. Allotments plots for nature conservation are funded by the Ministry of Environment. Number of projects implemented on time is approx. 40 consolidations of land with a total area of 75 000 ha and 60 parcels allotments 15 000 ha.

The landowners and other clients require more effective activities of public authorities: processes faster and more transparent. The authorities responsible for carrying out nature conservation and to improving road safety are becoming increasingly interested in their image in the eyes of the owners. They are interested to introduce alternatives to expropriation in the execution of projects.

#### *Land Consolidation in Norway*

In Norway the problem is resolved by the Court of land consolidation land consolidation. Each case brought before the Court begins with parties who have a problem to solve. The Court's legal competent land consolidation is limited to matters concerning property rights and other rights relating to property. For this reason land consolidation Court slogan is

"Land Consolidation Court resolve each owning part of Norway".

The Jurisdiction is divided into 41 sectors, each with its own CCT, CCT and five tones. As far as we know, Norway is the only European country which organized the consolidation of land completely within the legal system.

The first legislation based on land consolidation was originally adopted in 1821. Sevatal (1986) writes that this first legislation was based on existing legal structures to oversee and carry out land redistribution end. There was no concrete land consolidation departments of government established after the adoption pin "Land Consolidation Act" in 1857, when land consolidation service was founded in 1859.

Due to Land Consolidation Act 1857, decision-making body on issues of land consolidation was modeled in traditional court yard. Since 1950, these courts were given the status of Land Consolidation Court. The current version of the Act is in force since 1979. It can be said that Norway has a relatively rich experience in the field of land consolidation, and that currently has land consolidation services well developed. In 1996 Land Consolidation Courts have concluded 992 cases. In average every process had involved 75 participants.

The biggest event included 260 parties. In each case the Land Consolidation Court consists all of one judge and two additional judges appointed in case of necessity. To serve as a judge of the Court of land consolidation is necessary to hold diploma in Agricultural University of Norway, after completion of a course that includes a variety of relevant topics as: cartography, topography, land registration, and land consolidation law. It is also preferable that the future candidate for judge to be gained practical experience as a surveyor in land consolidation service before his appointment to office.

The appointment of judges of the Court of land consolidation is carried out by King of Norway. What it is actually land consolidation? The term "jordskiffe" who is actually the official name of the court and its activity in Norwegian, is usually translated as "land consolidation" in English or land consolidation.

A more accurate translation of the term "jordskiffe" in English as "reallocation and redistribution properties in comas have." This translation more accurately express the fact that many plots of land are joined together, and this whole show the same number of plots just as in a physical form and new legal and reorganized. At the same time these new plots retain their old values, broadly framed. Land consolidation is usually made for specific surface properties geographic limit.

The size and purpose of land consolidation vary from small adjustments of borders between two pine properties to complete rearrangement of hundreds of properties for planning and investment in new infrastructure. At a fundamental level, the process of land consolidation is meant to restructure outdated types and unsatisfactory property. Any property of land considered difficult to use effectively in existing circumstances may be subject to consolidation terms established by the Land Consolidation Act.

The same steps apply when circumstances become unfavorable as a result of construction, highway improvements and actions, including even the closing of private railways.

Delimitation of borders is a special case highlighted in the Land Consolidation Act. A landlord may require ATC to clarify to mark and describe boundaries of his property. Owners may also require the same service roads, footpaths, etc. After a decision has been taken, the borders are marked with permanent signs are placed on a map and coordinates are set so that the future will not reoccur dispute on this issue. Another problem frequently encountered is to clarify and determine the conditions for ownership and usage rights jointly and in other areas that are subject to public use when necessary for rational use of land.

#### *Dissolution of Joint Ownership*

In places where property rights are owned jointly CCT can dissolve acets property type in the divide sis common area so that each owner to have some individual needles corresponds to the jointly owned. Often huge fields owned jointly, and thereby get the right solution for each owner turn their use in a gun the way again.

#### *Property Division*

CCT can divide farm land, but only with the permission of the Department of Agriculture. Next destination surface must be agriculture. An example would be when the yard of a house in the country to be separated from the rest by distributing farmland or dissolution of common property system.

#### *Plan Development of New Properties*

Often properties are broken or have an odd shape. If a new project would be more profitable, CCT can redistribute properties through land exchange. New projects are also used in connection with the division of property and when land and rights to be arranged in accordance with the aims pursued in the Land Act. In connection with public construction projects such railways, roads etc. it may be necessary to carry out the exchange of properties so that the surface be productive framed in the new construction project. In such cases the court will initiate an assessment and decide on compensation for damage to each property.

The rules regarding prescribing the use of public land

In areas where there is shared grazing, hunting and others, CCT may prescribe rules for the use of data surfaces. Such rules may be prescribed also in areas owned jointly or in areas where property rights are complex land use difficult. The rules do not change the current ownership of land or their legal status, but specify how these properties can be used according to rights held on them.

#### *Common Measures*

Prescribing rules on land use is often not enough to solve problems. When there is a need for investments made to solve the problem, the case investigated is called "common measure". Often it can be a useful investiture several properties, and in such cases the court may organize joint action and split the costs.

### Elimination

Permanent rights so that the right to pasture to produce fine sin others can cause problems for the use of the estate under downward. Such rights can be eliminated by compensating the expression CCT material (dust) money or other valuable considerations.

### Land Consolidation in Sweden

The rural development has a direct link with improving living conditions in rural areas, the surroundings realty: infrastructure, means of communications, accessibility services and land management.

In this context the division of land into property units has the direct influence on rural development from different points of view of society, business and the environment. In Dalarna (province Sweden) there is a unique system of fragmented parcels, combined with a complex series of conditions of its own.

The land consolidation is the main tool used to obtain land concentration, and conditions in areas allotted simple cadastral issues. Since 1930 authorities have CADstream implementing this building land for about 450 000 ha, but is necessary land consolidation towards a desired outcome at least another 400 000 ha.

## II. CONCLUSION

In areas with moderate fragmentation of land distribution procedure is recommended voluntary. Strengthening radical land however, it is recommended for large areas that were worst fragmented and where there is an urgent need for land consolidation. Normally in such projects are trained 300-700 participants. For success of the project it is important to increase efficiency and benefit of better land consolidation and land propriarii among the public in general.

They are important for both participants and authorities to implement fully the following:

- The cost and financing;
- Public opinion on participants;
- Participation and influence participants in the procedure;
- Consolidated properties new location;
- Time to implement the procedure. More than those cadastral authorities have emphasized these demands:
  - Develop an efficient procedure and methodology;
  - Develop a reliable association with other authorities and associations;
  - introduction of a high GIS technologies;
  - Establish a dialogue of trust between participants and officials;
  - Obtaining political support to local, regional and parliamentary;

- Positive solving financial problems with government and EU representatives.

The results clearly show that the number of projects implemented private properties was significantly reduced with consequent improvement land division in terms of ownership. As a result of Implementation, it raised essential benefit for society and business.

The main benefits to society are:

- Lowering costs;
- Increase in fund-drive activity and agricultural and forestry;
- Revenue growth.

The main economic and commercial benefits are:

- The lower costs in agriculture and forestry;
- 80-90% reduction of the total length of the borders of the properties;
- Clean and safe borders in the absence of conflict;
- The property conditions prompt decisions proceeding from simple.

The cadastral engineer manages and is responsible for the entire process of project implementation until completion of cadastral procedure. Engineer is required to coordinate information, process decisions and investigations, evaluation and procurement solutions, negotiations and important decisions.

The cadastral procedure is a good way to realize the importance of land compensation, even in case of a widespread consolidation.

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