

# Could the Land Consolidation Process Be an Effective Tool for Nature and Environmental Protection in the Czech Republic?

Marie KOVANDOVA, Czech Republic

**Key words:** land consolidation, implementation of nature and environmental projects, land management

## SUMMARY

Land consolidation serves different purposes in each country. Current situation in the Czech Republic allowed using land consolidation in the traditional way. For other purposes is the present state and procedure character not sufficient. In consequence, common interest like nature and environmental protection could not be implemented in large extent.

The nature and environmental planning has firm position in Denmark. The procedure is compact and flexible. The compactness means, that the nature and environmental policy has strong support by authorities and successful projects attest to high public support. The flexibility is enabled through law, which allowed applying it for varied project. Also projects and their implementation are not burdened with lack of financial sources. Thus, the process has a good frame – on one side the idea's suppliers and public interest, on the other side the legal basis and financial subvention.

Chosen Danish nature and environmental projects implemented through land consolidation have been studied in the meaning of individual project's steps and in general way of planning activities by the related authority. The goal of the investigation was to define a framework of a nature and environmental project and its implementation in Denmark and focus on possibilities of transformation this experience into a Czech case.

## SUMMARY

Pozemkové úpravy jsou nástrojem, který je využíván pro specifické účely dané země. V České republice je proces pozemkových úprav užíván ve své tradiční podobě především ve formě komplexních pozemkových úprav. Pro jiné účely např. environmentální není současná politická a socioekonomická situace nakloněna. V důsledku toho otázky ochrany přírody a ekologické stability krajiny není možné zahrnovat do projektů pozemkových úprav, ačkoliv jediným komplexním řešením daného problému a téměř jediným řešením problému i jako individuálního.

V Dánsku mají pozemkové úpravy silnou pozici v projektech na ochranu přírody a životního prostředí. Proces implementace těchto projektů v rámci pozemkových úprav má významnou státní a veřejnou podporu a z technického pohledu jsou tato řešení environmentálních případů velice úspěšná.

Vybrané příklady dánských projektů byly konzultovány s jejich tvůrci a rámec řešení je popsán a shrnut. Cílem práce je dále využít znalosti dánského způsobu využití pozemkových úprav a zaměřit se na možné zapracování zkušeností do systému pozemkových úprav v ČR.

# **Could the Land Consolidation Process Be an Effective Tool for Nature and Environmental Protection in the Czech Republic?**

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## **1. INTRODUCTION**

Land consolidation is a comprehensive procedure of a new arrangement of agricultural property (parcels) or their parts in a strictly limited area. Land consolidation is used for specific purposes according to different conditions in the agricultural, economic, environment and economic sphere in each country. The traditional use of this procedure is to improve unsuitable land structure for farming and support the appropriate use of the real property without changing the status of ownership. Beside new structure of agricultural plots, also improvement of water management, landscaping, transport system, environmental management and nature conservation supplement the use of land consolidation procedure (Vitikainen, A. 2004).

Land consolidation could serve different purposes and each country disposes of special tools to achieve their own goals. As mentioned above, land consolidation has three basic approaches - a traditional (1), a nature and environment protecting (2), and a traffic system (3). Beside this purpose dividing, procedures set a specific technical character apart too.

It depends on several factors, which approaches and procedure's settings are the main in a country. Determinative factors are agricultural, economic, social and political, cultural and historical conditions, whose situation either support or hobble current needs of land consolidation (Sklenicka, P., Hladik, J. 2006). The history has developed each country individual. Central and eastern countries have common development – they were long time under communism regime. Also other European countries have some similar conditions like group of western or Nordic countries e.g. in the development of legal regulations.

Czech Republic belongs to the group of post-communism countries. Land consolidation procedure was newly formulated after 1989 and the purpose of this procedure was to solve land property, land structure and ownership issues. Private ownership did not exist over 40 years in the Czech Republic and hence it is a long-time problem to solve all demands now. The process of land consolidation has developed during 17 years from first ideas and simple land consolidation (simple LC) to comprehensive land consolidation (comprehensive LC). Nowadays, it is still used priority for the traditional purposes. But the needs for land consolidation are also in nature and environment protecting cases. However, there are some barriers to use the present procedure in this direction. Thus, an investigation about barriers and possibilities is important.

In Denmark, land ownership has had natural development and thus the land consolidation has more progressive development from the traditional procedure to next types of its use.

Danish land consolidation has changed markedly during 1980s from the traditional approach to land consolidation for nature and environmental projects. At that time, nature and environmental issues reached critical level in Denmark and new possibilities were searched. Nowadays, many nature and environmental projects are implemented through a land consolidation procedure.

## **2. LANDSCAPE CONSERVATION**

Czech Republic has started to regard conservation of the environment and landscape as an aspect of overall development of the community, based on the principle of sustainability, as a democratic state. In recent years, preparations for EU membership have stimulated intensive activities in this area.

The duty of the Regional Authority to process the Concept of Nature and Landscape Conservation in co-operation with the Ministry of the Environment of the Czech Republic arises from the regulation in the Act No. 114/1992, on nature and landscape protection in the wording of the pursuant regulations. The concept stems from the State Programme for Environmental and Landscape Conservation, which defines the system of medium-term and long-term regulations and measures contributing to a radical improvement in the condition of the environment and landscape.

The purpose of the Concept of Nature and Landscape Conservation is to further develop and specify these rules and measures on a regional scale, providing an adequate level of detail. The concept is based on an overall analysis of the present features of the environment and landscape, their development, causes of changes and, last but not least, an effectiveness assessment of existing tools for environmental and landscape conservation.

As the Concept of Nature and Landscape Conservation deals with responsibility for individual task at the municipality level, the cadastral area was chosen as the basic landscape unit, because it is more detailed and comparatively stable than the whole municipality unit. Moreover, the cadastral area is the smallest unit to which current and historical data can be applied.

The Territorial System of Ecological Stability (TSES) is projected as a spatial-functional minimum, which is to be supplemented by other measures aimed at optimizing ecological and aesthetic functions of the landscape. Progressive implementation of TSES ensures decreasing of landscape fragmentation and protects representative and unique types of ecosystems within relevant bio-geographical units.

Realization of the TSES is running very slowly and strictly speaking through land consolidations and landscape tending plan. The biggest problem to achieve given goals is not solved landownership. The basic tool for adjusting ownership relationship is the land consolidation system (DERA PR, 2004.).

### **3. LAND CONSOLIDATIONS IN THE CZECH REPUBLIC**

#### **3.1 Objectives and types of land consolidation**

The present type of land consolidation was defined at the beginning of 90s, when specific needs have arisen after the Velvet Revolution in 1989. The main objectives were to ensure real and indefinable ownership, to lead the restitution process and restoration of private ownership of land (MA CR, 2005). Data about the basic description stated below was obtained from the Methodical guide about proposals of land consolidation, 2004 and from the Almanac of land consolidation, 2001. Both were published by the Czech-Moravian Land Consolidation Association.

Two forms of land consolidation procedure were developed – simple LC and comprehensive LC. The definition of land consolidation is from Act No. 139/2002 Coll., on Reparcelling and Land Authorities and amending Act No. 229/1991 Coll., on the Arrangement of Ownership titles to Land and other Agricultural Assets, as amended. This act superseded the original act from 1991. First land consolidation processes have started in 1991.

Simple LC were used during first years after 1989 as a toll for recovery of agricultural property in the restitution process. First simple LC processes were used only for allocation of plots without ownership transfer in order to make possible for those interested to carry out farming. Later, simple LC was worked out with ownership transfer to relocated parcels with register in the land registry (cadastre).

Nowadays, the simple LC is being realized as an exchange of ownership rights to land in a area smaller than is one cadastral area, when is not necessary to consolidate plots in the whole cadastral area. Beside the exchange of land between several owners, it may involve an urgent landscape-forming measure (e.g. erosion control and flood control measures, access roads, etc.). Simple LC is used also for main road construction works.

Since 1994, comprehensive LC has been started. This procedure gives solutions to the whole cadastral area, both from the aspect of a new land and ownership arrangement and from the aspect of landscape forming and improvement of environment. A part thereof is a poly-functional skeleton of the landscape – so called common measures, which involve erosion control, flood control, water management, transport infrastructure, ecological and other measures.

#### **3.2 Present state**

The act about land consolidation (see above) points out a task of land consolidation. Objectives in a land consolidation procedure could be divided into several groups – set by landowners, set by society, set by other interested parties, set by other interest groups (Arvo Vitikainen, 2004). Nowadays, lack of financial state support and large number of applied projects press land consolidation offices to select project according to “a list of priorities”. It

means that current land consolidation could not work sufficiently for all four groups of objectives, but only for the preferred one.

Central Land Consolidation Office sets the Conception about activities of land consolidation offices for 2006-2008. This document specifies needs in the society and anticipated development of specific conditions and relations, and financial requirement for the given time period. Restitution activities and land consolidations are the important task for land consolidation offices. The main priorities have land consolidation focusing on the critical structure of ownership relations in a cadastral area, land consolidation related to construction works (especially main roads), land consolidation applied by land owners of absolute majority agricultural land in related cadastral area. In the Czech Republic, the management of land consolidation tries to keep 2-3 comprehensive LC initiated and finished per year in a district and 1-2 simple LC initiated and finished per year in a district. Czech Republic has 77 districts. Beside the central office in Prague, a local office is in each district. This steering of LC is under specific financial support from the state budget and EU founding and mentioned number of LC per year is the minimum to keep the land consolidation on sustainable level (Hladik, J. 2006).

A list of land consolidation applied by land owners is long and financial support allowed to open and finished only limited number processes as mentioned above. Land consolidations are gradually initiated according to concrete conditions in the area and the depth of the situation from the list. The group of projects, which is realized, is usually composed of projects applied by landowners. These projects enable to realize objectives set by landowners, which means mainly improvement of land structure for better farming and smaller water management measures. Other objectives like nature and environment protection or ecological stability at regional level are out of landowners set of interest. Next two mentioned priority in land consolidation projects (critical structure of land ownership and construction works) are often worked out as simple LC, thus without common measures.

Environmental aspect is included in comprehensive LC, which is initiated at landowners request according to priorities in the conception. Landowner's interest in these projects limits possibility to add nature and environmental protection part.

It is an uneasy situation, when LC offices have to choose territories for LC according to mentioned priorities, so that the funding is used effective and the main problems will be solved in the rural area.

Time duration of a procedure is 5, 5 years by comprehensive LC and three years by simple LC (MA CR, 2005).

### **3.3 Barriers and needs in the land consolidation procedure**

The procedure of land consolidation shows some critical points from its initiation to its completion and subsequent realization of results. These critical points slowed the process down and built barriers against a use of land consolidation for all applied and needed projects

and also against utilization as a tool for other purposes beside the traditional use. Facts could be summarized in a group of current barriers, needs and questions about land consolidations in the Czech Republic.

Critical point number one is missing necessary financial support from the state budget and related ideological support of land consolidation by the government. This point has only political character and shows lack of interest by present government to carry out basic aims of LC like adjusting ownership relationship and thus support other projects, which are depending on the ownership structure.

Second critical point relates to data arrangement about the cadastral area. The registry of property rights in the cadastre proves many shortages and precision and data actuality is low, which slowed down incipient steps in data collection and the final planning too. The issue about land registry improvement is in fact one of objectives of land consolidation.

Critical point number three is the set of landowners' interests. According to critical point number one, the number of comprehensive LC is limited and financial support is used priority for applied cases by landowners. Environmental issues do not have enough space and support in this kind of projects.

This critical points result in insufficient conditions and barriers: number of projects, time duration, implementation of common measures. Time duration is important for all participants in the procedure. Landowners are interested in farming and develop their activities as soon as possible. Number of projects overlays only the minimum of needs and this minimum of projects is uncertain every year as well. In consequence, common interest could be implemented only through comprehensive LC, where landowners' interest is the main objective. Simple LC is used for implementation of construction works, for common measures the support is deficient.

Land consolidation has the potential to be effective tool for common measures for nature and environmental protection, but current economic and political conditions, do not allowed to use present procedure. For this and further investigation questions arise like how land consolidation could be an effective tool for nature and environmental issues, how the present procedure could be used or transformed for other objectives, how foreign experience could be transferred into the Czech system of land consolidation.

## **4 LAND CONSOLIDATIONS IN DENMARK**

### **4.1 Objectives and types of land consolidation**

In the historical view, the process of land consolidation originated as a tool to reduce fragmentation and to implement re-distributive land reform. During the time, this traditional use has transformed to "improvement of structure" rather than reduction of fragmentation. The development in the procedure has transferred land consolidation to use as a tool for property changes following public interventions as environmental regulation and construction of major roads (CLCO Tønder, 2006).

The law states the basic definition of land consolidation and also two different technical type of land consolidations in relation how many participants are involved. One is a procedure for Danish small voluntary land consolidation projects with 5-10 participants and the second one procedure for Danish large voluntary land consolidation projects with 10-50 participants. The procedure of land consolidation is based on voluntary participation and the planning is based on negotiation (a combination of selling and buying land). A signed agreement about transactions becomes a transfer document. All signed agreements become legally effective in one ruling by a special empowered land commission. The costs of planning, negotiation and property registration are paid from the state budget and are co-financed by EU through rural development programme.

The prospect of compensating farmers in alternative and better located land is a critical prerequisite to voluntary agreements. As virtually all land in Denmark is privately owned it is necessary to purchase land actively on market terms with the purpose to have such land in store for subsequent compensation.

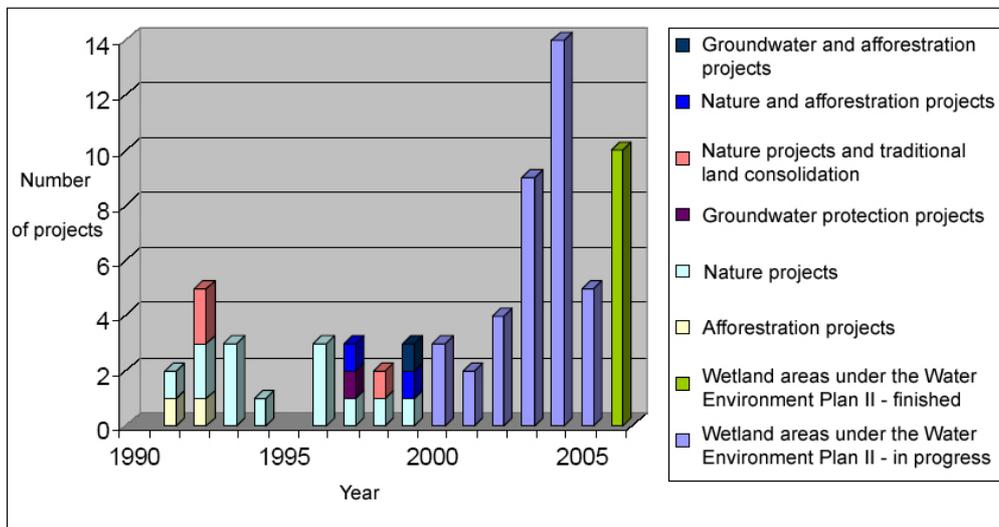
A traditional land consolidation is initiated on request of a group of landowners. Because of voluntary basis, it is not needed that all owners in designed area have to participate. A representative committee, elected at the beginning of the process participates actively in negotiations. The procedure takes approximately 1-2 years. Projects initiated by land owners are realized by a private land surveyor.

Construction of major roads and highways are implemented in a process of land consolidation in order to decrease injury on farm structure. The expropriation commission has narrow mandate to expropriate only the land that is needed to the construction together with only small adjacent land parcels. Land consolidation is used to chart the scope for voluntary in the vicinity of the road and worked out the part of compensation and resolution of conflicts of interests. New arrangement is made legally effective by the ruling (judgement) of the expropriation commission. Cost of land consolidation is part of the project.

In 1980s, land consolidation has increasingly been used as tool of implementation of nature restoration and afforestation projects. These projects are realized with a support of land banking activities, which is one of important conditions to solve the task successful. Most of the projects are carried out the so-called Water Environment Plan II, which is currently under implementation and following plan number III is in progress. Its objective is to establish meadow-biotopes to reduce pollution from agriculture, the so-called "wet areas". About 100 projects are currently under either preparation or implementation nation wide. About 30 projects covering 1900 hectares are implemented. Another 40 projects (5000 ha) are approved for implementation and about 30 projects (2000) ha are approved for preliminary investigations. Figure 1 describes number of projects for special purposes in the nature and environmental issue.

The negotiation on compensation and re-organization of land is performed as a land consolidation project. It is a part of the strategy that agreements with farmers shall be reached on a voluntary basis. However, there is a provision to apply expropriation in exceptional

cases where almost all landowners participate on a voluntary basis. Projects initiated by public intervention are typically implemented by land consolidation planners from the Division of Land Consolidation. Data in this chapter were obtained by interviewing at the County of Northern Jutland.



**Figure 1:** Nature and environmental projects, Denmark (Tønder Office, 2006)

#### 4.2 The Danish way with concrete projects description

As particular examples, four Danish projects have been chosen to describe the basic procedure steps and to find transfer possibilities of Danish experiences into the Czech system of land consolidation. The projects are: Vilsted Lake Project, Drastrup Project, Tim Enge Project, and Gedved Lake Project. Projects location is demonstrated in the figure 2.



**Figure 2:** Location of selected projects in Denmark (T.P.Christiansen, A.H.Ringgørd Lauridsen, 2006)

The Vilsted Lake Project was carried out by the County of Northern Jutland. The Drastrup Project was managed by the Municipality of Aalborg. The Tim Enge Project is running under the Ringkøbing County Office. The Gedved Lake Project was directed by the Vejle County Office.

Data in this chapter were obtained by interviewing at the County of Northern Jutland, 2006, at the Aalborg Municipality, 2006, and by students working group at the Aalborg University, Department of Development and Planning, 2006.

In generally a nature and environmental project is developed from a problem definition and formulation of a planning idea. The problem's investigation is made by the authority and follows local needs, or is worked out by the state through the national nature and environmental policy. When the problem is defined, the authority implements it in its planning activities. It means that they are searching for possibilities how to solve the indicated problem. Developed ideas are then included in a plan – by the state e.g. in the legislation, by the county in the Regional Plan, by the municipality in the Municipality Plan.

The Vilsted Lake Project was initiated by the Danish Forest and Nature Agency under the Water Environmental Action Plan II as a wetland project in 1998. And the County of Northern Jutland took over the project and continued in 1999. The aim of the project was a nature restoration of a lake and the project should reduce the discharge of nitrogen.

The Drastrup Project was initiated by the Aalborg Municipality under a new groundwater strategy for groundwater protection as an afforestation project for sustainable land-use in

1995. The Tim Enge Project and the Gedved Lake Project were initiated by the counties offices under the Water Environmental Action Plan II as wetland projects.

The ability to provide these projects is based on legal framework for nature and environmental planning - the Planning Act, the Environmental Protection Act, the Nature Protection Act, the Watercourse Act, the Raw Materials Act, the Road Act, the Land Consolidation Act. At the municipality level it is exceptional, that the Planning Act has been used to change and plan the land-use for protecting the groundwater. The fundamental idea was protection instead of treatment in the Drastrup municipality project. If the idea gains the authority's support and is embraced in a plan, the problem's solution takes a form of a nature and environmental project. A planner for nature and environmental protection and improvement usually becomes the head of the project. Firstly, a concrete project enters into a phase of pre-investigation. The head of the project manage all steps in the pre-investigation and prepared analyses, which describe the definite problem. The analyses are worked out by the authority according to their time and professional limits or are provided by a private company. These analyses point out, how grave is the chosen situation and what kind of solutions should be created to reach the goals of the project.

All projects are based on analyses about the ownership structure, land structure and owners' opinion about the project. Other analysis like study about fauna, flora and rare species, soil analysis, vulnerability of the groundwater resources, chemical descriptions, traffic and road system study are worked out according to concrete project adequate detailed. One of the analyses is a study about the opinion of probable participants related to the project area. Results of this investigation show possibilities to find solutions according to the public will. On the basis of worked analyses in the pre-investigation phase, the project starts to find financial subventions. The amount and possibilities depend on the project's specifications.

Projects have several possibilities to find ways of their funding. The financial support could be from state e.g. the Ministry of Environment of Denmark, from EU programme and projects, from the municipality budget and from private a person or commercial foundations and associations.

The Vilsted Lake Project was funded by the state and the County of Northern Jutland, by the EU project MOPARK and substantially by commercial contribution from Aage V. Jensens Foundation. The Drastrup Project was financed by the City of Aalborg and by a project from the EU LIFE II programme. The Time Enge Project is financed by the Ringkøbing County Office. The Gedved Lake project was financed by the Vejle County Office.

After the projects had received the needed acceptance by the authority and financial support, begin a design phase. The head of the project manages the work and according to possibilities the authority works the project itself or the proposal is elaborated by a private company chosen through a public submission. During the time, the analyses continue and specify the project's goals and needs. The Vilsted Lake Project was designed in three variants.. For the implementation was chosen the 2.scenario, which is a compromise in the water depth, open water surface and gives more area for meadows according to the first and the third scenario.

The authority (head of the project) also decides about implementation tools to realize planned measures. The possibilities are given in the related law as subsidy schemes and agreements based on negotiation between planning authorities and land owners. In fact, a project for nature and environmental purposes could be implemented using expropriation, through single money compensation or using environmental subsidy payments for a time period. For another Danish project the state has created a law to obtain the land. Next possibility is use of land consolidation procedure. The possibility of expropriation is given by law, but is not used because all the projects should be based on voluntary participation and no force is demanded.

All four studied projects were implemented through a land consolidation procedure. In the Vilsted Lake Project 177 landowners took part and 3 participants have been expropriated. In the Drastrup Project, 206 participants took part, 2 landowners are still out of the designed measures and an expropriation of their property is not able because of missing legislation provision. The third Tim Enge Project is in progress and the appropriate land compensation is missing, an expropriation is not possible in this case of large number of landowners for expropriation. The fourth project Gedved Lake was cancelled because of unsuccessful negotiation, an expropriation was not practicable according to large number of landowners for this solution.

Because of the time interval between the first phase of pre-investigation and the phase of designing, the costs may change depending on new research in the area, on designed methods and also on economical situation in the country. According to these factors, the project is once more under financial analysis and new amount needs an official acceptance. When the final proposal and the financial support of the project are accepted, the implementation starts. The mentioned projects have been implemented through land consolidations. This way of implementation is based on negotiation between a planner of land consolidation and participants in the related area. The planner could be a private chartered surveyor or an employee by the Land Consolidation Office in Tønder. The planner is a neutral person, which deals with interest of the owners and to solve the land conditions for the project on the other side.

In the Vilsted Lake Project, the land for the lake restoration was acquired through 3 processes of land consolidation. Each land consolidation process took approximately one year. During the procedure, 257 parcels were involved in the negotiation, which presents area of 2971 ha. The lake takes area of ca. 451ha, of which ca. 278 ha is an area of reeds and 173 ha is the water surface area with the high about 1m. The maximal water depth is 1,75 m. The water surface and the lake are about 2,4 and 2,6 m above the sea level. In the Drastrup Project, the land was negotiated through a land consolidation process during 3 years. An area of at least 210 hectares has been obtained to convert it into permanent grass areas and forest. Some of the planned areas for afforestation have not been acquired which has forced a change in the planned location of the forests and consequently the net of paths is not fully completed. Also two gravel pits are still in function due to a lack of voluntary agreement.

When the needed area is obtained, the construction phase can start. The construction work is carried out by an engineering company, which is chosen in a public submission. During the whole project, the steering authority cooperates with other authorities. It collects data and links to data resources. The data collection depends on concrete project and its provider. An official opening ceremony opens the created area, after finished construction works.

### **4.3 Summary about the Danish projects**

The land consolidation for implementation of nature and environmental projects is a tool which enables to put together needed land under one owner. In practice, a planner negotiates with landowners in related area they to sell their land, to swap their parcels or in special cases to accept a special land-use according to nature and environmental demands using a subsidy as compensation. Successful negotiation and thus land consolidation procedure is based on three elements. These elements build so called Theory of Mobility and are – land structure, land bank and knowledge (E.M.Sørensen, 1987).

Land and farming structure and rate of agriculture determine possibilities of land mobility in the solved area. There are some rules e.g. high amount of farms in the project's area create small possibilities to get some land for compensation, the land swoping is easiest in areas where small-scale farms are predominant. The land for compensation should be at least comparable in quality to original plots, should offer effective traffic distance and sufficient plot's shape. If this compensational land is missing, the owners don't get a good land offer for compensation and they don't participate in the land consolidation. Thus, the whole project couldn't be worked out.

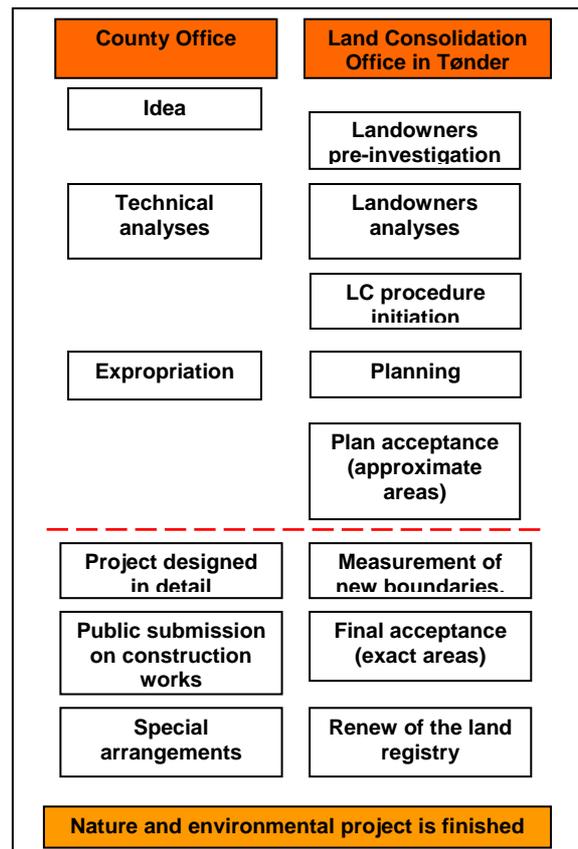
The second important element in the Theory of Mobility is the land bank. Land bank is aggregated land under one owner – under the state, the county or municipality, which is needed before realization of nature and environmental projects. Quality land bank could be created depending on mentioned land structure in solving area. Beside this fixed territory and land conditions, the land banking depends also on financial possibilities and on planning and communication skills of person responsible for this process of negotiation. The land bank creation should start as soon as possible.

The third element is knowledge, which has two approaches – one is the planner's knowledge about the area which he negotiates, about the implemented project, about local habitants and their relation to the environment. The planner creates the land bank and his on his negotiation depends, if the whole project could be implemented. Thus, it is very important so that the planner is trustful person for the participants in the negotiation. The second approach is participant's knowledge. The landowners should be very good informed about the nature and environmental project, about objectives and usefulness. They need information about their possibilities and advantages in the land consolidation negotiation. They should be informed during the whole process and have opportunity to ask and negotiate about the whole project.

If these three elements are in sufficient starting position and a space exists for their development, the project could be used successful for implementation of nature and environmental issues.

Chosen sample of nature and environmental projects could be divided in two groups. One group is comprised of projects, which were solved successful according to mentioned elements of Theory of Mobility. Second group involves projects, which were difficult to solve according to the elements. The importance of sufficient combination of land structure, land bank and knowledge was confirmed in all projects. Projects Vilsted Lake and Drastrup were successful implemented. Land structure and land bank allowed in both projects to finish the process of negotiation and start construction works to implement designed project. In both cases, it was very difficult and long way to find final solutions. But the principal condition was a good land bank in related area. This activity has started with first pre-analysis of the nature and environmental project and was acting during whole project. Open space has offered much more possibilities to find land for compensation in the Vilsted Lake project, but amount of 170 participants was the other side of the project making the work harder. The negotiation was carried out in three land consolidation. Each land consolidation took approximately one year. In the end, three landowners have been expropriated. In the Drastrup project, which was implemented and open for public in 2001, two farms are still under original land-use and landownership, finding a solution is still in progress. Land bank was sufficient in this case and possibility of subsidy or adequate financial compensation too. Only these two landowners' interest to profit by selling inadequate their property has broken the idea to implement the whole area. The possibility to expropriate the land was in this project unable because of formulation in the law of groundwater protection. This act allowed an expropriation only in cases for groundwater protection. Mentioned problematic farms are in a part of project, which is under afforestation and an expropriation is not able in this kind of environmental protection. In both projects, the participants were regularly informed about the project and the current situation through common meetings, personal appointments, leaflet distribution and twenty-four hours service by the planner. Also the choice of the planners was essential because of his skills to steer the negotiation.

Second group of projects represent cases, which have difficulties with land structure and land bank in the designed area. The Gedved Lake project has been cancelled according to lack of land for compensation. The Tim Enge project is under progress, but still is the situation with land compensation complicated. The area is divided by a river and property for compensation is located on the other bank. Thus, the landowners do not want this land because of long traffic distance from their original area of farming and other property. These two examples show importance of the thoroughgoing pre-analysis about land structure and land bank possibilities. The pre-analysis should be made in real options and the nature and environmental project should be worked in some variations to ensure some flexibility. As a weak site in these projects could be not quality pre-investigation and too positive view about the area and the project. Also the choice of the planner could be one of facts, which slowed the project down.



**Figure 3:** The scheme of the steps in a nature and environmental project implemented through a land consolidation procedure.

Beside this nature and environmental projects, Danish land consolidation are developing in a direction to use negotiation under land consolidation for implementation of national parks. A project about Lille Vildmose National Park has been studied, which is a “pilot” one. The project has run into some difficulties according to no experienced consequences. The project is taking too long time period in the phase of investigation, analysis and negotiation. Big lack of communication with participants caused negative stand to the negotiation. One of reasons could be the level of project’s steering, because it is worked out at the national level including experts and some local people. People from the county or the district area could have better position in the negotiation with participants. Land structure determinates also a problematic negotiation according to big number of large farms, which is hard to compensate outside the area with adequate land (A.M.F.Sorensen, B.H.Skieller, F.Svenstrup, 2006).

All nature and environmental projects are divided in individual steps – a policy (nature and environmental strategy), a plan, planning activities. Furthermore, the planning activities could be divided in a pre-investigation, proposal work, project implementation and final realization. Figure 3 describes the steps in a nature and environmental project implemented through a land consolidation procedure. The nature and environmental project and the implementation

procedure are managed by a different professional. The project is carried out by the authority and companies, which elaborate special work. The land consolidation procedure (negotiation) is managed by a professional planner.

#### **4.4 Danish approach, pros and cons**

The nature and environmental planning has firm position in Denmark. The procedure is compact but also flexible. The compactness means, that the nature and environmental policy has strong support by authorities and successful projects attest to high public support. The flexibility is enabled through law, which allowed applying it for varied project. Also projects and their implementation are not burdened with lack of financial sources. Thus, the process has a good frame – on one side the idea's suppliers and public interest, on the other side the legal basis and financial subvention. But of course there are some barriers, which emerge according to changes in the society. Then, it depends on the steering section how they adapt to changing conditions and select new direction in the development.

How the nature and environmental planning thrives, it is proved by implemented projects and two of them are introduced in this report. Weak sides are detectable in the third and fourth case, which deal with obstacles.

One of barriers seems also a project application procedure, which is worked by a planner. The problem is in complicated terms in law and documents. The consequences are lack of interest on the planner's side caused also by long duration of the whole project, and also this kind of LC project is too large and too moiling for a small planner. Next, for the planner is difficult to study new law and to understand it and create an application. Because of difficulties with formulation of the application, the number of applied and initiated project is affected. In the long term, this trend could mean progressive losing of knowledge about the methodology and of passing experience to other generation. The solutions could be simpler administrative procedure for application to speed up the process. Difficult terms should be cleared up and also a guide of applying for a LC project could be very good tool for successful start of a project.

As described above, project management select tools for implementation – expropriation, single money compensation, environmental subsidy payments for a time period, land compensation or land consolidation procedure. Basic rule for all projects is a voluntary participation. Thus, the expropriation is not used because of any force into the project. For an establishment of special protection measures, the land consolidation procedure or land and single money compensation are the best way how to gain needed area and which is also under one landowner. We can say that small projects with few participants could be implemented through land and money compensation. Projects with many landowners and large projected area are implemented through one or more land consolidation procedures. Here, a new person enters into the project – a planner. His role is more then important. He directs all negotiations with participating landowners and creates land bank. Successful projects is an implemented project, implemented project is successful negotiation. If the planner could not offer a good

proposal for land compensation the project has low possibility to be realized. Beside the mobility of land in solved area, planner's skills are determination of effective negotiation.

On one side we have land and its structure in the area. These conditions are fixed and should be evaluate in the pre-investigation how far could cause barriers in the mobility of land, compensation and further negotiation with participants. And is no man-strength to change it. On the other side is the planner, his skills and knowledge. He has the potential to develop possibilities in the project. He is a component in the project, which could be improved. The negotiation is solved easier, when all participants are good informed about the nature and environmental project and about the land consolidation. Regular leaflets and public meetings, possibility to ask and get needed information anytime play no less important role.

## **5 POSSIBILITIES IN THE CZECH SYSTEM OF LAND CONSOLIDATION**

In the Czech Republic, there are two basic issues. Firstly, present land consolidations miss the public support although the importance is evident. Thus, a discussion about the land consolidation tasks and advantages of the procedure should be promoted. Certain cultural character in the behavior to land property in the Czech society affects thinking about a process changing ownership relations.

Only good examples of successful finished land consolidations could open possibilities for larger and positive participation in the procedure. In the Czech Republic, 468 land consolidations have been finished through 12 years (since 1994). This number of projects has touched only a few of 13000 cadastral areas in the Czech Republic, but it is a huge number of participants for an information and experience exchange and promoting.

Secondly land consolidations are important tool for implementation of nature and environmental measures e.g. the Territorial System of Ecological Stability in the Czech Republic. According to limited number of projects and priorities in the selection, land consolidation for nature and environmental purposes do not have any possibility to be initiated. Some environmental issues are solved in comprehensive land consolidations as part of the plan of common measures, but technically the plan concerns of other task and the financial amount is divided or preferentially used for the most critical issues (e.g. traffic accessibility of parcels). A partly solution is that all common measures are designed as multifunctional.

The time duration of a procedure is for all involved subjects too long. For farmers it is a period, which affects their farming activities and development. For not farming subjects, the time stops a possibility to treat with their property. For nature and environmental issues the implementation is demanded in short time to ensure speedy protection. Experience with floods during last decade emphasizes current needs in the environmental respect and fast solutions.

As mentioned by Vitikainen, A. (2004), further land consolidation development should shorter the time duration to increase its efficiency. This could be achieved with simplification

of the procedure omitting the associated projects delaying the process as improvement of the roads and drainage networks. This means that the process will focus on key problems like in the traditional land consolidation. Omitting mentioned tasks, a group of issues is left (roads improvement, water management measures). For these issues should be find a way, how to implement them. Because the ownership structure is not solved in the Czech Republic and for realization of common measures just one owner is needed, still a process of land consolidation is the solution to implement them in the Czech Republic. But this new process should have tools to implement them in public interest e.g. some kind of expropriation in Danish system.

Danish system of implementation nature and environmental projects through land consolidation shows how effective this way of realization could be. Chosen Danish projects have been studied in the meaning of individual project's steps and in general way of planning activities by the related authority. The goal of the investigation was to define a framework of a nature and environmental project and its implementation in Denmark. Further step is trying to transform this experience into a Czech case. Czech case studies will be chosen according to selected Danish examples and a fictive case in the Danish way of steering will be worked out. Finally after all investigations, a new approach in the nature and environmental protection and its implementation should be presented.

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## **BIOGRAPHICAL NOTES**

Miss Marie Kovandova is a PhD. student at the Department of Geodesy and Land Consolidation at the Czech Technical University in Prague. She has already finished a study stay at the Department of Development and Planning at the Aalborg University. During her study stay, she was working on the investigation about land consolidation in Denmark and the comparison with the Czech Republic. She is interested in land consolidation and its use in different countries, possibilities of using land consolidation in nature and environmental issues and other purposes. Mentioned topics are parts of her PhD study and thesis focusing on innovation in land consolidation in the Czech Republic. She is also interested in progress in educational methods in geodesy.

## **CONTACTS**

Marie Kovandova  
CTU in Prague, Department of Geodesy and Land Consolidation  
Thakurova 7  
160 00, Prague 6  
CZECH REPUBLIC  
Tel. +420 354 662

Email: [marie.kovandova@fsv.cvut.cz](mailto:marie.kovandova@fsv.cvut.cz)  
Web site: [www.la-ma.cz](http://www.la-ma.cz)