

Central European Land Fragmentation in the Years to Come – A Scenario Study into the Future Need for Land Consolidation in Central Europe

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Key words: Fragmentation, Land Market, Central Europe, Scenarios, Autonomous Development.

ABSTRACT

Central European agriculture suffers from extreme fragmentation of land ownership. Land consolidation may be a solution, provided that specific regional conditions are considered. Current regional conditions are the subject of several studies, but do lack the time-dimension. Investigating Central European fragmentation should not be confined to the present, for three reasons. Firstly, considering Western European experience, land consolidation is not only useful for a swift reduction of fragmentation, but stays important for constantly adapting farm outlay to the ever changing conditions of world market, agricultural policies or regional economic developments. Secondly, present land use may not reflect underlying ownership fragmentation. In that case, consolidation of holdings is not needed acutely, but likely will be necessary in the future. Thirdly, mid-term autonomous developments may have important effects on land ownership distribution.

This paper presents likely developments in land fragmentation and the consequent need for land consolidation. The aim is not to forecast, but to reveal determining factors. The developments in land ownership distribution in part rely on factors that are predictable, for example the initial situation, demography and consumer behaviour. On the other hand there are rather uncertain factors, especially agricultural policies and level of economic wealth. Both types of factors, relevant for developments in land ownership, are used to describe four scenarios of events. The resulting land ownership structure is then analysed in the light of land consolidation.

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1. INTRODUCTION

The Central European agriculture suffers from extreme fragmentation of land ownership. Land consolidation may be a solution, provided that specific regional conditions are considered. Current regional conditions are the subject of several studies, but do lack the time-dimension. Investigating Central European fragmentation should not be confined to the present, for three reasons. Firstly, considering Western European experience, land consolidation is not only useful for a swift reduction of fragmentation, but stays important for constantly adapting farm outlay to the ever changing conditions of world market, agricultural policies or regional economic developments. Secondly, present land use may not reflect underlying ownership fragmentation. In that case, consolidation of holdings is not needed acutely, but may be necessary in the future. Thirdly, mid-term autonomous developments may have important effects on land ownership distribution.

It is not hard to make a list of processes and changes that would have profound consequences on the Central European land market. Liberalising the restricted land market, improving tenants' rights (for instance pre-emption rights), inheritance of plots, land value raise because of EU accession, improved profitability of agriculture and drastic decline of unemployment. This is just an arbitrary list of possible developments that would change the group of landowners and land users.

This paper presents scenarios of likely developments in land fragmentation and the consequent need for land consolidation. The aim is not to forecast, but to reveal determining factors. The developments in land ownership distribution in part rely on factors that are more or less certain, for example the initial situation, demography and consumer behaviour. On the other hand there are rather uncertain factors, especially agricultural policies and level of economic wealth. Both types of factors, relevant for developments in land ownership, are used to describe four scenarios of events. The resulting land ownership structure is then analysed in the light of land consolidation.

2. PREREQUISITES FOR MAKING LAND MARKET SCENARIOS

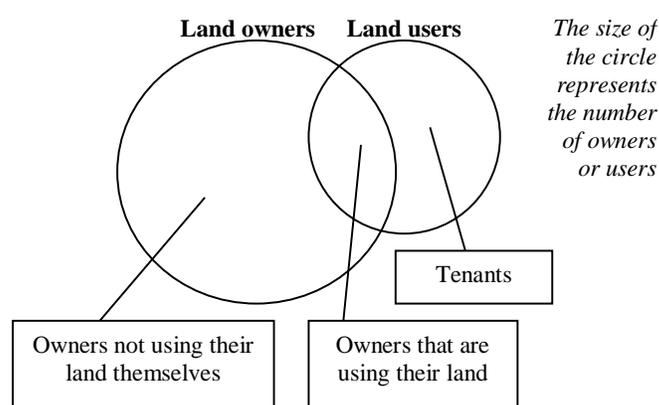
2.1 Variables Expressing Fragmentation

Since this paper's aim is to explore developments in fragmentation, the term must be quantifiable in order to make statements about it. The term 'fragmentation' must be made more concrete. Fragmentation is too vague a term.

Acreege per landowner is the most commonly used indicator for fragmentation in Central European analyses. In other words, the number of owners among which a county's agricultural land was distributed. Figures on Central European land ownership are shocking. Average acreege per landowner is well below 5 hectares in all Central European countries. For describing market processes in scenarios, the total number of landowners is more suitable than their average acreege, although both figures indicate the same problem.

However, ownership distribution alone does not give a complete image of fragmentation. Ownership statistics not always correspond with the actual parcelling of the landscape. The actual use of agricultural land may be quite consolidated through land lease. Especially in the Czech Republic, Slovakia and to a lesser extent Hungary, the land use structure is much better than the ownership statistics suggest. Enterprises have succeeded in acquiring tenancy on large amounts of leased land, typically hundreds of hectares. In other cases, like in Bulgaria, private landowners join forces and form family associations. So, the number of users is the second indicator of fragmentation, addressing the production structure.

The third indicator of fragmentation is the overlap of the former two. The overlap represents owners that at the same time are users, i.e. the share of owners that are using their land themselves. If this overlap is small, lease is playing an important role in agricultural land use. Analyses on Central European land markets, for example in Schulze (2000) and Swinnen (1999) as well as economic theory (Currie, 1981), suggest that land use that largely depends on lease suffers important drawbacks. The most obvious drawback is that leased land is more expensive to use than owned land. Data sets from several countries show a lease price some tenths of the selling price. Another drawback is that leased land can not be used for mortgages, hampering investments in machines and buildings. Furthermore, the lack of legal tenant-protection results in insecurity of the mid-term continuity of a farm. As Low noted more than one and a half century ago: 'If a farmer cannot look to the future with security (...) all great improvements, but even the most common works of the season [will] be imperfectly performed. If we shall deny to the farmer that security of possession (...) we may rest assured that his capital will be sparingly expended on another man's property.' (Low, 1844, p.9)



Schematic representation of fragmentation in its three indicators. Shrinking of the circles and/or increase in overlap mean reduction of fragmentation

So, the indicators used in the scenarios are (1) number of owners, (2) the number of users and (3) the overlap of these two. Reduction of fragmentation occurs when the number of owners and/or users declines and when the share of owners that use the land themselves raises. These indicators discard an aspect that is important in Western analyses. This aspect is the number of parcels used or owned by one person. It is very hard to make accurate prediction on that. Most of all because data on the initial situation are failing.

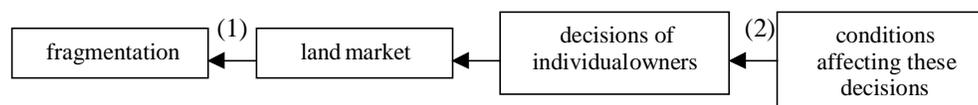
2.2 Determinants for Land Markets and Fragmentation

In order to formulate scenarios, insight is required in what factors affect the distribution of land ownership and land use. These factors will partly be predictable, but to a large extent not. A more analytic approach to the land market and fragmentation is useful in order to discover the determining factors.

In fact, developments in fragmentation are the result of a chain of events. Fragmentation is influenced by the land market (arrow 1), characterised by two things. First of all there has to be a significant number of land transactions. The size of supply and demand (the market activity) dictates the speed of changes in land ownership. Secondly the question is whether or not the traded parcels are merged in, or withdrawn from, a larger parcel. To answer this question, we have to know the type of sellers and buyers. The type of sellers relates to the parcel size on sale, the type of buyers relates to the plot size in which it will be merged.

In the Central European countries, four land market actors are present: (1) absentee-owners, typically owning small parcels that are leased or lay fallow; (2) subsistence farmers, using small plot for personal consumption, (3) private farmers, mainly middle sized, using a mixture of owned and leased land; and (4) enterprises in many legal forms, typically measuring several hundreds of hectares, all in lease. As a fifth party, foreign investors are potential land buyers but they are not allowed to. Land transferred from absentee-owners to privates or enterprises means a reduction of fragmentation. The other way around would aggravate the fragmentation problem.

The land market in turn is dependent of many individual owners making the decision to sell or buy. No land market, no change. The individual owners take their decisions considering (arrow 2) their personal and external situation.



2.2.1 Economic Circumstances

In order to predict how economic circumstances affect land ownership, it is assumed that a landowner meets the *homo economicus* model. That is, the landowner decides to sell or buy on rational economical considerations, thus trying to find a balance between profits and

security. Of course, this assumption does not reflect reality. Like all other commodities, the trading of land is subject to many more considerations than economic ones alone (see for example Brekke and Howarth, 2000; Frank, 1985 and Howarth, 1996). Postan (1975, p. 151) directly refers to the peasant's special relationship to his land, making land 'a "good" worth possessing for its own sake and enjoyed as a measure of family fortunes and a fulfilment and extension of the owners' personality'. However, there are no data that allow an accurate modification to the *homo economicus* model.

The post-transitional instability in the Central European region has made landowners wary of exchanging land for money. This attitude perfectly makes sense in a highly imperfect financial capital market, given the risks entailed in lending money, and given the uncertainties attached to the future real value of financial wealth particularly in an economy suffering from inflation (Currie, 1981).

A first clue on economic determinants for the land market is provided by analyses on the current bad situation. These analyses, as provided by several authors like Csáki and Schulze, elaborate on the macro-economic conditions impeding the development of land trade. The scenarios can describe how landowners would act if economic impediments would seriously improve.

Analysts suggest a number of problems. An important fact is the huge amount of landowners having a small piece of land that serves as a symbol of security in the unstable first years of market economy. Part of these owners cannot or wants not use the land they have. In these cases, the land is leased or lays fallow. Nonetheless, sale is hardly an option, since it is more useful to keep some land for bad times than to have cash. The other part uses the small plot for growing vegetables or keeping animals, without any commercial intentions. These 'survival-plots' are used for this purpose because of the unemployment that keeps people from leaving the rural areas.

Thus, unfavourable economic conditions are conserving fragmented ownership. Unemployment results in rural overpopulation and subsistence farming, low purchasing power and inflation negatively influence rates of return in agriculture and inflation makes agricultural parcels an asset to city people.

2.2.2 Demographic Developments

From a demographic point of view, the age of landowners is interesting. Land privatisation has typically led to landowners at relatively high age. Privatisation procedures tried to do historical justice, resulting in returning land to whom it was taken from. These original landowners now are elderly, if not passed away.

Thus, on the mid-term, large numbers of plots will probably be inherited, which can mean sale. The question is whether or not the family inheriting the plot is equally resentful to the idea of selling the land. Taking into account that the new owners are younger, it is likely that they have a job and resources of their own, resulting of little interest in owning the plot.

Therefore, a considerable proportion of the land of absentee-owners will potentially be open to sale.

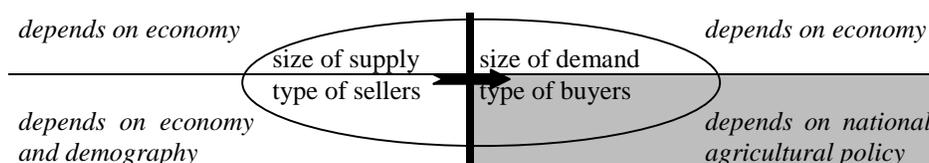
2.2.3 National Agricultural Policy

Last but surely not least, future developments are dependent of the extent in which politics wants to control developments. At one end of the continuum, free and unrestricted economic forces are the sole determinant of developments in agriculture. At the other end, all developments are planned and controlled by a very strict agricultural policy.

Agricultural policy will very likely be neither fully absent, nor fully controlling. The non-intervention approach would probably lead to a massacre among the farmers' population. Hundreds of thousands of family farms and even enterprises, weakened by the crisis of the last decade, would be crushed in the free market arena. As a result, enormous social problems would arise in rural areas. Very strict government control can neither be the case. The preparations for joining the European Union have proceeded too far already.

Nonetheless, more subtle policy inclinations are important for the developments in fragmentation. Let's make a distinction between liberal and protectionist policies. The liberal approach will allow market forces as much as possible as long as social welfare for the rural population is secured. In this case, the land market will be affected by abolishment of part of the existing restrictions. Changes that would fit the liberal approach are allowing enterprises and foreigners to own land. Another crucial change would be giving tenants more rights, like pre-emption right and minimum contract validity. This would enable the currently quite efficient enterprises to acquire more secure land use rights.

The protectionist approach will try to confine market forces in order to achieve goals that would otherwise not be met. The goal that will probably be aimed at is already prominent in the current politics of Central European countries. This goal is establishing a Western type family farm structure. Clearly, in a more liberal, spontaneous development, large enterprises have much better chances of succeeding.



Schematic image of relevant characteristics of the land market (amount of land and type of actors) and how these are externally influenced.

In the preceding subsections it is argued that the economy is the most important factor for the size of supply and demand in the land market. It is an important determinant for the type of sellers as well, and so is demography. The type of buyers that will be present on the land market is mainly dependent of what agricultural policy is chosen.

3. METHODS OF FUTURE RESEARCH

It should be noted first of all that no single future study can generate objective, undisputed facts about future developments. The methods that are used in future research are the result of five decades of history and several different types. There is quite an extensive amount of literature on the subject. Van Latesteijn (1999) gives a clear overview of typology and applicability. His study is especially interesting for citation here, because it is placed within the framework of advising a government (in this case the Dutch) on long-term land use policy.

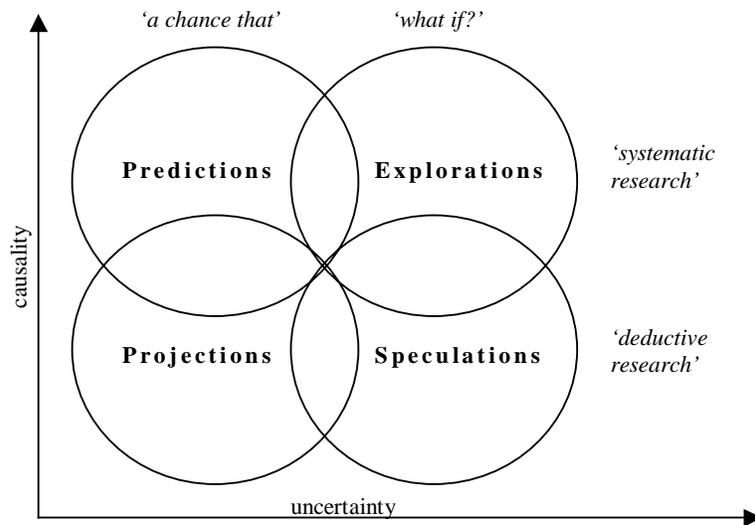
Various definitions of scenarios are at hand. Schwarz (1991) defines scenarios as plausible and consistent images of the future based on realistic estimations about external factors. The narrative element of scenarios is underlined by Kahn and Wiener (1967): scenarios are appealing stories about the future that serve to broaden the mind.

In practice very different types of scenario studies can be encountered. There may be predictive, probabilistic elements, for example to sketch a baseline scenario. Often this will be mixed with projections too. The selection and detail of the external factors that will be included in the study forms the speculative or explorative part of the study. The result will depend on the emphasis that is given to any of the elements. So, the expression 'scenario' is used for approaches of varying probability, which can be very confusing.

3.1 Origins and Typology

Scientific future research finds its origins in military activities that were started during World War II. The brains of generals alone were not sufficient to develop the complex strategies needed in modern warfare. Technological developments proved to be a decisive factor and information on the progress of these developments was crucial to devise appropriate strategic decisions. Within this context scientific activities were deployed to reveal some of the secrets that the future was safeguarding.

The successes of this new scientific activity were not unnoticed and outside the military other copied the approach. In the first decade after World War II, several new methodologies were applied in all sorts of studies. Institutions like the Rand-corporation and the Hudson Institute in the US acted as a catalyst in the development of new approaches like Delphi-rounds and scenario studies. These new methodologies were used to assess future needs and problems in all sectors of society. Gradually the understanding grew that not all future studies rendered the same type of information. More research effort put into improving forecasting techniques led to the recognition of many shortcomings of predictions. The reliability of predictions was discussed vigorously. If a prediction was unreliable, how could sound policy proposals be deduced from those predictions? In reaction to that, forecasters started working with 'conditional predictions' or scenarios that could give information on future developments, if certain prerequisites were met.



Becker and Dewulf (1989) typology of future research. If uncertainties in data and models are apparent, only 'what-if'-type questions can be addressed. If the uncertainties are small, the likeliness of future events can be assessed. Systematic future research is possible if causality of the models is prominent. If causality is lacking, only regressive or deductive methods are available leading to projections or speculations of future events. Source: Van Latesteijn, 1999

At present, the activities within the field of future studies can be grouped into four categories based on two criteria. The first criterion is the level of uncertainty that has to be dealt with. The uncertainty can have very different origins, such as the collected historical data, the parameters built into the model or exogenous developments that are to be assessed and statistical error terms. The second criterion is the level of causality used to arrive at a forecast. Models can be built on information on causes of certain developments or on statistical regressions that have been found. If this type of information is at hand, then the causal underpinning of the future research is relatively strong. In other cases, only an untested theory or a verbal model is at hand. This constitutes a much weaker causal foundation for a conclusion about future developments. The four categories of future research are classified by Becker and Dewulf (1989) as predictions, explorations, projections and speculations, as depicted in the figure.

Projections and predictions are both characterised by a relatively low level of uncertainty but they differ in causality. A projection uses relatively certain estimates but has no clear causal model with which an assessment of future developments can be made. There is no information available on feedbacks or other mechanisms that will influence future developments. For example: there is confidence that the number of people on earth will rise. This is a relatively certain estimate of things to come. But, when we only assume a straightforward continuation of current growth levels, we are merely producing a projection of population numbers for, say, the year 2020. In this case, the information that is available about certain topics in the present is used as a yardstick for the future by mere projection.

A prediction is meant to give information on the probable development of an observed

phenomenon over a limited period of time in the future. Information gathered in the past and present, together with information on causality of the system is used to calculate future values. The predictive model must find a balance between copying the real world situation as closely as possible and limiting the number of parameters in the model. The problem is how to discern between essential and non-essential elements.

Projection merely transplants current knowledge and information into the future, without claiming any predictability. Projections are completely based on historical time-series, with nothing more to support it than a tentative theory. The notion of continuity is widely adhered to in this line of research. This presumption gives rise to debate and uncertainty of the results. A projection may evolve into a prediction if more information is available on the possible relations. Of course, the distinction between the two categories is rather arbitrary. For example, suppose we know how the number of people in a region will influence economic developments. Suppose next that we have a model on how this can influence both natality and mortality rates. Together, this information on causalities enables us to predict instead of project population numbers for the year 2020. In reality the prediction of future population will be a daunting task because this prediction will always be based on assumption about relevant relations. Only if we are dealing with a repeating system like a chemical reaction, the causal relations within the system can be described with more confidence.

When it comes to investigation developments over the longer term, the danger arises that predictive research may prematurely leave out alternative developments and policy options.

Explorations and speculations might render more satisfactory results.

If there is little information about the causal relationships and the level of uncertainty is relatively high, we are left with speculations about the future. For example: if we know that current natality and mortality rates will not hold for the future, but there is no information on how these matters could change over time, we can only speculate about the world population in 2020.

If more information is available about how different developments are related, a speculation changes into an exploration of the future. This holds for long-term prospects and if breaks in the trend are not to be ruled out in advance. The concept of continuity is put aside, nonetheless with some foothold derived from the characteristics of the system under investigation. In our example: if we have information on how economic developments might influence both natality and mortality, but different theories exist alongside each other, we can set up an exploration of how the world population might develop. So this type of forecast aims to give a range of possibilities for the future. Given certain assumptions about uncertain developments an exploration points to the limits of what is feasible within the system itself.

In practice, the four categories cannot be distinguished very sharply. The two criteria (level of uncertainty and of causality) are prone to very subjective interpretations. Therefore the distinction between the categories is subjective as well.

3.2 Best Practice for this Study

7.16 Land Consolidation Experience from the Field

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Terry van Dijk

Central European Land Fragmentation in the Years to Come – A Scenario Study into the Future Need for Land Consolidation in Central Europe

The former subsection shows the many different ways to give content to a scenario study. The choice for the most suitable future study method for this specific case can be based on two different principals. On the one hand the leading determinant can be the data that are available for the research, taking into account the in the former subsection elaborated characteristics of the data available that categorise the methods of future research. Thus, the causality and the level of certainty of the data point out in which area of the spectrum the studied object is located.

The information available for this paper is highly causal of nature and also quite uncertain. The causality lies in the chain: policy/economy – land owner behaviour – land market – fragmentation, which is assumed to allow a considerable level of predictability. The uncertainty stems from the beginning of the chain, i.e. the policy and economic situation. A number of alternative external situations need to be analysed. The above reasoning selects explorations or ‘conditional predictions’ to be the suitable method.

Surprisingly, Van Latesteijn (1999) chooses the second principal. In his study he does not select a method on data availability, but on the type of results a method delivers. For him, the leading determinant is the type of results that are demanded by the goal of the future study, although his report acknowledges that the four sorts of future studies have no predefined types of results. From his point of view, policymaking, predictions and projections are most interesting, generating information about the future with a certain degree of accuracy. If the future can be predicted in this sense, some of the uncertainties of the future will be eliminated, making policy less prone to false estimations of developments.

Applying the second principal to this paper, the type of results follows from the main question. How will the need for land consolidation develop in the mid-term future? The type of results demanded by this question needs maximum certainty. So, speculations are not useful. As for causality, this can strengthen the certainty of the result. Thus, this paper presents explorative scenarios or conditional predictive scenarios.

4. FOUR SCENARIOS

From the above it follows that the two main variables affecting fragmentation are economy and the agricultural policy. Together, they allow four combinations, being four different scenarios. The four scenarios are labelled as follows.

<i>Policy/economy</i>	<i>growth</i>	<i>decline</i>
<i>liberal</i>	‘Unlimited Growth’	‘Free Survival’
<i>protectionist</i>	‘Restricted Prosperity’	‘Controlled Crisis’

4.1 Unlimited Growth

The country has successfully joined the European Union. Although adaptation to the EU standards is not quite complete, the efforts of the past decades have not been in vain. Profiting from the EU economic boom, the national economy has experienced considerable

foreign investment, rise in GDP and normalisation of inflation. The improvements of purchasing power have made farming more profitable than it has been for a long time. On the land market, supply has increased. Especially absentee-owners sold their land, since the advantages of holding on to the plot had disappeared. Inheritance has further stimulated this process. Also, the subsistence plots lost their social function. The urban areas have absorbed access labour and pensions have gone up. Part of the private farms went on sale as well, especially in cases where motivation, ambition and ability were declining already.

The characteristics of the demand-side have led to an important scaling up of both land use and land ownership. The liberal policy gave way to the most efficient land users to expand. The enterprises (like new co-operatives), already strong because of their economies of scale, can expand even more. Liberalising the land market gave their potential the legal freedom. Abolishment of the maximum for enterprise-owned land, allowing foreign investment and granting tenants pre-emption rights all benefited the large scale farming companies. This way, the enterprises consolidated the numerous restitution-plots. Apart from enterprises, the class of strong private farms acquired additional land. They fill in the market niche of more labour-intensive products and are profiting from the low land use costs they have.

Conclusion is that the profitable economic circumstances and the liberal land market have led to a relatively swift spontaneous consolidation of fragmented ownership and an increase of the overlap of land ownership and land use.

4.2 Restricted Prosperity

The country is experiencing a thorough recovery of economy, not in the least because of the accession to the European Union, enabling to profit indirectly from the success of the well-established industrial nations. Being aware of this luxurious position, the right-wing government has decided to use its resources for restructuring rural areas into a Western-model private farming structure. Instruments for this policy are the continuation of restrictions on land ownership by large enterprises, subsidies for smaller farms and improvement of financial services to smallholders.

A genuine land market has emerged, resulting from demography but mainly from absentee land ownership and subsistence farming no longer being advantageous. So, supply has gone up, mainly consisting of very small parcels. The private farms have the best chances of acquiring that land, due to government regulations mentioned above. Existing private farms have been able to enlarge their acreage by adding new parcels and also new private farms emerged on formerly absentee owned land.

Bottom line is that the establishment of a Western model farming structure meant a moderate scaling up of land ownership. Tenure now plays a less important role. The internal fragmentation on the private farms that is a direct consequence of this scaling up process is increasingly felt to be a problem.

4.3 Free Survival

The economic transition, after some years of seeming success, encountered increasing problems. The Western-model institution building became too costly to proceed, cultural differences became painfully clear and finally a world recession left the country with a disrupted and weak economy. The rate of return in agriculture is depressingly low. Lacking the money for strong government intervention, the politicians opt for the liberal approach.

The economic crisis is blocking the development of a dynamic land market. Landowners are reluctant to sell. Land is one of the few certainties that the transformation has rendered. Only demographic developments have caused some parcels to be sold. In addition, large numbers of private farms cannot cope with the harsh economic climate are partly sold. The other part of their land is used for subsistence farming. Thus, the private farms giving up commercial farming reduce the number of land users but only in part giving room for improvement of the remaining farms.

The large enterprises and large private farms are the only buyers in this situation. They have the means to cultivate the land and profit from their advantages of scale. Foreign investments may add to their position of being the most efficient user of land. But despite relaxing the constraints on land ownership by enterprises and foreigners, the actual effect is small, given the bad land market.

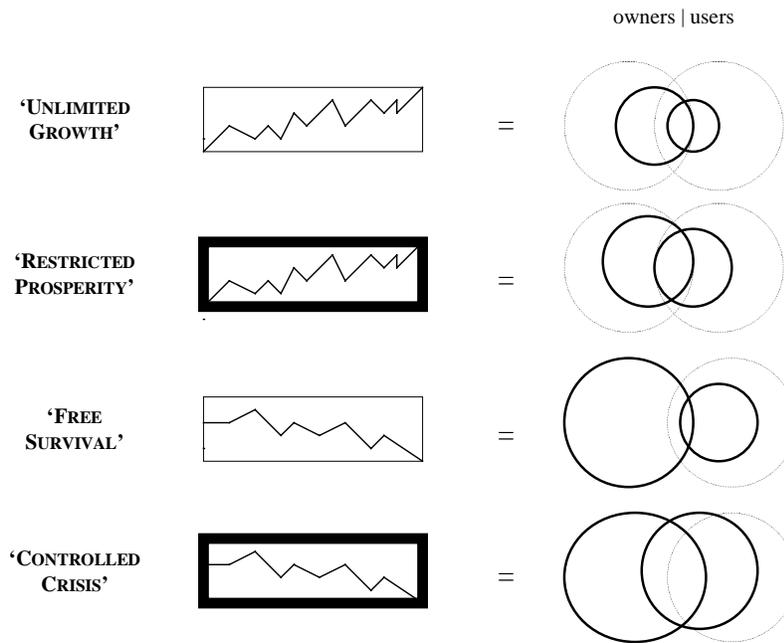
All in all, the number of owners has hardly declined. The number of users shows a moderate decline. Tenure still plays an important role.

4.4 Controlled Crisis

The transitional phase has not led to the establishment of a flourishing market economy. Instead, a protracting economic crisis is dictating everyday life. Profitability of agriculture is low, and so is the market value of land. Due to the substantial proportion of the country's population living and working in rural areas, active government intervention is chosen. For reasons of social welfare, private farming is heavily subsidised. Agricultural enterprises are seen as a threat to private land ownership. Therefore the regulations frustrating their expansion are not removed. Enterprises are still not allowed to own land and neither do foreigners.

The supply of land on sale is very low. The crisis forces landowners to hold on to their plot, leasing it for their indispensable additional income, or using it to improve their diet. Practically the only source for acquiring land are demographic developments (resulting in sale of absentee-owned plots) and private farms closing down. Large private farms are the main buyers of land. They are financially sufficiently strong to acquire additional land.

The resulting situation is one in which the number of owners has hardly declined and the number of users has declined moderately. Use and ownership now have more overlap.



Schematic presentation of the four scenarios, their meaning and their impact on fragmentation. Curves within the boxes represent the economic growth. Thick lines around the box relate to the presence of restrictions. Dotted circles refer to the initial situation. Solid circles refer to the situation in the future.

5. CONCLUSIONS

This paper shows that it is possible to explore future developments in land ownership. Since there is a clear relationship between fragmentation and the decisions of landowners, it is possible to make scenarios on what will happen to fragmentation under various conditions. The trends in economy define how fast developments will go as well the change in importance of tenure. The agricultural policy defines how land transactions will affect fragmentation. The liberal approach is probably leading to a spontaneous consolidation of land use units. Fragmentation, both in terms of the number of land users and internal farm fragmentation, is relatively unimportant in this scenario. Only when parcels are sold to expanding private farms, as under the protectionist scenario, fragmentation will be an important future drawback on farming efficiency.

The importance of land consolidation is assumed to be twofold. Land consolidation can fight the fragmentation once this has resulted from the establishment of a private farm structure. Also, it can be applied during the process of changing, by facilitating the outflow of labour from agriculture. Either way, the protectionist policies seem to result in the largest demand for land consolidation.

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BIOGRAPHICAL NOTES

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