UML NOTATION FOR THE RURAL LAND TRANSACTION PROCEDURE

POSTOPEK TRANSAKCIJE RURALNIH ZEMLJIŠČ V ZAPISU UML

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ABSTRACT

Real property significantly contributes to the prosperity of today's society. Therefore, the society has paid much attention to the real property transaction, which is often a complex procedure. In order to enable the analysis of its general structure we have focused on a particular domain, i.e. the rural land transaction in Slovenia, which allows us to reduce the complexity of the phenomena involved. The purpose of the paper is to increase our understanding on how rural land markets act in an institutional context. It is also aimed at identifying the obstacles in rural land transactions, particularly in terms of organizational framework, which hinder the development of the rural land market. Rights, use and consequently transaction of the rural land, as the holder of specific environmental, economic and societal functions, are strongly regulated by the specific legislation and regulations of the government and local communities. The specific procedures of rural land transactions related to the agricultural land, forests and farms according to the Slovenian legislation are: the public announcement of the sale, the order of pre-emption beneficiaries according to law, and the approval of sale from the relevant administration office. This procedure prevents the active actors in the land market, vendors and buyers, from direct communication, which is the vital mechanism of any effective property market, affecting the crucial market forces: demand and supply. In the article the UML notation is used to represent the process of rural land transactions. The emphasis is on the dynamic flow of the rural land sale process.

KEY WORDS

land, rural land, agricultural land, forest, sale, land market, real property, UML

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IZVLEČEK

Nepremičnine predstavljajo pomemben dejavnik družbene blaginje, zato pripisuje današnja družba veliko pozornosti nepremičninskim transakcijam, ki so pogosto zapleten postopek. Z namenom analizirati osnovni potek nepremičninskih transakcij smo se pri nalogi osredotočili na ožje področje, to je na transakcije ruralnih zemljišč v Sloveniji, kar omogoča poenostavitev obravnavanega problema. Osnovni namen je izboljšati razumevanje delovanja zemljiškega trga, tudi z vidika vpletenih institucij. Cilj prispevka je med drugim prepoznati dejavnike, ki vplivajo na transakcije ruralnih zemljišč in ki ovirajo razvoj zemljiškega trga, še posebno z organizacijskega vidika. Pravice, raba in posledično transakcije ruralnih zemljišč kot nosilcev posebnih okoljskih, gospodarskih in družbenih funkcij so uravnani s strogimi sektorskimi zakoni in pravilniki države in lokalne skupnosti. Posebnosti transakcij ruralnih zemljišč, ki vključujejo kmetijska zemljišča, gozdove in kmetije, so po slovenski zakonodaji javna ponudba, zakonsko določen prednostni red predkupnih upravičencev in odobritev prodaje pristojne upravne enote. Omenjeni postopek preprečuje neposredno komunikacijo med aktivnimi udeleženci zemljiškega trga, to je med prodajalci in kupci. Neposredna komunikacija predstavlja osnovni mehanizem učinkovitega nepremičninskega trga in vpliva na odločilni tržni sili, na ponudbo in povpraševanje. V prispevku je predstavljen postopek transakcije ruralnih zemljišč z uporabo UML-zapisa. Poudarek je na dinamični naravi postopka prodaje ruralnih zemljišč.

KLJUČNE BESEDE

zemljišče, ruralna zemljišča, kmetijska zemljišča, gozd, prodaja, zemljiški trg, lastninska pravica, UML

1 INTRODUCTION

Land represents one of the most vital assets of any society. Because of this, the individual interests of the owner are usually limited, rather they are harmonized with the general interest of the society. Land is an important source of capital in the market economy under the proviso of a functioning land market. The proper social and economic development is dependent upon the proper functioning of the land market and efficient accessibility to the relevant information about the market. Each country has legal acts used by the government to control the private ownership and the transfer of the title when it comes to transaction of land. To implement governmental policies, the government needs proper instruments (laws, organizations) to bring about changes and to monitor the situation. In developing countries and in third world countries, where the land markets are underdeveloped, land is considered as »dead capital« (de Soto, 2000).

Land market is the environment in which real properties, considered as legal concepts of the land, are traded between vendors and buyers. Among the key constraints of the land market, the legal base and the governmental and administrative framework of the property transaction are of vital importance. The institutions and legislation affect the land market activities through regulations. The regulations do not drive the land market but rather, they supply the basis for the land market and provide the infrastructure to service the needs of active actors in the market. Frank (2003) laid stress on the historical development of legislation and legal institutions in the western countries, ranging from simple rules to complex constructs that are not easily understood and do not necessarily provide the ideal solution for the developing countries. Consequently, if there is no traditional land market, land markets can easily be undermined by bureaucratic resistance and affected by indecision and slowness of different branches of the government.

Ownership is the elementary right to land. The transaction of the ownership can be presented as a system of actors, activities and institutions that interact in order to achieve the final stage – the legal registration of the new owner. A model as the representation of such a system serves as a base for a better understanding of the procedures and legal regulations, and it can be used for estimating the time expenditure for the transaction procedure. In the framework of the European COST G9 project – Modeling Real Property Transaction, the methodologies for describing and modeling real property transactions were introduced and some examples of models were developed. Modeling was mainly done in UML activity diagrams, but there were some examples of class and use case diagrams with the UML notation as well. The descriptions, modeling and comparison between different countries were mostly concentrated on the processes of the real property transaction and subdivision of the urban land (Šumrada, 2002; Arvantiis and Hamilou, 2004; Šumrada, 2006).

A special real property market is represented by the market of rural land, which includes agricultural land, forests and farms. In Slovenia, the agriculture is dominated by small private farms with an average of around 5 ha of utilized land. Not only that the majority of farms are small, but they are frequently divided into many parcels, which are spatially disconnected. Here the land market appears to be working in that the number of farm holdings has decreased in the last decade. More specifically, with the active rural land market the farm structure can shift into

favouring large-sized farms. The transactions of rural agricultural land, forests and farms are strictly regulated by law, that is, in order to support suitable and sustainable development of the society and to improve the land structure of farm holdings. On the other side, the complex procedures for the transfer of the land ownership can hinder the land market activities. Studies that include rural land in the analysis of the property market are rare. Time expenditure of title transactions for the rural land is also a neglected issue in the research area in Slovenia.

We assume that the processes of rural land transactions can be represented at an abstract level in terms of models. The comprehensible models of rural land transaction can provide support to the efficient behaviour of the active actors, because too much time is spent in trying to understand all the regulations and procedures, particularly for a new actor in the rural land market. Furthermore, the transaction models can be used as the base for optimization of the transaction procedures. The models can be the starting point for simplification and acceleration of the procedures of the ownership transfer. In order to provide a useful base for time and cost reduction, and assessment of economic efficiency of the title transfer, the models have to be correct, formalized and complete. The models of rural land transaction include the representation of individual intentions and behaviour of the actors involved, since they are the crucial elements of such transactions. The approach of modeling rural land transaction, as represented in this article, can be used for arbitrary socio-economic processes in our society.

2 MODELING THE REAL PROCESSES

Modeling of societal processes cannot happen without the data (set) oriented way of thinking, which can be represented by structural diagrams, however, neither without the process approach representing the constant flow of activities in man–land relations in order to reach the result of processes in consideration. Presently, which of the diagrams is best suited to the model cannot be answered in general terms, but depends very much on what the model is being used for (Zevenberger and Stubkjær, 2005). According to the general idea of explaining things in terms of formal models, the basic purpose of this article is the construction of the adequate model for the rural land transaction procedure. In the paper, the term rural land refers to agricultural land, forests and farms.

The rural land transaction is presented with the Unified Modeling Language (UML) version 2.0, which has been adopted as standard by The Object Management Group (OMG). The OMG is an open membership, non-profit consortium that produces and maintains computer-industry specification for interoperable applications. The advantage of the UML models of a system is in stability of the models that are not dependent on the technological environment which changes over time (Eriksson et al., 2004). The UML notation in the form of diagrams can be used to present and to explain the complex real or virtual systems. In the work presented, the UML use case diagrams and sequence diagrams were chosen for the representation of the rural land transaction in Slovenia.

A use case diagram describes an interaction of the actor with the system (Figure 1). At the system level, use case represents the external behaviour of the subject as visible to outside users.

The actor represents the user of the system and can be a human, a machine or another system (Rumbaugh et al., 2005).

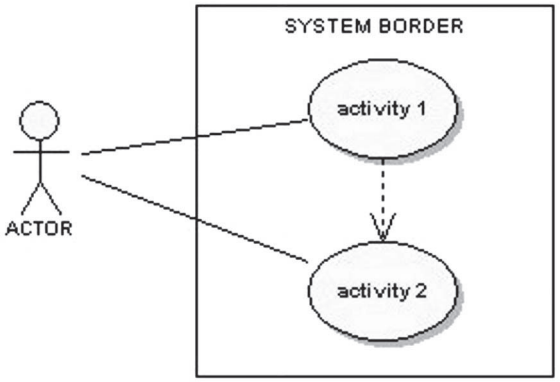

Figure 1: *A simple use case diagram.*

The first task of modeling the transaction procedure is the identification of actors and institutions involved, identification of use cases by the ownership transfer, and definition of the legislation and regulations that affects the rural land market. The UML use case diagram gives an overview of the rural land transaction, where the activities concerned, their sequence, actors and institutions involved and their cooperation are represented. In continuation, the use case diagram serves as a base for modeling the sequence diagram. Finally, the time expenditure and costs of the rural land transaction are discussed.

3 RURAL LAND TRANSACTION

In Slovenia, the framework for the rural land market was given by the Agricultural Land Act (2003). In the act it is stated that the transaction of agricultural land, forests and farms may only be possible with the approval of the title transaction of the relevant administration office, where the land or farm is located. There are some exceptions to these rules. The approval of the sale of the administration office is not required, for example, if agricultural land, a forest or farm holding is acquired within spatial planning operations of agricultural land; between spouses or cohabitation partners, between co-owners where agricultural land, forest or farm holding is in the ownership of two co-owners, on the basis of a lifelong maintenance contract etc. The Agricultural Land Act (2003) stipulates restrictions on trade in agricultural land, whereby the approval of a legal transaction to acquire agricultural land is not issued if:

- the conditions stipulated in relation to exceptionally permitted division of protected farm holdings are not fulfilled (The Inheritance of Farmsteads Act, 1995),
- the transaction has not been conducted according to the procedure and method stipulated under The Agricultural Land Act (2003),
- the order of the pre-emption beneficiaries according to the law is not considered,

- land parcels obtained by land consolidation have been physically divided as a result of such a transaction,
- the price drastically differs from the current market prices of the comparable land or it is anticipated that the buyer will not manage the land in accordance with The Agricultural Land Act (2003).

Another transaction-related issue is that (1) co-owners, (2) farmer whose land in his/her ownership is adjacent to the land to be sold, (3) leaseholder of the land to be sold, (4) another farmer, (5) the agricultural organisation or a self-employed person who require land or farm holding to perform their agricultural and/or forestry activities, and (6) the National Farm Land and Forest Fund of the Republic of Slovenia, have the pre-emption right to buy such land if it is offered for sale. If none of the pre-emption beneficiaries asserts the pre-emption right, the vendor may sell the rural land to any person who accepted the offer in time and in compliance with The Agricultural Land Act (2003), if the contract concluded is approved by the administrative office.

In transactions involving land located in the area of special importance for defense purposes, the approval of the Ministry of Defense is required in compliance with The Defense Act (2004). In addition, there are special pre-emption rights referring to the protected and protective forestland (The Forest Act, 1993), special protected areas (The Nature Conservation Act, 2004), and the water and water-side land (The Waters Act, 2002). In the case of special pre-emption beneficiaries that are determined by law the vendor has to offer the land to the relevant institution that is the holder of the pre-emption right. If the institution does not exercise the pre-emption right, the agricultural land, forest or farm sell follows the procedure according The Agricultural Land Act (2003) under the same conditions (the same price). The special pre-emption rights extend the time for concluding transactions and are therefore one of the impediments to land markets in the Slovenian context.

3.1 The use case diagram of the rural land transaction

The aim of the land transaction is the registration of the new owner in Land Registry that provides the legal security of the ownership. This process involves people and institutions. Each society that is undertaking real property (land) transaction has more than one institution involved in the transaction process. The process of the transaction and registration itself is divided into several steps, where the number of steps and organizations involved differs from country to country.

Our model of the rural land transaction has been developed progressively. When acknowledging that there are no special pre-emption beneficiaries the rural land transaction can be described as it is presented in the generalized flow chart (Figure 2). In the chart the legal aspects are marked as elliptic boxes, and technical aspects of the process are represented as rectangular boxes.

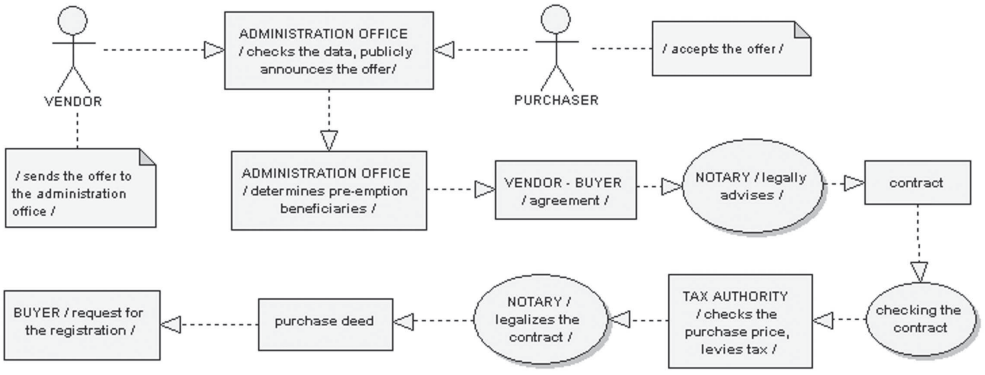

Figure 2: *Flow chart instead of text description.*

For the purpose of modeling the use case diagram, the actors, activities and sub-systems of the represented transaction have to be identified more precisely. The active actors in the process of the rural land transaction are the vendor, the potential buyers, the beneficiary (buyer) and, indirectly, the notary. Four main sub-systems are involved in the process of the rural land transaction:

- The administration office, which regulates the rural land market with the public announcement of the sale, consideration of the pre-emption beneficiaries and the approval of the purchase;
- The Land Registry that provides the legal security of the holders of the registered rights referring to real properties;
- The Land Cadastre that represents the technical support to the Land Registry, and
- The Tax Authority.

According to the Slovenian legislation, the procedure of agricultural land, forests and farms transaction includes the public announcement of the sale and offer, respectively, determination of beneficiaries by considering the pre-emption rights determined by law, and the approval of the purchase from the relevant administration office. The approval of the administration office is the prerequisite for the continuation of the transaction procedure. Furthermore, the preliminary condition for the verification of the purchase contract is the payment of the transfer tax. In order to certify that all the required prerequisites are fulfilled, the notary checks the Land Registry data, the approval from the administration office and the payment of the transfer tax. The verified sale contract is the base for the title registration in the Land Registry, and consequently in the Land Cadastre.

The use case diagram (Figure 3) specifies actors, use cases in their interactions (connections) in detail. A line or arrow connects the actor to the use case in which it participates. The arrowhead on one end of the line is used to indicate the explicit direction of the relationship or to indicate the primary actor within the use case. An association exists, whenever an actor is involved with an interaction described by the use case. The dotted lines denote use-case dependencies.

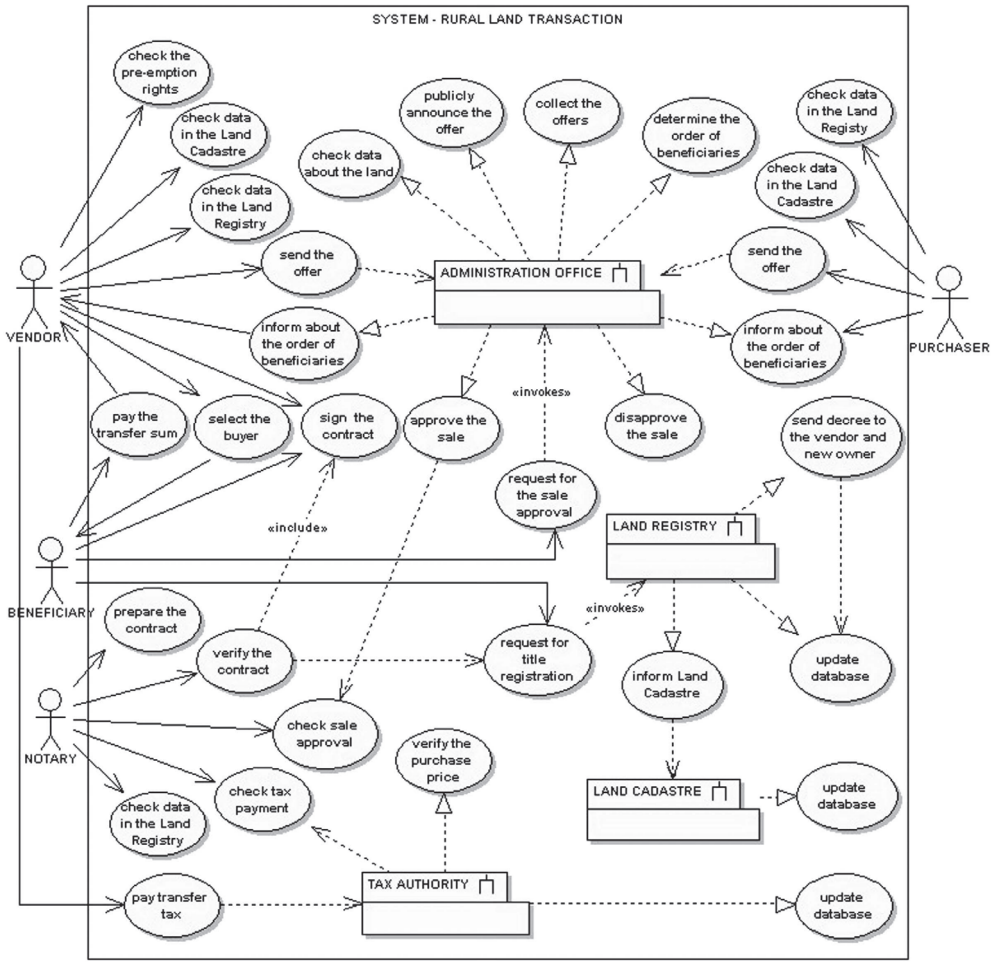

Figure 3: *UML use case diagram for the rural land transaction in Slovenia.*

3.2 The sequence diagram of the rural land transaction

The interaction of the object in the system can be described as a sequence diagram, which is as a two-dimensional time chart. The vertical dimensions as dashed lines (lifeline) are the time axis and the time proceeds down the page. The horizontal dimension shows the roles that represent individual objects in the collaboration. During the time an execution specification of a procedure on the object is active, the lifeline is drawn as a double line, i.e. as a band. The important aspect of this diagram is the representation of a sequence of messages (between the activities), which are exchanged between the objects, and at the same time, it represents one- or both-side exchange of the data. It also shows the interaction between objects, something that happens at one specific time point in the execution of the system (Rumbaugh et al., 2005).

In the sequence diagram (Figure 4) the message is shown as an arrow from the lifeline of one object to that of another. The arrows are arranged in time sequence down the diagram. Over the message arrows the action of the object is written. In the brackets over the message arrows, the conditions can be given as well as the information about the time expenditure.

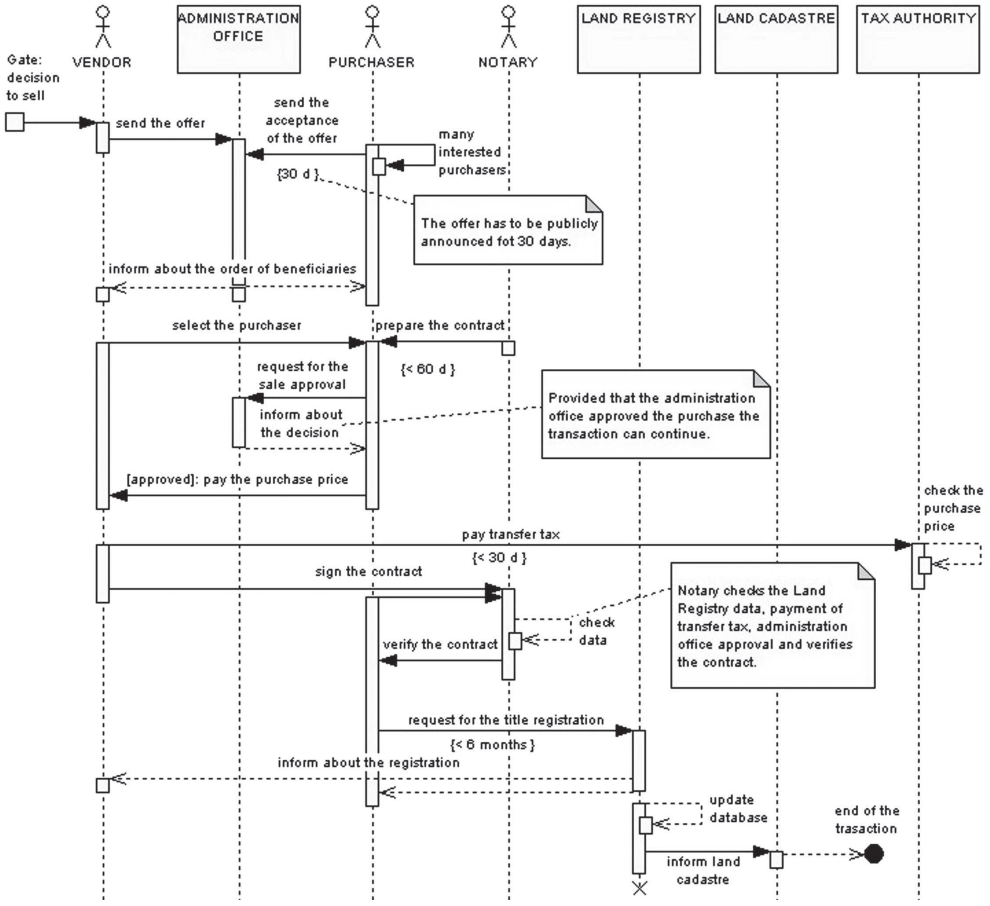

Figure 4: *The UML sequence diagram for the rural land transaction in Slovenia.*

3.3 The time and cost aspect of the rural land transaction

3.3.1 Time expenditure of the transaction

In general, a sequence diagram shows only sequences of messages between the objects and not the exact time intervals. A timing diagram can be used when metric time is important, but for understanding the sequences of the process, the sequence diagrams are usually sufficient. By providing additional notes about the time constraints even the sequence diagram can be used for the estimation of the time expenditure.

From the sequence diagram (Figure 4) it is evident that the owner of the rural land offered for sale must notify the administration office, which publicly announces the offer to sell for 30 days. Within this time period the potential buyers have the opportunity to make an offer to purchase the land. After the expiration of the thirty-day term the administration office has to determine the order of the beneficiaries and inform the vendor and beneficiaries. The request for the approval of the purchase together with the contract has to be sent within 60 days from the date of receiving information about the pre-emption beneficiary from the administration office. On the administrative decision the active actors have the right to appeal but this option was not considered in more detail as the system of the rural land transaction is complex as it is. The vendor is obliged to pay the transfer tax within thirty days from the tax declaration (when the tax authority is informed about the contract). In order to protect the title transaction legally, the buyer has to send the purchase deed to the Land Registry within six months. Due to the arrears of the Land Registry, the registration can take several months but with the reception of the request for the registration the buyer is legally protected against the third party.

In case of special areas, where the state or local communities have the pre-emption right, the confirmation of waving this right from the pre-emption beneficiary is needed, which can take up to two mounts. The pre-emption rights on special protected areas are one of the crucial burdens in the rural land market that obviously extend the course of activities.

3.3.2 Transactions costs

The cost associated with choosing, organizing, negotiating, and entering into contracts is called the transaction cost. North (1997) distinguishes between the measurement and enforcement cost. The measurement cost is the cost of measuring the valuable attributes and characteristics of what is exchanged. The enforcement cost is the cost of protecting rights, policing and enforcing agreements (North, 1997).

The purchase price of the land is high in comparison with other goods. Because of this, the decision for land purchase is usually based on the mature consideration. In addition, there are the transactions costs that certainly cannot be neglected. The formal rules for the costs of the institutions and individuals are regulated by the politics of a country, and the costs often reflect the need of interest groups to protect their interests. Land registration in the Land Registry is needed for the reduction of uncertainty on exchange of land rights. The transactions costs connected with legal security of land rights should be such that they are compensated by the reduction in uncertainty. Therefore, the institutions that are responsible for the organizational support of the transaction and for the land registration should provide reliable and up-to-date information, which reflect all transactions and legal facts. In relation to this we can distinguished between two important transaction costs:

1. costs that can be measured in terms of money and which are laid down by different laws, and
2. costs of governmental institutions involved in pure transactions, and institutions establishing the rules and norms in a society.

The transaction costs that can be estimated with money and which are laid down by law are for

example the transaction tax (2% of the sale price or estimated market value), administrative and court fees (such as fees for the application to issue the certificate for (non)enforcement of municipality's pre-emption right, for extract from the electronic land register, for entry of title and preliminary note of ownership etc.), notary fees for certification of the ownership transfer contract that is determined with respect to the value of the land etc. In comparison with the purchase price these costs do not represent a special obstacle in the land market.

The transaction costs of the institutions involved are not easy to estimate and represent the costs for the administration. These hard-to-measure costs, which involve the organizational aspect of the transaction, make it difficult to assess precisely the total transaction costs. In addition, the transaction of the rural land is linked with the credible income loss for the investor, when the transaction process takes several months, being the case in Slovenia. In practice, the most important impediment to rural land transactions may be excessive and disturbing time expenditure. For that reason, the main goal of governmental institutions should be the establishment of a stable and efficient transaction procedure for the rural land. Furthermore, the transaction costs should reflect the uncertainty by including a risk premium.

4 CONCLUSION

The land market requires an environment of good governance in which to thrive. The infrastructure for land market has to involve clear governmental land policy and legislation, together with the institutions that support the public regulations, and simple and transparent procedures. The countries with the former command economy, such as Slovenia, have developed the system of the market-oriented economy in a relatively short period. However, the ideal solutions of the complex problem could not be found overnight. When compared with the systems in the western countries, this aspect has to be taken into consideration. The criticism of the transaction system in the sense »in the west, systems have evolved and developed over a long period«, should not serves as an excuse of ineffective and slow transaction process in the future.

In Slovenia, the procedure for the ownership transfer of the rural land has proved to be slow, inflexible and cumbersome. In reality, there are many barriers in the rural land market, which mainly derive from the lengthy processes, and these also include the lack of historic or current market statistics on supply and demand. Public regulations of the land market cause the additional uncertainty to the active actors in the land market. Based on a clear understanding of the economic, environmental and social development strategy, in order to support sustainable development, the responsibilities and activities of the involved institutions should be clearly defined and the time for the decisions concerning the rural land market has to be shortened. The information flow between the involved institutions, which have the responsibility and opportunity to affect the market of agricultural land, forests and farms, has to be improved. This is of vital importance for transparent decision-making and effective functioning of the institutions.

The comprehensive and formal models of transaction systems can have several positive effects. Since the procedure can be easily understood and easily used by different stakeholders, such approach of modeling transactions can result in new possibilities of optimizing the transaction

procedure, even in order to shorten the time expenditure. So far, modeling of the real property transaction in the framework of the COST project has led to positive discussions in the form of providing comparative models of the transaction and sub-division procedures between different countries in the EU. There is a common sense that we are heading into the right direction. Modeling of the rural land transaction holds benefit of all parties to exchange the experiences in order to support the rural land market and sustainable development of the rural landscape in the future. The approach of modeling the transaction procedure with the standardized modeling language UML can be implemented for real or virtual business systems.

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