

## DEVELOPMENT OF RURAL SETTLEMENTS IN LAND CONSOLIDATION

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### ABSTRACT:

This paper presents spatial and urban characteristics, typology, state and problems of rural settlement planning in the Republic of Serbia. We analyzed policy documents and legislation related to spatial planning, urban planning, construction, environmental protection and redistribution of agricultural land as the basis for development of villages. We have presented the possibilities and rules for the preparation of urban and technical documents such as allotment designs, borders correction designs and urban land consolidation through the process redistribution of agricultural land.

**KEY WORDS:** *rural settlements, urban planning, land consolidation, project division in urban consolidation.*

### 1. INTRODUCTION

Rural development in today's conditions includes numerous activities in order to achieve balanced and sustainable development of the country, as well as improve the social standard, protect the environment and create better natural and economic conditions for the inhabitants of the rural areas respecting the proclaimed principles of sustainable development.

Main characteristics of the rural area are connected to: population, rural settlements, farm centers, farmland, watercourses, roads, utility infrastructure, forests, landscapes, protected areas, agricultural parcels, relief, climate, flora and fauna etc.

The most common form of development agricultural land is land consolidation which is defined as the most complex system of land development measures. Land consolidation in Europe has evolved from the original concept of agricultural parcel enlargement to an instrument of spatial development and a mechanism for achieving spatial, urban, strategic, agricultural and other plans. Beside the consolidation of agricultural land, the consolidation of the rural settlement itself can be done. Consolidation of agricultural land and rural settlement at the same time enables the optimal and expedient solutions to be found which will improve the living conditions, economic activities and standard of living [24].

This paper describes the possibilities of development of rural settlements through land consolidation, based on the actual legal framework in the Republic of Serbia.

### 2. CHARACTERISTICS OF RURAL SETTLEMENTS IN SERBIA

Rural settlements include populated areas of rural territory which is surrounded by agricultural land. In the past villages in central and south Serbia were planned by local residents according to their own needs and capabilities, following their experience and tradition. Historical circumstances, especially wars, caused movement of the population, abandonment of some areas and settlement of other and, also, the interventions by the authorities in field of defining the form and the look of rural settlements. That was the case mostly in northern parts of Serbia, the territory of Vojvodina. The position of the settlement was determined by the characteristics of the agricultural production, tools and techniques, historical events.

Industrialization of the country after the Second World War significantly changed the way of life in rural areas. It also caused population movement to urban areas and endangered the survival of a large number of villages. Many old villages vanished and new bigger were formed mostly near towns and main

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roads. Those settlements were mostly created without proper planning. This way of rural development caused the specificity and traditional values of the villages to disappear.

Agriculture, human activity and functions determined the definition of rural settlement, its differentiation from urban settlements, micro position, physiognomic features, types and processes within. Characteristics of rural settlements caused the typology. There are several typologies that can be found in the literature, and they depend on the basic source of the classification.

Serbia has very diverse structure of rural settlements whose residents are engaged in agriculture. Those settlements can be divided in more different ways.

The following typology of rural settlements can be defined in the territory of Serbia [24]:

By genesis the settlements are distinguished: nucleated, spontaneously created in Srem and Macva and other non-nucleated, spontaneously created in the other parts of Serbia.

By density and urban-morphologic structure the settlements are distinguished: nucleated -planned type created by existing plans in Banat and Backa, nucleated Srem-Macva type, spread Ibar and Starovlasiki type, semi compacted Sumadija type, diluted-compact Morava type, compacted Timok and south Morava type.

By number of inhabitants settlements are divided into: little (up to 500 inhabitants), middle (from 500 to 1000 inhabitants) and large (over 1000 inhabitants).

By geographic position settlements are divided into: hilly, mountain, plain and settlements in valleys.



Figure 1: Review of several characteristic rural settlements in Serbia

By the type of household: agricultural, mixed, non agricultural, specialized (tourist, mining, spa etc.)

By distance to roads: villages near main roads, villages far from main roads.

By distance to town: suburban, less remote and more remote.

By function which they have in a network of settlements: primary, with village centers, as centers of more surrounding rural settlements.

Figure 1 presents the examples of rural settlements in some characteristic areas of Serbia in accordance with presented typology.

Centers of the farms (farm yards) are basic elements of rural settlements and their characteristics (shape, size and type) are directly linked with the type of settlement. Main function of the farm yard is to unite all needs and activities of the household (living, commercial activities, storage of products, livestock, agricultural machines, necessities etc.). Near farm yards it is common to find vegetable gardens and orchards.

Three types of farm yards can be differed in Serbian villages [1]: planed yards, yards created in planed settlements and yards created spontaneously mostly in all other settlements weather they are compacted, nucleated, spread or dispersed.

Considering current state, the development of rural settlements is necessary in order to prevent further migrations from rural to urban areas and enable equal development of the whole country. Development of the rural areas must be in function of improvement of agricultural production. However, rural areas can no longer be reduced only to agricultural production, considering the fact that more and more rural population is not engaged in agricultural production. Villages should also become a place for vacation and recreation for the urban population which creates opportunities for development of tourism.

Bad connections to main roads, lack of utility infrastructure, low standard of living, unemployment, insufficient level of education of rural population, unfavorable age structure and fragmentation of parcels are the problems that must be dealt with in the future in order to achive the goals proclaimed in all strategic documents.

Experiences of developed European countries headed by Germany are the examples how the development of rural areas can be achieved through the procedure of land consolidation. German development of rural areas includes planning, coordination and implantation of measures, which are, considering environmental, cultural, social and economic aspects, suitable for improvement of functions of living, working, recreation and permanent improvement of environment in rural areas.

### 3. BASIC PRINCIPLES OF RURAL SETTLEMENT PLANNING

Contemporary rural settlement planning in Republic of Serbia can be viewed from several aspects, which result the defining of conceptions and goals that needs to be achieved, see [4] **[Error! Reference source not found.]** and [0]. Agricultural policies and rural development reforms in developed countries have big influence in defining new visions of rural development. Those visions, in terms of sustainable development, have the goal of harmonizing three basic systems: natural system, made-built system and socio-economic system.

Sustainable development is the term that is defined as a model which reflects the synchronization of environmental requirements with wanted economic development and demographic trends. In other words, sustainable development is a long term process, not the goal. It doesn't end in achieving the ecological balance but it also includes the proper economic development taking into account the social aspects. Current goals of sustainable development in rural areas refer to the overcoming the conflict between the agricultural production, industrial development, environmental protection and the needs of the population for tourism and recreation in the country side.

Large amount of farm yards in rural settlement can not properly satisfy the basic functions of the farm. In the process of rural settlement planning it is necessary to deal with these problems in order to eliminate the deficiencies of the farm yards.

The position of the settlement within the village and distribution of the hoses (farm yards) has the decisive influence in designing and execution of activities in land consolidation. Different characteristics of settlements, farm yards and farmland require different approaches and models in development and revitalization of the rural areas.

In Serbia, the position of the settlements and farm yards, area and shape of the village depend on the characteristics of the area in question. For example, in Vojvodina we can find planned villages which include larger areas and are properly shaped, while in central and south Serbia we can find spontaneously formed villages with smaller areas and improperly shaped, because the boundaries are dictated by landforms (gullies, reefs, rivers, streams etc.).

Vision of future concepts of rural settlement planning in Republic of Serbia must rely on existing strategic documents and legislation which defines all areas of spatial content. Main goal of rural settlement planning is achieving the sustainable development based on considering the real needs of modern concept of living in rural and urban areas.

#### 4. SPATIAL AND URBAN PLANNING DOCUMENTS IN SERBIA

Spatial and urban planning in Republic of Serbia is regulated by law [13] which defines the documents of spatial and urban planning: planning documents which include spatial and urban plans, documents for the implementation of spatial plans and urban and technical documents.

**Spatial plans** include: Spatial plan of the Republic of Serbia (state level), regional spatial plan (regional level), local spatial plan (municipality or city level) and spatial plan for area of special purpose.

*Spatial plan of the Republic of Serbia* is adopted for the territory of the Republic of Serbia and it represents the basic document of spatial planning and development in the country. It has strategic-development and general regulatory function. It is adopted for the period of 10-25 years.

*Regional spatial plan* is adopted for the territory of the region. It elaborates the goals of spatial development and it determines the rules of rational space use respecting specific needs of every region itself.

*Local spatial plan* sets the guidelines for the development of economic activities and land use as well as preconditions for sustainable and balanced development on the territory of the local community.

*Spatial plan for area of special purpose* is adopted for the area that has exceptional values and potentials and therefore requires special regime of organization, use and protection of space. It can refer to infrastructure corridors, protected tourist areas, mineral deposits etc.

**Urban plans**, according to the law [8], are: General urban plan, General regulation plan and Detail regulation plan.

*General urban plan* is a strategic development plan which includes general elements of spatial development. General urban plan is adopted for settlement which is the administrative center of local government and has the population of more than 30000.

*General regulation plan* must be adopted for settlement which is the administrative center of local government and also, can be adopted for other settlements on the territory of the municipality if specified in local spatial plan.

*Detail regulation plan* is adopted for undeveloped parts of the settlement, development of informal settlements, zones of urban restoration, infrastructure corridors, construction in urbanized areas and out of settlements and in protected surroundings of zones of cultural heritage.

**Documents for the implementation of spatial plans** are (see [8]): implementation program for the Spatial plan of the Republic of Serbia, implementation program for the regional spatial plan and implementation program for the spatial plan for area of special purpose.

**Urban and technical documents for implementation of plan documents** are (see [8]): urban design, allotment design and urban land consolidation.

Urban and spatial planning documents have been changing in the last period in terms of their definition and content in accordance with the changes of the political system and understanding of social needs.

Development of rural areas is conducted by land consolidation. **Land consolidation** is the most complex system of measurements for realization of spatial and urban plans. Law on agricultural land [10] and law on state survey and cadastre [11] define the basic principles for the implementation of land consolidation. Of course, all activities are in comply with other laws and bylaws which are the basis for spatial development and protection (forests, waters, environmental protection etc.).

*Allotment* presents the establishing of construction, agricultural and forest parcels and complexes in accordance with spatial and urban plans, for the purpose of construction, development and utilization of space. Allotment plan is a general act which can be a part of regulation plan or independent act.

*Expropriation* is deprivation of rights of ownership of real estate (land, buildings) to the government with market value compensation when it is necessary for the construction of infrastructure, commercial, res-

idential, utility, health, educational and cultural facilities, facilities for national defense and other objects of national interest. Real estate can be expropriated or the right of ownership can be limited when it is necessary to execute other works of national interest, see [9].

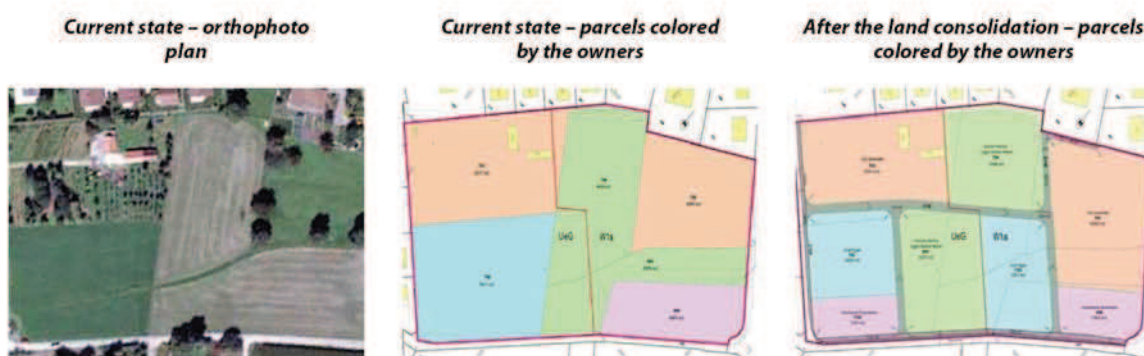
*Urban design* is made when it is specified by urban plan, local spatial plan or spatial plan for area of special purpose for the needs of urban and architectural shaping of public areas and urban and architectural elaboration of location, see [8].

*Allotment design* is a procedure that changes the shape and size of cadastral parcels in accordance with urban plan for the purpose of forming the construction parcels. One cadastral parcel can be divided into more construction parcels, in a way that is specified in plan document, based on the allotment design. Integral part of allotment design is the geodetic marking design, see [8].

*Borders correction design* is made based on the request of the owners or beneficiaries of the cadastral parcels with the consent of the owners or beneficiaries of the neighboring cadastral parcels. The goal is to create construction parcel(s) and to determine the boundaries for the areas of public needs provided that in accordance with the current urban plan. Body within the local government responsible for spatial an urban planning, based on the request of the owner or beneficiary of the parcel, issues the conditions for the borders correction with the neighboring parcels. While determining the conditions for borders correction certain rules must be obeyed. Those rules are: the cadastral parcel which is added to neighboring parcel must not fulfill the conditions required to be a separate construction parcel and that is smaller than the parcel that is being add to.

*Urban land consolidation* (land consolidation in a function of urban development of the settlement) is newly introduced in current law on planning and construction. It is applied in urban development of areas in the outskirts of the settlements which are expanding on the surrounding land. It can also be applied on smaller areas in partly built parts of settlement. Urban land consolidation is used for shaping or creating the conditions for shaping the construction parcels in construction area. It is also used for providing land for streets, parks and construction of public buildings (public areas), while at the same time sorting property relations. New allotment gives the landowners the parcels with area and shape which are adjusted to the urban development criteria defined, with mandatory access from the street; see [5] and [6].

Reduction coefficient in urban land consolidation is significantly higher than in land consolidation of agricultural land, and it equals around 20-30 percent. The reduction coefficient is that high because of the providing land for streets, parks and public needs. However, the value of new parcels significantly increases due to existence of the legal urban conditions for construction, so the benefit is obvious for the owners as well as the local government. Reduction coefficient in urban land consolidation can be synchronized with the reduction coefficient for the part of land consolidation area which refers to agricultural land.



**Figure 2:** Example of the urban land consolidation on a smaller area

Land evaluation in urban land consolidation is based on market value of land. The example of urban land consolidation on a smaller area is shown in figure 2.

Implementation of urban land consolidation and the determination of the area that is being consolidated must be in accordance with the general regulation plan or the detail regulation plan.

Environment includes natural and hand made values and whole space in which people live.

Natural values are natural wealth (land, water, forest, air, flora and fauna). Hand made values are goods which are created by man (buildings, road, railways etc.). Protection and preservation of the nature and environment in Serbia is conducted on the basis of the set of laws, see [15] and [23].

Documents of spatial and urban planning listed above as well as the documents for the implementation of spatial plans and urban and technical documents together with urban land consolidation present the basis for the development of the rural settlements through the process redistribution of agricultural land. Well designed and timed procedure with harmonized documents would enable efficient development of rural settlements through obtaining public areas, allotment, borders correction and creating conditions for long term development in accordance with adopted documents.

## 5. DEVELOPMENT OF RURAL SETTLEMENTS IN LAND CONSOLIDATION

According to current law [8], on the basis of local spatial plan it is necessary to make general regulation plans for rural settlements. Those plans have the goal to determine the long term projection of the development and spatial organization of the settlement, protection and designated use of space, as well as specifying the rules of consolidation and construction. General regulation plan can be made in the process of land consolidation.

According to law [8], general regulation plan is made based on collected data, documentation and conducted previous works. It contains:

- 1) boundaries and coverage of the construction area;
- 2) division of the area to special entities and zones;
- 3) majority usage of the land by zones and entities;
- 4) regulation and construction lines;
- 5) needed leveling heights of the junctions of the streets and the public areas;
- 6) corridors and capacities for traffic, power, utility and other infrastructure;
- 7) protection measures for the cultural and historical monuments and protected natural zones;
- 8) areas for which it is mandatory to make detail regulation plan with ban of construction until its adoption;
- 9) locations for which it is mandatory to make urban design;
- 10) rules for arrangement and rules for construction by zones and entities for which it not planned to make detail regulation plans;
- 11) Other elements significant for the implementation of the plan.

Content of the plan is presented in form of text and graphic part of the plan in which the spatial content is presented in form of maps.

According to [1] zoning (usage of space) of the rural settlements is the basis for the production of the plan for further development of village. Zoning of the different categories in rural settlements is a result of given types of categories of settlements and development program. Zones of rural settlements are 24]: residential zone, village center, commercial zone, utility zone, parks and recreation zone, traffic network zone, zone of cultural and historic, ethnographic, natural and other monuments and rarities.

Parts of residential zone can be further subdivided in: agricultural yards, mixed yards and non-agricultural yards.

Because of its significance, as well as because of the fact that the most of the existing village centers don't satisfy the modern criterions of living, the forming and development of the village centers is necessary. Uprising of economic strength and changes of the population structure caused the new demands for social and service functions depending on the level of development of the village and its category in the settlement network.

Commercial zone will not exist in all villages depending on the level of development of the village and its function in the settlement network. In primary settlements with more agricultural land the need for

locating the agricultural commercial space will rise, and its size will depend on the size of agricultural land it serves.

All categories of the rural settlements must have utility facilities and services. In primary settlements the content of this zone among other things are also: cemetery, animal cemetery, garbage dump, transformer substation etc.

Parks and recreation zone need to be planned in accordance with the category of the settlement. The primary settlements should have playgrounds for children within the residential zone, ballparks for football, basketball, handball and volleyball. Settlements which are the municipality centers, tourist settlements and suburbs in addition should have a covered sports hall in elementary school, swimming pool, parks etc.

During preparation of the plans for further development in all rural settlements it is necessary to plan building of new and reconstruction of old roads taking into account the design of network of field roads in agricultural areas of village. Concept of roads should be in accordance with zoning and usage of blocks and individual farms. It is necessary to separate village roads from local and regional roads. In planned settlements the network of roads is good even now in terms of disposition but not in terms of technical quality.

Zones of cultural and historic, ethnographic, natural and other monuments and rarities should be determined in most of the rural settlements. The examples of those zones are: birth houses of distinguished historical figures, significant historical sites, monuments of culture, religious monuments, ethnographic sites etc.

Considering the existence of agricultural yards, mixed yards and non-agricultural yards in rural settlements, it is necessary to design sizes and structure of yards in accordance with needs. Size and structure of the yards should be determined in manor that it satisfies hygienic, visual, functional and commercial needs of the household.

## 6. CONCLUSION

Development planning of rural territory is complex long process. It must be complete an multidisciplinary, see [1], [2], [3], [7], [26] and [26].

It is necessary to carry out the development of rural settlements in land consolidation. For that to be done there are important presumptions and facts in technical and legal sense:

1. The resolution to conduct the land consolidation covers all land in land consolidation area including the settlement and it should be expanded with part related to the adoption of detail regulation plan,
2. Collection of real estate data during the state survey renewal, production of digital cadastre and topographic maps which can be the basis for the production of the general regulation plan, allotment design, urban design, urban land consolidation and borders correction design,
3. Determination of the actual state of the property rights is done for the rural settlement also. That is the basis for implementation of the part of the general regulation plan which refers to the public land and new allotment,
4. Land consolidation evaluation can be done in the rural settlement a well, so it could be the basis for the production of the detail regulation plan,
5. Boundaries of the rural settlement are being determined and corrected, land for public needs and settlement needs (like enlargement of construction zone for residential and commercial needs) is being provided,
6. New network of roads is being designed. That network should be well matched for the whole village (settlement and agricultural land) and in accordance with local spatial plan,
7. Public display of detail regulation plan can be coordinated with activities in land consolidation implementation,
8. Basis for development of individual parts like village center can be solved by detail regulation plan or urban design continuously,

9. Part of the general regulation plan which refers to the creation of parcels for public needs, new parcels formation (according to allotment design, borders correction design or urban land consolidation) can be conducted as a part of activities in land consolidation.

In order to achieve these complex goals, the legislation needs to be updated, adjusted and harmonized. This kind of approach would efficiently develop rural settlement and make prerequisites for further long term realization of individual construction through long period of time and would create conditions for sustainable development.

### Literature:

- [1] Gostović M. (1989): Uređenje seoske teritorije, Naučna knjiga, Građevinski fakultet, Beograd,
- [2] Jovanović, S. (1973): Agrarne operacije, Građevinska knjiga, Beograd,
- [3] Malobabić, M. et al. (2004): Prostorno urbanistička pravila za uređenja seoskih naselja Srbije, Zbornik radova, Institut za arhitekturu i urbanizam, Beograd,
- [4] Mihajlović, R. (2009): Komasaacija-napredni kurs, Univerzitet u Beogradu, Građevinski fakultet, Beograd,
- [5] Mihajlović, R. (2010): Optimizacija raspodele komasacione mase kod uređenja zemljišne teritorije komasacijom – doktorska disertacija, Građevinski fakultet, Beograd,
- [6] Mihajlović, R. (2011): Optimization of Land Distribution in Urban Land Consolidation, INTERNATIONAL SCIENTIFIC CONFERENCE AND XXIV MEETING OF SERBIAN SURVEYORS "PROFESSIONAL PRACTICE AND EDUCATION IN GEODESY AND RELATED FIELDS, Kladovo,
- [7] Miladinović, M. (1997): Uređenje zemljišne teritorije, monografija, Univerzitet u Beogradu,
- [8] (2009): Zakon o planiranju i izgradnji, ("Službeni glasnik Republike Srbije" br. 72/2009, 81/2009, 64/2010 i 24/2011).
- [9] (2010): Zakon o eksproprijaciji ("Službeni glasnik RS", br.53/95, 23/01 i 20/2009),
- [10] (2006): Zakon o poljoprivrednom zemljištu ("Službeni glasnik RS", br. 62/2006 i 41/2009),
- [11] (2009): Zakon o državnom premeru i katastru ("Službeni glasnik RS", br. 72/2009 i 18/2010),
- [12] (1978) : Zakon o komasaciji i arondaciji, "Službeni glasnik SAP Vojvodine" br. 16/78, 32/78, Novi Sad,
- [13] (2001) : Zakon o eksproprijaciji (Službeni glasnik RS, br. 38/2001).
- [14] (2005) : Zakon o vodama, "Službeni glasnik RS br. 46/91, 53/93, 67/93, 48/94, 54/96, 101/2005,
- [15] (2004) : Zakon o zaštiti životne sredine, "Službeni glasnik RS", br. 135/2004,
- [16] (2005): Zakon o šumama "Službeni glasnik RS" br 46/91, 83/92, 53/93, 54/93, 60/93, 67/93, 48/94, 54/96, 101/2005,
- [17] (1994): Pravilnik o načinu vršenja geodetsko-tehničkih radova u postupku komasacije zemljišta, Nacrt pravilnika, Republički geodetski zavod Srbije, Beograd,
- [18] (1984): Pravilnik o načinu izrade izvođačkog projekta komasacionog područja, Pokrajinska uprava za geodetske i imovinsko-pravne poslove, Novi Sad,
- [19] (2010): Zakon o Prostorni plan Republike Srbije od 2010. do 20120. godine, "Službeni glasnik RS", br. 88/2010,
- [20] (2005): Strategija razvoja poljoprivrede Srbije, "Službeni glasnik RS" br. 78/2005,
- [21] (1986): Strategija razvoja šumarstva Republike Srbije, "Službeni glasnik RS" br. 135/2004
- [22] (1986): Strategija turizma Republike Srbije br. 135/2004
- [23] (2004): Zakon o proceni uticaja na životnu sredinu (Službeni glasnik RS, br. 135/2004),
- [24] Simović, Đ. et al. (1993): Uređenje seoske teritorije i naselja, Beograd,
- [25] Thomas, J. (1995a) Special Planning and Environmental Protection-Implementation through Land Consolidation, FIG-Symposium "From centrally planned to market economy. Deutscher Verein fur Vermessungswesen e. V. Schriftenreihe.
- [26] Thomas, J. (2004): Modern Land Consolidation - recent trends on land consolidation in Germany, Germany
- [27] 27. Thomas, J. (2005) Actual Trends concerning Land Management, Land Readjustment and Land Consolidation in Europe, Thessaloniki, Greece