



# PROCEEDINGS OF

International conference on Contemporary  
Theory and Practice in Construction XVI

Banja Luka, June 13-14, 2024

# ЗБОРНИК РАДОВА

Међународне конференције  
Савремена теорија и пракса у градитељству XVI

Бања Лука, 13-14.06.2024.



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International Conference on Contemporary Theory  
and Practice in Construction XVI

Banja Luka, June 13-14, 2024

INTERNATIONAL CONFERENCE ON CONTEMPORARY  
THEORY AND PRACTICE IN CONSTRUCTION XVI

МЕЂУНАРОДНА КОНФЕРЕНЦИЈА  
САВРЕМЕНА ТЕОРИЈА И ПРАКСА У ГРАДИТЕЉСТВУ XVI

PROCEEDINGS

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**СТЕПГРАД XVI**

# **PROCEEDINGS**

## ЗБОРНИК РАДОВА

Вања Лука, June 13-14, 2024  
Бања Лука, 13-14.06.2024.



## FOREWORD

It is our great pleasure to write this Foreword to the Proceedings of the International Conference on Contemporary Theory and Practice in Construction, XVI - STEPGRAD. The conference was held on June 13 and 14 at the Faculty of Architecture, Civil Engineering and Geodesy, University of Banja Luka. As in previous years, the conference STEPGRAD XVI continues a tradition of bringing together researchers, academics, and professionals from all over the world, experts in Civil Engineering, Architecture, Geodesy, and related fields, so this year it brought participants from fourteen different countries. The Conference enables the interaction of research students, young academics and engineers with the more experienced academic and professional community to present and to discuss current accomplishments. Their contributions make these Proceedings outstanding. The published papers provide the most recent scientific and professional knowledge in the fields of Computational mechanics, Structural engineering, Building materials, Road planning, Energy efficiency, Urban planning, Architecture, History of architecture, Surveying, Education of engineers, etc.

Almost ninety manuscripts were submitted, while 74 of them were accepted and categorized. Each contributed paper was refereed by the two reviewers. The papers were refereed based on their interest, relevance, innovation, and application to the broad field of Construction. Inviting lecturers this year were dr Ajla Akšamića, professor from the School of Architecture, University of Utah in USA, dr Vlatko Šešov from the Institute of Earthquake Engineering and Engineering Seismology, North Macedonia, dr Marija Nefovska-Danilović, associate professor, from the University of Belgrade and dr Todor Stojanovski from KTH Royal Institute of Technology Stockholm in Sweden.

These Proceedings will furnish the scientists and professionals with an excellent reference book. We trust that it will give an impetus for further studies in all subject areas. We thank all the authors and reviewers for their valuable contributions. Special thanks go to our sponsors and the members of the Organizational Committee and Working team.

Snježana Maksimović  
Miroslav Malinović  
*Editors*

## ПРЕДГОВОР

Изузетно нам је задовољство написати овај Предговор за Зборник радова са међународне конференције Савремена теорија и пракса у градитељству XVI – СТЕПГРАД. Конференција је одржана 13. и 14. јуна на Архитектонско-грађевинско-геодетском факултету Универзитета у Бањој Луци. Као и претходних година, конференција СТЕПГРАД XVI наставља традицију повезивања истраживача, наставника и стручњака из цијелог свијета, експерата грађевинарства, архитектуре, геодезије и сродних области, па је ове године окупила учеснике из четрнаест различитих земаља. Конференција је омогућила интеракцију студената, младих инжењера и научника са искуснијим члановима академске и стручне заједнице у циљу дискусије о савременим тенденцијама у градитељству. Њихов допринос је учинио овај Зборник изузетним. Објављени радови пружају увид у актуелно научно и стручно знање из рачунске механике, инжењерских конструкција, грађевинских материјала, саобраћајница, енергетске ефикасности, урбанизма, архитектуре, историје архитектуре, геодезије, образовања инжењера, итд. Од скоро деведесет достављених рукописа, 74 је прихваћено и категорисано. Сваки рад је био прегледан од стране два рецензента. Критеријуми за одабир радова су били њихова актуелност, значај и допринос широкој области градитељства. Позивни предавачи ове године били су проф. др Ајла Акшамија са универзитета у Ути из Сједињених Америчких Држава, др Влатко Шешов са ИЗИИС института у Сјеверној Македонији, проф. др Марија Нефовска-Даниловић са Универзитета у Београду и др Тодор Стојановски са краљевског технолошког института КТН у Шведској. Овај Зборник радова ће послужити као корисна референца стручњацима и истраживачима те смо сигурни да ће пружити подстицај за даљња истраживања у предметним областима. Захваљујемо свим ауторима и рецензентима на њиховом изузетном доприносу. Посебну захвалност упућујемо нашим спонзорима те свим члановима Организационог одбора и Радног тима.

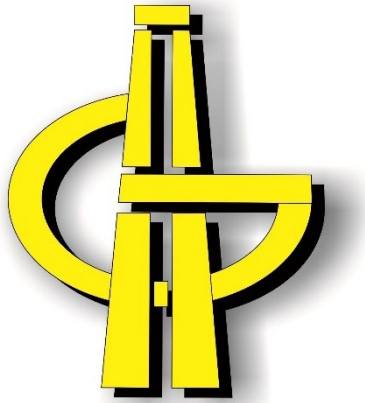
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## THE SIGNIFICANCE OF THE DEVELOPMENT AND IMPROVEMENT OF MULTIPURPOSE SPACES AS CENTERS IN RURAL AREAS OF SERBIA

### *Abstract*

The research examines the possibility of improving the spatial and functional capacities of centers in rural areas of the Republic of Serbia. The basic question raised in the paper refers to the specific definition of the center, more precisely the criteria that define it in the contemporary context. That is, how rural areas and settlements can be integrated into contemporary development trends. The initiation of multipurpose spaces is analyzed as a development model that can contribute to the social and economic sustainability of the settlement. The relevance of the study is based on the analysis of examples, i.e. the analysis of positive and negative sides of different types of spatial entities that represent centers in rural areas.

*Keywords: multipurpose spaces, rural centers, rural development, rural areas*

## ЗНАЧАЈ РАЗВОЈА И УНАПРЕЂЕЊА ВИШЕНАМЈЕНСКИХ ПРОСТОРА КАО ЦЕНТАРА У РУРАЛНИМ ПОДРУЧЈИМА СРБИЈЕ

### *Сажетак*

Истраживање испитује могућност унапређења просторних и функционалних капацитета центара у руралним подручјима Републике Србије. Основно питање које се поставља у раду односи се на конкретну дефиницију центра, тачније критеријума који га дефинишу у савременом контексту. Односно како рурална подручја и насеља интегрисати у савремене развојне токове. Иницирање вишенамјенских простора анализира се као развојни модел који може допринијети социјалној и привредној одрживости насеља. Релевантност студије се заснива на анализи примјера, односно анализи позитивних и негативних страна различитих типова објеката који као појавни облици представљају центре у руралним подручјима.

*Кључне ријечи: вишенаменски простори, сеоски центри, рурални развој, рурална подручја*

## 1. INTRODUCTION

The complexity of the social, economic, cultural and other determinants of different settlements in the Republic of Serbia largely makes it impossible to find a common solution that should be followed in the situation of arrangement and revitalization of rural centers. Accordingly, the subject research largely indicates to the former socialist practice of arranging village centers through the construction of cooperative homes as objects of an economic and cultural character, but also to the appearance of a different practice in the modern context which, following the development of tourism as one of the important carriers of rural development, initiates the placement of new contents such as wineries which in contemporary architectural practice have greatly surpassed the category of production facilities and have become important multi-functional spaces. This question is particularly interesting considering the former socialist context of Serbia, where wineries mostly represented production facilities that were not accessible to the general public and which, apart from their basic purpose, had no other contents.

Methodologically, the research presents an analysis of the current practice of spatial and functional arranging of rural centers in Serbia, suggesting the possibility of introducing some new approaches in this field. The paper essentially indicates a paradigm shift in the understanding of the meaning of rural centers (regardless of whether they are spaces of a private or public property) where the introduction of a different interpretation of the definitions of rural centers in this sense should trigger some new thinking on this topic.

Changes in the way of life, technological development as well as other changes in society have greatly influenced numerous issues regarding the development of rural areas. There is a need to devise innovative approaches to the revitalization of existing ones and to devise new contents that should serve the purpose of economic and cultural improvement of the quality of life in the rural areas. The issue of the development of rural areas has become a comprehensive issue of the development of a specific state and society [1]. Affirmation of rural centers in the contemporary context has actually become a question of the general development of the settlements which in fact ensures the social and economic sustainability of the entire surrounding area.

The importance of individual settlements will largely influence the fact whether they will remain neglected in the future or will be integrated into the wider context of the development of a specific community [2]. The selection of settlements will mainly depend on the number of inhabitants, spatial-geographical, social, touristic and other factors as parameters that will indicate certain potentials of their sustainability. Diversification of the rural economy, as a legitimate reflection of changes in the social sphere, in its various combinations will affect certain changes in the rural area, which will be reflected by the planning of some new contents.

However, the planning and definition of multi-purpose spaces and contents will not be of decisive importance for the survival of a settlement. The reason for this is certainly the impossibility of forcing someone to stay if he does not want to live and work in the countryside. Mechanisms for such a thing do not exist in practice. On the other hand, the point of the entire philosophy of rural development should be based on providing elementary living conditions to the population that chooses to live in the countryside. First of all, health and social protection, and then other conditions worthy of the civilizational development of the 21st century (infrastructural, cultural-educational, service contents, etc.). Otherwise, modern strategic approaches and rural development plans remain in the category of demagogic claims.

Starting from the assumption that the initiation of multi-purpose spaces within individual buildings or groupings of them can promote the improvement of the quality of life in rural areas, the research examines some possibilities of future spatial-functional arrangement and affirmation of village centers. Combining different approaches in the understanding and interpretation of the definition of a village center, that is, the analysis of their meaning as the center of public and social life. By showing the positive and negative sides, the contribution of the research moves within the limits of attributing new/different development models in the matter of defining future rural centers.

## 2. CONTRIBUTION TO THE AFFIRMATION OF RURAL CENTERS

An insufficient number of researches refer to eventual possibilities of improvement of the existing rural centers. The deterioration of rural settlements in the modern context is most often associated with the concept of "depopulation" of rural areas. A large number of studies point out the phenomenon of leaving the countryside and moving to the cities, which puts the emphasis on the consequences and not the real causes of their stagnation. However, one of the reasons for leaving

the villages is certainly the inadequate conditions and quality of life in them [3]. It is a practice that has long been present in all European countries.

The question of the quality of life in rural areas is an issue that deserves more and more attention today. That is, whether the population in rural areas should receive the same treatment in terms of providing services as in urban areas. This refers above all to the provision of basic services of public life such as buying and selling, but also the availability of the internet and other modern information-technology services [4]. Precisely for the reason that by improving services in the countryside, they encourage their integration into the modern trends of society, ensuring the social and economic sustainability of the settlement.

The architectural-urban definition of village centers can be categorized into two groups based on their spatial-physical and functional characteristics. The category of spatial-physical village centers includes spaces most often positioned at the intersection of the main roads in the settlement (Figure 1) or along one of them as a dominant direction (linear type of center). Within such spaces, individual buildings with different purposes are usually grouped, such as a church, school, cooperative center (center of culture), catering facilities, and the like [5].

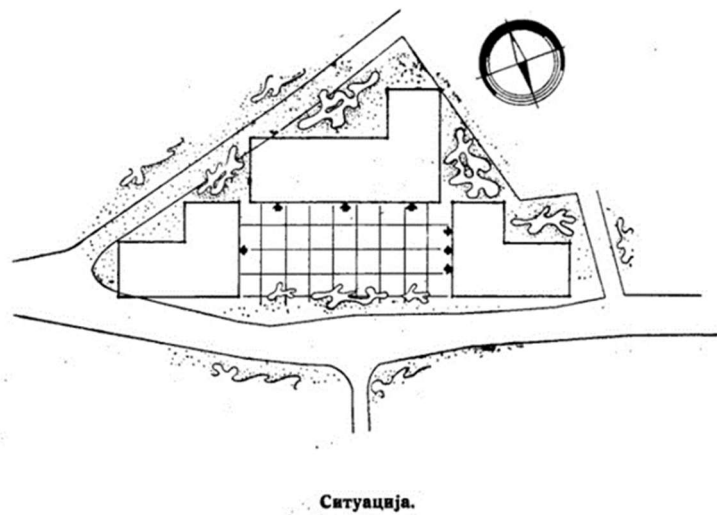


Figure 1. Arrangement of the village center. (J. Krunić, ed. *Zadružni domovi: Zbirka projekata masovne izgradnje na teritoriji uže Srbije, Autonomne Pokrajine Vojvodine i Autonomne Pokrajine Kosovsko Metohijske oblasti u 1948. godini*. Beograd, Srbija: *Zadružna knjiga*, 1948. p.83.)

The concept of the center as a functionally cohesive element of the settlement, on the other hand, represents a different approach to defining centers that spatially and physically do not have to occupy a central position in the settlement. In the earlier period of the development of rural settlements in the Republic of Serbia, there was a tendency for the spatial-geographical position of the settlement to influence the formation of a common center for several rural settlements, which would somehow rationalize the possibility of using numerous contents [6]. However, that idea never fully took off in practice, except for individual cases. The reasons for this were numerous, but among the most important were certainly the disintegration of the Yugoslav state in the 90s and the economic stagnation of its republics.

The contemporary development of rural areas, on the other hand, has moved the village centers from the previous framework and as such, thanks to their function and contents, they have become individual spaces physically displaced from the core of the settlement. Thanks to their multipurpose character, they have acquired the character of places that target a diverse user profile. In this sense, it is important to integrate such spatial units into a network of centers that can function in synchronization at the wider level of the specific area.

The centralization of public purpose content in rural areas, regardless of modern development trends, is still an ideal and profitable model for the provision of various services in one place. Especially

bearing in mind the configuration of rural settlements which, for example, analyzing the context of the Republic of Serbia, mostly belong to the categories of broken or semi-broken settlements [7]. However, improving the quality of services in rural areas, following the example of those in urban areas, should not remain the main task of rural development. [8]. There is a great demand for new, more advanced models in the provision of services that will reduce the depopulation process, aware of the fact that if there are no adequate living conditions in the specific area, there is no possibility of sustainability of the local community.

A huge credit for changing the paradigm of planning and defining rural centers unequivocally goes to tourism as a globally accepted model for the development of rural areas. Their strategic development was generated by using the so-called tourist potential, which, in addition to the promotion and protection of natural and cultural heritage, largely influences the improvement of the competitiveness of various areas, which indirectly encourages the improvement of the contents in the settlement [9]. Certainly, this contributes to the economic improvement of the local population's position, but the question arises whether and to what extent it can also contribute to the improvement of some other needs of the local population. By comprehensively integrating various contents as a response to frequent changes in society that are more pronounced today than it was in some earlier periods.

The improvement and development of rural centers, in line with the trend of tourism, should be seen in a wider context. The existence of certain cultural-historical or natural values can be used to define the programmatic content of newly designed or adapted buildings. Focus special attention on the arrangement of open spaces and spaces in their surroundings, which can play a significant role as gathering places and daily activities in the countryside. To the extent that they go beyond the basic tourist and hospitality purpose.

### 3. FORMER MULTI-PURPOSE SPACES WITHIN RURAL CENTERS

The development of rural centers and public facilities within them have always indicated the degree of economic development of a particular settlement as a whole. The existence of commercial services, crafts or other facilities significantly improved the quality of life of the local population [10]. The first multi-purpose public buildings in the countryside in the Republic of Serbia were cooperative homes (Figure 2). Massively built after the Second World War, they were typical buildings defined on the basis of the criteria of size and economic potential of the settlement. What is interesting to point out is that homes, regardless of the different interpretations and the importance of their construction, had a large share in the planning of rural settlements [11]. They were mostly centrally located in the settlement in the immediate vicinity of the main roads. The access plateau in front of the this buildings represented a space in the form of a landscaped area (square) where, when the weather conditions allowed, various events and festivities in the settlement were held.

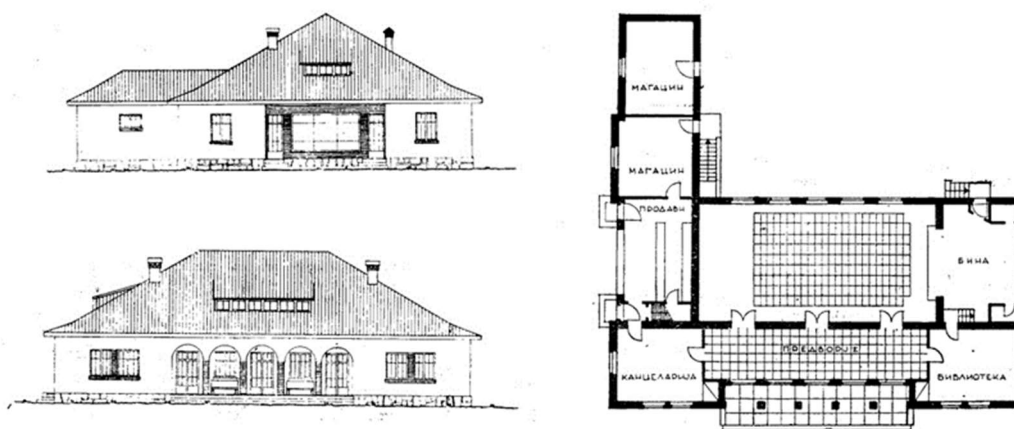
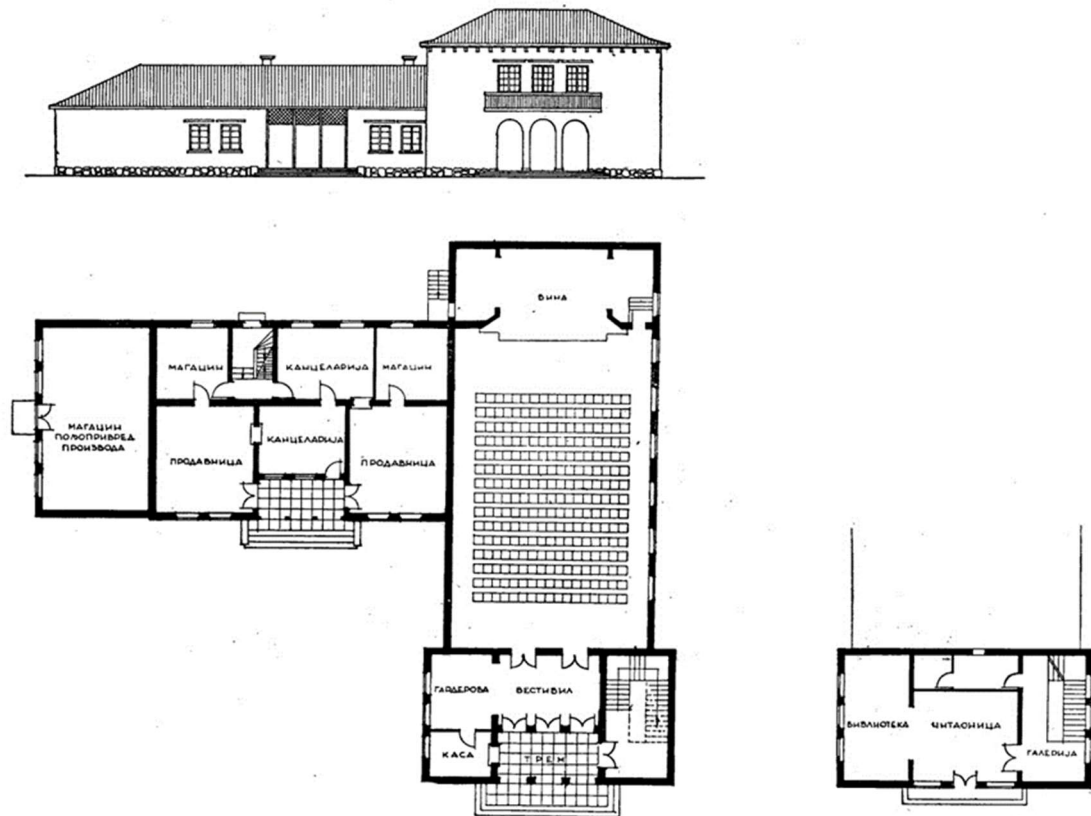


Figure 2. Cooperative home type 1, architect Dimitrije Marinković. (J. Krunić, ed. *Zadružni domovi: Zbirka projekata masovne izgradnje na teritoriji uže Srbije, Autonomne Pokrajine Vojvodine i Autonomne Pokrajine Kosovsko Metohijske oblasti u 1948. godini*. Beograd, Srbija: Zadružna knjiga, 1948. p.3.)



**Figure 3.** Cooperative home type 4, architect Dragomir Simić (the most frequently executed project). (J. Krunić, ed. *Zadružni domovi: Zbirka projekata masovne izgradnje na teritoriji uže Srbije, Autonomne Pokrajine Vojvodine i Autonomne Pokrajine Kosovsko Metohijske oblasti u 1948. godini*. Beograd, Srbija: Zadružna knjiga, 1948. p.27)

However, a large number of co-operative homes are currently falling into disrepair, while only a part of them has been adapted and brought to a new purpose. When analyzing the genesis of their origin and development, the fact that their concept was conceived in such a way that it satisfied both spatial and physical as well as functional criteria is observed. Excluding the ideological framework of these buildings and the fact that they were built on the model of Soviet kolkhoz homes, it can be considered that they represented an ideal combination of elements that included agricultural (a station for the purchase of agricultural products with an accompanying warehouse) and socio-cultural contents (a universal hall for events, festivities, cinema screenings, local office, post office, library ...). Depending on the type of cooperative home, the content structure varied (Figures 2, 3). According to this, perhaps their role has gained importance again today, because with the possible reconstruction, repurposing or planning some new contents, they can be integrated into the modern development processes of rural areas [12].

The arrangement of village centers and the construction of cooperative homes in practice were able to be accompanied by adequate infrastructure (traffic, electric power,...). To a large extent, traffic connections have always meant the survival of settlements, enabling the exchange of goods and the placement of agricultural products. Today, however, some other trends are in force, so that sometimes the existence of traffic and other forms of infrastructure are not a guarantee of the village's survival. Simply put, the culture of living and changed ways of understanding life (life priorities), the desire for an easy life, primarily in the city, degraded the countryside in every sense. But this does not mean that the population that remained living in the countryside remains excluded from the context of providing basic life services.



#### **4. DISPLACING THE IDEA OF A RURAL CENTER FROM TRADITIONAL FRAMEWORKS: CONTEMPORARY PRACTICE**

The development of tourism on a global level initiated new models of providing tourist and hospitality services. Contemporary tourism practice, following the contemporary rhythm of life and habits, today implies shorter stays that enable a more dynamic experience of natural and created values, local environments and culture. Following these changes, there is a need to improve existing and plan new contents within rural areas.

The newer practice of planning and building tourist facilities in rural areas is certainly represented by visitor centers in the most diverse forms. As information points or as multi-purpose spatial complexes that unite different contents (service-hospitality, cultural-educational) with the idea of promoting tangible and intangible heritage. Essentially, visitor centers are an ideal example of multipurpose structures as a reflection of complex social processes and needs [13]. Similar to cooperative homes, they enable the combination of agricultural production contents with educational and catering facilities. Modern wineries are certainly an example of that, which very often grow into serious hotel and spa centers providing countless other services. The advantage of the multi-purpose character of such facilities is precisely the possibility of providing different services and organizing different manifestations with the aim of attracting different users who contribute to the possibility of functioning throughout the year.

For instance, wineries in the former socialist context of Serbia represented exclusively production facilities, typologically defined as production, storage or combined spaces, while according to their position on the ground they could be underground, above ground or combined (Figure 4). Similar to cooperative homes, they were made as typical buildings devoid of any detail of aesthetic-shape specificities. Today, on the other hand, they represent complex structures that generate a wide variety of contents and that, based on their architecture and scope, create striking spaces.

The essence of the subject research is not the analysis of the content and structure of visitor centers, wineries and other tourist facilities, but the suggestion of the possibility that such spaces, in addition to their tourist and hospitality facilities, may have some other facilities that can be of great benefit to the local population. Bearing in mind the fact that tourist hospitality facilities represent a different type of public purpose facilities, one can think, for example, about harmonizing and integrating with some facilities such as a local office for the provision of certain administrative services, which, by the way, can form part of the information spatial unit (info-point) of the visitor center. Or to find contents intended for culture and education within a visitor center as universal spaces (halls, classrooms, workshops,...) which can be of much greater importance for the local population than for tourists. Such an approach would certainly have an even greater impact on the integration of all factors and actors of the local community, raising the level of service provision in the specific area. Regardless of whether they represent newly formed individual facilities and contents or are adapted spaces of existing facilities such as cooperative homes.

The example of the Loisiium winery (Langenlois, Austria, architect: Steven Holl, 2003 (Figures 5-7)) indicates precisely the above-mentioned possibility of combining related contents with the aim of economic and cultural sustainability [14]. In addition to the hotel facilities (rooms, wellness program,...), wine cellar and restaurant, the visitor has at his disposal a multi-purpose area, a bookstore and a store of local products. Also within the complex there are spaces intended for holding seminars that can function independently from the others. Within the multipurpose role, we should mention open spaces in the form of terraces and plateaus in the immediate surroundings of the building and vineyards, suitable for various events such as concerts and film screenings (or lectures), which may or may not be directly related to the culture of winemaking. The specific example of the Loisiium visitor center is only one in a series of similar buildings in contemporary architectural practice that has in every sense moved the previous boundaries and standards both in terms of performing touristic activities and in terms of planning production and agricultural capacities in rural areas.

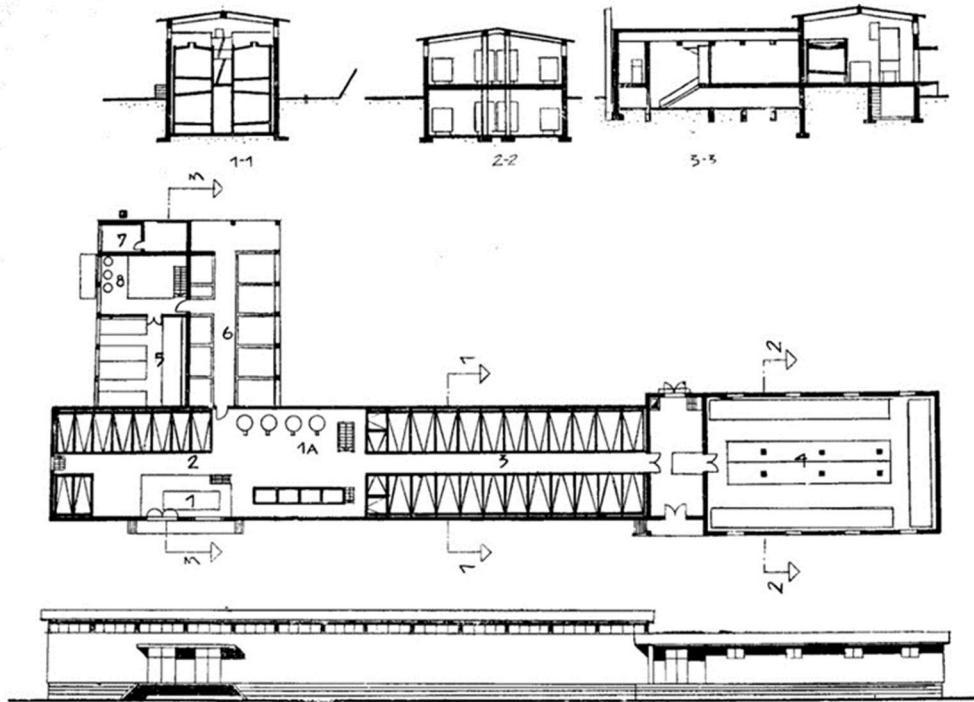


Figure 4. Project of a winery in the village of Rajac with a capacity of 150 wagons („Invest zavod“Belgrade ) (Б. Којић, Ђ. Симоновић, Пољопривредне зграде и комплекси, Београд: Грађевинска књига, 1978. р.163.)



Figure 5. Loisium Winery (Langenlois, Austria, architect: Steven Holl, 2003)  
(<https://www.loisium.com/en/weinwelt-langenlois>)

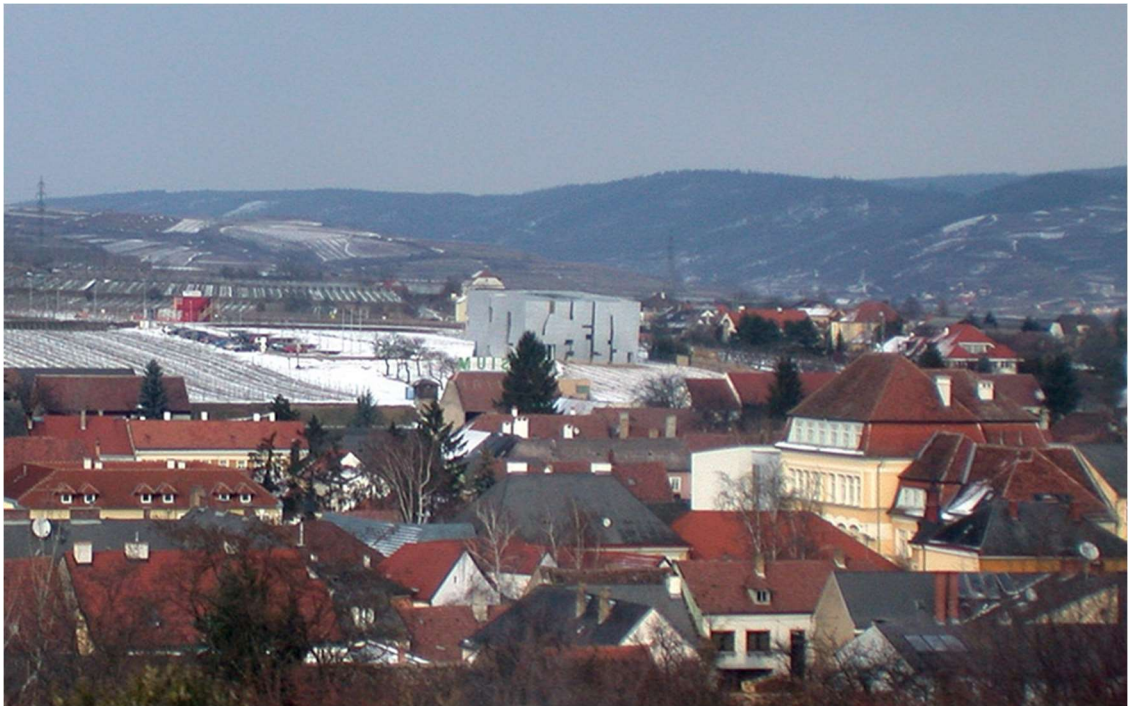


Figure 6. View of the Loisium winery in relation to the settlement  
(<https://www.archiweb.cz/en/b/vinarske-centrum-loisium>)

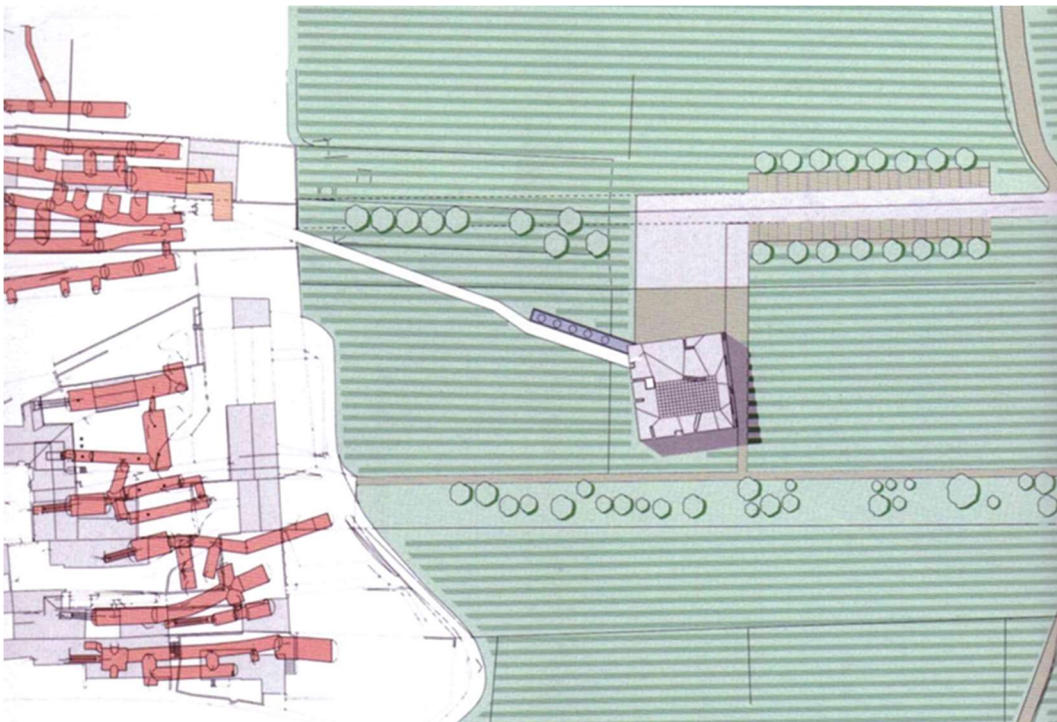


Figure 7. Loisium winery, situation. (<https://www.archiweb.cz/en/b/vinarske-centrum-loisium>)

## 5. CONCLUSION

The modern way of life and the changed conditions of functioning in rural areas have called into question the need to return the deprived functions to the countryside or, if they did not exist until now, to integrate them. The existence of public purpose facilities such as the local office, ambulance, post office and similar facilities essentially mean the survival of the population on their hearths, ie. sustainability of the settlement. If the trend of their non-existence continues, the smallest problem is

that the centers of settlements will disintegrate spatially and functionally. A much bigger problem will be the deepening of the depopulation process, which will inevitably lead to the closure of most settlements in rural areas. It must be understood that the new contents do not have an exclusive role in the provision of certain services, but create the possibility of employment and also the active presence of state institutions by providing certain services of a public nature (administration). On the other hand, the improvement of the content should not be exclusively viewed as a need of the local population, but should indicate a situation in society that clearly does not recognize the natural, economic, cultural and other potentials of rural settlements and areas in a global context.

Bearing in mind the spatial-geographic criteria of the structure of most rural settlements, for example in the Republic of Serbia (broken and semi-broken settlements), the integration of various contents within the newly formed centers would mean enormous support for rural development. Carrying out tourist activities in this sense should be on the second plan, that is, it should be the initiator of all other activities, and above all agricultural production as one of the basic determinants of rural areas.

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