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SOME MEASURES FOR SOIL REGULATION IN BELGRADE PERI-URBAN ZONE

Jelena Živanović Miljković

The development of controlled and planned construction of peri-urban areas in Belgrade and Serbia did not exist in the last decades. Depending on different factors, urban area of Belgrade sprawles on fertile agricultural soil, often causing the accelerated or progressive changes in agricultural soil use. Evidently, that kind of city development is not sustainable from the viewpoint of natural resources protection (agricultural soil protection in the first place), nor from the viewpoint of entire environment protection. This paper analyses functional and environmental measures for agricultural soil use regulation in Belgrade region. Also, paper looks into the issues of concern for substantiation of means for soil regulation and protection in Serbia, especially in Belgrade, through analysis world's and domestic soil regulatives and new EU guidelines regarding sustainable soil use and urban development. The attention is drawn to protect agricultural hinterland of Belgrade region by basic planning arrangements.

PREFACE

Cities are places with concentration of many environmental problems, but they are also the economic drivers of development. The city as a whole cannot be observed independently from its closest surrounding, because its rural surrounding becomes city periphery eventually, i.e. its peri-urban area. At the certain urban development level, part of the urban functions shifts to the periphery, and in the majority of cases that means, occupation of the best quality agricultural soil. In the past 100 – 150 years, the major city characteristic was its accelerated spatial, demographic and economic growth. Thereby, not only that it occupied agricultural soil on its hinterland, but it also changed the way of land use [1]. The direction and pressure on agricultural soil is the most influenced by the planning system and the other public soil managing and controlling systems.

NEWLY EU EXPERIENCE ABOUT SOIL REGULATION AND PROTECTION

A growing population and an increasing energy consumption, transport and agricultural activities, linked to pressures such as global climate variability and warming are additional increasing pressures on the natural resources in general, especially on the soil environment.

Soils and their different natural qualities are fundamental to land uses and functions in providing ecological services. European soils are under pressure by non-sustainable land use practices. Understanding the varying properties of the soil system in space and time that determine the opportunities for more eco-efficient land uses is essential for future integrated resource management policies [2].

The main directions of changes in big cities peri-urban areas relate on soil which has been used or is used for agriculture. The only tendencies for that soil are reversing it for urban purposes. Agricultural soil reduction due to conversion into non-agricultural purpose is consequence of economic development and that has to be tolerated, but, at the same time, it has to be very carefully controlled [3].

Soil protection problems in Europe are contained in all partial policies, especially in spatial development policy of rural areas, as well as urban. Thematic Strategy on the Urban Environment [4], initiated by 6th Environment Action Programme (2001-2010), stresses that "appropriate land-use planning will help reduce urban sprawl and the loss of natural habitats and biodiversity". Integrated management of urban environment should foster sustainable land-use policies which avoid urban sprawl and reduce soil-sealing, include promotion of urban biodiversity and raise awareness of urban citizens. Better urban management can reduce the impacts of day to day use of resources, such as energy and water, so, avoiding urban sprawl through high density and mixed-use settlement patterns offers environmental advantages regarding land use, transport and heating contribution to less resource use per capita.

Thematic Strategy for Soil Protection [5] is also initiated by 6th Environment Action Programme, and it started with standing that "soil can be considered essentially as a non-renewable resource", regarding the fact that soil formation is an extremely slow process. Soil degradation is driven or exacerbated by human activity such as inadequate agricultural and forestry practices, industrial activities, tourism, urban and industrial sprawl and construction works, and that results in loss of soil fertility, carbon and biodiversity, lower water-retention capacity, disruption of gas and nutrient cycles and reduced degradation of contaminants. The most important threats to

soil, which make serious economic and social consequences in Europe, are stressed: erosion, contamination (local and diffuse), loss of organic matter, loss of biodiversity, compaction and other physical soil deterioration, salinisation, floods and landslides and sealing.

Commission on Sustainable Development (Sustainable agriculture and rural development - SARD) stresses that "urbanization has dramatic impacts on peri-urban zones, including on land use, the structure of family farms, the economies of farm households, production and marketing" [6]. In most cases, urbanization initially leads to resource degradation in peri-urban zones due to increasing pressure on land resources.

Appropriate tools and measures should be applied wisely in order to implement soil degradation reduction and long-term development. As European Economic and Social Committee (EESC) stresses, objectives for the conservation and development of peri-urban agriculture must be done. One of three objectives is "preventing peri-urban agricultural areas from becoming part of the urban process, through regional planning and municipal initiatives". That implies using regional and urban planning, land use instruments, municipal funding and agricultural impact studies in protection of peri-urban agricultural soil from "city's constant demand for land (for urban growth, etc.) and to prevent any land degradation that could be used to discredit and justify the disappearance of peri-urban agricultural areas" [7]. EESC also stresses that "society needs to understand that land is limited natural resource and a common heritage that is difficult to recover once it has been destroyed and for that reason, inward urban growth must be promoted trough programmes designed to restore and reclaim degraded urban areas, "as this will prevent the loss of even more land to construction, and trough specific legislation to stop speculation in the farmland in the periphery of many European cities".

LAND USE PLANNING AND MEASURES FOR SOIL REGULATION IN BELGRADE PERI-URBAN ZONE

Problem of peri-urban areas in Serbia, especially in Belgrade, is much unattended in social and legislative sense, which is related to non-planned, non-regulated and non-controlled construction. Present individual housing is often insufficiently neither racional by population density nor infrastructural and suprastructural equipment. The impacts of agricultural soil occupation are magnified by unplanned and inadequate human activities, including insufficient safety measures. Advanced and integrated land use, planning and natural resource management play a critical role in reducing non-adequate soil use.

Belgium study of agriculture in peri-urban areas [8] is starting from the fact that "the agricultural sector becomes more and more confronted with pressures from inhabitants, environmental policy or stringent spatial planning". Still, agriculture in these peri-urban areas plays an undeniable role in "maintaining the landscape, locally increasing the socio-economic quality of life, performing an ecological function and so on" and in order to maintain this role, "agriculture needs to be sustainable in such urbanised areas".

On Belgrade territory covered by Master plan [9], most presented purpose in 2001 was agricultural purpose (Table 1). A projection for 2021 is decreasing of agricultural area by 36% (16 400 ha).

It is necessary to point up that situation on field is very different from projected situation in Master plan and Cadastre. Cadastre and plan show only legalized changes in land use, but there is significant part of land, that is still officially agricultural, although it has been changed into constructed land. In peri-urban areas of larger towns it is obvious that some parts of agricultural land in cadastral are used for some other purposes. This so-called quasi-agricultural land [10] is the consequence of urbanization process in rural areas, with the typical land use for residental, bussines, weekend facilities and other purposes related to small distances from cities, increased values and frequencies of land sales and socio-economic and cultural changes in land-owners value system. Intensity of the quasi-agricultural land amount, as a rule, subsides with increasing of the city center distance.

Obtained urbanization data for Belgrade peri-urban settlements is neither entire nor always correct, because urbanization process is constant. It is evident that comprehensive construction was out of all control in last decades. That kind of city development is not sustainable by nature resources preservation, agricultural soil at a first place, neither by infrastructural systems loading aspect and environmental preserving in whole [11].

Last seventeen years in Serbia, as a consequence of tragic scenes in Balkan region, many refugees from Croatia, Bosnia and Kosovo, as domestic dwellers with unsolved residences, tried to reach their own "roof above head" by illegal building of houses on

Table 1: Planned purpose and soil areas in 2001 and 2021 year (from Belgrade Master plan)

Purpose	Current year 2001 (ha)	Increase period 2001-21 (ha)
Residence	12,571.65	1,570.25
Economic activity and zones	1,595.22	1.929.35
Commercial zones and city centres	667.98	1.147.6
Public serves, objects and complexes	1,123.1	257.04
Sport objects and complexes	685.87	502.01
Green area	11,365.27	9,044.64
Agricultural areas and objects	39,657.32	-16,463.32
Water areas	4,071.05	101.16
Cemeteries	344.69	144.51
Transport areas	4,424.15	1,503.56
Communal activity and infrastruc. areas	345.3	436.4
Non-constructed areas	750.39	-750.39
TOTAL	77,602	

agricultural soil in peri-urban area of Belgrade. This is a consequence, above all, of negligence of the competent managing and planning agency. Unfortunately, for such situation of illegal constructions, only that people pay and are sanctioned, though they are not the only one to blame [12]. Urban territory sprawl can't be avoided, especially in case of such a big city as Belgrade is, and undoubtedly that implies to agricultural soil occupation. However, it is possible that, with organized and responsible planning arrangements, a compromise can be found. The best quality agricultural soil needs to be protected and kept for its basic purpose, and less good quality soil, soil with marginal agricultural productivity can be left over for urban purposes.

Soil use in Serbia is regulated through several laws, which mainly treat soil partially (Law on Planning and construction, Law on agricultural soil, Law on forests, etc). Legislative problem in Serbia is lack of the horizontal law adjustment, as well as the lack of rules which protect and regulate soil and its natural properties like an ecological complex.

FUNCTIONAL AND ENVIRONMENTAL MEASURES FOR AGRICULTURAL SOIL REGULATION IN BELGRADE REGION

These measures are essential for the protection and future prospects of agricultural soil that is diminishing because of urban pressure and lack of care. Agricultural soil in peri-urban areas could be "a key element in regional planning as prevention of unlimited growth of cities, fashion and landscape" [13].

Land use planning and management is the most commonly used instruments for regulation of land use, and in urban areas that means dividing land into zones (such as residential, commercial, industrial, etc.) and enforces standards and legislations for construction. The creation of an adequate institutional framework for agricultural soil use regulations and the mechanisms to put them into practice are of the utmost importance [14].

Responsibility for basic agricultural soil management should be decentralized and delegated to local levels, supported by adequate supervision and coordination at the national level. A special attention must be drawn to municipalities that have the most agricultural soil in Belgrade region (Palilula, Zemun and Voždovac). The role of municipalities and community organizations in soil protection is crucial. National authorities should establish standards and regulations about soil management, and coordinate and supervise local efforts. However, it is not enough. There should be a unique strategy on agricultural soil, at the city level, as a part of integral rural development policy. That strategy should control development of Belgrade agricultural sector in total. The strategy could be strengthened by improving access to agricultural soil management information, and enhancing the capacity of the local level for implementation of preventive measures.

Agricultural and the other green areas in Belgrade peri-urban area act as a "green lungs". Preserved, high-quality and productive agricultural soil is often ruined under the huge urbanization pressure, and yet somehow, that same soil should prevent urbanization.

The agricultural sector in Belgrade region is increasingly confronted with pressure coming from the population, illegal construction and poor coordination of a competent management agency, planning and their lack of responsibility. Also peri-urban agriculture area has an important role in food provision, the preservation of the landscape, the ecological functioning of this Belgrade area, which is what multifunctional role of agriculture and agricultural soil consists of.

It is important to analyze policies to support the development of agriculture in peri-urban zones. Efficiency and effectiveness of policies in promoting multifunctional role of agriculture is crucial.

Of course, political commitment to reduce the urban sprawl on agricultural soil is essential. That includes development actions, legislation, allocation of financial and human resources, political decisions and actions.

CONCLUSIONS

Agricultural soil must be regarded as economically potential part of settlements in peri-urban area and Belgrade in whole. Besides obligatory agricultural soil protection, it is necessary to stimulate agricultural production, especially in peri-urban areas where is high soil standing. In that case, agricultural soil in Belgrade peri-urban area could be important resource for city development, and it should be constantly preserved and promoted.

The main limits for implementation of agricultural soil regulation measures in Belgrade region is a high illegal construction performance on, previously, agricultural soil, and improper construction control and use of urban and peri-urban area. The basic start should be change of legislation framework and identification of necessary regulation, protection and construction rules. But without adequate institutional capacity, plans are never effectively realized, nor can enforcement be properly conducted in practice.

Apparently the evidence of the common soil degradation in the world and in Serbia, is the fact that decision makers insufficiently realise that maintaining of soil quality is their top responsibility. In order to maintain agricultural soil in Belgrade peri-urban area, and in Serbia in whole, some actions on local and national level have to be done:

- land policy which is not a result of the political will,
- clearly defined land policy aims which provide efficient land market, social equality and environmental sustainability,
- cadastre consolidation and updating,
- ownerhip land use regulation ,
- stop land speculation by state intervention at the land market
- respecting of the determinated urban and spatial-planner regulatives and soil legislatives adjustment, with identification of the institutions chargeable for land use,
- horizontal adjustment of the laws and plans related to the land, opposite to the current partial access.

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