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SUSTAINABILITY OF AGRICULTURAL LAND MANAGEMENT IN THE AUTONOMOUS PROVINCE OF VOJVODINA

Vesna Rodić, Danica Bošnjak, Nataša Vukelić

INTRODUCTION

Though the concept of sustainable development emerged in scientific circles in the early 1970s, it has reached the wider public only after the report “Our Common Future” by the World Commission on Environment and Development had been published. In this report sustainable development is defined as the development that seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future (Bruntland, 1987).

The potential for meeting the needs of present and future generations depends to a great extent on the overall capital available – natural, human and produced capital – as well as on the pace of their exploitation (Jovanović-Gavrilović, 2003). Due to the possibility of substitution of various forms of capital and to technical progress, sustainability does not necessarily mean conservation of all the natural resources (Solow, 1992); however, some of the components of natural capital are so important that their loss would have highly uncertain and most probably irreversible consequences for the mankind.

Land is certainly such a resource: unvaluable, unmultiplicable, unmovable, and in agriculture it is an irreplaceable factor of production (Rodić et al., 2006); land is “the entire mankind's good and not a generation's, a nation's, a group's or a person’s one” (Hadžić, 2004). That is why sustainable land management is an important precondition for achieving sustainable agricultural development; any type of land management, at the macro or/and micro levels which leads to land losses and/or degradation can be considered unsustainable, and socially unacceptable (Debicki, 2000).

VOJVODINA’S LAND FUND

The Autonomous Province of Vojvodina covers the area of 21,534 km². In 2005 only 199,157 ha (9.0 per cent of total land area) was infertile land, and not more than 163,650 ha (7.6 per cent) were forests - making Vojvodina one of the least

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The rest, i.e. 1,790,565 ha (83.0 per cent) was agricultural land, of which 1,649,037 ha (or 76.6 per cent of total land) was cultivable (Graph. 1).

Regarding the fact that the population of Vojvodina is around 2,031,992 according to the 2002 Census, it can easily be calculated that there is 0.88 ha of agricultural land per inhabitant or 0.81 ha of cultivable land. If compared to the world average of 0.25 ha per inhabitant in the same year and the European of 0.42 ha/inhabitant (www.fao.org) the conclusion is obvious that in Vojvodina land is not a limiting factor to agricultural development. Moreover, the land is of a high quality: over 43.0 per cent of Vojvodina's overall land area is chernozem (Hadžić et all., 2005).

However, this doesn’t mean that agricultural land is managed in a sustainable manner in the long run. The examples of land neglecting have recently increased, at both the macro level and among farmers, which results in long lasting losses of agricultural land, in change of its use and on the other hand – in land degradation, which has been the topic of numerous studies and analyses.

![Graph 1 Land areas per categories of usage in AP Vojvodina in 2005](image)

Although general conclusions regarding all the agricultural land in the Province are not easy to derive, the fact is that in the majority of samples a reduction of humus content is evident (Marko, 1993, Bogdanović et all, 1993, Hadžić et all., 2004, Vasin and Sekulić, 2005). At 5.0 - 7.0 per cent of the samples analysed higher levels of easily

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1 In Serbia, forests average 27.4 per cent, and in Europe around 29.0 per cent.
accessible phosphorus and potassium contents were found (Hadžić et al., 2004, Vasin and Sekulić, 2005), as a result of the earlier uncontrolled and non-rational use of mineral fertilizers. However, the content of heavy metals, pesticide residues and dangerous or harmful matter in the samples analysed was below the tolerable maximum values, so the authors agree that soils in Vojvodina are of a good quality and can be used to produce healthy food.

PROBLEMS IN AGRICULTURAL LAND MANAGEMENT

The Constitution of the Republic of Serbia guarantees the freedom of usage of privately owned agricultural land, forests and urban land for construction. However, according to the Constitution the forms of land use and management can be legally limited, i.e. conditions can be regulated so as to avoid the danger of activities harmful to the environment.

In the Republic of Serbia over three quarters of agricultural land and in Vojvodina some two thirds are privately owned. That is why the recently ratified Law on Agricultural Land (Sl. Glasnik RS br.62/2006) regulates additionally protection, preparation and use of agricultural land as a public good, regardless of the land ownership. However, it seems that a mechanism has not yet been established which would provide for a sustainable management of this important resource.

The Law states the measures for agricultural land protection in terms of purpose of land use, prohibition of waste water discharge and disposal of dangerous and harmful matters, preventing erosion, obligatory controls of soil fertility and quantity of mineral fertilizers and pesticides used, and it also defines the jurisdiction. However, the penalties for offenders, as defined by this Law, especially for individuals – land owners or users – are relatively low financial penalties although it is a common knowledge that “when the land loses its primary purpose and is taken from agricultural production – it can not be substituted by anything at any price” (Vučić, 1982).

As for the purpose of land usage, a contradiction is obvious between the general provision in the Article 15 of this Law (which reads “agricultural land is used for agricultural production and can not be used for other purposes except in cases and under conditions defined by this Law”) and the provisions in some later articles. So in spite of the Article 22 ("It is prohibited to use the cultivable agricultural land ranging I-V cadastre class for non-agricultural purposes") Article 23 defines the exceptions to this prohibition, reading also that cultivable agricultural land can be used for other purposes in certain, justified and “...other cases ... providing the compensation sum is paid”.

The sum to be paid as a compensation for conversion of farmland for an indefinite period is defined as 50.0 per cent of the land market value on the day the request is
submitted, and can not exceed € 1.500 (in dinars) per hectare, except for the first and second cadastre classes. The Article 26 defines further on the cases when the compensation is not to be paid at all.

Real market prices and the everyday practice show that these recently introduced measures for protecting the agricultural land from conversion to other purposes than agricultural production have not been giving the expected results. It remains to be seen whether the ratifying of the Agricultural basis, a plan document aimed to provide operationalisation of the Law, will make any improvement. For this document to be brought and introduced at the national level a 3-year period is approved and at the provincial and local levels additional 5 years.

The analysis of the agricultural land fund in the AP Vojvodina over the period 1955–2005 (Tab.2) shows that overall agricultural land has been reduced by over 88,000 ha, which means that in only half a century time almost 5.0 per cent of Vojvodina's agricultural land has «vanished». Although the changes in question have been relatively slow and smooth, it should be taken into account that the time series is merely 50 years, an exceptionally short period regarding sustainable development and the so-called inter-generation justice, as well as regarding the importance and specific properties of land as an agricultural production resource. It isn't difficult to conclude what would happen if this trend continued, and how incompatible such a land management is with the concept of sustainable development, the concept only formally promoted in this case.

In Serbia the information basis is too insufficient to provide valid information on what precisely happened with the agricultural land in question. However, regarding the fact that forest areas have not significantly increased in the period observed, the assumption should be correct that the loss of agricultural land resulted from urbanization, i.e. newly built residential buildings, plants, roads, waste disposal sites, etc. In view of agricultural production these land areas can be considered as permanently lost, since their «re-conversion» to agricultural purposes would be extremely expensive. Moreover, this process of farming land reduction was generally uncontrolled and anarchical so it was usually the highest quality agricultural land that was conversed and not the least productive one.

An additional problem makes it impossible for this analysis to provide the exact data: significant acreages, especially the land on the edges of urban areas, where numerous residential quarters were illegally constructed over the last decade (so-called wild construction), is still recorded (by the official statistics and cadastres) as agricultural land. If it were properly added to already calculated agricultural land

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1 That is the area almost equal to total protected land (national and regional parks and special natural reservations) in the AP Vojvodina - 90,049 ha
that has been «lost» for ever, the true picture of land resource loss would be even more disturbing.

Table 1 Changes in the AP Vojvodina land fund, 1955-2005

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<tbody>
<tr>
<td>Orchards</td>
<td>6.969</td>
<td>10.099</td>
<td>12.309</td>
<td>16.865</td>
<td>17.143</td>
<td>17.775</td>
<td>+ 10.806</td>
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<tr>
<td>Meadows</td>
<td>50.162</td>
<td>40.474</td>
<td>37.663</td>
<td>33.598</td>
<td>33.542</td>
<td>38.542</td>
<td>- 11.620</td>
</tr>
<tr>
<td>Pastures</td>
<td>179.918</td>
<td>153.084</td>
<td>143.632</td>
<td>126.193</td>
<td>115.890</td>
<td>109.211</td>
<td>- 70.707</td>
</tr>
<tr>
<td>Agricultural areas</td>
<td>1.878.679</td>
<td>1.823.943</td>
<td>1.809.503</td>
<td>1.780.640</td>
<td>1.794.882</td>
<td>1.790.565</td>
<td>- 88.114</td>
</tr>
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At the macro-level, the state-owned farmland rental as regulated by the Law (Article 62) appears to be most disputable. According to some estimations (www.psp.vojvodina.sr.gov.yu) 339,000 ha of land in the AP Vojvodina are state-owned, and can be rented for periods longer than a year and not longer than 20 years; for certain types of land there is an additional limitation to maximum 3 years. These legal provisions favour the development of a free land market and the enlargement of small farm land resource, but on the other hand they are most disputable regarding the sustainable land management: the short-term tenants/operators will most probably not invest in soil structure and fertility improvement, but will exploit the rented farmland as a mine – which leads inevitably to land degradation in the long run. The control over these processes is still very inefficient.

If compared to the most developed countries, the pressure of agriculture intensity on the farmland in AP Vojvodina at its present level is still not so strong, but it anyway does contribute to land degradation. The very structure of agricultural production as it is does not provide the necessary balance of crop and livestock productions. While the developed countries face the problem of a high density of livestock production (Gerber at all, 2003, Wossink and Wefering, 2003) and the
resulting soil and underground waters pollution\(^1\), in Vojvodina it is at the level of 0.2 heads/ha (Rodić et al., 2007). Such a low density of livestock production provides for only 22.0 per cent of necessary manure (Bošnjak et al., 2007) making it impossible to maintain a favourable soil structure. In our conditions the problem is even bigger due to the fact that other organic fertilizers (compost, green manure) are exceptionally rarely used and the postharvesting residues usually burned up.

Neither the structure of plant production can be considered as satisfying with respect to preservation of this resource: it is dominated by crops\(^2\) that are in the fields for relatively short periods of year, often less than 200 days\(^3\). As for meadows and pastures, they only make for 8 per cent of agricultural land in the Province, and the so-called permanent crops (lucerne and clover), the important elements of environmental stability, only make for 4 per cent. Land used for organic production is generally considered as one of the agroenvironmental indicators (OECD, 2001) since this production is environmentally acceptable; in Vojvodina, the land used for this production is of a marginal acreage. The lack of adequate statistical data makes it impossible to even consider the number of farm household involved in organic production, not to mention its structure. The only reliable data source is that of the TERRA’S association from Subotica, referring to 178 hectares of organic production in Vojvodina, in 2002. It is beyond any doubt that Vojvodina has favourable conditions for organic and other alternative types of agricultural production, that have not been sufficiently used in spite of the fact that these types of production are far more acceptable in the concept of sustainable agricultural development than the present conventional systems.

Although the use of mineral fertilizers per hectare in Vojvodina lags significantly behind that in the developed countries\(^4\), the manner of their application often causes land degradation and other related environmental damages. Farmers most often do not manage the soil in accordance with its potentials, since they are insufficiently educated and not fully conscious of the need for soil protection. Family farms’ inputs and outputs are in most cases not recorded at all; these farms usually have no long-term plan for sowing, manure and fertilizers use and plant protection, and do not practice rotation. Farmyard manure is not only in modest quantities, but also added mostly to the parcels close to villages – due to the lack of storage capacities and modern mechanization for manure application. Manure is usually applied in winter, when farmers are less occupied with other duties.

\(^{1}\) For instance, over 2UG/ha in the Netherlands and Belgium.

\(^{2}\) 40 per cent of arable land is under corn, 20 per cent under industrial plants (sunflower, soya, sugar beet).

\(^{3}\) In the developed countries crops occupy farmland for 250 days a year.

\(^{4}\) Average consumption of mineral fertilizers is 140 kg/ha, and pesticides around 1.2 kg/ha.
Fertilizers are often used without soil being previously analyzed, which results in negative economic and environmental consequences. In 2002 the action was initiated of free of charge soil analysis and undertaken by the Provincial Secretariat for Agriculture, Forestry and Water Management, in co-operation with the Scientific Institute for Crops and Vegetable Production from Novi Sad and the network of regional professional services, aiming at all the privately owned land properties in Vojvodina. Over the period 2002-2006 over 87,000 soil samples were collected and analysed free of charge, but all in all a rather small portion of farm land was covered, since there were as many as 587,708 separate family farm land parcels according to the 2002 Census. As stated in the Law soil analyses should be done at least once in a five-year period, so the scope of this action was rather modest.

Some of the problems presented could be resolved by adequate education of farmers in the principles and importance of good practices\(^1\) and the significance of preservation of natural resources and environment. The education should be realised through the extension service in the first place, but it is still insufficienly developed. On the one hand the extension service itself needs additional education in that respect and on the other, for the time being it is engaged in relatively few cases, with the so-called selected farms – which is not enough for producing more significant results.

**CONCLUSION**

Agricultural land is surely among those resources that must be used in a sustainable manner, otherwise speaking about sustainable agricultural and overall social development is meaningless. Although the Province of Vojvodina has relatively favourable conditions and such a level of intensity of agricultural production that still does not endanger the soil and environment on the whole, that doesn't mean that there are no problems and that the aims of sustainable agricultural development can be achieved spontaneously. The Law on Agricultural Land represents the first but insufficient step towards sustainable management of this important resource. The official statistical data, though rather unreliable as they are, indicate that over the period of only half a century almost 90,000 ha of agricultural land has been turned into other purposes – which is serious warning. The additional bylaws planned to be brought will not change a lot unless accompanied with a more developed consciousness, will and readiness of all the decision makers at the macro level and farmers themselves to preserve the land «for the generations to come»

\(^1\) The codex of good agricultural practice has not yet been completed and it is under the jurisdiction of the Ministry of Agriculture
REFERENCES


