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## **SIGNIFICANCE OF ESTABLISHMENT OF FOREST TREE AND SHRUB PLANTATIONS FOR THE STABILITY AND SUSTAINABLE DEVELOPMENT OF ECOSYSTEMS IN VOJVODINA**

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**Abstract:** This paper analyses the state of forest cover percentage in Vojvodina and the potentials of establishment of forest tree and shrub plantations on the new areas, aiming at the dynamic balance and sustainable development of its ecosystems. Forests occupy about 137000 ha, or 6.37% of the total area in Vojvodina, i.e. on the average 1.5% in the zone of agricultural region, and even below 1% in some regions. Consequently, this area belongs to the category of agricultural-steppe-forest regions, as the example of extremely endangered ecosystems. The estimated ideal forest cover percentage in Vojvodina accounts for 14.3% of the total area.

**Key words:** ecosystem, site resource, the percentage of forest cover, forest communities.

### **ZNAČAJ PODIZANJA ZASADA ŠUMSKOG DRVEĆA I ŽBUNJA ZA STABILNOST I ODRŽIVI RAZVOJ EKOSISTEMA U VOJVODINI**

**Izvod:** U radu se analizira stanje šumovitosti Vojvodine i mogućnost podizanja zasada šumskog drveća i žbunja na novim površinama, radi dinamičke ravnoteže i održivog razvoja njenih ekosistema. Šume zauzimaju oko 137000 ha, ili 6,37% od ukupne površine Vojvodine, odnosno u zoni poljoprivrednih regiona prosečno 1,5%, u nekim područjima i ispod 1%. Zbog toga, ovaj prostor pripada kategoriji poljoprivredno-stepsko-šumskih oblasti, kao primer izraženo ugroženih ekosistema. Procenjena idealna šumovitost Vojvodine iznosi 14,3% od ukupne površine.

**Ključne reči:** Ekosistem, stanišni resursi, šumovitost, šumske zajedice.

## **1. INTRODUCTION**

Vojvodina, situated in Panonian plain, is classified as agricultural-steppe-forest region, in the category of endangered ecosystems. It is said that it is the least afforested region in Europe.

Forests covers approximately 137000 ha, which is 6,37% of total area of Vojvodina (Vlatković, 1986). Agricultural parts are only 1,5% afforested, while some parts of Vojvodina are less than 1% afforested (Rončević, et al. 2005). Even more, the distribution of forests and non-forest greenery is not uniform throughout the territory (Orlović, et al. 2006). The major forest stands are situated on Fruška gora and Vršачke Mountains, on Deliblato and Subotičko-horgoška Sands and along the river inundations. Outside these areas, there is almost no forest stands, or there are in small, less than hectare, fragments. The least afforested

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areas are areas of intensive agricultural production. These areas have all characteristics of steppe regions: poor precipitation, hot summers and cold winters, negative wind influence (wind erosion) (Ivanišević, et al. 2005). The process of evaporation is considerable because of absence of forests, causing significant losses of water in soil that is need by agricultural crops and forest stands. In these conditions ecological balance is endangered by degradation processes (salinization and alkalization) linked with spreading and accumulation of salts in soil (Salt-Affected soils) (Miljković, 1963). Within zones with Salt-affected soils, the process of desalinization and dealkalization (Acid degradation) is present in small patches, usually supported by forest vegetation – common oak and ash dominated forest stands. These facts show that soils of Vojvodina are endangered by many different degradation processes.

Low percentage of forest cover supports numerous negative consequences that will be difficult to repair in the future. The protection and preservation of ecosystems of Vojvodina are directly dependent on the establishment of different forms of forest and non-forest greenery stands, like: forests for protection, windshalter-stands, hunting resorts and different forms of horticultural orchards. (Ivanišević, et al. 2005). Thus, as a method of biological melioration versus mentioned degradation processes is increase of percentage of forest cover and the establishment of ecosystem stability, especially for agroecosystems.

These facts show the need for increment of percentage of forest covered areas in Vojvodina on optimal 14.3% (Vlatković, 1986), by establishment of forest stands on new areas, shelterbelts beside motorways and railways, rivers and canals etc., hunting resorts and other forms of protection stands, especially on the soils endangered by certain degradation processes.

The establishment of new trees and shrubs stands would increase the production and economic potential of Vojvodina, decrease negative effect of wind erosion, achieve biological melioration of salt-affected soils, improve microclimatic conditions, protect resources for food production, improve environment, increase the stability of ecosystems and insecure their sustainable development.

## **2. MATERIALS AND METHODS**

For the analysis of condition and distribution of forests, distribution of soil systematic units and potential vegetation, we used the maps of Vojvodina, of different size and specialization. Beside, for this work the Directions of The plan of space utilization in Vojvodina from 2002 was used too. The criterion for selection of new areas for the establishment of new tree and shrub plantations was the degree of endangerment of particular eco-area by some degradation process. In that way selected areas are classified as potential areas for afforestation in the zone of forest production, areas endangered by salt accumulation in agricultural production and areas under dealkalization process in halomorphic zone, formally inhabited by common oak-ash forests.

The election of tree and shrub species for afforestation is performed according to their natural occurrence, depending on dominant pedological processes.

## **3. RESULTS AND DISCUSSION**

Vojvodina is characterized by different ecological conditions. Among them it is possible to define potential habitats for the establishment of new stands of forest tree and shrub species. The soil characteristics appeared to be dominant criterion for the definition of these areas. Soil, as a result of climate, relief, geological basis, hidrological regime, natural vegetation and its utilization, represents a reliable criterion for the defining of the utilization of certain eco-areas.

According to the way of soil moisturing and dominant pedological processes, as well as the degree of performed technical works on the soil several ecological zones could be defined: automorphic, hydromorphic, halomorphic and antropogenic.

Table 1. Afforested and not afforested area structure in Vojvodina (Data from Ivanišević, et al. 2006)

Tabela 1. Struktura pošumljenih i nepošumljenih površina u Vojvodini (Podaci iz Ivanišević, et al. 2006)

Organization <i>Organizacija</i>	Afforested <i>Pošumljeno</i>		Not afforested <i>Nepošumljeno</i>				Rest <i>Ostalo</i>		Total <i>Ukupno</i>	
			Fertile soil <i>Plodno zemljište</i>		Unfertile soil <i>Neplodno zemljište</i>					
	ha	%	ha	%	ha	%	ha	%	ha	%
PE"Vojvodinašume" <i>JP"Vojvodinašume"</i>	96212	4.47	17528	0.82	12407	0.58	4443	0.21	130590	6.07
PE"Vode Vojvodine" <i>JP"Vode Vojvodine"</i>	6642	0.31	2887	0.13	1821	0.08	1697	0.08	13047	0.61
NP "Fruška gora"	21307	0.99	1143	0.05	-	-	-	-	22450	1.04
Agricultural org. <i>Poljoprivredne org.</i>	12933	0.60	-	-	-	-	-	-	12933	0.60
Total <i>Ukupno</i>	137094	6.37	21558	1.00	14228	0.66	6140	0.29	179020	8.32

The soils effected by some of degradation processes, like: salinization, alkalization, desalinization and dealkalization, could be meliorated by the establishment of new forest stands. It is well known that forest stands moderate or stops the action of those degradation processes, protecting this hard-to-reestablish natural resource. Also, negative effects of degradation processes (wind erosion, flooding etc.) could be considerably decreased by the establishment of shelterbelts (Ivanišević, et al. 2005). It is of particularly important for preservation of sustainable development in areas of field-crops production i.e. agroecosystems for growing of agricultural crops. The soils of poor production characteristics could be meliorated by the establishment of new forest stands. These areas are usually not suitable, or less suitable for agricultural production. Ameliorative measures are needed in order to enable their utilization.

Thus, potential habitats for the establishment of new plantations of forest tree and shrub species could be defined according to soil conditions and degree and intensity of the endangerment of the area. Before all, there are habitats in the zone of forest production. These habitats, except those on Fruška gora and Deliblato Sands, are on hydromorphic soils, defined as alluvial-hygrophilic forests.

The potential areas for the establishment of new forest plantations in the forest production zone are presented in Tab. 1, Fig 1.

As it is presented in table 1, afforested area covers 137094 ha, or 6.37% of the total area of Vojvodina (Vlatković, 1986, Orlović, et al. 2006). The areas planed for afforestation (fertile soil) covers 21558 ha, or 1.00%. Thus, by afforestation of this area the degree of forest cover would be increased by 1% (Ivanišević, et al. 1998, 1999). For successful establishment of new forest plantations on this area the soil examinations are needed as well as the election of tree species and technology of the establishment, cultivation and protection of plantations.

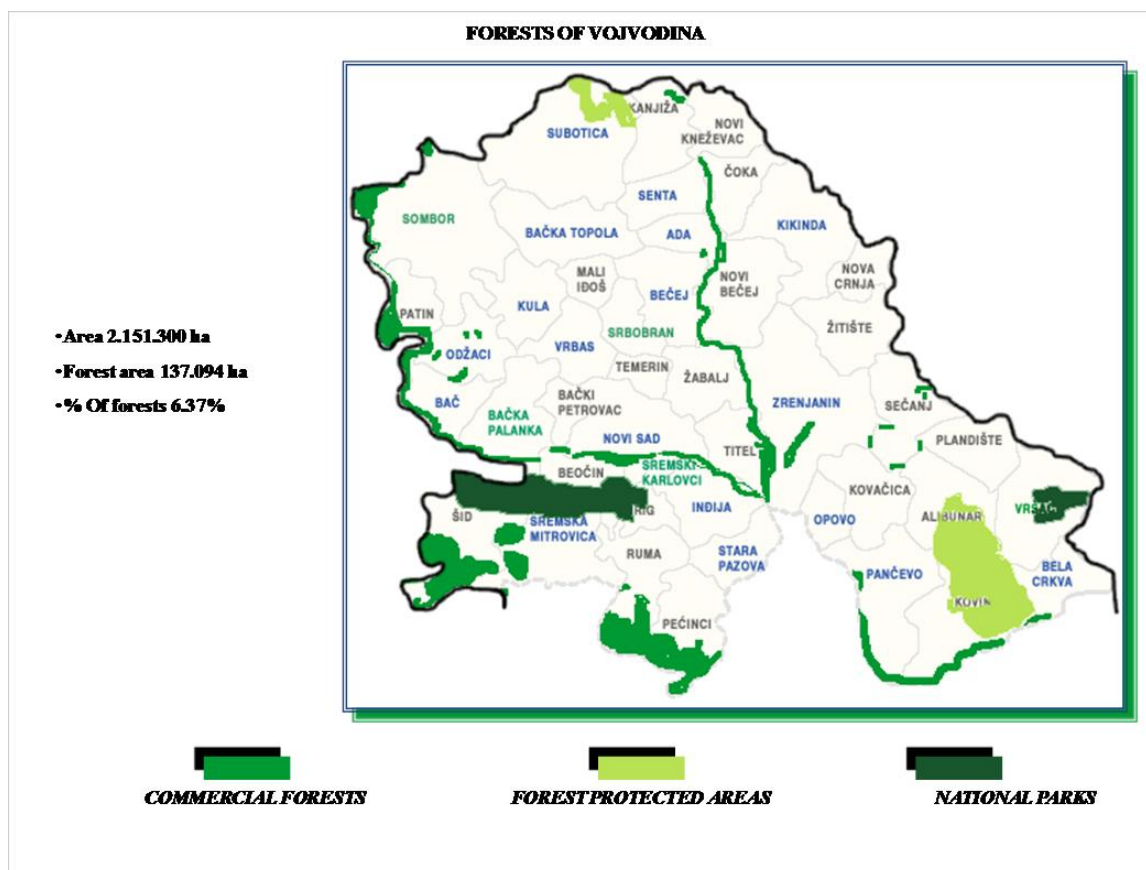


Fig.1. Forests of Vojvodina  
 Slika 1. Šume Vojvodine

Beside these areas, there are habitats endangered by degradation processes in soil (salt-affected soils). These areas are not suitable for agricultural production. Potential areas of salt-affected soils for the establishment of new forest trees and shrubs stands in Vojvodina are presented in table 2, Fig. 2, Fig. 3, Fig. 4 and Fig 5.

The data in table 2 suggest that it is possible to establish new plantations of forest tree and shrub species on 119413 ha, which would increase the percentage of forest cover in Vojvodina by 12.92%. Areas in hydromorph ecological zone dominate in the structure of potential areas (3.62%), and then areas in automorphic zone (1.32%). In these two zones 74145 ha are endangered by salinization (3.46% of the total area)), and 21728 ha by alkalization (1.00% of the total area). Areas in halomorphic ecological zone under the processes of desalinization and dealkalization are 10459 ha large, (0.49% of the total area). These areas were dominantly covered by common oak-ash and common oak-horn-beam forests.

The total area in Vojvodina under the processes of desalinization and dealkalization is 20827 ha large (0.97%). In antropogenic ecological zone are deposol soils on bents along the chanals, on the area of 2713 ha (0.13% of the total area). The data on the areas with solonchak and solonetz area missed in this study for poor data about survival of tree and shrub species on them (Miljković, 1963, 2005).

Table 2. Potential areas of salt-affected soils for the establishment of new forest trees and shrubs stands in Vojvodina (Data from Ivanišević, et al. 2006)

Tabela 2. Potencijalne površine solima ugroženih zemljišta za osnivanje novih zasada drveća i žbunja u Vojvodini (Podaci iz Ivanišević, et al. 2006)

Eco-zone <i>Ekološka zona</i>	Soil type <i>Tip zemljišta</i>	Degradation process <i>Degradacioni proces</i>	Area (ha) <i>Površina (ha)</i>	Index (%)
Automorphic <i>Automorfna</i>	Chernozem <i>Černozem</i>	Salinization <i>Salinizacija</i>	3712	0.17
		Alkalization <i>Alkalizacija</i>	17474	0.81
	Eutric cambisol <i>Eutrični kambisol</i>	Acid degradation <i>Kisela degradacija</i>	7268	0.34
	<b>Total Ukupno</b>		<b>28454</b>	<b>1.32</b>
Hydromorphic <i>Hidromorfna</i>	Fluvisol	Salinization <i>Salinizacija</i>	8261	0.38
		Alkalization <i>Alkalizacija</i>	3297	0.15
	Semigley	Salinization <i>Salinizacija</i>	21409	1.00
		Alkalization <i>Alkalizacija</i>	957	0.04
	Humogley	Salinization <i>Salinizacija</i>	37160	1.74
		Acid degradation <i>Kisela degradacija</i>	3100	0.14
	Eugley	Salinization <i>Salinizacija</i>	3603	0.17
	<b>Total Ukupno</b>		<b>77787</b>	<b>3.62</b>
Halomorphic <i>Halomorfna</i>	Solonetz-solod <i>Solonjec-solođ</i>	Acid degradation <i>Kisela degradacija</i>	4035	0.19
	Solod <i>Solođ</i>	Acid degradation <i>Kisela degradacija</i>	6424	0.30
	<b>Total Ukupno</b>		<b>10459</b>	<b>0.49</b>
Antropogenic <i>Anropogena</i>	Deposol	Mechanical (banks) <i>Mehanička (obale)</i>	2713	0.13
<b>Total Sve ukupno</b>			<b>119413</b>	<b>5.55</b>

Mentioned ecological zones differs by soil, relief and hydrological characteristics, by the degree and intensity of degradation processes, and by the degree and intensity of the soil utilization. In that sense, the natural biodiversity should be respected, the principal functions defined and tree and shrub species selected. Basically, these plantations have dominantly protective function, but until the complete reestablishment they have many other sociocultural functions.

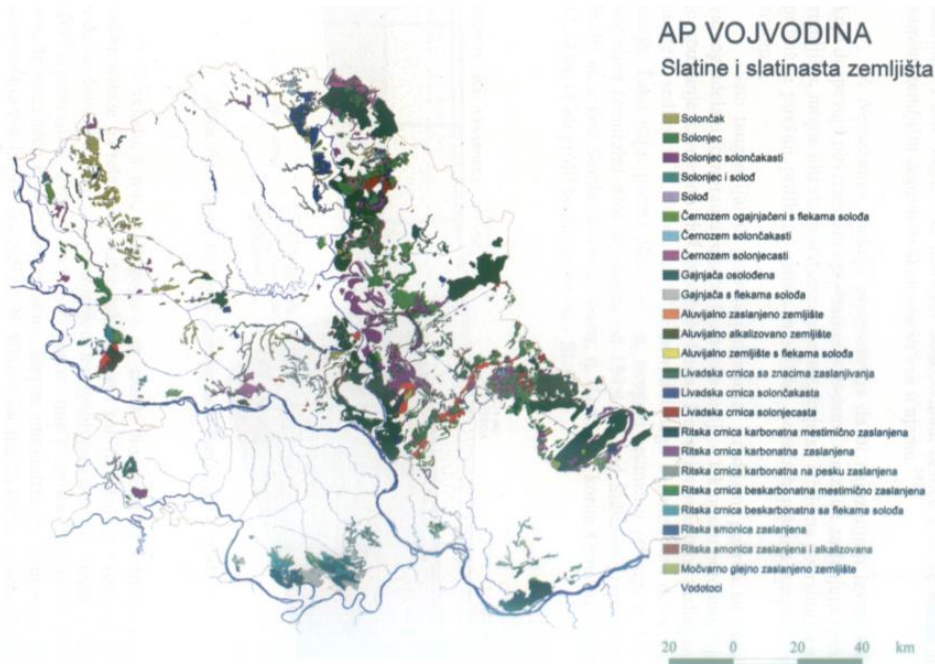


Fig. 2. Salt-Affected Soils of Vojvodina (Data from Miljković, 2005)  
Slika 2. Zemljišta ugrožena solima u Vojvodini (Podaci iz Miljković, 2005)



(A)-C  
Arenosol



Asa-C  
Salinized chernozem  
*Zaslanjeni černozem*



A-Eg-Btg-C  
Acid degraded eutric cambisol  
*Kiseli degradirani eutrični kambisol*

Fig. 3. Soils of automorphic zone  
Slika 3. Zemljišta u automorfnoj zoni

Thus, potential areas for the establishment of new forest plantations in Vojvodina cover 140971 ha (6.55% of the total area). By the afforestation of these areas, the percentage of forest cover would be increased on 12.92%. With shelterbelts beside traffic lines, the percentage of forest cover in Vojvodina would approach optimal 14.3% (Vlatković, 1986).

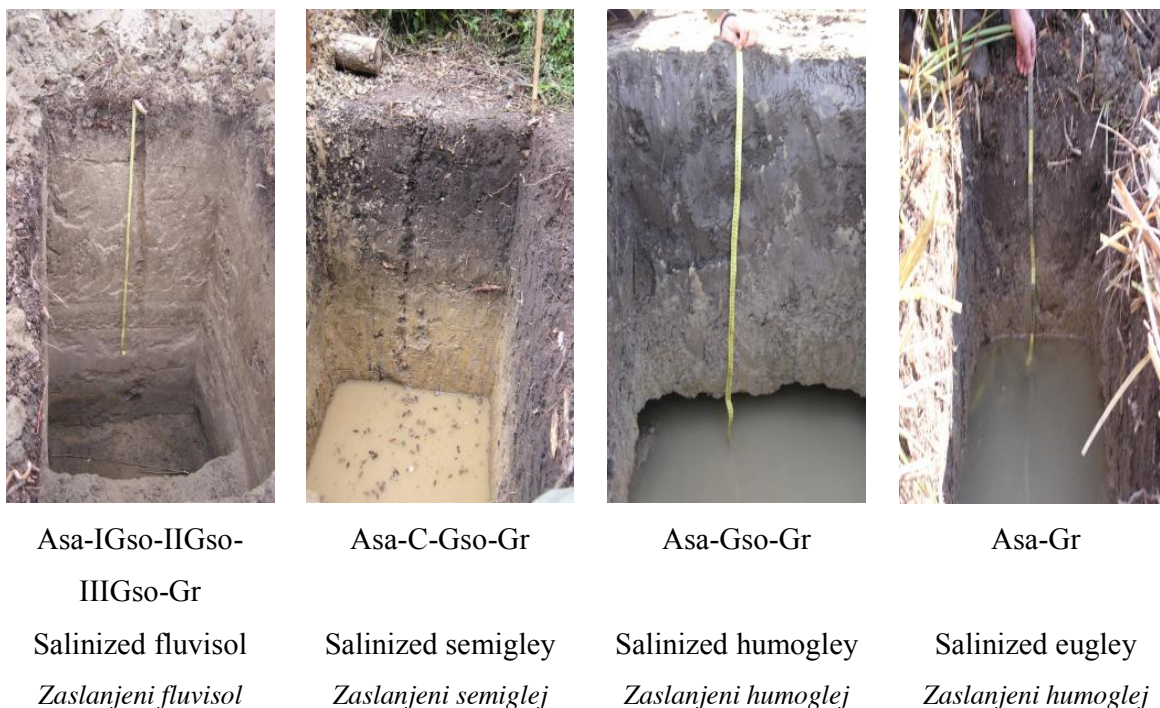


Fig. 4. Soils of hydromorphic zone  
Slika 4. Zemljišta u hidromorfnoj zoni

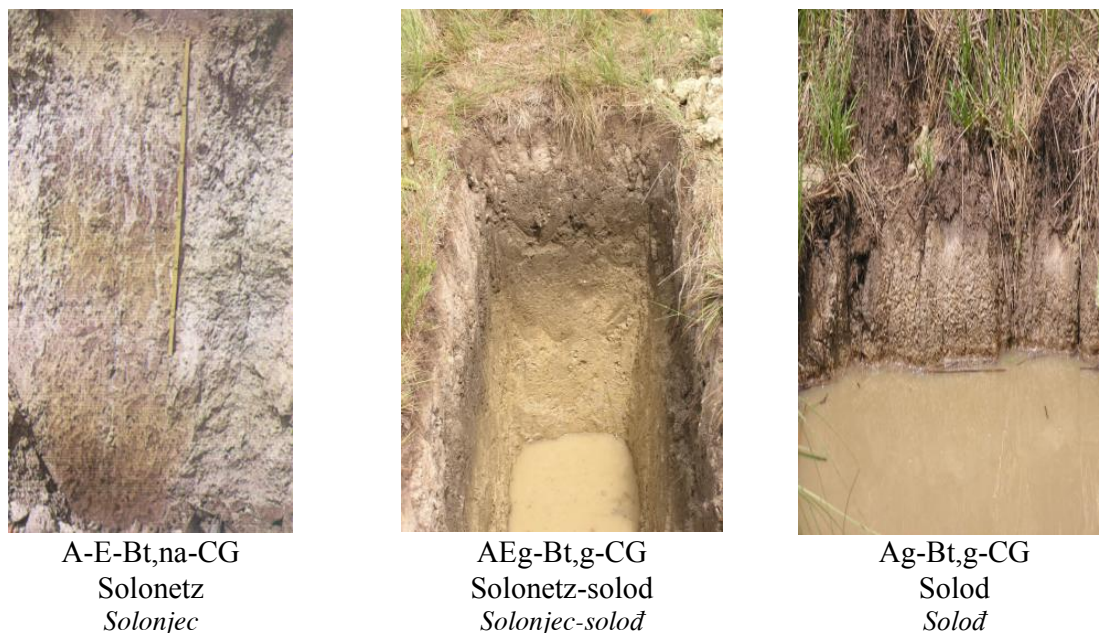


Fig. 5. Soils of halomorphic zone  
Slika 5. Zemljišta u halomorfnoj zoni

The selection of appropriate forest species is of considerable importance, regarding soil and hydrological characteristics, and natural biodiversity as well (Tomić, 1992; Galić, 2003; Jović et al., 1991).

Plant communities and the selection of appropriate forest species are presented in table 3.

The selection of tree species is performed according to natural biodiversity of forest tree species, adopted to particular ecological conditions.

Table 3. Selection of forest tree species for afforestation of eco-zones in Vojvodina (Data from Ivanišević et al., 2006)

Tabela 3. Izbor vrsta drveća za pošumljavanje eko-zona u Vojvodini (Podaci iz Ivanišević i sar., 2006)

Eco-zone <i>Ekološka zona</i>	Soil type <i>Tip zemljišta</i>	Plant community <i>Biljne zajednice</i>	Tree species <i>Vrste drveća</i>
Automorphic <i>Automorfna</i>	Chernozem <i>Černozem</i>	<i>Quercion pubescentis-petraeae, Aceri tatarico-Quercion</i>	<i>Quercus robur, Quercus cerris, Quercus patraeae, Quercus pubescens, Quercus virgiliana, Quercus deleschampi, Quercus polycarpa, Robinia pseudoacacia, Fraxinus ornus, Tilia argentea, Acer tataricum, Acer campestre, Sorbus domestica, Sorbus torminalis, Pyrus piraster, Cornus mas, Cornus sanguinea, Crataegus monogyina, Rhamnus cathartica,</i>
	Eutric cambisol <i>Eutrični kambisol</i>	<i>Carpino-Fraxino-Quercetum roboris, Carpino-Quercetum roboris</i>	<i>Quercus robur, Carpinus betulus, Fraxinus angustifolia,</i>
Hydromorphic <i>Hidromorfna</i>	Fluvisol	<i>Salici-Populetum nigrae, Populetum nigrae, Populetum nigro-albae, Populetum nigrae-Quercetum roboris</i>	<i>Salix alba, Populus nigra, Populus alba, Quercus robur, Fraxinus angustifolia</i>
	Semigley <i>Semiglej</i>	<i>Querceto-Fraxinetum angustifoliae, Populetum nigrae</i>	<i>Populus nigra, Populus alba, Quercus robur, Fraxinus sp, Carpinus betulus, Ulmus sp. Acer sp. Tilia sp. Aesculus hippocastanum, Juglans nigra, Juglans regia</i>
	Humogley <i>Humoglej</i>	<i>Querceto-Fraxinetum angustifoliae,</i>	<i>Quercus robur, Fraxinus angustifolia, Ulmus sp, Populus nigra, Populus alba, Celtis sp.</i>
	Eugley <i>Euglej</i>	<i>Salicetum albae, Fraxinetum angustifoliae</i>	<i>Salix alba, Fraxinus angustifolia, Acer negundo</i>
Halomorphic <i>Halomorfna</i>	Solonetz-solod <i>Solonjec-solod</i>	<i>Querceto-Fraxinetum angustifoliae, Querceto-Carpinetum</i>	<i>Quercus robur, Fraxinus sp. Carpinus betulus, Morus sp, Pirus piraster, Prunus sp, Malus sp, Elaeagnus angustifolia, Tamarix sp,</i>
	Solod <i>Solod</i>	<i>Querceto-Fraxinetum angustifoliae,</i>	<i>Quercus robur, Fraxinus angustifolia</i>
Antropogenic <i>Antropogena</i>	Deposol	<i>Robinetum pseudoacaciae, Populetum albae, Quercetum cerris</i>	<i>Robinia pseudoacacia, Populus alba, Quercus cerris</i>

#### 4. CONCLUSIONS

Vojvodina is situated in Panonian plain, mainly utilized for the production of agricultural crops. However, the stability of its ecosystems mainly depends on the percentage of forest cover. The actual afforestation degree (6,37%) is considerably lower than planned optimal degree (14,3%). It is not sufficient for sustainable development, dynamic balance and biodiversity of the ecosystem of Vojvodina.

Treeless areas cover 21558 ha of the zone of forest production. The afforestation of this area would increase the afforestation degree of Vojvodina by 1.00%.



In the zone of agricultural production there are several ecological zones according to the degree of endangerment by degradation processes and intensity of the soil exploitation: automorphic, hydromorphic, halomorphic and antropogenic

The habitats of steppe and forest-steppe type dominate in automorphic ecological zone. The dominating soil type in that zone, chernozem, is in some areas endangered by alkalization and less by salinization (mainly at the contact with halomorphic soils. Significant area (7268 ha) is with eutric cambisol, with process of acid degradation, mainly in Donji Srem. The establishment of new stands of trees and shrubs in the automorphic ecological zone, on the area of 28454 ha, would increase the degree of afforestation in Vojvodina by 1.32%.

The analysis of the habitat potentials in hydromorphic ecological zone shows the considerable participation of hydromorphic soils under the process of salinization, partially alkalization, whose utilization is limited by its physical and hydrological characteristics. The establishment of forest stands in hydromorphic zone, on the area of 77747 ha, would increase the afforestation degree of Vojvodina by 3.62%. The biological method of melioration of the salt-affected soils would be performed, as the most suitable system of sustainable development of these ecosystems.

The establishment of new stands of trees and shrubs in the zone under the degradation processes of salinization, alkalization and particularly acid degradation, on the area of 10459 ha, would increase the afforestation degree in Vojvodina by 0.49 %. These soils were covered by common oak-ash and common oak-horn-beam forests in the past. The ecological potential in halomorphic zone could be considerable area for increment of afforestation degree in Vojvodina, after detailed research of degradation process intensity and testing of adequate tree species in such ecological conditions.

By afforestation of treeless forest lands under the forest production and mentioned ecological zones in agricultural production, the afforestation degree in Vojvodina would be increased from present 6.37% to 12.92%. Beside, establishment of shelterbelts, green corridors, hunting resorts and non-forest greenery the afforestation of Vojvodina would support the sustainable development of its ecosystems. Along that, some tree and shrub species could be utilized in regulation of degradation soil processes in order to preserve this difficult-to-restore resource.

## 5. REFERENCES

- Galić, Z. (2003): "Izbor vrsta drveća za pošumljavanje različitih staništa Vojvodine", Doktorska disertacija, p.120, Poljoprivredni fakultet, Novi Sad, 2003. (in Serbian with English Summary).
- Ivanišević, P., Galić, Z., Rončević, S., Orlović, S. (1998): "Gajenje crnih topola na nasipima u zoni osnovne kanalske mreže (OKM) u Vojvodini", Topola No. 161/162: p.p.31-44, Beograd, (in Serbian with English Summary).
- Ivanišević, P., Galić, Z., Rončević, S., Orlović, S., Macanović, M. (1999): "Osobine zemljišta u zaštitnim šumama uz odbrambene nasipe u Vojvodini", Topola No. 163/164: 31-40, Beograd, (in Serbian with English Summary).
- Ivanišević, P., Galić, Z., Rončević, S., Pekeč, S. (2006): "Stanišni resursi u funkciji povećanja šumovitosti Vojvodine, Topola No. 177/178: p.p.106-137, Beograd, (in Serbian with English Summary).
- Ivanišević, P., Rončević, S., Galić, Z., Marković, M., Andrašev, S., Pekeč, S. (2005): "Shelterbelts as the factor of Ecosystem Stability in South Banat", Contemporary Agriculture, No. 3-4, p.p. 193-197, Novi Sad.
- Jović, N., Zagorka Tomić, Jović, D. (1991): "Tipologija šuma", Šumarski fakultet, Beograd, (in Serbian).

- Miljković, N. (1963): "Karakteristike vojvodanskih slatina", Savez vodnih zajednica NR Srbije, Novi Sad, (in Serbian with English Summary)
- Miljković, N. (2005): "Meliorativna pedologija", Univerzitet u Novom Sadu, Poloprivredni fakultet, Departman za uređenje voda, Novi Sad, (in Serbian).
- Orlović, S., Tomović, Z., Ivanišević, P., Vlatković, S., Galić, Z., Marković, S., Pejanović, R. (2006): "Mogućnost pošumljavanja u Vojvodini", Savetovanje "Pošumljavanje u cilju realizacije prostornog plana i razvoja poljoprivrede, šumarstva i vodoprivrede Republike Srbije", Zbornik radova, p.p. 98-128, Novi Sad, (in Serbian).
- Rončević, S., Ivanišević, P., Andrašev, S. (2005): "Forest and Nonforest Greenery in the Function of Enviromental Protection and Sustainable Development of Agriculture", Contemporary Agriculture, No. 3-4, p.p. 508-514.
- Tomić, Z. (1992): "Šumske fitocenoze Srbije" Šumarski fakultet, Beograd, (in Serbian).
- Vlatković, S. (1986): "Funkcije šuma i optimalna šumovitost Vojvodine", Doktorska disertacija, p. 321, Institut za topolarstvo, Novi Sad, (in Serbian).

### *Rezime*

#### **ZNAČAJ PODIZANJA ZASADA ŠUMSKOG DRVEĆA I ŽBUNJA ZA STABILNOST I ODRŽIVI RAZVOJ EKOSISTEMA U VOJVODINI**

*Ivanišević Petar, Galić Zoran, Rončević Savo, Kovačević Branislav, Marković Miroslav*

*U radu se analizira stanje šumovitosti Vojvodine i mogućnost podizanja zasada šumskog drveća i žbunja na novim površinama, radi dinamičke ravnoteže i održivog razvoja njenih ekosistema.*

*Šume zauzimaju oko 137000 ha, ili 6,37% od ukupne površine Vojvodine, odnosno u zoni poljoprivrednih regiona prosečno 1,5%, u nekim područjima i ispod 1%, čime ovaj prostor pripada kategoriji poljoprivredno-stepsko-šumskih oblasti, kao primer izraženo ugroženih ekosistema. Procenjena idealna šumovitost Vojvodine iznosi 14,3% od ukupne površine.*

*U zoni poljoprivredne proizvodnje neobrađive površine zauzimaju oko 150600 ha, ili 7%, odnosno u zoni šumske proizvodnje neobrasle, plodne površine oko 21500 ha, ili 1% od ukupne površine, što predstavlja deo potencijalnih površina, staništa za podizanje novih zasada šumskog drveća i žbunja.*

*Posebnu problematiku predstavljaju halomorfna zemljišta na površini od 106000 ha, odnosno zemljišta koja se naslanjaju na njih, a koja su zahvaćena istim degradacionim procesima (salinizacija, alkalizacija) na površini oko 127000 ha, koja se ekstenzivno koriste.*

*Podizanje određenih oblika šumskih zasada na ovakvim staništima predstavlja prirodan način njihovog korišćenja (u prošlosti postojale lužnjakovo-jasenove šume), pri čemu se istovremeno vrši biološka melioracija ovih zemljišta.*

*Ugroženosti ekosistema značajno doprinosi eolska erozija u jugoistočnim delovima Vojvodine, kao i izloženost nepogodama u plavnim područjima, što podizanje šumskih zasada može znatno ublažiti.*