

MEDICINAL HERBS AS PART OF THE DEVELOPMENT OF SUSTAINABLE TOURISM IN NATURE PARK "STARA PLANINA"

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Summary

Implementation of the concept of sustainable exploitation of medicinal plant resources facilitates the development of tourism offering and the related activities that would enhance the development of rural areas in this region. When managed in a sustainable manner, tourism can bring many advantages to protected areas, tourism industry and a local community. By using high-resolution satellite images and application of GIS technology, a method is developed for monitoring periodic changes in eco-systems. The collected data enable design of models that incorporate in themselves dynamics of changes taking place in natural ecosystems. By means of periodic imaging of characteristic areas, the spatial representation of eco-systems will be monitored, along with the changes in their composition and structure, which may seriously endanger the development of tourism potential in the region. The integral approach to the management of medicinal herb resources in the region of Mt. Stara Planina, based on the results of this study, necessitates the integration of these results with the results of the studies investigating views and needs of the local population, whose quality of life depends on sustainability of the process of collection and valorisation of this resource.

Key words: *Nature Park, Mt. Stara Planina, medicinal plants, sustainable tourism, GIS techniques*

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Introduction

Sustainable tourism represents a type of approach that incorporates within itself preservation and enhancement of natural resources and increase in value of local cultural characteristics and traditions. Sustainable tourism is a responsible tourism, aiming at an increase of employment and revenue derived from natural resources, while exerting little or no impact on environment

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or local culture (Banerji et al., 2011, Annie Abraham, 2012). The tourism developed based on medicinal herb resources is becoming increasingly popular in a number of developed countries, especially as a part of alternative medicine. This results in a growing demand for medicinal herbs, which, in consequence, may lead to an excessive use of this resource in natural habitats and, consequently, to the extinction of some species (Ratknić et al., 2011).

In Serbia, rural development is established as an economic, social and ecological priority. Diversification of rural economy in a socially, economically and ecologically sustainable manner is essential for improvement of quality of life, reduction of poverty level, as well as for combat against social and ecological degradation. Millennium development goals (MDG) are focused on extreme poverty and famine eradication, ensuring environmental sustainability and development of global partnerships (Stankov, 2007).

Sustainable rural development in Serbia depends on practical application of a combination of 'multi-functional agriculture' concepts and an integral approach to an all-encompassing improvement of life conditions and the socio-economic position of the village and rural communities, through an increase of employment opportunities outside agriculture (an increased diversity of economic activities), in keeping with the available resources.

The previous, as well as the present Serbian agricultural policy has been dominated by a ubiquitous fallacy, which identified the agricultural development with the rural development (Đorđević-Milošević, Milovanović, 2012). Tourism was recognised as the key sector capable of giving impetus to the process of rural economy diversification (Stankov et al., 2011).

A special emphasis is laid on environmental protection and conservation in rural areas, aiming at the preservation of specific habitats, plant and animal diversity, genetic resources of autochthonous species and races (Dowling, Fannell, 2003).

LEADER programmes still allocate more funds to agricultural support than to improvement of quality of life in rural areas. This may lead to conflicting situations, particularly in special protection areas (Natura 2000) (Strzelecka et al., 2014). These conflicts, a result of different level of participation of local communities, directly harm the development of rural tourism, rather than contributing to its development (Ćurčić, 2003).

This paper aims to demonstrate the possibilities of using medicinal herb resources in the role of development of tourism potentials of mountain massifs by presenting the case of Knjaževac Municipality, which encompasses parts of as many as three mountain massifs of Eastern Serbia.

Study area and method

The study was conducted at 'Stara Planina' Nature Park, within its part belonging to the territory of Knjaževac Municipality in Eastern Serbia. The territory of Knjaževac Municipality includes 86 settlements with 37,172 inhabitants and covers the area of 1,202 km². It is located in the eastern part of the Republic of Serbia, along the border with the Republic of Bulgaria. Knjaževac Municipality is a hilly-mountainous region, with the altitudes ranging from 176 and 2,169 metres and a prominent plain in the valley of the Timok River, which extends to the

Danube lowland. The territory is isolated from the neighbouring municipalities by mountain ranges. The hilly-mountainous character of the municipality is reflected in the fact that 75% of its territory is located at the altitude of 400m.

The major tourism potential of the municipality is 'Stara Planina' Nature Park. Tourism in this region is still at an emerging stage, with inadequately organized rural tourism development potentials, which are insufficiently connected to other forms of tourism (water, mountain, spa, hunting and fishing tourism, etc.).

The major potentials for tourism development include the region's morphological properties, as 40% of its territory consists of areas located at the altitude of 1,100-2,000 metres, suitable for development of winter-sport tourism. The ranges between 1,000 and 1,500 metres are suitable for recreational purposes and accommodation-catering facilities, while the lowest mountain areas at the altitude of 800-1,200 metres provide opportunity for development of health-recreational tourism. As a bordering area, the region has a large capacity for development of tourism in Serbia and Bulgaria. The Mt. Stara Planina region has at its disposal values in form of remains of old civilisations (numerous fortresses and remains of ancient towns), along with monasteries, churches, liberation war memorials, well-preserved ethnographic artefacts, potentials for development of hunting and fishing tourism, etc. (Dragović et al., 2011; Lazarević, 2015; Mijović, 2001; Miljović, Bugajić, 2004; Milošević, Markićević 2004; Ostojić, 2001). The integral part of 'Stara Planina' Nature Park's tourism offering are the resources of medicinal herbs, forest fruits and mushrooms, which may significantly support the revaluation of this region's tourism potentials, where biodiversity and natural ecosystem protection must be promoted, along with the development of organic agricultural farming.

For the purpose of identifying vegetation units, a method of application of high-resolution satellite images was applied for the assessment of medicinal herb resources and locations. This method enables reducing to a minimum expensive field work on data collection and, at the same time, ensures that a sufficient amount of accurate and practically applicable data is obtained (Ratknić et al., 2002). Remote-control data from satellite images were used concurrently with the conventional map presentations, such as topographic maps, inclination and exposure maps, hydrographic maps, pedological, lithological and geological maps, erosion maps, etc., and incorporated into an integrated geographic information system (GIS) (Ratknić et al., 2009).

In this manner, a multi-disciplinary integration was attained, providing answers to complicated questions related to use of space, environmental protection and development of tourism potentials in the region based on medicinal herb resources. Within the selected homogenous vegetation units, a field evaluation of medicinal herb diversity was performed, from the aspect of potentials for the development of eco-tourism. The Serbian habitat classification system is based on the EUNIS classification system (Davies, Moss, 2002; Lakušić et al., 2005).

Study results

A great abundance and diversity of local flora in Serbia can be illustrated by the total number of medicinal herbs. Over 700 medicinal herb species have been identified, out of which 400

are officially registered and 280 are sold on the market. 152 plant species are legally protected from being used and sold on the market, while their collection is subject to control. That means that 10% of the total species are of medicinal value (Matović et al, 2005; Stevanović, Vasić (eds), 1995; Cooper, Pezold (eds.), 2010). The diversity of edible herbaceous plants and wild fruits is even higher. Homogenous vegetation units on the territory of Knjaževac Municipality, within 'Stara Planina' Nature Park, identified for the purpose of assessment of potentials of medicinal herb resources, are presented in Figure 1.

Figure 1. Vegetation homogenous units in the assessment of potentials of medicinal herb resources



Source: The authors' map obtained on the basis of high resolution satellite image (Ikonos 80-cm Natural Color)

The highest number of medicinal species in the area of Mt. Stara Planina is represented in the altitude zone under 1,000 metres. Medicinal herbs are classified into five categories, depending on their potentials, the domestic and foreign trade and the possibility of regeneration (Ratknić et al., 2011). The groups are dynamic and depend mainly on the level of exploitation in previous years.

The first group includes species with significant resource potentials, however, characterised by an intensified exploitation, on account of a high market demand. These species have the highest economic importance. When collection is performed in a proper manner, population regeneration is regular. When plants are collected, they should be cut off, leaving 30-40% for in-semination, while rotation principle should be applied in selection. Under this type of treatment, population regeneration is regular.

In certain cases medicinal herbs fail to survive after being used, which may result in their gradual or abrupt disappearance (*Euphrasia officinalis*, *Asperula odorata*); therefore, it is necessary to establish a restricted-use regime. Similar problem is experienced by *Hypericum perforatum*, *Mellisa officinalis*, *Thymus sp. diversa*, *Rosa canina*, *Tilia cordata*, *Tilia platyphyllos*, *Tilia tomentosa*, *Matricaria chamomilla*; however, in this case, the restricted use can be avoided by plantation cultivation.

The second group includes broadly-represented species with the modest ecological needs, well tolerating an intensive exploitation and representing a significant resource. This group includes the following plants: *Achillea millefolium*, two Common broom species (*Cytisus sp.*), *Malva sylvestris*, *Teucrium polium*, *Veronica officinalis* and others.

The third group of medicinal herbs is characterised by an increased market demand and limited resources. This group includes the following plants: *Valeriana officinalis*, *Althaea officinalis*, *Adonis vernalis*, *Betonica officinalis*, *Juniperus oxycedrus*, *Asplenium trichomanes*, *Sedum acre*, *Origanum vulgare* and others. It is necessary to establish a regime of restricted use for plants in this group; however, the regime may be avoided by application of plantation cultivation.

The fourth group includes medicinal herbs of limited resources and limited demand. On account of numerous biological and ecological factors, their regeneration is protracted, while plantation cultivation is in most cases impossible. A significant number of plants in this group are included in the list of legally protected plants or plants under a special prohibition-of-use regime. The more important species among the plants in this group are the following: *Ruta graveolens*, *Alchemilla mollis*, *Sideritis syriaca*, *Drosera rotundifolia*, while some of the species under control are *Phyllitis scolopendrium*, *Hellichrysum aranarium*, *Orchis sp. diversa*) and others. Introduction of some of the above-mentioned species into the cultures will facilitate stability of the existing habitats and re-introduction of species.

The fifth group includes species widely known as 'the weeds'. They are of importance for medical purposes, and some of them are sold off in large quantities: *Urtica dioica*, *Centaurea cyanus*, *Cicoirium intybus*, *Arctium lappa*. Under adequate conditions, these species enable fast accumulation of significant quantities of biomass.

The plants collected in the altitude zone between 1,000 and 2,000 metres are difficult for cultivation, while preservation of their gene pool can be attained solely by prohibition of use. Some of the species within this group are the following: *Hieracium pillosella*, *Bistorta major*, *Betula pendula*, *Vaccinium myrtyllis*, *Vaccinium vitis idaea*. Certain poisonous medicinal herbs, of limited resources and included into the list of protected species, are also widespread in this altitude zone. Other species are under a special regime, on account of danger of resource depletion resulting from an intensive demand. The plants of significant economic importance in this zone are *Hypericum perforatum*, *Betonica officinalis*, *Thymus sp.*, *Tussilago farfara*, *Solidago virgaurea* and others. Ruderal species, such as *Urtica dioica*, *Rumex alpinus*, *Chenopodium bonus-henricus*, *Verbascum thapsiforme*, *Veratrum album* also have good resource potentials in this zone.

Both the taxa critically endangered globally and the taxa critically endangered in Serbia have been identified in the study area (Stevanović, (eds.) 1999).

The current disorganised and highly destructive use of medicinal herbs has endangered the survival of some medicinal herb species, which has become rare and may become completely extinct. The taxon critically endangered globally, recorded in the study area is:

Campanula calycialata V. Randelović and Zlatković – bellflower. – It populates rock gaps and grass fields at the altitudes of about 1,700 metres. In the only known site, it creates sub-alpine vegetation in rock gaps, of the *Silenion lerchenfeldianae* alliance. It appears on perm red sandstones, south exposure and a relatively flat terrain. It propagates by seeds and vegetatively. Two populations were found at the ‘Babin Zub’ location. The first population has between 10 and 20 specimens. The plants in the other population are nearly completely destroyed by constant tramping, resulting from the site location on one of the most frequently visited observation points at Mt. Stara Planina. The population figure has decreased by over 80% in last ten years. On account of their attractive appearance, plants are dug out from the soil and removed to private gardens, which additionally contributes to their destruction in natural habitats.

The taxa critically endangered in Serbia, identified in the study area, are the following:

Swertia perennis L – felwort – populates wet or peat-covered places around springs and streams in the mountain and sub-alpine belt. The ‘Arbinje’ site is a sub-association of sphagnum type - *Eriophoro-Caricetum flaviae allietosum sibiricae prov.* It propagates by seeds and vegetatively by lateral meristems from a crawling rhizome. It can be found at the following locations: ‘Kopren’, ‘Tri Čuke’ and ‘Vražja Glava Potoci’. At the ‘Arbinje’ site, six populations have been identified with the total number of 250 specimens. In the broader area of ‘Tri Čuke’ and ‘Kopren’ sites, 5-6 groups have been identified with 100-150 specimens. The species has become endangered as a result of excessive livestock grazing, nutrification and draining, as well as excessive collection of species for pharmacological research. A prohibition or restriction of livestock grazing at peat bogs should be imposed, along with a mowing restriction of peat meadows. Furthermore, it is necessary to impose prohibition of plant collection for medicinal purposes.

Eranthis hyemalis (L.) Salisb – winter aconite – It is recorded at the ‘Vrška Čuka’ site in ‘Stara Planina’ Nature Park, Zaječar, Knjaževac (Novi Han). Plant populations are exceedingly small-numbered. Forest clearing and an excessive plant collection - a result of attractiveness of its decorative flowers - produce a negative impact on the plant population figure.

Tozzia alpina L. *subsp. carpatica* (Woloszyczak) Dostal – Carpathian Tozzia – It can be found on highly wet and peat-covered soils, mainly at the stream springs and along mountain streams in the sub-alpine and alpine belt (at the altitude of 1,550-2,000m). It grows in microhabitats of flattened, terraced peat-bogs, watered from the higher positions, in which the sphagnum peat’s compact layer is broken by a constant outflow. It is recorded at the following locations: the Dojkičačka River basin, ‘Krvave Bare’ and ‘Arabinje’, ‘Gornje Lise’. The Mt. Stara Planina population of this plant covers only several square metres and includes less than 100 specimens. The population is endangered due to a reduction of water inflow from higher

positions, occurring as a result of water spring catchment or terrain drainage for construction of tourism facilities. The spring-adjacent areas are exposed to trampling and nutrification by a large and small livestock, while the uncontrolled use of peat as a vegetable and flower fertiliser, along with extensive picking of plants for herbarium collections, contribute to a further decline in the population figure.

Alnus viridis (Chaix) DC. subsp. *viridis* – green alder – It grows at the altitudes of 1,300-2,100 metres, near mountain streams on siliceous rocks. It was recorded at the following locations: the Dojkinačka River basin, 'Kopren', 'Bratkove strane', 'Arbinje', 'Popova Vunija', 'Propadla Vunija', beneath 'Gocina Kočina', beneath 'Tri Kladenca', the Jelovička River spring, 'Šišine Vunije' (Šošina tumba), the Toplodolska River basin, 'Krvave Bare' (beneath 'Vražja Glava'), 'Popova Livada', the Crnovrška River basin, beneath 'Žarkova Čuka'. The areas are few and show a constant tendency to decrease. The total sub-population covers about five hectares and includes approximately 1,000 specimens. It is exposed to defoliation by domestic animals in the vicinity of pastures. It sporadically grows at pastures, where prevents the growth of grass, for which reason it is being cut and cleared.

Primula halleri Honckeny – long-flowered primrose – It can be found in pastures and stone fields in the alpine and sub-alpine region in the zone of spruce and dwarf mountain pine forests. The endangerment level is low, on account of inaccessible terrain on which it grows. It should be protected within 'alpinetums' (alpine botanic gardens).

Senecio pancicii Degen - (no English common name) – At the Mt. Stara Planina, it is located near 'Kopren', in a habitat with a wet meso-climate, favourable for development of peat vegetation. Other locations are 'Bratkova Strana', 'Supra', 'Topli Do', 'Kopren', 'Krvave Bare', the Dojkinačka River spring, 'Govedarnik', 'Tri Čuke', the Jolovička River spring, 'Džemerovo Lojze'. Mountain peats are endangered by draining, livestock grazing, nutrification and trampling. These negative impacts are intensified as a result of an extension of the main forest road, which connects 'Topli Do' with 'Dojkince', runs across the 'Krvava Bara' mounting pass and represents a potential tourist route. The sub-population is estimated at 1,000 specimens, with a tendency to be further reduced.

Ranunculus lingua L. – great spearwort – it populates wet soils, marsh and mire edges and peats at the altitudes under 1,200 metres (Dimitrovgrad, Smilovci, Odorovačko and Smilovsko Blato). The number of specimens is under 50 within a 10m² area. The species is endangered due to marsh draining, land reclamation works and transformation of habitats into land used for other purposes (agricultural land, fishponds).

Sparganium natans L. – bur-reed – It populates mountain oligotrophic mires, marshes, ponds, canals, sphagnum peats (Knjaževac, Podvis, Svrliški Timok). The species is endangered as a result of mire draining and technical regulation of the watercourse.

Eryngium serbicum Pančić – (no English common name) – It is widespread in the surroundings of the town of Pirot, (Osmakovo, Crnoklišta), in shrubs of continental hilly-mountainous regions, dry thermophilic lowland and hilly grass habitats on limestone, siliceous terrains.

Genista subcapitata Pančić – (no English common name) – It is widespread at 'Vidlič'

and 'Rakoš'. It populates dry thermophilic hilly grass habitats, as well as the habitats above the upper limit of forest vegetation, precipitous cliffs, compact rock blocks and terraced precipices.

Stachys milanii Petrović - (no English common name) – It is recorded in the region of town of Knjaževac (Vratarnica) and Pirot (Staničenje, Sinjevac), in salt marshes and salt-marsh meadows, steppes, agricultural fields and other types of ploughland.

Corallorhiza trifida Chatel- early coralroot – It can be found at several locations at Mt. Stara Planina (Babin zub, Sveti Nikola, Sokolov Kamen). It populates wide-leaf deciduous and natural coniferous forests, high strongly-acidic peat bogs and flat peat bogs, usually in depressions.

Orhis militaris L. – military orchid – It populates shrubs and thickets, natural or slightly ameliorated wet or mired valley meadows, and high-grass communities near streams in hilly-mountainous regions. It can be found in pastures and mowing meadows in lowland, hilly and mountainous and pre-mountainous areas.

Discussion

Numerous researchers have pointed out to the fact that 'there is a need for a new paradigm of rural development...'. (Blamey, 2001). Its main characteristics should be focusing on territories, rather than sectors, and emphasising investments rather than subsidies. Furthermore, goals such as levelling up living conditions in rural and urban regions, an increase of farm revenues, farm competitiveness, should be complemented by competitiveness of rural regions, valorisation of local resources, exploitation of unexploited resources (Björk, 2007; McAreave et al., 2011). The key actors in implementation of such paradigm are not only national governments and farmers, but also all levels of authority (supranational, national, regional and local) and various local actors (public, private, non-governmental organisations) (OECD, 2012).

The development of tourist capacities based on natural resources is a long-term process. Therefore, it is necessary to conduct their rapid evaluation, spatial location and the assessment of the endangerment level (Mišić et al., 1978). High-resolution satellite images, with the application of GIS technology, were used for that purpose.

Based on the existing renewable resources of Mt. Stara Planina (Mišić et al., 1978), it is possible to develop a significant economic activity, including: collection and processing of forest berries and fruits (wild cherry, wild pear, wild apple, rowan berry, whitebeam berry, hazelnut, cornus mas berries, wild rose, sloe berry, bilberry, blackberry, raspberry, strawberry, juniper berry, etc.), collection, processing and final processing of medicinal, aromatic and seasoning herbs, etc.

Renewable natural resources of medicinal herbs, their processing and final processing will enable creating employment opportunities for a large number of workers of different occupations. In addition, it will facilitate dislocation of manufacturing plants from industrial centres and establishing smaller plants in rural areas (Reckoska et al, 2002).

The abundance of medicinal and related species, represented in the diverse flora of Mt. Stara Planina, offers large possibilities for their rational use. However, careless, irresponsible and, most frequently, unskilled collection of wild medicinal herbs in the last few decades has contributed to destruction and excessive reduction of numerous valuable species in their natural habitats. This also may be due to the lack of participation of interested parties in the decision-making process. (Samardžić, 2014).

The local population that collects herbs for sale most commonly receives an inadequate financial compensation for the unprocessed herb material. Most wild species, medicinal species in particular, are still to be collected in wilderness, which means that it is very important to maintain eco-systems in which they live. On the other hand, sustainment of local communities and care for their well-being also represent a priority. Sustainable collection that includes processing at farms or within the community, along with cultivation of specific plants as a form of 'on-the-spot' protection and a source of large amounts of herb material in demand by the market, are increasingly seen as the key factors for the strategy of preservation of species collected in the wilderness and their habitats. This is particularly important given the current and potential contribution of the species to the local economies and their increased value for collectors in a long-term period. The basic idea is to use at the local level the material collected non-destructively from nature, and, in that manner, to support the existence of the local population and the species, as well as the diversity of eco-system. These resources should not be overestimated in that respect, nor should local economies rely solely on them. Hence there is a need to recognise and strengthen the role of local population in the process of herb registration, monitoring and assessment of impact, as well as to integrate the use of wild fruits into the overall management of natural resources.

Cultivation of medicinal herbs will require their wider spread into different (for agriculture) marginal areas, mountains, marshes, sandy and similar terrains. Small local farms will play an important role in that process, as that activity may secure the opportunities for increase of revenue derived from intensive land management. That benefit may also be of indirect nature, as the introduction of extensive cultivation of medicinal herbs may help local population to manage valuable terrains and rural areas in a sustainable manner, and earn money in the process. Maintaining agricultural land of high natural value and semi-natural areas attractive for tourists, along with other products obtained in these areas, may increase the interest for their rural tourism offering. Given the fact that medicinal herbs play one of the central roles in rural customs, these products, being traditional medicaments, with added value may become an important merchandise for sale, if sufficient funds are invested into processing and packaging that adhere to modern standards (Jaramaz, Jaramaz, 2009). Local level cultivation of medicinal herbs is also important for prevention of environmental degradation and loss of genetic diversity, as well as for prevention of undermining incentives for wild population preservation.

Conclusion

A full revitalisation of hilly-mountainous regions can be attained by fulfilling some critical conditions: construction of modern road network, organisation of modern traffic (road, postal,

telephone communications), organisation of health and veterinary services, organisation of cultural, entertainment and sport activities, creating conditions for education of young people. Realisation of the above-mentioned requisites, with the abundance of natural resources, will create preconditions for development of tourism, trade and other activities. That will contribute to the return of the population to these regions. Medicinal herb resources may greatly encourage development of economic and tourist potential of the Mt. Stara Planina broader area.

Work on gaining knowledge and the assessment of medicinal plant potentials is a highly complex task, requiring close and permanent cooperation between scientific, professional and business organisations. Various activities involved in collection, primary and final processing of wild medicinal herbs, including application of the produced preparations, can be accompanied by tourism offering initiated by the rural population of Knjaževac Municipality.

Tourism may change the socio-economic balance of the rural area, if the revenue derived from tourism services is higher than the revenue generated from traditional activities. However, when managed in a sustainable manner, tourism can bring many advantages to protected areas, tourism industry and a local community.

By using high-resolution satellite images and application of GIS technology, a method is developed for monitoring periodic changes in eco-systems. The collected data enable design of models that incorporate within themselves dynamics of changes taking place in natural eco-systems. By means of periodic imaging of characteristic areas, the spatial representation of eco-systems will be monitored, along with the changes in their composition and structure, which may seriously endanger the development of tourism potential in the region. The conducted study created a significant starting point, providing information on diversity, representation, the level of endangerment and resource grouping of medicinal herbs in the area of 'Stara Planina' Natural Park; however, this study should be extended by further research. The integral approach to the management of medicinal herb resources in the region of Mt. Stara Planina, based on the results of this study, necessitates the integration of these results with the results of the studies investigating views and needs of the local population, whose quality of life depends on sustainability of the process of collection and valorisation of this resource.

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LEKOVITO BILJE KAO DEO RAZVOJA ODRŽIVOG TURIZMA U PARKU PRIRODE “STARA PLANINA”

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Sažetak

Na osnovu koncepta održivog korišćenja resursa lekovitog bilja moguće je razviti turističku ponudu koja bi svojim delovanjem unapredila razvoj ruralnih područja na ovom prostoru. Sa druge strane kada se upravlja održivo, turizam može da donese mnoge prednosti zaštićenim područjima, turističkom sektoru i lokalnoj zajednici. Korišćenjem satelitskih snimka visoke rezolucije, a uz primenu GIS tehnologije, razvijen je metod praćenja periodičnih promena u ekosistemima. Prikupljeni podaci omogućavaju izradu modela koji u sebi sadrže dinamiku promena u prirodnim ekosistemima. Periodičnim snimanjem karakterističnih područja pratiće se prostorna zastupljenost ekosistema, kao i promene u njihovom sastavu i strukturi koje mogu u velikoj meri da ugroze razvoj turističkog potencijala na području. Integralni pristup upravljanja resursima lekovitog bilja na području Stare planine, zasnovan na rezultatima ovog istraživanja, zahteva njihovo integrisanje sa rezultatima istraživanja stavova i potreba lokalnog stanovništva, čiji kvalitet života zavisi od održivosti procesa sakupljanja i valorizacije ovog resursa.

Ključne reči: *Park prirode, Stara planina, lekovito bilje, održivi turizam, GIS*

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