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## **GEOGRAPHIC INFORMATION SYSTEMS IN THE PAY OF ALTERNATIVE TOURISM –METHODS WITH LANDSCAPE EVALUATION AND TARGET GROUP PREFERENCE WEIGHTING**

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### **Abstract**

There is a large variety of types of rural areas and many of them are rich in landscape beauty. However, their preserved culture and traditions are revalued in today's rapid transformation of lifestyles. Alternative tourism is thus an emerging potential to economically support these areas, at the same time helps to preserve natural and cultural heritage.

The methods provide sophisticated means to analyse the characteristics and the potential attractiveness of landscape and cultural attractions from the viewpoint of alternative tourism development. Homogenous tourism sub-regions can be defined and the most suitable development scenarios can be found to the certain areas.

**Keywords:** alternative tourism, Geographical Information System (GIS), landscape evaluation, attraction evaluation, tourism target groups, segmentation

## 1. Introduction

The 'energy and environment-intensive production patterns of mass tourism today places enormous stress on the natural assets...' (Curtin and Busby, 1999, 136). Alternative tourism, gaining importance from the 1980s, is defined in contrast to conventional mass tourism as 'tourism [that] no longer concentrates on economic and technical necessities alone, but rather emphasises the demand for an unspoiled environment and consideration of the needs of local people' (Fennell, 1999: 9). This softer type of approach places natural and cultural resources in the forefront of development activities and spatial planning, with a special regard for impacts on local economic development (Aubert 2001, Csapó 2004, Fennell 1999). It increases attention not only as an alternative to mass tourism, but also as a means to promote a country's/region's economic development and environmental conservation. (Bunruamkaew and Murayama, 2012). Nor mass neither alternative tourism can be considered to prioritise specific tourism products. Sustainability as a horizontal policy appeared both in mass and alternative tourism. However, it can be said that sustainability issues rather belong to alternative tourism. Concerning Prosser (1994) 'four forces of social change are driving this search for sustainability: (1) dissatisfaction with existing products; (2) growing environmental awareness and cultural sensitivity; (3) realisation by destination regions of the precious resources they possess, both human and natural, and their vulnerability; and (4) changing attitudes of developers and tour operators' (Prosser, 1994, 31). Alternative tourism can be defined with the principles of sustainable development, and those type of activities can be named as alternative tourism which have labels such as 'soft, green, responsible, harmonious, quality, gentle, eco, progressive, sensitive, community, appropriate' (Cazes, 1986, Prosser, 1994). At the same time rural tourism, cultural heritage tourism, as well as ecotourism (water-, bicycle-, equestrian-, trekking- and hiking-related activities) can be ranked to alternative tourism, based on their basic features (Cater, 1994, Cazes, 1986, Fennell, 1999, Gyuricza, 2008, Handbook, 2011, Prosser, 1994). In this paper we use the above mentioned segments as alternative tourism.

The benefits and impacts of alternative tourism are widely discussed. The potential benefits for the local level include generation of financial resources, job creation and promotion of environmental learning. Threats include environmental degradation, unequal economic resurgence and instability, negative socio-economic and cultural changes within the local community. The embeddedness of alternative tourism into the local economy requires thorough quantitative and qualitative analysis and assessment during the development phase (Whelan, 1991, Gulinck et al. 2001, Briassoulis, 2002, Hajnal, 2006, Péntzes, 2009).

Development activities, tourism development decisions and land use planning can cause changes in landscape. Therefore it is essential to design an in depth (landscape) analysis of the existing resources in order to identify a use for the natural assets that will not prejudice future development (Senes and Toccolini, 1998).

The present study reveals some of the findings of a Hungarian-Croatian Cross-border co-operation programme (IPA HU-HR). The aim of the work has been to create an underlying development framework for a region with lagging behind economy and

high natural richness, to be the ground for actual tourism development tenders based on empirical research. This underlying research includes the assessment of sectoral and spatial development concepts of the region, the GIS based mapping of the territory, a complex (natural and cultural) landscape assessment and a distinctive assessment for the potentials of a development based on specific tourism target group/market segment preferences.

This paper presents two methodologies and assesses their ability for alternative tourism development for an economically and socially underdeveloped territory which is rich in environmental and cultural values. A complex, GIS based natural and cultural landscape evaluation and a target group preference distinction were applied to define the location, the concentration and the peculiarities of places and attractions and existing services. Target group preferences were made quantitative with a weighing method. Another aim of the paper is to reveal new opportunities to modify or fine tune existing product specific tourism region delimitations. In this analysis we concentrate on the supply part of alternative tourism. The demand assessment was a part of other studies, however their consideration is not relevant for the aim of this paper.

The outcome of the analysis is GIS supported recommendation for the decision makers who design alternative tourism development plans. In this paper the analysis and the methodologies are presented.

## **2. Study area**

The study area of the project is the 40-40 km wide belt stretching along both sides of Drava River, including a small bit of Danube River bank (see Fig. 1). Being a border river, the Drava cuts the study area into a Hungarian and a Croatian part. Despite differences in administrative delimitations and data accessibility an identical methodology for the empirical research has been applied for both countries. The Hungarian part of the study area covers 14 230 km<sup>2</sup> in the South-Western part of the country, including Baranya, Somogy and Zala counties, while the Croatian part (Međimurska, Koprivničko-križevačka, Virovitičko-podravska, Osječko-baranjska, Varaždinska, Bjelovarsko-bilogorska, Požeško-slavonska and Vukovarsko-srijemska counties) covers 16 757 km<sup>2</sup>. This paper contains the results for the Hungarian side, touching upon Croatian insights only if it is necessary for better comprehension or comparison.

Along the Drava River, both sides of the border area are historically peripheral, characterized by poor economic performance. During the soviet era both countries were subject to socialist ideology, however, former Yugoslavia was not part of the Soviet ascendancy area. The whole area had a very unfavourable position in terms of investment due to the geopolitical risks on the Hungarian side and the Yugoslav civil war in the 1990's. The area is still representing an underdeveloped and increasingly backward region with GPD per capita levels deep under the national averages (Croatia 73% (2006); Hungary (72%) (2007); Source: Hungarian Statistical Office, Croatian Statistical Office.)

The number of settlements on the Hungarian side of the region is very high (803 in a 14231 km<sup>2</sup> area), however, with remarkably uneven distribution of

population. A greater part (79,33%) of the settlements in this rural area has less than 1000 inhabitants, hosting a total of 23,20% of the population of the whole area. The majority of these villages have an ageing demographic structure; the population is decreasing dramatically in most of the villages and the education and adaptability level of the active population is relatively low. The distinct problem in this size category is accompanied by the increasing ratio of Roma population. In many cases the expression “inactive settlement” has been coined where the overwhelming majority of the population has neither salary nor wage, but lives on different types of allowances (Hajdú, 2003). The EU planning period and its funding round of 2007-2013 has had little if any impact on the general state of development in the region. Subsidies have been concentrated in urban areas leaving henceforward blank rural areas especially close to the border.

The weak access to transport infrastructure in the region is to be explained by its geographical as well as macro-regional location, being left intact by European mega-corridors and peripheral for South-Eastern countries (Erdősi, 2003). Insufficient local road and rail infrastructure is also a result of weak economic performance stemming from the border side position.

Due to the above historical reasons natural assets remained in good state. From the 1990s high attention has been drawn to the natural protection in this area. On the Croatian side Kopački rit was designated on the List of Ramsar areas in 1993. On the Hungarian side Danube-Drava National Park (and Directorate) was established in 1996 in order to pay high attention on the natural heritage. In the 2000s, between the two states several attempts can be detected in order to create an extended common natural protection area, however the conception is still an idea as economic interests (Croatia would like to build another hydroelectric station on the Drava) hamper the feasibility. Despite all these – especially on the Hungarian side –, several visitor centres, thematic (geological, biological) trails were established by the National Park Directorate in order to show the natural heritage of the region.

Tourism has a varying economic significance within the area. The role of tourism is relatively high in the bigger cities due to their heritages (e.g. Pécs, Osijek). Some areas have higher role due to wellness and bath sites (e.g. Harkány) or being a quality wine area (e.g. Villány-Siklós wine area) (Somogyi, 2003, Aubert et al. 2010). Owing to the adjacent draining systems, to the level of pollution and to relatively heavy water-borne freight, the Danube is less attractive for water tourism, whilst on the Drava, one of the most pristine waterways of Europe, water tourism is on the increase in co-operation with natural protection authorities. On Drava River the traffic load of large motorboats is minimal due to strict environmental protection and the lack of river regulation on the one hand, and to water level fluctuation and bed motion caused by the daily performance variability of water power plants situated on the upper sections of the river on the other.

Protection of natural assets and biodiversity is essential in this region. The Danube-Drava National Park established along the two rivers is the largest protected area of national importance in the region. Wetlands are ex-lege protected, waters are continuously monitored under the umbrella of the European Water Framework Directive (EC 2000/60). Not only is the Drava under national natural protection for-

and-aft on the Hungarian side. Almost 20% of the study area is NATURA 2000 area, 6.6% is under high national protection and 1.1% is under strict national protection totally closed from the public (Fig. 1.).

The preserved natural environment of the study area creates a potential for alternative tourism, which is still unexploited, supposedly due to the backward socio-economic situation of the region. On the other hand, tourism development bears a risk of natural degradation and thus requires careful consideration of investment activities.

### **3. Materials and methods**

To support the decision-making process of regional tourism development and in order to delimitate thematic tourism zones a two-fold methodology was applied (see Fig. 2). Based on existing geographical approaches of landscape classification (Van Eetvelde and Antrop, 2009), Fig. 2. shows the model of the whole evaluation process. Firstly, a complex landscape assessment (CLA) was carried out (left side of Fig.2) based on available geographical and landscape data. The second pillar of the research (right wing of Fig. 2) is an empirical assessment of 2077 actual attractions that were surveyed during field work (see details in Annex 1 and Annex 2). Here a Complex Potential Value (CPV) index was created that allows in-depth evaluation of the attraction capacity of different territories from the point of view of different tourism target groups. A common examination of the two aspects allowed for a complex, in depth analysis and results. Both the landscape evaluation and the complex potential value were developed in order to guide decision makers in the allocation of development resources. Results help to identify the most promising tourism segments in certain areas or in previously delimited tourism zones, in some cases proposing modifications to the delimitation of the latter.

#### *3.1 Landscape evaluation*

Van Eetvelde and Antrop (2009) refer to the landscape as being defined by unique relations between natural and human components. These natural and human components were represented in the landscape analysis (e.g. in the form of morphology or land use) in order to show the richness and diversity of the landscape (Ode and Miller, 2011). It was also regarded that alternative tourists have a wide scale of preferences in which landscape aesthetic is a significant factor.

The methodology of landscape evaluation was developed partly based on Gyuricza's (1998) work. The landscape experiences, the scenery, the relief and its diversity are the most important factors for alternative tourism (Gyuricza, 1998). Satisfaction with landscape view, place attributes have a positive influence on revisit, recommendation hence on attractive potential intentions (Prayag, 2012). Land use type, classification of the protected areas, surface waters as landscape aesthetic features and recreational potential should also be taken into consideration (Lóczy, 2002, Szilassi, 2003). Therefore in the landscape evaluation we used seven indicators shown in Table 1 as determining factors of the landscape from the point of view of alternative tourism. (All landscape and geographical data were collected from respective authorities and national data sources.) Each factor has a scale of basic values derived from the actual geographical attributes of the analysed spatial units.

The dissection index characterises the orography of the surface (Gyuricza, 1998) as an attractive feature for alternative tourism. It is calculated as the rate of relative and absolute relief within one cell. Other landscape attributes such as lake or river proximity, dominant land use category, presence of protected area or watching points were involved in the evaluation as well.

The factors are weighted according to their importance for alternative tourism. In order to make the weights as objective as possible we used Gyuricza's (1998) classification as a basis. In the weighting process relating to relief we used Gyuricza's (1998) weight. In the case of water, watching points and vegetation we used lower weights than Gyuricza. The reason was that we also took into consideration protected areas as a physical geographical attraction factor for alternative tourism and we intended to keep a balanced weighting between relief and other factors. As Gyuricza (1998) argued relief is one of the most important factors for tourists as a "landscape experience" and also relief determines other factors (such as density of water-network, vegetation) which all form landscape scenery (Gyuricza, 1998, 178). In our research protected areas also have a high importance for some segments of tourists (cyclists, equestrians, hikers) hence the strength of the protection is also regarded. The closeness of surface waters (lakes and rivers) was also considered as a positive factor for alternative tourism. Waters were ranged in four size-categories, the larger size entailing higher value, assuming a more diverse selection of activities. In the assessment of the scenery we took into consideration the evaluation methods and values of aesthetic importance proposed in the work of Csemez and Kollányi (2010).

The spatial units of the analysis were defined as grid cells with sides of 0.01° (=36 arc sec) resulting 11 584 rectangles of approximately one km<sup>2</sup>. (Recently several researchers use this tool e.g. Gyuricza, 1998 or Van Eetvelde and Antrop 2009). Each cell received a complex landscape value based on its geographical and landscape attributes multiplied with the weights of Table 1. The Shuttle Radar Topography Mission (SRTM) collected data for creating a digital elevation model (DEM). This DEM covers all landmasses on Earth between 60°N and 57°S. As an altitude database the SRTM project was available with resolution level of 3 arc sec. These data are publicly available at <http://seamless.usgs.gov> (Rabus et al. 2003, Blumberg, 2006, Ehsani and Quiel 2009). This finer grid has 12 points across in both directions in our 36 x 36 arc sec. "evaluation cells". Every rectangular cell holds exactly 144 altitude points. The mean (absolute relief) and standard deviation (relative relief) of these 144 values in each cell were categorised in such a way that higher CLA index belongs to higher variety of the surface (for detailed categorisation see Table 1.).

All data were referenced to the same geographic system (WGS84) and combined in a Geographic Information System using MapInfo 9.5 software.

### *3.2 Field research*

After identifying the potential attractions (desktop research), each attraction was visited during field work. (Additional attractions missing from the preliminary list were identified in situ.) At local perception the first task was to decide whether the attraction was proper as a potential destination or facility for alternative tourism or not. If yes, a data collection template (see in Annex 2) was filled out recording the

most important attributes of the attraction and photos that were taken on site. Then data recorded in the template were digitalised. The template was the basis of unified data collection and analysis. The whole database about the attractions was built up by the data gained from fieldwork, completed with geographical data (i.e. relief, hydrogeology, road-system etc).

A total of 2077 attractions were recorded, however, due to technical issues the final database consists of 3900 rows. This is a matter of data-recording – since in the case of two questions (type of attraction and target group) a total of three variations of answers were possible, in some cases the same point is recorded in two or three variations.

Forty five types of attractions were previously defined and grouped into seven categories (Annex 1). Twelve target groups were identified based on existing classifications (Jancsik et al. 2010), tailored to the specific features of the project: Holiday making, Ecotourists, Hikers, Cyclists, Equestrian, Water-based activities, Hunters, Cultural tourists, Wine and food lovers, Wellness, Health treatment, Incentive travel. The importance of the place was decided by the field worker. A general guide described the categories of importance as seen in Table 2.

Categorization (only in the case of catering and accommodation facilities) and state of condition reveals quality conditions of the attractions. The assessment of points was comprehensive, aided by a common guide for fieldworkers, however, due to the “human factor”, some degree of subjectivity is possible in the case of the information that was drawn from the templates.

A large amount of information was gained from the templates and allowed for extensive descriptive statistical analysis.

### *3.3 Evaluation of the attractions based on target group preferences*

The underlying aim of the entire analysis was to appoint certain territorial units (i.e. tourism zones) that have development perspectives for certain well defined target groups. Generally viewing the assessed points, no areas of heavier concentration can be detected. However, it was supposed that a distinction of attractions along target groups would entail stronger concentration areas, facilitating the adjustment of tourism sub-regions to existing potentials. For this deeper and more sophisticated method a description of each of the 12 target groups’ preferences was applied (Jancsik et al. 2010).

The evaluation took into consideration existing tourism development strategies and theoretical tourism zones in the region. The classification (Aubert et al. 2010) that was a basis in this project classified the region into 11 tourism sub-regions and rendered a leading tourism product to each of them (see details in the result section). This classification is a useful guideline in specifying potential development areas, however, as it comes out later in this evaluation, in some cases the borders of sub-regions (Final Report 2011, based on Aubert’s work) divide important concentration areas of tourism attractions. Thus, this classification is used in the evaluation, but later some modifications are proposed to it as a result of the CPV assessment.

The evaluation of attractions summarises all available qualifying information for each assessed attraction and unites them in a complex potential value (CPV) of

different territorial units. A large part of this information was gained from the template, another part from basic GIS maps and other external sources of information. (In the concept of CPV, complexity refers on one hand to the large variety of information (physical, geographical and infrastructural) assessed for each attraction, and, on the other, the distinction of the importance of attributes from the viewpoint of each target group.)

Based on the above described information, “quality factors” were produced. The factors are identical for each observed attraction and each target group. The basic values of each “quality factor” move along a scale, according to the specific attributes of the observed points. For example, the basic values for the quality factor of “importance” will be 1 if importance is “local”, 2 if “regional”, 3 if “national” and 4 if “international”. The basic value is multiplied with a weight according to the preferences of the different target groups defined before. The same quality factors will have different weights in the case of different target groups using a 1-5 scale, where 1 shows very small preference, while 5 means very strong preference. 0 means total inadequacy. (For the basic values and weights see Annex 2.) Weights were standardised so that the sum of weights is identical for every target group. Thus, the final value – the CPV - of a certain attraction will be the basic value multiplied with the standardised weights according to the preferences of the given target group.

## **4. Results**

### *4.1 Landscape analysis*

The complex landscape values of the grid cells were illustrated in dot density maps. The values each cell could receive varied between 6 and 75 points (with mean=25.2 and st. dev.=13.1.). Fig. 3. shows the final result of the landscape evaluation.

High values based on CLA belong to cells located in mountainous areas. Besides the hilly areas high scores (typically with 40-50 scores) can be found in the Drava and Danube river banks. Five areas (23 grid cells) can be identified that received scores above 60. Among these, three are located in the forestry Mecsek-mountain bearing the state of national and international (NATURA 2000) level of natural protection. One area is also in a mountainous area (Villány-mountain) with a special micro-climate, also a high level of natural protection with endemic, ecologically unique species. The fifth area is lying along the river bank of Drava. Many parts of the Drava-bank are nationally protected, covered by forests. The reason for mountainous areas receiving the highest scores is that in the method the mountainous attributes appear with three factors (absolute relief, relative relief and dissection index) while others, e.g. water relativeness, with only one. The reason was that dissection, as a natural related landscape view, was considered as more attractive for alternative tourism (Gyuricza, 1998) and in a mountainous area attractions and out-door activity types (trekking, hiking, mountain biking, horse riding, ecotourism etc.) are more diverse than near waters (Jancsik et al. 2010).

### *4.2 Descriptive statistics about attractions*



The descriptive statistical analysis itself revealed some discrepancies in the tourism supply of the region. The overwhelmingly large proportion of observed attractions is only of a local importance. The region's endowment with nationally or internationally important attractions is markedly weak. The distribution of the attractions is quite even in the case of attractions, and, on the contrary, there are remarkably few services linked to attractions (e. g. boat or bicycle rentals etc.). The most frequently mentioned target groups for the observed attractions were cultural tourists, holiday makers, cyclists, hikers and eco tourists. This fact is favourable from the point of view of nature-related tourism, but may also indicate that the region is not characteristic of any target groups of a higher level of specialisation.

The accessibility of attractions is good, however, public transportation service needs to be improved (Table 3). Almost all of the attractions can be reached on low traffic roads or bicycle roads. Surprisingly, there are certain areas where low traffic roads or cyclist routes are available, but there are no attractions dedicated to cyclists to reach on these routes. Another discrepancy occurs at the Drava bank in the Baranyai Drávamente tourism zone (see Fig. 4.), where the majority of boat ports are located, but there are no catering facilities nearby the sport-boat-ports.

#### *4.3 Complex evaluation based on target group preferences - CPV*

The results of the target group preference evaluation are 12 target group tables. Each attraction in the tables has a complex potential value based of a certain target group preference. Based on these complex values the target group specific tourism potential of a certain area can be assessed. In order to have a very refined picture, the areas for which CPVs are summarised are 500 meter radius, overlapping circles. The centres of circles are set on a 100m\*100m grid network. The value of a circle centre is the sum value of complex values of observed attractions within the 500 meter radius circle.

For the visualization of the complex potential values allocated to the 500 meter radius circles, graduated maps were used where the size of the bubbles refers to the strength of a given circle centre. The 12 maps produced for the target groups reveal that, despite the very even distribution of undistinguished attractions, when regarding only the attractions dedicated to the certain target groups, and with the calculated potential attractiveness value described above, intensive and characteristic concentration areas can be found in the case of all target groups.

The maps also have important implications for the preliminary specification of tourism zones/sub-regions (white borderlines on Fig. 4). Strikingly, some previously defined tourism zone borders indeed split important concentration areas for almost all of the target groups. An example of this can be seen on Fig. 4 in the case of bicycle tourism. This delimitation of previously defined tourism sub-regions was based on statistic data (accommodation capacity and performance data, local tourism tax), tourism networks and development activity, decisive tourism products and present attractions (Aubert et al. 2010). The delimitation was also based on extensive consultation among local stakeholders, local governments and tourism experts (Handbook, 2011) – this in turn bears the threat of the picture being distorted by subjective interests. Impoundment of these sub-regions took into consideration the

peculiarities of the ecotourism activities i.e. cycling-, equestrian-, water based-, and hiking-related development possibilities. We argue that using the CPV method we can refine and re-draw the delimitation of the area, allowing for more homogenous and suitable tourism zones for the specific target groups. Whilst the former delimitation renders target groups to areas based on the relative strength of a target group within one previously defined area, the CPV method renders areas to target groups based on the absolute strength of certain areas (building up from the smallest possible units, cells) taking into account their preferences.

Based on the CPV not only maps can be constructed but a matrix produced that shows the potentially strong characters of each previously defined touristic zones in the study area. Creating this matrix the sum of complex values in the case of each target group were ordered along the touristic zones (Table 4.). The cells highlighted with grey show the highest values within a given touristic zone, and ruled cells the highest values along the target groups. Bold numbers signal the coincidence of highest values relative to both aspects. This provides a suggestion of appointing target groups to tourism zones.

Additional insights can be gained when comparing the classification based on the complex assessment of sites with the one in the Handbook, 2011 (based on Aubert et al.'s work (2010)). In general, the two classifications harmonize with each other although, in some cases, there are some important differences in the dedication of a certain tourism sub-region to a tourism target group. Remaining at the example for cyclists, table 4. indicates that the areas that bear the highest importance from their point of view are Zalai-dombvidék, Muramente, Nagykanizsa-Zalakaros, Somogyi-Drávamente. This is in contradiction with the Aubert classification that sees development potential for the cyclist target group in different tourism zones (see Table 5).

The complex potential value of attractiveness allows for another implication. Comparing the CPV to the sum of importance ranks (described in Annex 1.) the attractions have received within a certain touristic sub-region and with regard to target groups, the development perspectives of different sub-regions can be derived. Importance ranks can be regarded as the present state of development of the attractions and the CPV as the potential attractiveness from the point of view of a target group. If low level of importance accompanies with a high level of the complex value, it implies that the supply is not well developed enough compared to its potential, and there are good prospects for further development.

## **5. Discussion**

Landscape is an extremely complex category. Landscapes do not only have a physical reality, but also mental, social and cultural. Therefore they should be considered as holistic and dynamic entities. (Antrop, 2000, Antrop and Van Eetvelde 2000, Tress et al. 2001, Van Eetvelde and Antrop 2004). Analysing natural landscapes and their attributes is an important resource for the types of alternative tourism that are analysed in this paper. A complex approach should support a circumspect decision making and adequate delimitation of potential (tourism) development zones.

The first and foremost issue that can be interesting to discuss in this article is the wider applicability or generalisation of the methods used. The complex landscape evaluation and the evaluation applying tourism target group/segment preferences is of particular interest here, the former being tailored and improved for the special attributes of the research field and the latter developed within this project. Both methods aimed to aid the appointment of potential tourism development zones. CLA successfully combined three existing approaches, enriching the outcome with favourable attributes:

- Objectivity: The data used derive from geographical and landscape attributes
- Flexibility: The weights can be modified thus the method can be fine-tuned to more specific needs of certain target groups.
- Refinement: The density of grid cells allows a thorough measurement of the physical attributes of the landscape.

The CLA can give opportunity to appoint areas which bear the highest landscape values, thus the best potentials from the viewpoint of alternative tourism.

The evaluation based on target group preferences has the same advantage of flexibility due to the weights given to each of the attributes. The main difference is that in this case the actual information on tourism suprastructure and attractions were taken into consideration. The field work that gave the basis of information gathering was spatially comprehensive, however it focused on alternative tourism, thus wellness, health, hunting or incentive tourism were to some degree neglected parts of the assessment. The evaluation based on target group preferences applied the information gained from the CLA, promoting a geographical evaluation of the region based on a wide range of factors. The benefits of applying target group preferences, combined with information about the actual tourism suprastructure and the landscape, were unambiguous, considering that the formerly even-looking distribution of attractions and tourism suprastructure turned to have clear concentration areas, almost in all cases of the target groups. This, i.e. concentration areas being revealed for different target groups allowed for a specification of tourism regions and an attachment with adequate tourism products. Since there already exists such a specification (Aubert et al. 2010), a comparison has been carried out, and this revealed some discrepancies between the two. It is important that the existing classification used a large amount of tourism sector statistical data (e.g. accommodation capacity and performance data, local tourism tax), while the present assessment based on field work observation and took into consideration physical attributes, aesthetic values and infrastructural/accessibility condition of the attractions. Because of the data structure, Aubert et al. (2010) could only use the settlement (administrative border) as an evaluation unit. However, in our methodology in both – CLA and CPV – methods the grid cells as a geographical basis allowed for a more flexible application for any kind of geographical area or any territorial delimitation.

The differences between the two specifications touch upon both the delimitation and the association of tourism sub-regions with specific tourism products and target groups. This implies a necessity for the reconsideration of existing tourism sub-region delimitations. Although there are differences between the Aubert et al. (2010) methodology and our presented analysis, we argue that the former, based on supply

and demand parameters and our assessment based on physical, geographical, cultural (land use) attributes and target group preferences complement each other.

Beside all these, the analysis revealed some inner weaknesses of the region, namely the lack of necessary tourism suprastructure at possibly important attractions, the uncoordinated and sometimes oversized support of catering and accommodation facilities that seem to disregard the spatial allocation of important sights, as well as the very poor endowment of public transportation facilities and the low quality of roads. The latter handicaps might as well be cured with the development of alternative means of connection, facilitating active means of alternative transport in tourism, e.g. cycling, horse riding, hiking and paddling. These activities are themselves important branches of alternative tourism, at the same time they can operate as important means to connect attractions in a string.

Summarising the results of the research and the evaluation process what decision-makers can gain is twofold. The evaluation process provides a “tool” for decision-makers that physically appoints the most suitable location for different types of tourism developments, based on the GIS databases, alternative tourism potentials and the attributes of surveyed attractions,. On the other hand evaluations reveal the hindrances of development in certain areas (e.g. areas that have high landscape values but poor accessibility or inadequate infrastructure). Low level importance rank with high level of CPV indicates that supply is not underdeveloped compared to its potential.

## **6. Conclusion**

Industrialisation and globalisation have been inevitable transformation forces affecting agricultural societies and landscapes (Mörtberg et al. 2007). In such territories as the South-Western part of Hungary, where the considerable decline of the agricultural sector has not been accompanied by a dynamic tertiary sector development and urbanisation, rural areas preserved their nature-close characteristics which, turning into appreciated attributes in the last few decades, require special attention.

The challenge of tourism development of a backward region (as in the Drava region) has been a long debated issue. The potentials are grounded upon the natural assets of the area. However, economic and social backwardness, the scattered pattern of moderately attractive sights and the lack of coordination of tourism supply activities have inhibited the breakthrough of touristic utilisation of the region. The poor transportation accessibility increases the remoteness of the region. However, this can be an advantage for nature related tourism. The permeability of the region and the accessibility of tourism attractions can be enhanced by thorough organisation and the provision of elementary infrastructure for equestrian tourism, cycling, hiking and paddling. The resolving of the scatteredness of attractions and the smooth operation of alternative transportation modes both demand strong coordination.

Since finding an economically viable sector for local development is essential in this region, alternative tourism is supposed to be more adequate solution here than some few large scale investments. Although, the variety and attractiveness of

attractions could be enhanced by some additional facilities that fit into the net of planned and existing chain of attractions.

Due to the flexibility of the two methods developed in this project they can be applied for the spatial appointment of touristic investments, once the overall strategy for the whole region is prepared. The methods provide important complements (and in some cases even challenge) for the existing delimitations of tourism zones. A complex and comprehensive approach is needed during the planning to ensure coordination, synergies and the channelling of economic benefits and achievements throughout the region. It is important to mention that the focal point of the project was alternative tourism, thus the weight of other tourism concepts in CPV is disproportionately low.

A compromise should be found between rigid natural protection (on the Hungarian side) and the need to open up further parts of the protected areas for touristic purposes. Because of the natural vulnerability of the region, the area should be treated as one single development unit with alternative tourism being its main function.

The study presented two methods applied for alternative tourism in a territory with relatively low concentrations of existing tourism attractions. However, because of their objectivity and flexibility, the methods can be used in other types of areas as well.

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## Tables

Table 1: Landscape evaluation factors and weights

Factor*	Basic values	Weight	Maximum point
1. Absolute relief	1-7	1	7
2. Relative relief	1-8	2	16
3. Dissection index	1-5	3	15
4. Watching points	0 or 10	1	10
5. Surface water	0-5	2	10
6. Relative evaluation of vegetation/land use	0-4	4	16
7. Protected areas	3-5	4	20

*Basic values of landscape analysis factors:*

- Elevation: <160m: 1; 160-180 m:2; 180-200 m:3; 200-230 m:4; 230-260m: 5; 260-300 m:6; 300m<: 7 (here we can calculate with MEAN)
- If the m/km<sup>2</sup> is : 0-5m: 1; 6-10m: 2; 11-20m: 3; 21-30m: 4; 31-50m: 5; 50-75 m: 5; 76-100m: 7; 101-145m: 8
- Dissection index: the rate of relative and absolute relief in one cell. If the rate is: between: 0-0,05: 1 point; 0,05-0,1: 2 points; 0,11-0,2: 3 points, 0,21-0,3: 4 points; 0,31-0,4: 5 points; 0,41< : 6 points.
- If there is not: 0 point, If there is: 10 points
- Concerning Gyuricza (1998) classification and regarding the size of rivers:  
Lake size: small (<10 km<sup>2</sup>)-3 points; medium (10-100 km<sup>2</sup>) - 4 points; large (<100 km<sup>2</sup>) - 5 points  
River size (catchment basin): S (10-100 km<sup>2</sup>): 1 point; M (100-1000 km<sup>2</sup>): 2 points, L (1000-10000 km<sup>2</sup>): 3 points; XL (>10000km<sup>2</sup>): 4 points
- Settlements, artificial surfaces (industrial, commercial units, mine, dump and constructions sites): 0 point; cropland, agricultural areas: 1 point; vinery/garden: 2 points; pasture, meadow, wetland: 3 points; forest: 4 points;
- Protected areas: NATURA 2000 areas 3 points; National protected areas 4 points; National Park areas 5 points.

Table 2: Distinction of importance ranks

Importance	Description
* local	Visit if you are there
** regional	Worth a detour
*** national	Main attraction of a destination - it is worth to go only for this attraction
**** international	Worth to go only for this attraction

Table 3: Accessibility of attractions by car and by community transport

Accessibility of points	Accessibility by community transport			
	NO	YES	Total	
Accessibility by car	NO	58	3	61
	YES	256	1751	2007
	Total	314	1754	2068

(information not available in case of 9 points)

Table 4: The sum of CPV in the zones

Tour. zone name	Pécs-Mecsek	Siklós-Villányi	Mohácsi	Baranyai Drávamente	Somogyi Drávamente	Belső-Somogy	Nagykanizsa-Zalakaros	Zalai dombvidék	Muramente	Zselic-Szigetvár
Holiday	9195	2060	3881	590	7763	3466	3606	6876	1793	2223
Cyclists	5726	2455	121	1000	4521	2611	5449	7700	1189	3287
Water based	918	249	222	442	2594	1078	269	717	69	842
Hikers	3244	457	110	182	6439	3167	6175	4859	965	1272



Equestrian	453	422	75	329	174	238	294	288	0	135
Hunters	307	60	0	0	547	599	524	197	0	258
Eco tourists	3907	1084	242	420	3642	2432	2296	1861	270	4511
Cultural	9707	4562	43	406	4313	7593	5181	3977	833	7232
Health	260	356	0	0	50	653	241	345	90	92
Wellness	352	460	0	0	50	602	814	652	46	245
Gastro	1172	780	178	0	672	243	742	433	126	295
Incentive	242	238	0	0	0	0	586	89	0	0

Legend:

1	highest value within a given touristic zone
2	highest value along the target groups
3	coincidence of highest values relative to both aspects

Table 5: Sub-regional product matrix

Tourism Products	Baranyai Dráva-mente	Belső Somogy	Mohácsi (Duna-mente)	Muramente	Nagykanizsa-Zalakaros	Pécs-Mecsek	Siklós-Villány	Somogyi Dráva-mente	Zalai Dombvidék	Zselic-Szigetvár
Rural tourism										
<b>Bicycling</b>										
<b>Water based tourism</b>										
<b>Trekking and hiking</b>										
<b>Equestrian tourism</b>										
Fishing										
Hunting										
Bird watching										
Ecotourism										
Culture tourism										
Health and wellness										
Wine tourism										
River cruising										
Business tourism										

Legend:

Primary (characterising) products
Secondary (complementary) products

Source: Handbook, 2011, p. 121.

## Figures

Fig. 1: Protected areas in the study area

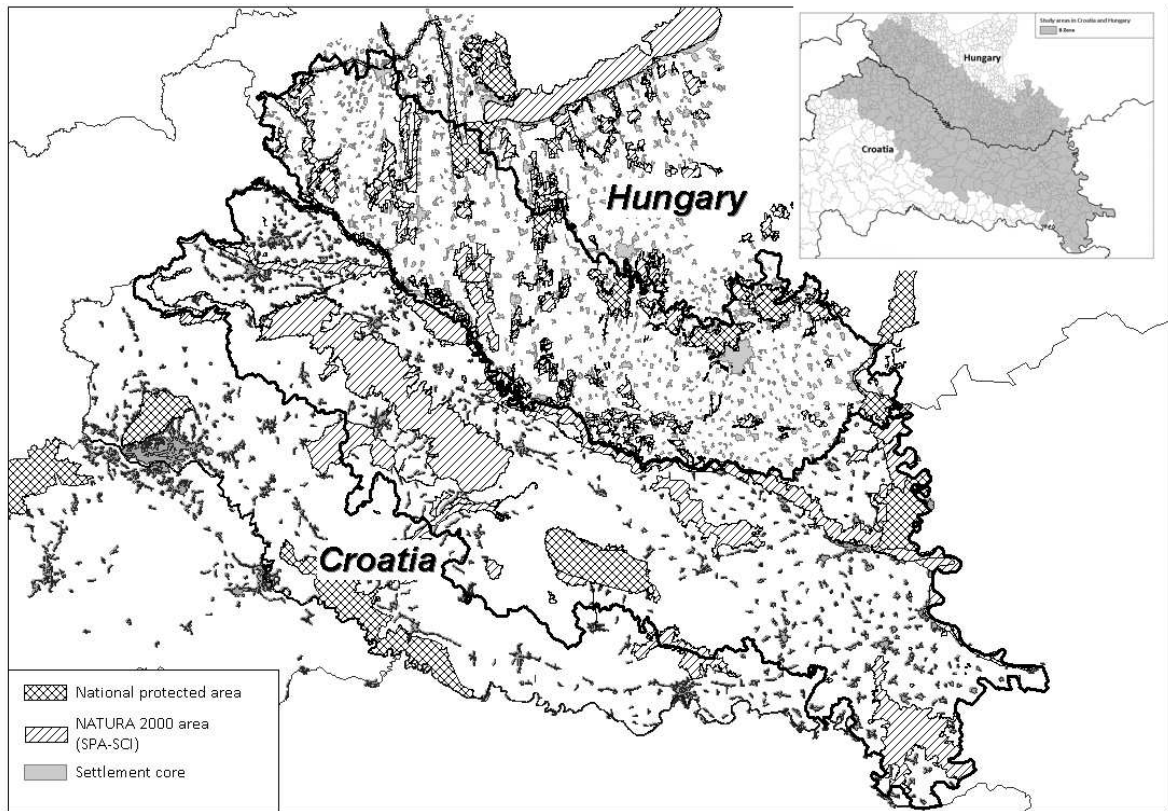


Fig. 2: The model of the evaluation processes

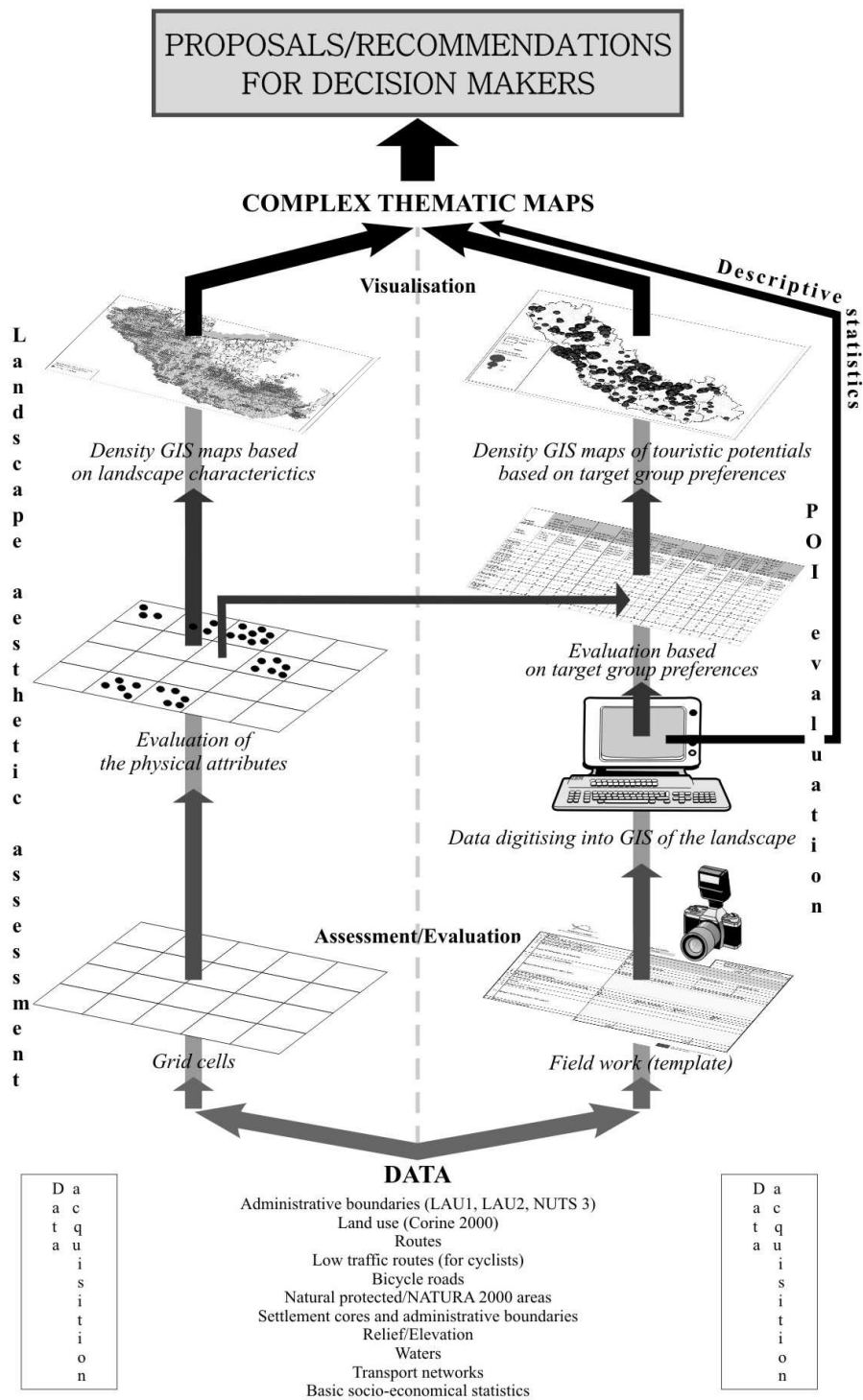


Fig. 3: Map of complex geographical landscape assessment (CLA) with protected areas

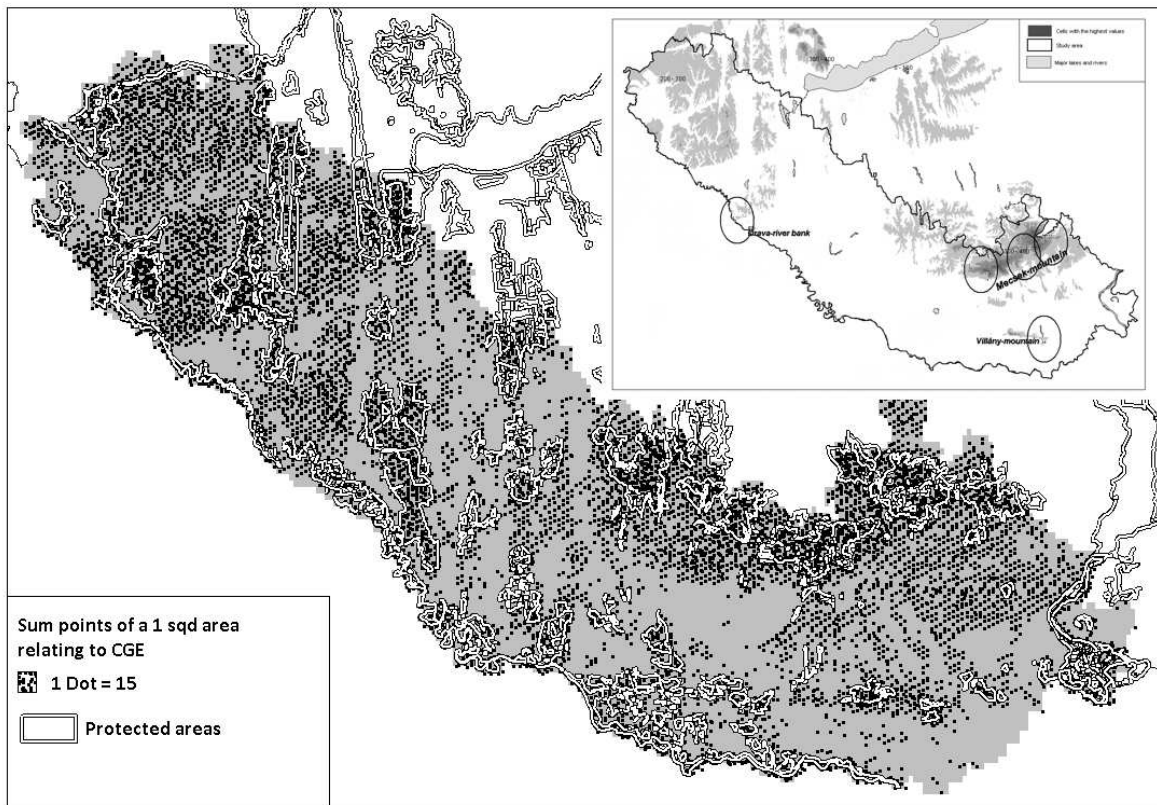
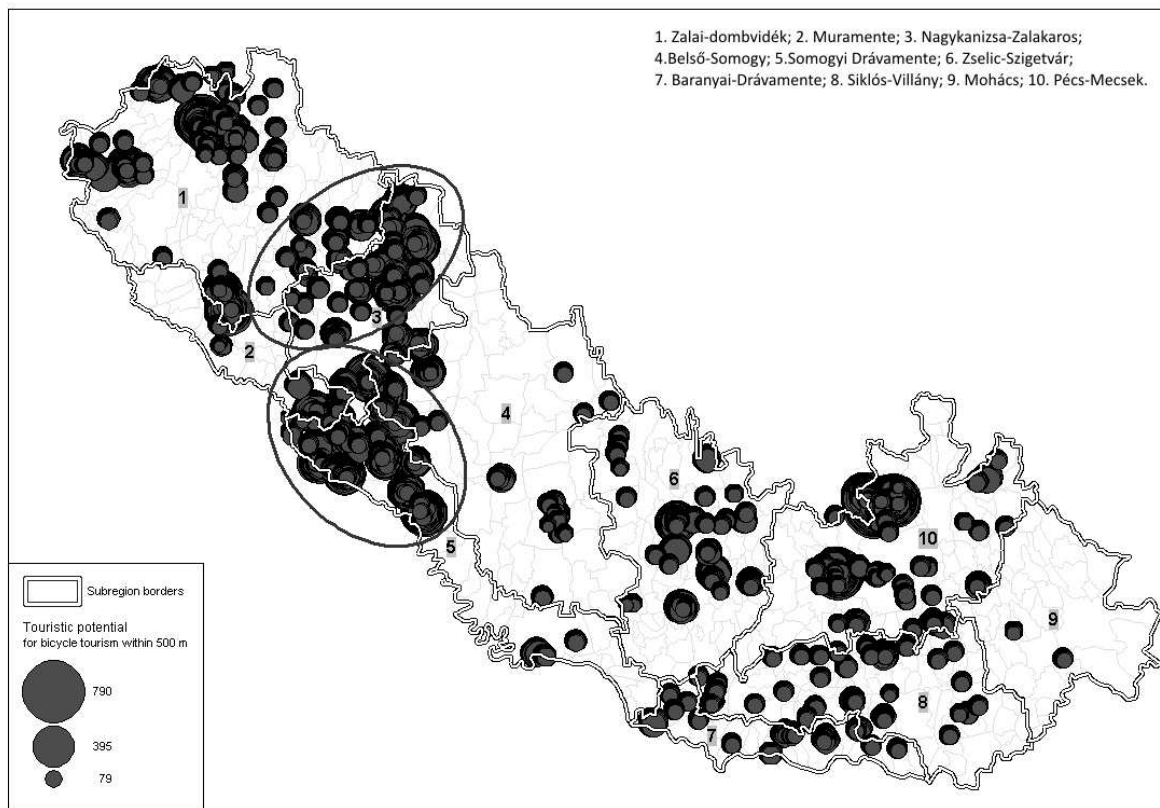


Fig. 4: Concentrations of high CPVs within the formerly defined tourism zones – cyclist target group



## Appendicies

Annex 1: The distribution of assessed attractions among types

Categories	Type of attractions	Assessed points
Tourism suprastructure	Hotels, pensions and similar	168
	Campsites	38
	Private accommodation	191
	Other accommodation types	84
	Wine cellars	34
	Important restaurants	168
	Other catering	111
Attractions	Important churches	377
	Pilgrimage sites	1
	Castle/residency/manor/mansion/ruin	94
	Other built cultural sights	347
	Flora related natural sights	89
	Fauna related natural sights	26
	Landscape and geological formation related natural sights	61
	Museums and exhibitions	134
	Craftsman workshop	31
	Study trail and forest schools	31
	Events	39
	Fishing points	109
	Hunting points	12
	Openside bathing points/potential ice skating points	20
	Organised trips (with starting points specified)	14
	Thematic parks	7
Extreme sport sites	6	
Services	Sports-grounds/fitness/wellness centres (without accommodation)	69
	Bath/Spa	33
	Horse riding ranches	30
	Sports or touring equipment rentals	13
Other	Ports	19
	Ferry boat point	3
	Bridges	4
	Bicycle resting basis/point with facilities	10
	Other	33
Route points	Resting place	105
	Shelter	10
	Well/fount	13
Routes	Walking/tracking routes	10
	Bicycle routes	5
	Horse riding routes	2
	Pilgrim or other thematic routes	1
	Other thematic routes	4
Areas	Wine routes/areas	4
	Spectacular view of a street (more than one buildings)	2
	Landscape	2
	Visual pollution	12

Target groups	categorization of hotels and restaurants	importance/significance OF accommodations	importance/significance OF catering	importance/significance OF Cultural attractions *	importance/significance OF Natural attractions **	importance/significance OF Fishing points	importance/significance OF Sport sites ***	importance/significance OF Bath/Spa	importance/significance OF Horse riding ranches	importance/significance OF bicycle resting points	importance/significance OF other resting place, shelter and well/fountain	importance of hunting points
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Annex 2. Basic values and weights of qualifying factors based on the preferences of target groups

basic values	*=1; **=2; ***=3; ****=4; *****=5	local=1; regional=2 national=3 international=4	local=1; regional=2 national=3 international=4	local=1; regional=2 national=3 international=4	local=1; regional=2 national=3 international=4	local=1; regional=2 national=3 international=4	local=1; regional=2 national=3 international=4	local=1; regional=2 national=3 international=4	local=1; regional=2 national=3 international=4	local=1; regional=2 national=3 international=4	local=1; regional=2 national=3 international=4	local=1; regional=2 national=3 international=4
<b>Weights</b>												
Incentive travel	5	5	5	4	3	0	4	5	2	0	0	0
Health treatment	5	5	5	2	3	0	2	5	0	0	0	0
Wellness	5	5	5	3	3	0	2	5	0	0	0	0
Wine and food lovers	5	5	5	3	3	0	0	2	0	1	3	0
Cultural tourists	4	4	4	5	4	0	0	2	0	0	3	0
Hunters	5	5	5	0	4	0	0	1	0	0	0	5
Water-based activities	3	3	3	3	5	3	2	3	0	0	3	0
Equestrian	5	5	5	3	5	0	2	1	5	0	3	0
Cyclists	3	3	3	4	5	0	2	1	0	5	4	0
Hikers	3	3	3	2	5	0	2	1	0	0	5	0
Ecotourists	3	3	3	3	5	0	0	1	0	2	5	0

Holiday making	3	3	3	4	4	2	3	4	2	2	2	0
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Target groups	state of condition	access. By car	access by comm. transport	access by bike	Location in protected area	absolute relief	Type of lake within 1km*	Type of river within 1 km	land use	type of road within 1km
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*Annex 2 continued*

basic values	untended=1; average=2 well maintained=3	no=0; yes=1	no=0; yes=1	1=not-acc. 2=hardly 3=with difficulty 4=easily	0=not prot. 3=NATURA2000 4=national prot 5=national park	actual relief/200	1-4 according to largest lake size 0 if none	1-4 according to largest river size 0 if none	artificial=1 cropland=2 vinyard/garden=3 meadows, wetlands=4 forest=5	highspeed/motorway =4 first cat road=3 second cat road=2 bypass/service road=1
Weights										
Incentive travel	5	5	3	1	3	2	2	2	1	5
Health treatment	5	5	3	0	2	2	1	1	1	5
Wellness	5	5	3	0	1	1	1	1	1	5
Wine and food lovers	5	4	4	2	4	3	3	3	3	4
Cultural tourists	5	4	4	3	5	4	4	4	5	4
Hunters	5	5	0	0	5	3	1	1	5	5
Water-based activities	5	5	1	0	5	1	5	5	5	5
Equestrian	5	4	0	0	5	3	3	3	5	4
Cyclists	4	3	4	5	4	5*1/	3	3	5	5*1/
Hikers	3	3	5	1	5	5	2	2	5	3
Ecotourists	3	3	5	4	5	4	5	5	5	3
Holiday making	5	4	4	3	4	3	4	4	4	4

\* Cultural attractions are the followings: Important churches, pilgrime sites, Castle/residency/manor/mansion/ruin, Other built cultural sights, Museums and exhibitions, Craftsman workshop, Events, Thematic parks

\*\* Natural attractions are the followings: Flora related natural sights, Fauna related natural sights, Landscape and geological formation related natural sights, Study trail and forest schools, Organized trips (with starting points specified)

\*\*\* Sport sites are the followings: Openside bathing points/potential ice skating points, Extreme sport sites, Sports-grounds/fitness/wellness centers (without accommodation), Sports or touring equipment rentals