Landscape Synthesis of the Liptov Basin

SUMMARY

Society's interests and needs increase hand in hand with its multisided development and their satisfaction reflects in the organization of society's life and projects by means of corresponding departments in the landscape. The problem of harmonization of various socio-economic interests in rational land use conducts geographic research towards the diagnosis of landscape system and solution of its spatial organization. The conception and methodology of landscape synthesis [26] we draw on in our diagnosis of landscape and solution of priority of spatial organization of interests in the Liptov Basin (Liptovska kotlina) are worded in this context.

Landscape Diagnosis

Landscape diagnosis embraces several procedures which respect the principle of landscape's complexity and the objective of the work, i. e. the evaluation of landscape structures for application of socio-economic functions. Detailed and relatively differentiated field research and field mapping (scale 1:10,000 and 1:25,000, aerial photographs at scale 1:33,000) of the original, natural layer as well as cognition of its transformations and present conditions of the landscape's cultural layer were the starting points we issued from in our investigation.

1. *Diagnosis of natural structure* on the following procedures:

— It drew on the cognition of the evolution of the original landscape and its reconstruction by man's interference, with the tendency to emphasize especially the bonds and regularities forming the autoregulatory landscape mechanism. *Genetic scheme* provided for the cognition of matter-spatial transformations of natural structure in dynamic dimension and contributed to the understanding of broader connections and to elucidation of the regularities of internal organization, which controlled the processes of its formation.

— The process of natural layer reconstruction was aimed towards the identification of the so-called key properties relevant especially from the aspect of their socio-economic application. Typization, conceived from the aspect of principles of classification of spatial units has been employed as the most suitable form of interpretation. Respecting the key propreties as classification characteristics, their spatial projection was expressed in the Map of *Natural Landscape Types* (Map 1).

2. *Diagnosis of the anthropogenic structure* involved the following stages:

— *Time-historical scheme* which presented the most important and far-reaching events of the human layer evolution. It elucidated the process of settlement of the territory as well as that of man's intensifying influence upon the landscape.

— Land use inventory which proved a suitable method for the identification of present-day conditions of the human layer. In our work we have classified and interpreted the results of land use inventory with the tendency to grasp the intensity of natural layer's transformation and man's influence upon the landscape. In this respect we have classified the basic forms (categories) of land use of the investigated region into areas that have been most transformed and influenced by man up to the areas that have been protected. In our more detailed typization of the basic forms we drew on the identification of key properties of the human layer in particular(i. e. those which were relevant from the aspect of the development of socio-economic activities) and interpreted them spatially in the Map of *Land Use Forms* (Map 2). According to their interconnections we also analyzed the present-day character of spatial organization of the human layer.

— In making the diagnosis of the anthropogenic structure \ye also analyzed some *basic socio-economic properties,* i. e. those which exhibited the hierarchy of nodal structures (commuting, centrality of settlements according to their functions, the size and mutual choric relations of settlements, etc.). The cognition of these properties and relations is closely connected with dynamism and its organization in the landscape, which in its final consequence evokes synergic and choric changes in the landscape structure.

— Cognition of properties and relations which involve both the natural and human layer. The cognition of these interactions made it possible for us to emphasize the dependence of the human layer on the natural one and to express the share and intensity of control processes (socio-economic and natural ones) and regularities as well as the intensity and correctness of bonds. Consequently, when making the diagnosis of the present-day cultural landscape it was necessary to know and take into account the hierarchy of spatial landscape structures both in all-state and broader spatial context, especially as far as solution and strategy of functional structure

planning were concerned. The above attributes were included in the Map of *Types of the Present-day Landscape* (Map 3).

3. Explicit evaluation of the landscape and its properties from the aspect of utilizing the socio-economic functions, i. e. *the evaluation of landscape's potential,* represented part of this diagnosis. The investigation of landscape's potential involved on the one hand the search for its qualitative values and selection of potential functions and on the other, their measurement.

— *Selection of potential functions* was predetermined by social needs and their hierarchy given by the degree of evolution and regulation of functioning of the socio-economic sphere, by properties (offer) of the landscape in regional dimension, as well as by broader spatial relations and their hierarchy. Havingtaken into account all these aspects along with the diagnosis of natural and anthropogenic landscape structure, 10 basic potentials were selected as landscape preconditions for materialization of socio-economic functions in the Liptov Basin such as landscape's potential (suitability) for:

— PI — urbanization according to its natural properties,
— P2 — urbanization according to its socio-economic (settlement) structure,
— P3 — construction of roads,
— P4 — agriculture,
— P5 — water supply making use of ground waters,
— P6 — water supply making use of surface waters,
— P7 — recreation,
— P8 — tourism,
— P9 — forestry and
— P10- — nature protection.

In their diagnoses differences of the norms of socio-economic functions, which facilitated their easier spatial identification, measurement and comparisons were also taken into consideration.

— *It the measurement of the basic potentials* we used the method of exact identification of multipreference units of the area. According to the properties which condition the application of potential function measurement, map transparencies of the types of natural landscape, land use forms and of the types of present-day landscape were used. Exact preference of a certain spatial unit (and/or type or form having the same value with regard to the classification characteristic) to another one, according to the employed criteria which constituted the norms and conventions of the corresponding socio-economic resorts, represented the essence of our measurings. The measurement itself actually consisted of partial stages, involving individual criteria. Besides an extraction of the characteristics relevant from the aspect of the evaluation, it claimed mainly determination of the weight, i. e. quality of these characteristics among themselves. In order to solve these relations we made use of the logic method of partial comparison, which finally enabled us to interpret multiple perferences of each potential in an uniform way. The arranged units of area were gradually added figures from 0 to 5 for each potential. Besides the order of figure succession, they also expressed the rate of application of individual potentials in the given unit of area, ranging from extremely low (0) to very high (5). Spatial projection of the ten principal quantified potentials was represented by partial outputs for each department, respectively. The outputs were presented in digital maps (Maps 4— 13) constructed for further solution and computer processing. We recorded them from transparencies of diagnostic maps (Maps 1—3) by means of regular network of points, i. e. intersections of axes oriented according to the orthogonal coordinates X (in W—E direction) and Y (in N—S direction) in a distance of 500 m. Respecting its shape, the whole area of the Liptov Basin was covered with a network of 2,416 points. The points on the borderline of the neighbouring units of area were always ascribed higher values, except the value = 0, which was preferred in coding. In the spatial projection of the tested region, however the recorded data of each point were transformed again into the area unit which had a size of 500 X 500 m. The unit of area then has been use as a homogeneous formation.

Functional Delimitation and Solution of the Priority of Interests

The landscape diagnosis revealed reserves and possibilities of application of various socio-economic interests. On the materialization plane, however, it is necessary to solve the problems of their spatial arrangement on both horizontal and vertical dimension, namely the problem of the priority and spatial harmonization of the interests of corresponding spheres. In the conception of landscape synthesis the above problems are solved by means of functional delimitation according to the potentials, their measures, spatial coexistence, and compatibility. Mutual interactions of the potentials were implicitly taken into consideration

already during the measurement. The rate of the potentials expressed not only their site conditions, but also the choric relationships between the measured spatial units. The above problems were explicitly solved using *the principal component analysis* and employing the R-procedure with Varimax rotation on a Wang 2200 computer. Using this method we were able to transform the 10 basic potentials entering into the system of exact comparison and measurement.

In our interpretation of results we drew on the component matrix (Table 2) and on the orientation of component loadings of the basic variables (potentials) towards the corresponding component. In the component, one quality is represented by variables that have the same sign and a similar, absolute value. The variables with an opposite sign are absolutely different quality. In most cases the components can be interpreted as complex variables with two poles. Nevertheless, it is possible to extract also combinations of variables bound in a component. In this component, however, only positive or negative component loadings can be interpreted (with regard to the absolute value of component loadings). When we projected this property into the plane of component score, we could add each interpreted part of the component a special (auxiliary) dimension, the positive score of which agreed with the contents of the interpreted component. The overall number of new variables (+ auxiliaries) was marked by *d,* where:

$q \leq d \leq 2q$

q — number of components

On condition that each unit of area has at least 1 function, we arrived at the criterion *P* defining the number of functions and the absolute value of the score, i. e. the functions order of succession.

$$P = \min \{\max \left(g_{j,i}{}^{d}_{j=1}\right)\}^{n}_{i=1}$$

Where

d - is the component score and

n - is the number of units of area.

On the basis of the component matrix we identified 6 ..complex" potentials, i. e. new variables representing concrete social interests in the investigated region (see footnotes to Maps 14—17). Their priority was defined according to the component score and interpreted spatially in Maps of *Functional Delimitation, According to First-rate to Fourth-rate Potentials* (Maps 14—17).

The conception of the preference of interests and their spatial organization were projected into the plane of landscape planning. The alternatives of solving the social interests in the Liptov Basin represent the objectified starting-point for decisionmaking in landscape planning and together with landscape diagnosis they provide the prognostic-preventive basic for control processes performed by department and administration authorities.

APPENDICES

(Footnotes to the maps)

Map 1. Natural Landscape Types of the Liptov Basin.
1 — Flood-plains with alder alluvial forest on alluvial soils:
1.1 — predominantly wide gravel flood-plains with very high bearing of porous and even capillary ground waters,
1.1.1 — very wide, moderately cool, moderately moist flood-plains with frost inversions and very large reserves of ground waters,
1.1.1.1 — flood-plains within the reach of episodic inundations with alluvial forest of submontane character,
1.1.1.1.1 — flood-plains with carbonate sediments, with deeper level of ground waters, with alluvial carbonate soils, local high level of ground waters and alluvial gley soils,
1.1.1.1.2 — flood-plains with silicate sediments with deeper level of ground waters, with typical alluvial soils, and local incidence of high-level ground waters and alluvial gley soils,
1.1.1.1.3 — flood-plains with organic sediments markedly influenced by ground waters and low moor on peat soils,

1.1.1.2 — low terraces with oak-linden-spruce forests,
1.1.1.2.1 — low terraces with carbonate sediments and alluvial carbonate soils up to brown rendzinas,
1.1.1.2.1 — low terraces with silicate sediments and alluvial soils to brown soils,
1.1.2 — predominantly medium-wide, moderately to predominantly cool, moderately to predominantly moist flood-plains with marked frost inversions and large or very large reserves of ground waters,
1.1.2.1 — flood-plains within the reach of episodic inundations, with alder alluvial forest,
1.1.2.1.1 — flood-plains with carbonate sediments,
1.1.1.1.1.1 — flood-plains with deeper level of ground waters and alluvial carbonate soils,
1.1.2.1.1.2 — flood-plains with high level of ground waters and alluvial gley soils,
1.1.2.1.2 — flood-plains with silicate sediments,
1.1.2.1.2.1 — flood-plains with deeper level of ground waters and typical alluvial soils,
1.1.2.1.2.2 — flood-plains with high level of ground waters and hydrophilous plants on alluvial gley soils,
1.1.2.1.3 — lood-plains with organic sediments, markedly influenced by ground waters, with low moor to temporary peat bogs on peat soils,
1.1.2.2 — low terraces with oak-linden-spruce forests,
1.1.2.2.1 — low terraces with carbonate sediments and alluvial carbonate soils to brown rendzinas,
1.1.2.2.2 — low terraces with silicate sediments and alluvial soils,
1.1.2.2.3 — low terraces with organic sediments and high moor up to temporary peat bogs on peat soils,
1.2 — narrow loamy flood-plains with very low bearing of predominantly capillary ground waters,
1.2.1 — predominantly cool and moist flood-plains with frost inversions and alder (submontane) alluvial forests,
1.2.1.1 — flood-plains with deeper level of ground waters and typical alluvial soils,
1.2.1.2 — flood-plains markedly influenced by ground waters,
1.2.1.2.1 — flood-plains with organic sediments and temporary peat bogs on peat soils,
1.2.1.2.2 — flood-plains with very high level of ground waters and alluvial gley soils,
1.2.2 — predominantly cool, or cool, predominantly moist, or moist flood--plains with marked frost inversions and alder (submontane to montane) alluvial forest,
1.2.2.1 — flood-plains with deeper level of ground waters and typical alluvial soils,
1.2.2.2 — flood-plains markedly influenced by ground waters,
1.2.2.2.1 — flood-plains with organic sediments and temporary peat bogs on peat soils,
1.2.2.2.2 — flood-plains with very high level of ground waters and alluvial gley soils to gley soils.
Proluvial-fluvial hilly lands with a cover of polygenetic loams and oak-linden- -spruce forests on illimerized and brown soils:
2 - Proluvial-fluvial hilly lands with a cover of polygenetic loams and oak-linden- -spruce forests on illimerized and brown soils:
2.1 — predominantly cool and moist, proluvial-fluvial moderately undulated hilly land with partial frost inversions,
2.1.1 — terraces and cones with medium or great bearing of porous to capillary ground waters and oak-linden-spruce forests,
2.1.1.1 — terraces and cones covered by polygenetic loams and illimerized soils,
2.1.1.2 — terraces and cones without a marked cover of loams,
2.1.1.2.1 — terraces and cones with predominantly carbonate sediments and brown rendzinas,
2.1.1.2.2 — terraces and cones with silicate sediments and saturated brown soils,
2.1.1.2.3 — terraces and cones with organic sediments and communities of high moors on peat soils,
2.1.2 — travertine hills and terraces with great bearing of bedded to porous--fissure ground waters and subxerophilous oak-pine forests on rendzinas,
2.1.3 — hilly land on flyschoid rocks (series of strata) of the Paleogene with very low bearing of fissure to fissure-bedded ground waters,
2.1.3.1 — hilly land on predominantly sandstone-claystone strata with very small reserves of fissure to fissure-bedded ground waters,
2.1.3.1.1 — hilly land on calciferous rocks with linden-spruce forests on pararendzinas,
2.1.3.1.2 — hilly land on non-calciferous rocks,
2.1.3.1.2.1 — remnants of denudation plateaus with oak-linden-spruce forests on saturated brown soils,
2.1.3.1.2.2 — hilly-land slopes with linden-spruce forests,
2.1.3.1.2.2.1 — smoothly modelled slopes of gentle inclinations with saturated brown soils,

2.1.3.1.2.2.2 — slide slopes of medium steep inclinations with pseudogley brown soils to gley soils,
2.1.3.2 — hilly land on claystone strata almost without reserves of ground waters,
2.1.3.2.1 — hilly land on calciferous rocks with linden-spruce forests on pararendzinas,
2.1.3.2.2 — hilly land on non-calciferous rocks,
2.1.3.2.2.1 — remnants of denudation plateaus with oak-linden-spru ce forests to *Querco-potentilletum* forests on pseudogley brown soils,
2.1.3.2.2.2 — hilly land slopes with linden-spruce forests,
2.1.3.2.2.2.1 — smoothly modelled slopes of gentle inclinations with brown, moderately pseudogleyed soils,
2.1.3.2.2.2.2 — slide slopes of medium steep inclinations with pseudogley brown soils to pseudogley soils,
2.1.4 — hilly land on carbonate basal strata of the Paleogene with medium bearing of fissure to fissure-bedded ground waters and fir-pine- -spruce forests on rendzinas,
2.1.5 — hilly land on non-carbonate Mesozoic shales and sandstones with little bearing and reserves of fissure ground waters and pine-spruce forests on saturated ground soils,
2.1.6 — hilly land on limestones and dolomites with great bearing and re serves of fissure to fissure-karst ground waters and subxerophilous oak-pine forests on rendzinas,
2.2 — predominantly cool and moist, proluvial-fluvial, undulated to moderately cut hilly land,
2.2.1 — remnants of high terraces and cones with little or medium bearing and reserves of porous to capillary ground waters, .
2.2.1.1 — terraces and cones with the cover of polygenetic loams and oak- -linden-spruce forests on illimerized pseudogley soils,
2.2.1.2 — terraces and cones without a marked loam cover,
2.2.1.2.1 — terraces and cones with predominantly carbonate sediments and oak-linden-spruce forests on rendzinas,
2.2.1.2.2 — terraces and cones with silicate sediments and oak-linden-spruce forests on saturated brown soils,
2.2.2 — travertine hills with great bearing of bedded to porous-fissure ground waters and subxerophilous oak-pine forests on rendzinas,
2.2.3 — hilly land on flyschoid rocks (series of strata) of the Paleogene with very low bearing of fissure to fissure-bedded ground waters,
2.2.3.1 — hilly land on predominantly sandstone-claystone strata with very little reserves of ground waters,
2.2.3.1.1 — hilly land on calciferous rocks,
2.2.8.1.1.1 — remnants of denudation plateaus with *Querco-potentille tum* to subxerophilous oak-pine forests on pararendzinas,
2.2.3.1.1.2 — slopes of hilly land with subxerophilous oak-pine to linden-spruce forests,
2.2.3.1.1.2.1 — smoothly modelled slopes of medium steep inclinations with pararendzinas,
2.2.3.1.1.2.2 — slide slopes of marked to steep inclinations with pararendzinas to gley soils,
2.2.3.1.2 — hilly land on non-calciferous rocks,
2.2.3.1.2.1 — remnants of denudation plateaus with oak-linden-spruce to *Querco-potentilletum* forests on pseudogley brown soils,
2.2.3.1.2.2 — slopes of hilly land with *Querco-potentilletum* or linden-spruce to pine-spruce forests,
2.2.3.1.2.2.1 — smoothly modelled slopes of medium steep inclinations with saturated brown soils,
2.2.3.1.2.2.2 — slide slopes of medium steep to steep inclinations with pseudogley brown soils to gley soils,
2.2.3.2 — hilly land on claystone strata almost without reserves of ground waters,
2.2.3.2.1 — hilly land on calciferous rocks with subxerophilous oak-pine forests on pararendzinas,
2.2.3.2.2 — hilly land on non-calciferous rocks,
2.2.3.2.2.1 — remnants of denudation plateaus with oak-linden-spruce to *Querco-potentilletum* forests on pseudogley brown soils,
2.2.3.2.2.2 — slopes of hilly land with linden-spruce forests,
2.2.3.2.2.2.1 — smoothly modelled slopes of medium steep inclinations with brown moderately pseudogleyd soils,
2.2.3.2.2.2.2 — slide slope of medium steep to steep inclinations with pseudogley brown soils to gley soils,
2.2.4 — hilly land on carbonate Paleogene basal strata with medium bearing of fissure to fissure-bedded ground waters,
2.2.4.1 — remnants of denudation plateaus with fir-spruce forests on brown rendzinas,
2.2.4.2 — slopes of hilly land with fir-spruce forests on rendzinas,

2.2.5 — hilly land on non-carbonate Mesozoic shales and sandstones, with little bearing and reserves on fissure ground waters and pine-spruce forests on saturated brown soils,
2.2.6 — hilly land on limestones and dolomites with very great bearing and reserves of fissure to fissure-karst ground waters and subxerophilous oak-pine to fir-spruce forests on rendzinas.
3 - Polygenetic subberglands predominantly with pine-spruce forests on saturated to unsaturated brown soils:
3.1 — predominantly cool and moist, fluvial, moderately to medium cut (dissected) subbergland,
3.1.1 — remnants of terraces and cones with little to medium bearing of porous ground waters and linden-spruce to pine-spruce forests,
3.1.1.1 — remnants of terraces and cones witii carbonate sediments and brown rendzinas,
3.1.1.2 — remnants of terraces and cones with silicate sediments and saturated brown soils,
5.1.2 — travertine hills and terraces with great bearing of bedded to porous--fissure ground waters and subxerophilous oak-pine forests,
3.1.3 — subbergland on flyschoid Paleogene rocks (series of strata) with very little bearing of fissure to fissure-bedded ground waters,
3.1.3.1 — subbergland on predominantly sandstone-claystone strata with very small reserves of fissure to fissure-bedded ground waters,
3.1.3.1.1 — subbergland on calciferous rocks,
3.1.3.1.1.1 — remnants of denudation plateaus with *Querco-potentille-tum* to subxerophilous oak-pin^ forests on pararendzinas,
3.1.3.1.1.2 — slopes of subbergland with subxerophilous oak-pine to linden--spruce forests,
3.1.3.1.1.2.1 — smoothly modelled slopes of marked to steep inclinations with pararendzinas,
3.1.3.1.1.2.2 — slide slopes of steep inclinations with pararendzinas,
3.1.3.1.2 — subbergland on non-calciferous rocks,
3.1.3.1.2.1 — remnants of denudation plateaus with *Querco-potentille-tum* to pine-spruce forests on moderately pseudogleyed brown soils,
3.1.3.1.2.2 — slopes of subbergland with linden-spruce to pine-spruce forests,
3.1.3.1.2.2.1 —smoothly modelled slopes of marked to steep inclinations with saturated brown soils,
3.1.3.1.2.2.2 — slide slopes of marked to steep inclinations with pseudo gley brown soils to gley soils,
3.1.3.2 — subbergland on claystone strata almost without reserves of ground waters,
3.1.3.2.1 — subbergland on calciferous rocks,
3.1.3.2.1.1 — remnants of denudation plateaus with *Querco-potentille-tum* forests on pararendzinas,
3.1.3.2.1.2 — slopes of subbergland with linden-spruce to subxerophilous oak-pine forests,
3.1.3.2.1.2.1 — smoothly modelled slopes of medium steep inclinations with pararendzinas,
3.1.3.2.1.2.2 — slide slopes of marked inclinations with pararendzinas,
3.1.3.2.2 —subbergland on non-calciferous rocks,
3.1.3.2.2.1 — remnants of denudation plateaus with *Querco-potentille tum* forests on pseudogley brown soils,
3.1.3.2.2.2 —slopes of subbergland with oak-linden-spruce forests,
3.1.3.2.2.2.1 — smoothly modelled slopes of medium steep to marked inclinations with saturated brown soils,
3.1.3.2.2.2.2 —slide slopes of marked inclinations with pseudogley brown soils to gley soils,
3.1.4 — subbergland on carbonate Paleogene basal strata with great bearing of fissure to fissure-bedded ground waters and subxerophilous oak-pine forests on rendzinas,
3.1.5 — subbergland on limestones and dolomites with very great bearing and reserves of fissure to fissure-karst ground waters and subxerophilous oak-pine forests on rendzinas,
3.2 — cool, moist, glacio-fluvial, undulated to moderately cut subbergland with long winters and pine spruce forests,
3.2.1 — terraces and cones with medium bearing and reserves of porous ground waters,
3.2.1.1 — terraces and cones with silicate sediments, with pine-spruce forests and locally underwetted spruce forests on unsaturated brown soils to pseudogleys,
3.2.1.2 — terraces and cones with organic sediments and high-moor communities on peat soils,
3.2.2 — subbergland on flyschoid rocks (series of strata) of the Paleogene with very low bearing of fissure to fissure-bedded ground waters,
3.2.2.1 — subbergland on non-calciferous predominantly sandstone- claystone strata with very small reserves of ground waters and pine spruce forests,
3.2.2.1.1 — remnants of denudation plateaus with pine-spruce forests on pseudogley brown soils,
3.2.2.1.2 — slopes of subbergland with pine-spruce forests,

3.2.2.1.2.1 — smoothly modelled slopes of medium steep to marked inclinations with pine-spruce forests on unsaturated brown soils,
3.2.2.1.2.2 — slide slopes of marked to steep inclunations with pine--spruce forests to underwetted spruce forest on pseudogley brown soils to gley soils,
3.2.2.2 — subbergland on non-califerous claystone strata almost without reserves of ground waters,
3.2.2.2.1 — remnants of denudation plateaus with pine-spruce forests on pseudogley brown soils,
3.2.2.2.2 — slopes of subbergland with pine-spruce forests to under-wetted spruce forests,
3.2.2.2.2.1 — smoothly modelled slopes of medium steep to marked inclinations with unsaturated brown soils to pseudogley,
3.2.2.2.2.2 — slide slopes of marked inclinations with pseudogley brown soils to gley soils,
3.2.3 — subbergland on carbonate Paleogene basal strata with great bearing and reserves of fissure to fissure-bedded ground waters, ,
3.2.3.1 — denudation plateaus on Paleogene basal strata with fir-pine spruce forests on brown rendzinas,
3.2.3.1 — slopes of subbergland on Paleogene basal strata with fir-pine- -spruce forests on rendzinas,
3.2.4 — subbergland on non-carbonate Mesozoic shales and sandstones with little bearing and reserves of fissure ground waters and pine-spruce forests on saturated brown soils,
3.2.5 — subbergland on limestones and dolomites with very great bearing and reserves of fissure to fissure-karst ground waters and fir-pine spruce forests to pine forests with *sesleriatum* communities on rendzinas.
Map 2. Land Use Forms of the Liptov Basin.
1 — Urban settlement-technicized land:
1.1 - residential areas,
1.1.1 — with family houses and gardens,
1.1.2 — with blocks of flats (mostly multistoreyed),
1.2 - areas of production,
1.2.1 — industrial works,
1.2.2 — areas of raw material exploitation,
1.2.3— agricultural farms,
1.3 - areas of recreation (short-term recreation) and sports,
1.3.1 — parks, cemeteries, communal greeneries,
1.3.2 — sports and recreational facilities,
1.3.3 — garden communities,
1.4 - areas devoted predominantly to services,
1.5 - transport networks and areas,
1.5.1 — motorways,
1.5.2 — roads,
1.5.3 — parking areas,
1.5.4 — railways and Czechoslovak Railways areas,
1.6 — non-utilized ana non-productive areas.
2 - Agricultural land:
2.1 — forms of large-scale farming,
2.1.1 — orchards and plantations,
2.1.2 — arable land,
2.1.2.1 — on plateaus (to 3°),
2.1.2.2 — on gentle slopes (to 7°),
2.1.2.3 — on medium slopes (to 12°),
2.1.2.4 — on marked slopes (to 17°),
2.1.3 — grassland,
2.1.3.1 — moist, mostly non-cultivated,"
2.1.3.2 — fresh,
2.1.3.2.1 — meadows,
2.1.3.2.2 — pastures,
2.1.3.3 — semidry,
2.1.3.3.1 — meadows,
2.1.3.3.2 — pastures,

2.2 — forms of small-scale farming (complexes of small plots of land).
3. Outdoor recreation (week-end to long-term) and tourist land:
3.1 — areas for all-year-round activities,
3.1.1 — for recreation,
3.1.1.1 — for confined recreation,
3.1.1.2 — for free recreation and tourism,
3.1.2 — for motorized tourism,
3.2 — areas for seasonal activities,
3.2.1 —for summer recreation (near water),
3.2.1.1 — confined,
3.2.1.2 — free,
3.2.2 — for motorized tourism,
3.2.3 — for winter sports and tourism.
4 - Forest land:
4.1 — productive forests,
4.1.1 — mixed,
4.1.2 — coniferous monocultures,
4.1.2.1 — spruce,
4.1.2.2 — larch,
4.1.2.3 — pine,
4.2 — non-productive (protected) forests,
4.2.1 — mostly closed,
4.2.1.1 — deciduous (willow-alder forests),
4.2.1.2 — mixed,
4.2.1.3 — coniferous monocultures,
4.2.1.3.1 — spruce,
4.2.1.3.2 — pine,
4.2.2 — very thinly closed (pasture) forests,
4.3 — reproductive forest areas (nurseries).
5 - Protected land (strictly protected areas):
5.1 — forest areas.
5.2 — predominantly meadow and rock-meadow areas.
6 - Surface waters:
6.1 — artificial water reservoirs,
6.2 — water streams (in natural and man-mad^ beds).
Map 3. Types of Present-Day Landscape of the Liptov Basin.
1 - ndustrial, technicized, intensively fettled landscape:
1.1 — urban landscape with concentrated technogenous structure and sources of environment contamination in inverse situation, predominantly on flood-plains,
1.2 — transitory residential landscape with both'technogenous and secondary natural elements in inverse situation, predominantly on flood-plains.
2. Agricultural landscape with concentrated rural settlement structure:
2.1 — flood-plains landscape with contamination of porous ground waters,
2.1.1 — grassland-ploughed landscape, predominantly with damp meadows and bank growths,
2.1.2 — forest-grassland-ploughed landscape, with damp meadows and mixed forests,
2.2 — hilly land with moderate to intensive erosion processes,
2.2.1 — gently to medium undulated hilly land with moderate erosion processes,
2.2.1.1 — ploughed landscape with deflation processes,
2.2.1.2 — forest-grassland-ploughed landscape with fresh meadows and mixed forests with deflation and slide processes,
2.2.2 — strongly undulated to moderately cut.hilly land with intensive erosion processes, predominantly with fresh meadows and mixed forests,
2.2.2.1 — forest-grassland-ploughed landscape strongly undulated with deflation and slide processes,
2.2.2.2 — forest-ploughed-grassland landscape, moderately dissected and with high occurrence of slide processes,

2.3 — subbergland landscape with intensive or very intensive erosion processes,
2.3.1 — forest-grassland-ploughed landscape, moderately dissected, with intensive erosion and slide processes, predominantly fresh meadows and mixed forests,
2.3.2 — forest-ploughed-grassland landscape, gently to medium dissected, with intensive erosion and slide processes, predominantly fresh meadows and mixed forests.
3 - Predominantly forest, unsettled to sporadically settled landscape:
3.1 — subbergland with predominantly closed monocultural spruce forests, with primary productive forestry function,
3.2 — subbergland with non-continuously closed to thinly closed predominantly spruce forests, with primary recreational function,
3.3 — subbergland with predominantly thinly closed spruce forests and extensive agriculture.

Map 4. Landscape Potential for Urbanization with Respect to Natural Properties.

Map 5. Landscape Potential for Urbanization with Respect to Socio-Economic (Settlement) Structure.

Map 6. Landscape Potential for the Construction of Roads.

Map 7. Landscape Potential for Agriculture.

Map 8. Landscape Potential for Water Supply Using Ground Waters.

Map 9. Landscape Potential for Water Supply Using Surface Waters.

Map 10. Landscape Potential for Recreation.

Map 11. Landscape Potential for Tourism.

Map 12. Landscape Potential for Forestry.

Map 13. Landscape Potential for Nature Protection.

Footnotes to Maps 4—13:

0 — extremely low potential,
1 — very low potential,
2 — low potential,
3 — medium high potential,
4 — high potential,
5 — very high potential,

area of 500 X 500 m.

Map 14. Functional Delimitation of the Liptov Basin According to the First-Rate Potentials.

Map 15. Functional Delimitation of the Liptov Basin According to the Second-Rate Potentials.

Map 16. Functional Delimitation of the Liptov Basin According to the Third-Rate Potentials.

Map 17. Functional Delimitation of the Liptov Basin According to the Fourth-Rate

Potentials. Footnotes to Maps 14—17:

K — potential for the construction of roads and urbanization (based on natural conditions),

R — potential for recreation and tourism,

A — potential for agriculture,

U — potential for urbanization (based on socio-economic infrastructure),

V — potential for water supply,

L — potential for forestry and nature protection,

area of 500 X 500 m.

Map 18. Geographical Situation of the Liptov Basin.

Table 1. Correlation matrix of basin potentials [$ri_{j} \geq$ abs (±0,2)]

Table 1. Principal component matrix loadings ≥ abs (±0,2)