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Landscape as a Basis for Tourist Mapping

Krajobraz jako podstawa opracowania map turystycznych

Abstract: Tourist maps are typically developed based on general geographic maps enriched with thematic data related to tourism. This approach provides them with high situational accuracy, detail, and rich content. These features, highly desired by users, enable precise location and navigation. In the era of widespread access to GPS receivers and navigation systems, these properties are slowly

losing their importance. At the same time, tourist maps developed this way lack much content that could be useful to tourists. Replacing the hypsometric base with a landscape base could enrich the map's content and make it more useful for tourists, especially since landscape perception is a natural way for humans to interact with their surroundings. Developing an appropriate landscape base is a significant challenge, as users of tourist maps are typically those without professional knowledge of landscape. Therefore, landscapes depicted on a tourist map should reflect the common understanding of the term, not its scientific definitions, and the map itself should have an appropriately edited legend. This work presents only a concept – an attempt to find better solutions. The aim is to stimulate discussion on how to improve tourist maps, not to evaluate the presented concept, which we leave to cartographers and tourists.

Keywords: tourist maps; landscape maps; landscape; tourism

Abstrakt: Mapy turystyczne zazwyczaj są opracowywane na podstawie map ogólnogeograficznych, wzbogaconych o dane tematyczne związane z turystyką. Takie podejście zapewnia im wysoką dokładność sytuacyjną, szczegółowość i bogatą treść. Cechy te, bardzo pożądane przez użytkowników, umożliwiają precyzyjną lokalizację i nawigację. W dobie powszechnego dostępu do odbiorników GPS i systemów nawigacyjnych właściwości te powoli tracą na znaczeniu. Jednocześnie mapy turystyczne opracowane w ten sposób nie zawierają wielu treści, które mogłyby być przydatne dla turystów. Zastąpienie podstawy hipsometrycznej podstawą krajobrazową mogłoby wzbogacić zawartość mapy i uczynić ją bardziej użyteczną dla turystów, zwłaszcza że postrzeganie krajobrazu jest naturalnym sposobem interakcji człowieka z otoczeniem. Opracowanie odpowiedniej podstawy krajobrazowej stanowi poważne wyzwanie, ponieważ użytkownikami map turystycznych są zazwyczaj osoby nieposiadające profesjonalnej wiedzy na temat krajobrazu. Dlatego krajobrazy przedstawione na mapie turystycznej powinny odzwierciedlać powszechne rozumienie tego terminu, a nie jego naukowe definicje, natomiast sama mapa powinna mieć odpowiednio zredagowaną legendę. W artykule przedstawiono jedynie koncepcję, stanowiącą próbę znalezienia lepszych rozwiązań. Celem jest pobudzenie dyskusji na temat tego, jak ulepszyć mapy turystyczne, a nie ocena przedstawionej koncepcji, którą pozostawiamy kartografom i turystom.

Słowa kluczowe: krajobraz; mapy krajobrazowe; mapy turystyczne; turystyka

INTRODUCTION

The tourist map is among most common types of contemporary cartographic mapping. The abundance of tourist maps stems from dynamic developments in the tourism market and related increase in demand for information which tourists need. It is also noteworthy that maps hold a special place among sources of tourist information as they still make the best medium for spatial data.

Tourist maps constitute a highly heterogeneous group of cartographic products because tourism refers to largely diverse human activities, which in turn result from various and often complex contexts. They differ in scale, territorial scope, graphic solutions, content scope, background, or intended use for a specific group of tourists and many other features (Kaprowski, 2004; Trafas, 2003).

Producing a precise definition of a tourist map is a difficult challenge in view of such great diversity. Despite the fact that such maps are clearly distinguishable from other cartographic works in terms of content, it is their designation and function that constitute main criteria for their distinction. These maps differ from general geographic maps in that they have much more extensive tourist content, while they differ from typical thematic maps in that they have much richer background content (Jancewicz & Borowicz, 2017). Consequently, tourist maps constitute a specific group that is something in-between thematic and general geographic maps.

A clear division into two groups emerges among tourist maps. The first presents a spatial differentiation of tourism as a phenomenon and is usually irrelevant for tourists, but proves useful for those involved in the broadly understood organization or the study of tourism (e.g. maps that are annexes to publications in the field of tourism geography, etc.). The second group consists of maps designed directly for tourists. They are used for planning, organizing and performing individual or group tourism activities (Wyrzykowski, 2002). Both groups are also highly diversified internally. They include maps of a general nature (general tourism) and maps dedicated to various types of tourism (e.g. special-purpose tourism, fishing, mountain tourism, etc.).

The quantitative richness of tourist maps is accompanied by a great diversity of ways of preparing them. This fact means that they ultimately provide information that is more or less useful to tourists. This text focuses on presenting a new, original concept of a tourist map, developed on the basis of a landscape map – a map that could provide more useful information for tourists and make it easier for them to plan, prepare and implement various tourist activities. Since the scale of presentation and the size of the presented area have a great influence on the way maps are prepared, our considerations are limited only to one of the most common groups of cartographic studies – medium- and small-scale maps of a general tourist nature. We also give up attempts to self-assess the presented concept, leaving it to the reader of the presented text.

GENERAL TOURIST MAPS

General tourist maps have a special position among the above-mentioned categories. This is determined not only by their quantitative superiority over other types of tourist maps, but also by the scope of usefulness. Due to their landscape-exploring character, they often make primary sources of information about the space on which a tourist's interest is focused. The fact that they often cover large areas (e.g. continents, regions or countries) means that they are used by tourists both at the

planning stage (defining the location of regions or tourist centres, marking routes, etc.) and at the stage of performing their tourist activities. They make it possible to obtain information about natural and cultural values, tourist infrastructure and transport accessibility in the area in which a tourist may be interested (Jancewicz & Borowicz, 2017; Musa, 2016; Wyrzykowski, 2002). Broadly speaking, general tourist maps are widely used either as a primary (often the only) or as a complementary source of tourist information irrespectively of tourists' interests and motivations.

The scale is an important feature common to general tourist maps, which results from a need to present relatively large areas. These maps are usually small- or at most medium-scaled. Typical scales utilized for the presentation of continents or large parts of continents range from 1:2 000 000 to 1:10 000 000. Maps of individual countries or large regions are usually published at scales of 1:500 000 to 1:2 000 000, while smaller areas are usually published at scales of more than 1:500 000 up to about 1:40 000. General maps are produced only occasionally in larger scales. This is because the smaller the area covered by a map, the less general and more regionally specific it becomes.

Being highly useful for sightseeing is an important feature of general tourist maps, which makes them practical for people involved in all types of tourism (Jancewicz & Borowicz, 2017). They facilitate finding one's position in a given area, assessing distances and accessibility of objects, and they also help to generally familiarize tourists with natural landscape values, providing information on various aspects of tourism (Kałamucki, 2003).

BACKGROUND OF GENERAL TOURIST MAPS

Each thematic map consists of background content and thematic content presented on its basis. In the case of tourist maps, the role of background content is particularly important because, in addition to providing information about the location, it should also provide as much information as possible about the geographical environment.

The background of contemporary general tourist maps (usually more detailed for mountainous areas than for lowland areas) is dominated by information about relief, usually additionally enriched with information about hydrography, settlement and communication networks (Cocean, 2010; Jancewicz & Borowicz, 2017; Musa, 2016). In maps of larger scales, information on land cover sometimes appears, most often in a generalized form, limited to a presentation of forests and meadows, less often thickets, orchards, parks or permanent crops. The base content of such maps shows a strong correlation with the content of topographic survey maps, on the basis

of which they are generally developed. The base of tourist maps often consists of topographic maps *in extenso* or, less frequently, of selected elements of these maps. Such a solution is not difficult to implement, especially if an editor of a tourist map uses digital data (Medyńska-Gulij, 2021). Consequently, rich background content may hinder the perception of the tourist content of the map (Podlacha et al., 2001; Wrochna, 2005). Tourist maps often include information that is of little importance or even completely unnecessary to tourists (e.g. administrative boundaries, some altitude points, paths in national parks that do not correspond with tourist trails, etc.). Another common feature of maps presenting mountainous areas is a very dense drawing of contour lines, often supplemented with shading (Popelka, 2014). Consequently, a drawing of a map base is too detailed and difficult for correct interpretation.

However, the use of topographic maps as a background for the presentation of tourist issues seems justified to a certain extent. It stems from a desire to provide a recipient with maximum information about the terrain. However, this objective cannot be achieved by taking shortcuts and limiting oneself to printing tourist content over a "content-complete" topographic map because this can lead to redundancy. It is better to make a rational selection of topographical content elements combined with complementary elements to improve perception (e.g. shading to emphasize plasticity of the relief – Bian et al., 2024).

When analysing tourist maps, it can be seen that it is the degree to which the underlay is adjusted to the thematic content presented on the map that largely determines the quality and usefulness of the presentation. The underlay content enables not only correct localization and orientation in the terrain, but also provides an appropriate environmental context – allowing one to "feel" the surrounding environment (Musa, 2016). It is especially significant as the visualization of thematic content on general tourist maps does not show much variation in terms of cartographic presentation methods and graphic solutions used.

THE CONCEPT OF A GENERAL TOURIST MAP BASED ON A LANDSCAPE BACKGROUND CONTENT

Since the influence of the map background is so important for the reception of the con-tent of tourist maps and their usefulness, the authors of this study decided to check whether replacing the "topographic" background with a landscape background would be a good direction for the development of tourist maps, increasing their informativeness and usefulness. In this respect, two approaches proved possible.

The first, and quite common, approach involves creating a main map and several smaller inset maps, each presenting various characteristics of the area

(climate, land cover, etc.). This approach provides tourists with rich and diverse information, but in practice it proves challenging, requiring extensive theoretical knowledge and the ability to use multiple maps at different scales simultaneously. Furthermore, it only allows for the presentation of a few selected topics.

A much better way to approach the background content of a tourist map seems to be to develop a map base based on synthetic information that is also easy to understand for an average tourist. Interesting solutions in this area were attempts combining information on terrain with information on selected climate elements (temperature, precipitation) (Darbyshire & Jenny, 2017; Patterson & Jenny, 2011). The resulting maps were much richer in information, but quite difficult to interpret correctly due to the different hypsometric scales, depending on the type of climate, and therefore were not useful in developing the desired background for a tourist map.

For the authors of this study, a natural solution to the above problems was to develop a map base based on the landscape – a synthetic combination of all elements of the environment (natural and cultural), which is also understandable to the average user of tourist maps.

Defining the term "landscape" is not straightforward. Landscape is a subject of interest across many disciplines, including the natural sciences, the exact sciences, the humanities, and the social sciences. It is also an object of interest in various fields of art and the term used in everyday language. In practice, there are many definitions in operation, many of which are considerably differ from each other (Myga-Piątek, 2016). While definitions functioning in science link landscape with space and environment, art emphasizes its physiognomy, aesthetics, symbols and metaphors (Frydryczak, 2011; Melcher, 2022). The problem is further complicated by the fact that the term "landscape" was originally synonymous with region – it referred to a section of space together with the people inhabiting it (Myga-Piątek, 2016). It was only much later that it was identified with the view and became the subject of works of art. This dualism in the approach to landscape has existed for a long time and is still clearly visible today. It is true that many scientific definitions refer to the physiognomy of the landscape (Myga-Piątek, 2001), but a colloquial understanding of the term, much closer to art, differs significantly from these definitions. The choice of which way of defining landscape would be more useful in the process of editing tourism maps is, however, less of a problem than the multiplicity of definitions would suggest. Lack of scientific preparation means that almost all tourists associate the term "landscape" with the view unfolding before them and evaluate it in aesthetic terms. Scientific definitions, typologies and regionalisms are of little use to a tourist as they are hardly understandable (Castaldini et al., 2005; Flippakopoulou & Nakoś, 1995). Consequently, landscape maps developed on such foundations (e.g. Shestakova et al., 2021; Solodyankina

et al., 2021) cannot become the basis of tourist maps. This situation forces a map editor to apply a different way of classifying landscapes, closer to the colloquial understanding of the term.

There are several important arguments in favour of the landscape approach to tourist map development. One of the most important is that the world around us is perceived through the senses, the sight being dominant and providing almost 90% of the information (Ministry of Forests, 1994). Visual perception of the environment is therefore of fundamental importance to the tourist. When observing the environment, a tourist does not directly perceive the processes taking place, complex relationships between its elements or its history. They only perceive the end result – the landscape understood as a specific view. In this sense, the landscape is a fundamental "interface" of the environment, providing the tourist with information about the surrounding space. Conclusions formulated on the basis of this information depend on the knowledge and experience that the tourist has. This way of perceiving and evaluating the environment is essential for the tourist because the human species has been perfecting and developing skills in this area for millennia.

Summarizing, it is possible to formulate a thesis that the tourist-perceived landscape is the physiognomy of the environment. It is made up of several leading visual components: terrain configuration, vegetation and animals (Äijälä, 2024), surface waters, as well as visible manifestations of human activity (agricultural areas, settlements, etc.) (Blankenship, 2017; Chmielewski et al., 2019; Fyhri et al., 2009; Juchacz et al., 2023; Ministry of Forests, 1994; Pressley, 2017; Skowronek et al., 2018; Steen Jacobsen, 2007). In practice, individual components play a greater or lesser role, creating a specific image of the environment, which should form the basis for a tourist typology of landscapes. In addition to the structure of visual components, the scale and the territorial scope of a map all have a great impact on landscape types. The decreasing scale of the study and increasing area is usually accompanied by an increasing level of generalization of landscape types.

Apart from the above-mentioned factors, which influence the way landscapes are delineated for the purposes of tourist maps, it is also important to use appropriate terminology which would be comprehensible for an average tourist. Terms such as "undulating, encrusted and inlayed landscapes" (Michalik-Śnieżek & Chmielewski, 2015), "warm lowland landscapes with oak-hornbeam forests" (Majchrowska 2013) or "carbonate and gypsum-eroded landscapes" (Richling & Dąbrowski, 1995) or "soundscapes" (Bernat & Hernik, 2015) say little to the vast majority of tourist map users. Employing a simple terminology that could be comprehensible to a tourist is by no means an easy task. While editing maps depicting areas that are unfamiliar and exotic to tourists, it is difficult to avoid using terms that they might find unclear. The solution to this problem appears to be a well-designed legend.

However, it must not be limited to mere concepts supplemented by an illustration of a typical appearance of the landscape in question. Even the best chosen image will not fulfil its task if the map user does not know which elements of the image play a key role in its characterization and to which elements they should pay attention. Complementing an illustration with a short, well-referenced description, containing information about most important features of a given landscape and possibly also about its typical variability (e.g. during the rainy season, during the winter, etc.) may allow for better orientation and better perception of the unknown pre-determined area on the map.

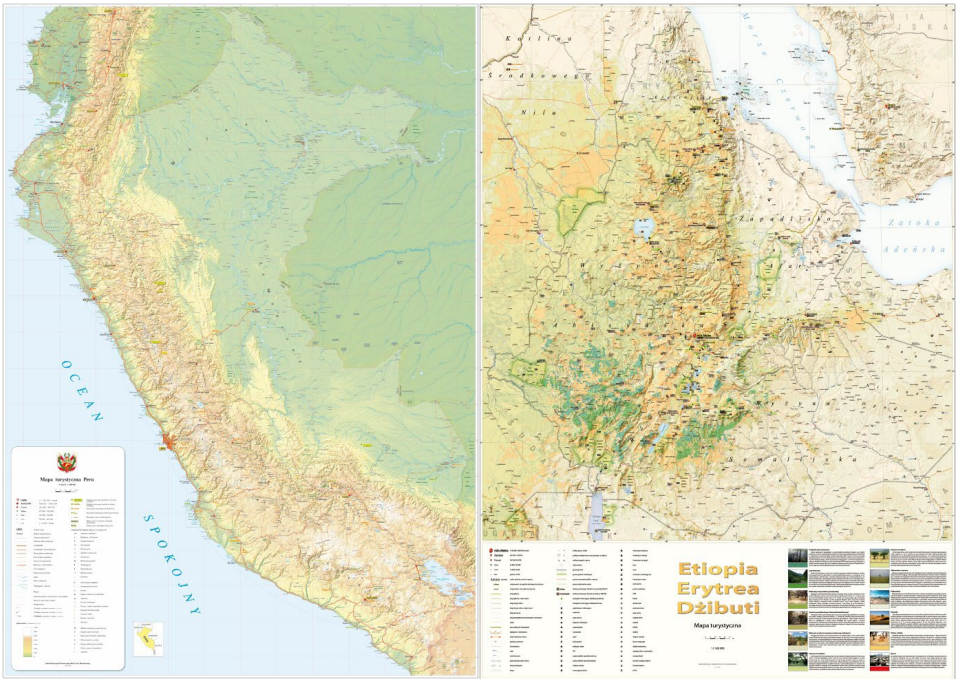

Fig. 1. Tourist maps of Peru (left) and Ethiopia, Eritrea and Djibouti (right), reduced image (maps in the original scale 1:1 500 000 are available at: https://phavi.umcs.pl/at/attachments/2024/0626/153144-peru-150-rgb.jpg; https://phavi.umcs.pl/at/attachments/2024/0626/153132-etiopia-150-rgb.jpg) (Source: Authors' own study)

EDITING THE MAP IN LINE WITH THE NEW CONCEPT

The above theoretical considerations concerning the base of tourist maps prompted the authors of this study to check in practice what effects can be achieved by enhancing a map with landscape content. To this end, two tourist maps were produced (Fig. 1).

The first was a map depicting Peru, the second a map of Ethiopia, Eritrea, and Djibouti. The choice of Peru as the subject of the first map was determined by the availability of data, primarily American military maps at a scale of 1:500 000, and the region's high tourist attractiveness. Analysis of this map inspired the authors to create a tourist map based on a landscape base. However, the lack of access to appropriate landscape data prevented the creation of such a map for Peru. Consequently, the authors decided to create such a map for another area with similar characteristics (significant terrain denivelation, extensive plains, similar size, and high tourist attractiveness) for which landscape data and base maps depicting the terrain at an appropriately large scale were available. After analysing the available data, it was determined that the areas of Ethiopia, Eritrea, and Djibouti met these requirements.

In order to ensure comparability, both maps were made in the same format (B0 – 1,000 × 1,414 mm) and at the same scale of 1:1 500 000. In editing the first map, the tourist map of Peru (Fig. 2), a hypsometric base was used, generated on the basis of a numeric terrain model developed on the basis of data from the SRTM satellite mission (https://www.usgs.gov/...). In order to improve the perception of the terrain, a colour hypsometric scale and shading were used, resigning from the presentation of horizons and brightening the image so that the background elements did not visually dominate the content. The background content of the second map, the tourist map of Ethiopia, Eritrea and Djibouti (Fig. 3) was also based on the above-mentioned SRTM numerical terrain model, however, only the relief shading was used in this case, while the hypsometric colours were backed up with a landscape base. The basis for the typology regionalization of landscapes was the Olson Global Ecosystem Complexes v. 2.0 database (https://grasswiki.osgeo.org/wiki/...). The data concerning 96 types of ecosystems, combined with information on their physiognomic features obtained from literature and internet sources, made it possible to distinguish 12 types of landscapes occurring in the area presented on the map. These were:

- tropical rainforests
- mixed forests
- widespread forests losing their leaves in the dry season
- dry sub-equatorial forests (thorny and succulent)
- thorny shrub thickets (holly and succulents)
- tree savannah
- grass savannah
- grassland communities
- semi-deserts
- deserts
- agricultural lands
- cities

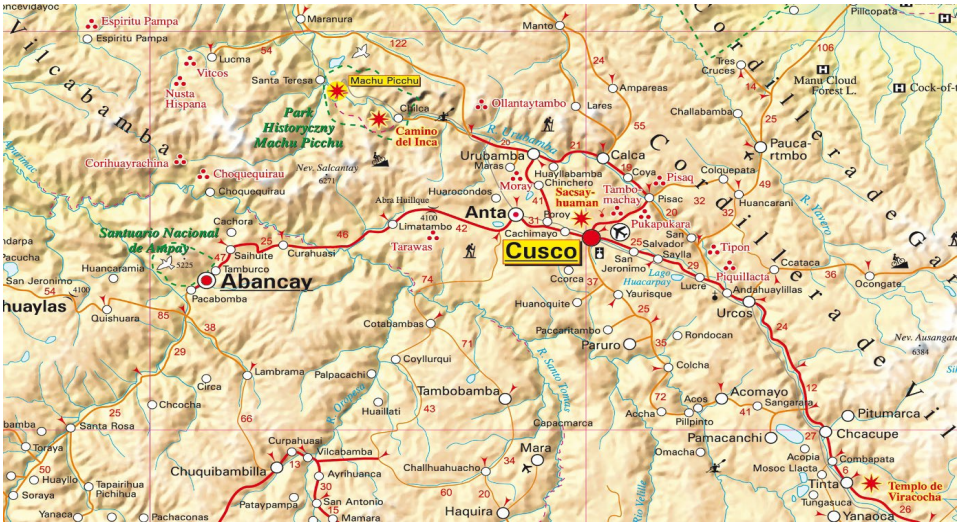

Fig. 2. Excerpt from the tourist map of Peru, 1:1 500 000 (Source: Authors' own study)

In order to increase the suggestiveness of the landscape presentation, a graphical approach was used to emphasize the extent of landscapes with a dominance of high vegetation (four types of forest landscapes) by applying the relief effect (brightening and darkening of the edges, according to the lighting from the north-west direction) and emphasizing the texture fragments on the markings of tree savannah (highlighting the dots). Although this effect was added very subtly, it is visible on close inspection of the map.

Fig. 3. Fragment of the tourist map of Ethiopia, Eritrea and Djibouti, 1:1 500 000 (Source: Authors' own study)

Besides a clear compilation of signs presenting general and thematic content, the map's legend also contained information about each landscape type. This information consisted of the name of the landscape type, the designation used on the map, an illustration presenting a typical appearance and a brief description of characteristic features of the landscape, its variation and dominant colours (Fig. 4).

Fig. 4. Landscape legend (fragment of the legend of the tourist map of Ethiopia, Eritrea and Djibouti), reduced image (full-size legend are available at: https://phavi.umcs.pl/at/attachments/2024/0626/153134-landscapes-150-rgb.jpg) (Source: Authors' own study)

CONCLUSIONS

The combination of landscape content with rich and diverse tourist information makes the map of Ethiopia, Eritrea and Djibouti still readable and the phenomenon of redundancy does not occur, despite the presence of much more information compared to the tourist map of Peru. Moreover, a map with a landscape background looks much more attractive than a map with only a hypsometric base. Moreover, it allows for a much more complete assessment of the presented area and significantly improves orientation in the field, being able to link the tourist's location not only

with the hydrographic, settlement and communication network, but also with land cover and land use.

However, the above assessment made by the authors of the study cannot be treated as objective and reliable. This is primarily due to the authors' personal involvement in developing a new concept of a tourist map, which automatically excludes objectivity. For this reason, the authors of the study leave the professional assessment of the effectiveness and usefulness of the presented concept to others.

The problem of map evaluation and determining whether the newly developed map is better or worse compared to previous studies of this type is a problem that is very difficult to solve unambiguously (Kałamucki, 1998). In the case of maps that are intended to serve tourists, a reliable assessment could only be obtained through their practical use during travel. However, this would require a representative test group, each member of which would be equipped with a map. In practice, this is a difficult task because collecting people who have travelled to remote and therefore rarely visited regions of the world goes far beyond the scope of this study. Out of necessity, the verification of the effects of the experiment was limited to the feedback from a group of experienced cartographers received during the presentation of both maps at the XXXIX National Cartographic Conference in Zwierzyniec (Poland). In their unanimous opinion, the use of landscape content as the background of the map clearly enriches it, makes it more useful and is a step in the right direction.

We recognize that the concept we propose is not perfect. Many of its elements require refinement and further research and experimentation. This includes the landscapes identified (their number, type, seasonality, degree of generalization, etc.), the graphical solutions used on the map (e.g. landscape type designations, colors and symbols), and the usability of this type of map for various user groups (young people, seniors, experienced tourists, etc.). However, we hope that this study will contribute to the discussion on the possibilities of using landscape content to create thematic maps, especially tourist maps, and to the popularization of landscape topics.

DATA AVAILABILITY STATEMENT

The data used to develop the landscape classification and shaded terrain model are available at:

1. Global Land Cover Characterization (GLCC) (https://doi.org/10.5066/F7GB230D).
2. Shuttle Radar Topography Mission 1 Arc-Second Global (https://doi.org/10.5066/F7PR7TFT).

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