

URBAN LANDSCAPE AS PALIMPSEST

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Abstract. The current urban morphology and the identity building of the city construction can be designed as a palimpsest; the spatial development stages of urban systems represent the result of their evolution over time. The characteristics of urban palimpsest depend mainly on the emergent factors that influenced the territorial dynamics and the configuration of urban bodies. Urban life and its quality are directly influenced by spatial and temporal factors of the city evolution. For this reason the study aims to achieve a research to explain the concept of urban palimpsest and the current morphology of urban tissue because they are products of landscape transformations along the history. The current knowledge on urban palimpsest characteristics is very important and useful to plan the current and future evolution of urban systems. The case study presents a vast view on the history of spatial development and urban system as well as a dynamics of the landscape interconditioned by the elements of such development in the context of reference historical eras.

Key words: landscape dynamics, urban image, local identity, spatial development, historical heritage.

1. Introduction

Cities are entities that can change permanently their appearances and their components and its can acquire new senses and functions (Kostof, 1991; Lynch, 1981; Crang, 1996; Khirfan, 2010). Holling and Orians (1971), Martin and Warner (1997), Crow *et al.*, 2006, say that

cities are „cities, with their highly structured landscapes and defining spatial characteristics, are logical places to explore the relationship between people and nature”.

The urban landscape can be conceived as a palimpsest comprising identity

elements specific of each historical eras, genuine heritage that transform this inheritance in urban system heritage. (AlSayyad, 2001; Graburn, 2001).

By using the palimpsest concept; it is suppose that a new urban layer is superpose on the previous one. The urban palimpsest, by analogy, emphasize the historical remnants (memorial traces), rituals, local traditions, folklore and another forms of built heritage (Nuryanti, 1996).

The process of urbanization leads to a deep change of natural landscapes; the territorial process impact in various ways the structure, function and dynamics of the urban systems. Irrespective of way the city was formed, its spatial pattern influences the internal, external, physical, socio-economic and ecological processes (Luck *et al.*, 2002).

The approaches of local actors to built heritage preservation and value enhancing should take account of the concept of palimpsest and its applicability; it should also convey the esthetical, historical, scientific, social and spiritual values of heritage to past, present and future generations (Feilden and Jokilehto, 1998; Tyler, 2000; Pendlebury, 2009).

The past, present and future heritage transforms the urban landscape into a product that belongs to the historical, political, economical and social factors. Nowadays, cities with a special history, such as Dej City, are confronted with the challenge to preserve their local history and identity (Norberg-Schultz, 1991; Larkham, 1996; Tiesdell *et al.*, 1996; Pendlebury, 2009).

Turistification of the historical cities should be the main concern of the local actors (Jansen-Verbeke, 1998).

Any renewal or rehabilitation proposal should mainly aim at preserving the identity of the place and enhancing their values by local marketing strategy and adequate urban design (Speaks, 2002; van Syngel, 2002; Vermeulen, 2002).

1.1. Palimpsest concept

The palimpsest concept is frequently use in various scientific fields. In the urban planning field, the concept of the palimpsest is used to explain the construction stages of the architectural monuments and the urban morphology development during the era (Azimzadeh *et al.*, 2007).

We can not imagine the city as a human habitat, but it can be seen as an entity, the processes and the socio-economic phenomena have an heterogeneous dynamics ant the phases of the spatial evolution give a new form to the current profile of urban system, where the old and new architectural elements are interdependent.

To analyze the current urban morphology, the concept of urban palimpsest can be centered on the urban tissue components as:

- Buildings;
- Image of the city (physical aspect of the urban system);
- Stages of spatial dynamics of the town during the reference period;
- Territorial development factors and elements that mutually condition the current urban configuration and its dynamics.

Specific aspects of urban morphology as built heritage and innovative design, can actively contribute to preservation of the local identity (Gospodini, 2004).

Individualization of the new modernity is not possible without a detailed analysis of the historical heritage.

The term is used in urban literature and nowadays it is used also in geographic literature, specifically in urban geography where it is explain the spatial and temporal development of a town, the current urban morphology and the physical geography(geomorphology) that describe the landscape and its neighborhood.

According to Bloom (2002), the landscape as palimpsest is one in which the different relief forms haven't the same characteristics (age, appearance, etc.).

The impact of human actions on landscape can be observed at the levels of urban ecosystems, transport routes, human settlements and architecture/archetypes (Bailey, 2007).

Chevallier (1976) defines landscape as a result of a dynamic yet instable combination of physical, biological and anthropologic interrelated elements that form a unique and inseparable ensemble in continuous evolution.

Zonneveld (1979) defines landscape by an ecological perspective : "part of the space on the Earth's surface, consisting of a complex of systems formed by the activity of rock, water, air, plants, animals and man and that by its physiognomy forms a recognizable entity".

European Landscape Convention, adopted on October 2000 in Florence, defines landscape as „a part of the territory; its character is the result of the action and interaction of natural and/or human factors" (Romanian Parliament, 2002).

Oke (1982) says that the urban landscapes are typically a complex combination of buildings, roads, parking lots, sidewalks, gardens, cemeteries, soil, water, and so on.

The 90s printed materials on geography analyze the physical landscape as palimpsest generated by multiculturalism (Daniels, 1988; Barnes and Duncan, 1992).

In other words, urban landscape as space of social interaction can be interpreted and analyzed as palimpsest taking into account the cultural diversity and ethnic categories (Van Aschee and Teampău, 2009).

Thus, the identity construction of Dej city was carried out in different historical eras and it has the impression of different cultures.

In the field of town planning, Assargård (2011) try to develop an urban landscape methodology; he wants to classify palimpsest as one of many strategies using a stratified layer.

The stratification is described as a structuring model for different place components, the landscape describes a global stratification of different urban systems; the natural, cultural and historical perspectives are dearly defined.

In 1980, the palimpsest concept was used for the first time by the American architect Peter Eisenman; this concept was used in urban renewal projects of brownfields in Western Europe and North America (Krinke, 2006).

Eisenman describes the palimpsest as a method to analyze the space and create a project based on multiple observation points (Krinke, 2001).

The notion of palimpsest is quite often used in archeology (paleontology) and refers to a deposit where the rate of fossils accumulation is much higher than the rate of sediment deposit, as well as to stratigraphic units representing large

period of time (Walker and Bamback, 1971).

Physical transformations that occur in the urban systems are the result of socio-economic, political and technological processes and different values, styles and cultures that can be found in the current landscape morphology.

The role of time in the evolution of land and landscape as palimpsest is very important to identify the profile and current urban image.

Urban space is treated, based on the concept of urban topography as palimpsest, as a scroll where buildings give identity to space and provide the premises of past, present and future development (Samuelson, 2008).

1.2. Study objectives

This study aims to analyze the palimpsest concept and how it is used in comparison with the urban palimpsest transformations and to emphasize its potential as theoretical and practical tool used in territorial analysis of the reference urban system - Dej Municipality.

The main objective of this study is to develop public policies and identify planning, design and management methods of urban landscape in order to increase the attractiveness of urban environment to the potential investors; a sustainable urban development and the quality of life of resident population.

The specific objectives of the study are:

- To clear up the palimpsest concept and its utilization in the field of town planning and architecture, in spatial and temporal context;
- How the concept of palimpsest can be used as a research tool of the spatial

and temporal evolution of the urban system;

- To identify the stages of reference urban system evolution in Romania - Dej city - and of territorial transformations over reference historical eras with direct implications on landscape.

2. Methodology

The city can be considered as a sedimentary layer formed during a long period of time (Min, 2009).

The characteristics of each place are the result of the transposition on time into space.

From the historical point of view, the method used in the analysis of the urban landscape consists in observing the spatial transformations and image of the complex urban system. The current image of the Romanian medieval cities is the product of a complex of historical, social, economic and environmental factors.

Over time, the morphology and urban architecture are two important elements in the transformation process of urban image.

In the context of the continuous territorial development of urban systems, local identity becomes a defining peculiarity for each city.

The reference architectural elements for local identity were destroyed in certain key stages during the urbanization process.

Urban landscape as palimpsest can be analyzed from the perspective of urban transformation in time and space, and are important for the configuration of its current image.

The identification and description of the defining elements may lead to a better understanding of the heterogeneous landscape composition and processes, such as urban areas (Weng and Lu, 2009).

The current configuration of the analyzed urban system – Dej city – it can be understood only by an historical study of the places and by the transformations of the urban image in various key stages that are very important for its territorial development.

3. Case study: Dej City, Romania

The city is an urban structure characterized by overlapping elements, produced during different historical eras (Rafailaki, 2006).

The urban palimpsest appears as an adequate tool to analyze the reference periods of time in spatial and temporal development of city ant to preserve its local identity.

The current settlement of Dej city was developed around the medieval and central core; it was built by salt mine, and exploited since roman occupation.

3.1. *Dej City and the spatial and temporal development*

On April 17, 1682 begins the building of the cities surrounding walls (Mânzat, 2006). It was built barriers and fosses to protect the city (Mânzat, 2006).

The first map that marks the limits of Dej city and Ocna Dej city dates from 1773 (**Fig. 1**). 1830 is a reference year for the territorial dynamics of Dej city (**Fig. 2**).

In the spring of 1894 begins the constructions to fortify the city, it was built defensive walls (Mânzat, 2006).

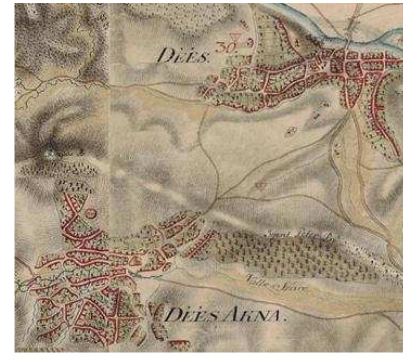


Fig. 1. The plan of the Dej city and Ocna Dej city in 1773

Source: Josephinische Landaufnahme, p. 53

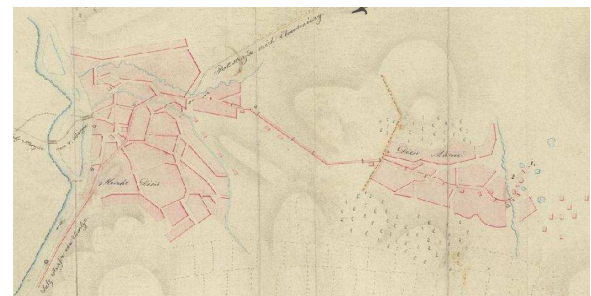


Fig. 2. The plan of Dej and Ocna Dej cities in 1830

Source: Mol Térkép, 2014

3.2. *Urban view over the socialist era*

Within the new regionalization of the 50s includes Dej city in Cluj region, comprising 14 districts. 108 rural settlements administratively depend on Dej city.

In 1968, the new territorial-administrative organization of the Socialist Republic of Romania, Dej city becomes municipality and Ocna Dej, Peștera, Pintic and Șomcutul Mic become localities of this city.

Between 1949-1968 the industrial development of city, simultaneously with the spatial development, was strictly related to the railway transport and Cellulose and Paper aggregate works.

In 1961 the industrial complex of Dej city and complex of wood industrialization were founded (**Fig. 3**).

Between 1965-1989 Dej city was subject to forced industrialization.



Fig. 3. Industrial landscape of Dej city
Source: Kosa, 2008

In the early 70's, the location of Cellulose and Paper aggregate works represented a big step in the urban development of city by the exodus from rural areas to urban areas in order to ensure the necessary labor; it was involved in the industrial process (Borzan, 2012).

In the socialist period, the urbanization process was synonymous with the industrialization process and it was strongly influenced by the political ideology of the socialist system, thus the building of residential areas was often construct by demolishing existing residential areas, without taking into account their architectural value and heritage. During this period, we can talk about the resizing of the city (**Fig. 4**).



Fig. 4. Urban renewal project by demolishing the existing buildings and constructing the new buildings, in the context of territorial systematization process
Source: Kosa, 1975-1976

3.3. *The palimpsest and current urban morphology*

The history of current landscape of the urban system and its stages of territorial

development is reflected in its current morphology.

The concept of palimpsest is used to describe the land use types, construction dynamics and architectural landscape in the context of major socio-economic transformations.

The economic post socialist restructuring culminated with restructuring the main activities of the industrial units.

The socio-economic and legislative changes have had a decisive impact on the current image of Dej city. Thus, the current urban landscape is represented by (**Fig. 5**):

- The central core where the old architectural elements interpenetrate the new once;
- The built residential area, on the one hand, by collective housing and individual housing with local nature and, on the other hand, by new residential areas, in the context of social segregation and new housing needs;
- The reorganized industrial area.
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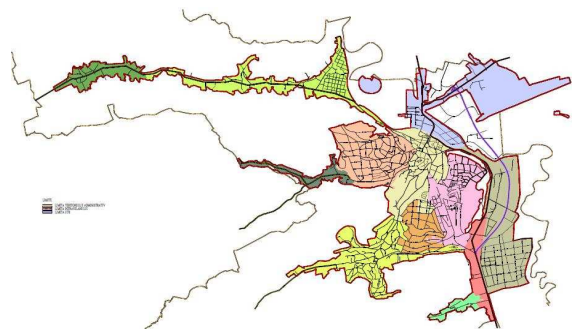


Fig. 5. Urban plan of Dej city, 2009
Source: Dej city Hall, 2009

4. Results and discussion

In the context of urban landscape, the concept of palimpsest is used to describe a sequence of stages of the city development (Kjerrgren, 2011).

Recent urban transformations manifested by gradual disappearance of the historical

monuments have led to a situation where the urban heritage conservation becomes a real problem for the local authority (Karimi, 2000).

Their responsibility as future experts in preserving historic spaces is to identify the current morphology factors of the space; to recognize and respect the social and cultural history of urban systems (Assi, 2000). The old city is a central core round which the new urban morphology is defined (Fig. 6).



Fig. 6. Morphology of the central area of Dej city (1898, 1970 and present)
(Source: Kádár, 1901 and Kosa, 2013)

In relation to other studies of urban landscape, the defining elements to preserve and enhance the value of historical and architectural heritage of the studied city can not be found in the current territorial profile.

Revitalizing the cultural heritage and enhancing its value become priorities for the sustainable, balanced, coherent and inclusive development of cities with a rich historical past.

Compared with scientific approach of palimpsest concept, the current scientific approach is based on the changes of the urban image over time, as reflected in the configuration of the studied city (Fig. 7).

The 19th century is representative for the identity construction of the city. Until the second half of century, Dej city was formed round a core composed by a public square, a Reformed Gothic church,

built in 15th century, and an old city. The city central area is a mix of styles, from Gothic style (Reformed church) to neo renaissance style (central buildings Ensemble built by architect Reményik Károly project in 1897; Prefecture Palace, 1897) and neo baroque style (National College Andrei Mureşanu”, 1900).



Fig. 7. Urban image of Dej city in 1866 and 2012
Source: Huber, 2002 and Kosa, 2012.

The loss of local identity is a characteristic element of spatial and temporal development of Dej city. Over time, many heritage buildings and monuments representative for the local history of the city have been replaced, the new architectural models have not commune elements with the past or not preserve the local nature: the walls of city and of Gothic church, Post Building of Dej city, National Theatre building of Solnoc Dăbâca, School of Painting, etc.

The Millennium Monument (Fig. 8) and Soviet Monument (Fig. 9) are two symbols of the historical central area of Dej city; in the current morphology of the local landscape, these monuments can not be found.



Fig. 8. Millennium Monument (1899)
Source: Kádár, 1901



Fig. 9. Soviet Monument (1946)
Source: Kosa, 2014

The conservation of historical heritage contributes decisively to improve the image and sustainable development of the cities (Wai-Yin and Shu-Yun, 2004).

The preservation of cultural identity can represent a concern whose final objective is to ensure the quality of resident population life (Scazzosi, 2004).

5. Conclusions

The urban palimpsest concept can be used to explain the dynamics of the reference historical eras – support for current urban configuration.

The stratification of development levels according to historical eras has particularly importance in the context of morphology configuration and the urban representation in correlation with the new public policies objectives of sustainable and balanced spatial development.

Past, present and future development of Dej city is the result of territorial and socio-economic transformations.

The urban landscape is treated as an image of the past era, a cultural construction of the present era and a starting point for its new development; all of these are reflected in the city architecture.

The new spatial dimensions and the extension of studied urban system must take into account the social, economic, political and human factors that actively contribute to a controlled, balanced and sustainable development in order to ensure the optimal quality of life.

Reusing the urban palimpsest involves three components: urban conservation, heritage preservation and innovative designs that combine the past and present era and preserve the traditions and local

customs, i.e. the continuous relation between past, present and future era.

The new geometry of urban forms should be in synergy with spatial elements and historic and present day influences.

The city considered as a palimpsest is an alternative to the establishment of the lost identity and the capacity to resist to fast, uncontrolled and stereotypical development of the urban system.

Preserving the local identity and combining old architectural elements with new ones are pre requisites of the analysis of urban landscape as palimpsest.

Palimpsest is a method to analyze and characterize the urban landscape. Each city is an urban palimpsest.

Excepting a nostalgic reconstruction of the urban system of Dej city, i.e. of all elements specifically to palimpsest such as central core, public square, heritage buildings, architectural elements, specific to various styles, should establish a rational continuity where the preservation and enhancing of value should synchronize with the contemporary management strategy and sustainable, coherent and integrate development objectives.

Thus, the new regeneration and urban renewal project should take into account the history of city and aim to preserve the historical heritage by integrated revitalization and enhancing its values.

REFERENCES

- AlSayyad N. (2001), *Global norms and urban forms in the age of tourism: manufacturing heritage, consuming tradition*, in: AlSayyad N. (Editor), *Consuming Tradition, Manufacturing Heritage: Global Norms and*

- Urban Forms in the Age of Tourism*, Routledge mot E F & N Spon, New York, pp. 1-34.
- Assargård H. (2011), *Landscape urbanism: from a methodological perspective and a conceptual framework*, Master's thesis, Swedish University of Agricultural Sciences, Department of Urban and Rural Development, Uppsala.
- Assi E. (2000), *Searching for the concept of authenticity: implementation guidelines*, *Journal of Architectural Conservation* **6(2)**:60-69.
- Azimzadeh M., Bjur H. (2007), *The urban palimpsest: the interplay between the historically generated layers in urban spatial system and urban lyfe*, Proceedings, 6th International Space Syntax Symposium, Technical University Faculty of Architecture, Istanbul, pp. 1-14.
- Bailey G. (2007), *Time perspectives, palimpsests and the archaeology of time*, *Journal of Anthropological Archaeology* **26**:198-223.
- Barnes T.J., Duncan J.S. (1992), *Writing Worlds. Discourse, Text and Metaphor in the Representation of Landscape*. Routledge, London.
- Bloom A.L. (2002), *Teaching about relict, no-analog landscapes*, *Geomorphology* **47**:303-311.
- Borzan S.C. (2012), *History and Economy. From the "Uprising from the Bridge over Someș" to the communist aggregate works [in Romanian]*, Editura Texte, Dej ISBN 978-606-92392-8, pp. 5-386.
- Chan W.Y., Ma S.Y. (2004), *Heritage preservation and sustainability of China's development*, *Sustainable Development* **12(1)**:15-31.
- Chevallier R. (1976), *Le paysage palimpseste de l'histoire: pour une archéologie du paysage*, *Mélanges de la Casa de Velázquez* **12**:503-510.
- Crang M. (1996), *Envisioning urban histories: Bristol as palimpsest, postcards, and snapshots*, *Environment & Planning A* **28**:429-452.
- Crow T., Brown T., De Young R. (2006), *The Riverside and Berwyn experience: Contrasts in landscape structure, perceptions of the urban landscape, and their effects on people*, *Landscape and Urban Planning* **75(3-4)**:282-299.
- Daniels S. (1988), *Landscape, Image, Text*, Cambridge: Cambridge University Press.
- Feilden B. M., Jokilehto J. (1998), *Management Guidelines for World Cultural Heritage Sites*, second ed. ICCROM, Rome.
- Gospodini A. (2004), *Urban morphology and place identity in European Cities: built heritage and innovative design*, *Journal of Urban Design* **9(2)**:225-248.
- Graburn N. H. H. (2001), *Learning to consume: what is heritage and when is it traditional*, in: AlSayyad, N. (Editor), *Consuming Tradition, Manufacturing Heritage: Global Norms and Urban Forms in the Age of Tourism*, Routledge mot E F & N Spon, New York.
- Holling C.S., Orians G. (1971), *Toward an Urban Ecology*, *Bulletin of the Ecological Society of America* **52**:2-6.
- Huber A. (2002), *The city over time. Incursion into the local history [in Hungarian]*, Editura Gloria, Cluj, ISBN 973-8267-07-2, p. 7.
- Jansen-Verbeke M. (1998), *Tourismification of Historical Cities*, *Annals of Tourism Research* **25(3)**:739-742.
- Karimi K. (2000), *Urban conservation and spatial transformation: preserving the fragments or maintaining the "spatial spirit"*, *International Journal of Urban Design* **5(3)**:221-231.
- Kádár J. (1900), *Solnoc Dăbâca shire monography [in Hungarian]*, Editura Demeter and Kiss, Vol. III, Dej, pp. 6-219.
- Khirfan L. (2010), *Traces on the palimpsest: Heritage and the urban forms of Athens and Alexandria*, *Cities* **27**:315-325.
- Kjerrgren L. (2011), *Layers of Land. The Palimpsest Concept in Relation to Landscape Architecture*, Bachelor's project at the Department of Urban and Rural Development Swedish University of Agricultural Sciences, Uppsala.
- Kostof S. (1991), *The City Shaped: Urban Patterns and Meanings through History*, Fifth Printing 2004 eds. Bulfinch Press, Time Warner Book Group, NYC.
- Krinke R. (2001), *Overview: design practice and manufactured sites*, in: Kirkwood N. (Ed.), *Manufactured sites*, Spon Press, London.
- Krinke R. (ed.) (2005), *Contemporary Landscapes of Contemplation*, Ed. Routledge Taylor & Francis Group, London and New York, pp. 201.
- Larkham P.J. (1996), *Conservation and the City*, Routledge, NYC.
- Luck M., Wu J. (2002), *A gradient analysis of urban landscape pattern: a case study from the Phoenix metropolitan region, Arizona, USA*, *Landscape Ecology* **17**:327-339.
- Lynch K. (1981), *Good City Form*, ninth ed. The MIT Press, Cambridge, Massachusetts.
- Martin A.J., Warner B.S. (1997), *Urban conservation: sociable, green, and affordable*, in: Nassauer J.I. (Editor), *Placing Nature, Culture and Landscape Ecology*, Island Press, Washington DC, pp. 109-122.

- Mânzat G. (2006), *Dej city monography* [in Romanian], Second edition, Editura Astra-Dej, Dej, ISBN 973-86591-6-7, pp. 10-11.
- Min K. Y. (2009), *An analogy of palimpsest as a strategy transforming urban structure into architectural discourse – focused on Dominique Perrault's architecture of strata*, in: 4th Conference of the International Forum on Urbanism, Amsterdam.
- Mol Térkép (2014), *Plan of Dej and Oca Dej municipalities* [in Hungarian] (1830), <http://mol.arcanum.hu/terkep/opt/a101205htm?v=pdf&a=start>
- Norberg-Schultz C. (1991), *Genius Loci: Towards a Phenomenology of Architecture*, Rizzoli, NYC.
- Nuryanti W. (1996), *Heritage and postmodern tourism*, *Annals of Tourism Research* 23(2):249-260.
- Oke T.R. (1982), *The energetic basis of the urban heat island*, *Quarterly Journal of the Royal Meteorological Society*, 108, pp. 1-24.
- Romanian Parliament (2002), *Law no. 451 8 July 2002 to ratify the European Landscape Convention, adopted on 20 October 2000 in Florence*, *Official Gazette* 536(1).
- Pendlebury J. (2009), *Conservation in the Age of Consensus*, Routledge, New York.
- City Hall Dej (2006), *General Urban Plan* [in Romanian], S.C. G&T Creator S.R.L., Dej.
- Rafailaki E. (2006), *The implications of the "palimpsest" of the grids of the main city of Piraeus on creation, transmission and application of cognitive knowledge*, University College of London Bartlett School, Msc Built Environment, Advanced Architectural Studies, London.
- Samuelson M. (2008), *The urban palimpsest: Representing Sophiatown*, *Journal of Postcolonial Writing* 44(1):63-75.
- Scazzosi L. (2004), *Reading and assessing the landscape as cultural and historical heritage*, *Landscape Research* 29(4):335-355.
- Speaks M. (2002), *Individualization without identity*, in: Vermeulen M., Florian B., Mommaas H., Speaks M., van Synghele K. (Editors), *City Branding: Image Building and Building Images*, NAI Uitgevers Publishers, Rotterdam.
- Tiesdell S., Taner O., Heath T. (1996), *Revitalizing Historic Urban Quarters*. Architectural Press, an Imprint of Butterworth-Heinemann, Oxford.
- Tyler N. (2000), *Historic Preservation: An Introduction to Its History, Principles, and Practice*, Second edition, W.W. Norton & Company, New York.
- van Synghele K. (2002), *City branding for eight Dutch cities: from conceptual to literal image building*, in: Vermeulen M, Florian B, Mommaas H, Speaks M, van Synghele K (Editors), *City Branding: Image Building and Building Images*, NAI Uitgevers Publishers, Rotterdam.
- Van Aschee K., Teampău P. (2009), *Layered encounters: performing multiculturalism and the urban palimpsest at the "Gateway of Europe"*, *The Anthropology of East Europe Review* 27(1):7-19.
- Vermeulen M. (2002), *The Netherlands, holiday country: introduction*, in: Vermeulen M, Florian B, Mommaas H, Speaks M, van Synghele K (Eds.), NAI Uitgevers Publishers, Rotterdam.
- Walker K. R., Bambach R. K. (1971), *The significance of fossil assemblages from fine-grained sediments: time-averaged communities*, *Geological Society of America Abstracts with Programs* 3:783-84.
- Weng Q., Lu, D. (2009), *Landscape as a continuum: an examination of the urban landscape structures and dynamics of Indianapolis City, 1991-2000, by using satellite images*, *International Journal of Remote Sensing* 30(10):2547-2577.
- Wikipedia (2014), *Plan of Dej and Oca Dej municipalities* [in Romanian] (1773), http://ro.wikipedia.org/wiki/Fi%C8%99ier:Josephinische_Landaufnahme_pg053.jpg
- Zonneveld I.S. (1979), *Land Evaluation and Land(scape) Science*, ITC Textbook VII.4 (Second edition), ITC Enschede, 134 pp.

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