

SUSTAINABLE DEVELOPMENT IN THE CITY OF VOLOS THROUGH REUSE OF INDUSTRIAL BUILDINGS

Mitoula Roido

Associate Professor, Harokopio University
mitoula@hua.gr

Eleni Theodoropoulou

Associate Professor, Harokopio University
etheodo@hua.gr

Barbara Karali

Master in Sustainable Development, Harokopio University
karali_b@yahoo.gr

Abstract

This paper is investigating an important sector of urban renewal that concerns utilization of abandoned industrial buildings and accommodation of various activities. In particular, the case study of this article is to present the restoration and reuse of five factories positioned inside the urban web of Volos: Tsalapatas' old brick factory, the silk factory, Adamopoulos cotton-mills, Papastratos' tobacco warehouses situated at the city's waterfront, Spirer's building, and the old electric factory. The aim of this presentation is to study the way these buildings affect the metamorphosis of the picture of Volos within the frame of orientating city's growth to sustainable ways.

Key words: *city's sustainable development, Volos, industrial heritage.*

Introduction

The geographical area occupied by cities concentrates an abundance of functions that fulfill various needs such as economical, social or cultural, at an individual and public level. However, in the course of time cities change trying to adjust to different circumstances.

Nowadays, current changes observed globally, are related to the phenomenon of globalization, which is mainly characterized, as far as its economic dimension is concerned, by the flexibility of markets as well as capital which exceeds national borders, penetrating in other economies regardless of their geographical position. In this framework, cities are the main receivers of new changes, having great impact not only on their social and economic life but also on their structured environment, resulting in phenomena of uniformity which are threatening their character. On the other hand, some exceptional efforts of building as well as region reformations are observed, thus contributing to the general aim of improving the abandoned areas and to the urban sustainable growth generally. Such policies use physical and cultural city resources, through the exploitation of old and abandoned structural elements such as architectural style, urban planning, monuments, etc. embodying them to the modern city and promoting city identity. (Stefanou J., Mitoula R., 2003)

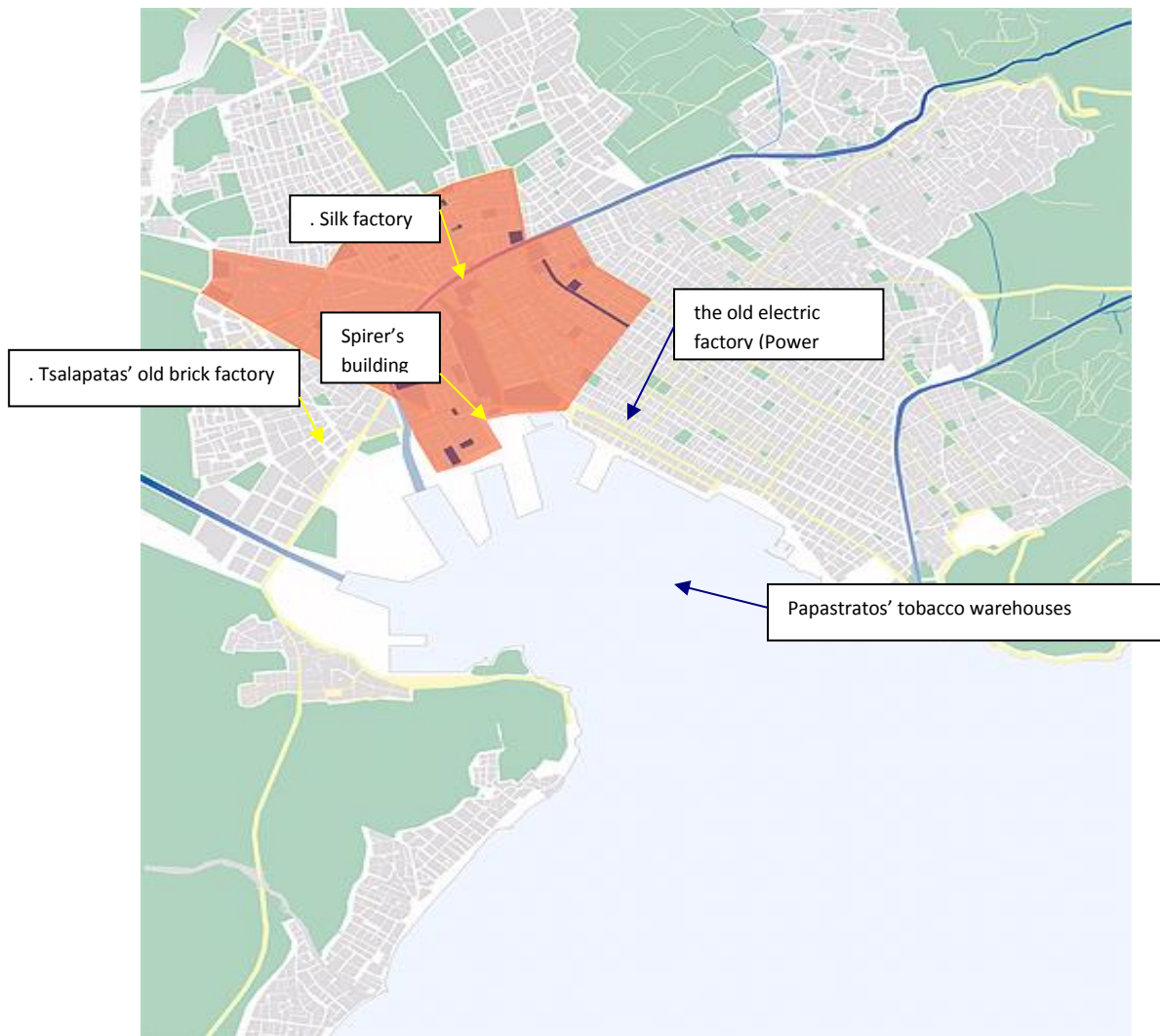
Consequently, by implementing urban renovation practices a double objective is achieved: a) promotion of a city ("place or city marketing") and b) redefinition of the identity of urban space ("place identity").

This paper is investigating an important sector of urban renewal that concerns utilization of abandoned industrial buildings and accommodation of various activities. This causes multiple positive results and is connected to terms of sustainable development as the existing city's building reserve is exploited ("building recycling") (Hutton, 2004). The objective of practices like the ones mentioned above is the promotion of industrial cultural heritage, better arrangement of basic urban functions and reuse of abandoned buildings and areas found within the city's net.

In particular, the case study of this article is to present the restoration and reuse of five factories positioned inside the urban web of Volos: Tsalapatas' old brick factory, the silk factory, Adamopoulos cotton-mills, Papastratos' tobacco warehouses situated at the city's waterfront, Spirer's building, and the old electric factory.

The aim of this presentation is to study the way these buildings affect the metamorphosis of the picture of Volos within the frame of orientating city's growth to sustainable ways.

Figure 1. Map of the town of Volos (www.demekav.gr), the marked points are the case study where reuse of browfields took place within urban net as follows:



Industrial cities

Growth of industry as a phenomenon involved important consequences to the structured environment of those cities, where it was developed. Therefore, an industrial city is being easily recognized firstly from the optical picture that it presents, that is to say from the localization of factories in its net. As a result, industrial buildings influence the city's outline (e.g. presence of big chimneys or notched roofs). They also influence the architectural style of the city, particularly when factories of 19th and 20th century are met, because they are characterized as architectural heritage having stone, timber and tile as their basic structural materials (Palmer M. and Neaverson P., 1998).

The research object of industrial archaeology is to study the secondary sector which was recently developed (18th -20th century) and specifically the ways of production as well as the consequences upon the rhythms and relations between the city and its residences. (Palmer M., 2007),(Agriantoni H., 2006) Aim of industrial archaeology is to understand, maintain and promote public memory in places and mostly in cities where industrial growth took place, underlining all those elements that constitute monuments: related history evidence and reference places of urban space (Palmer M. and Neaverson P., 1998). Buildings are the most recognizable elements to be found within the city and therefore constitute monuments of industrial heritage.

The term 'monument' in industrial archaeology does not exclusively include elements that "obey" to aesthetic rules but anything that is related to the growth of industry, for example equipment and factory files, and particularly the wider impact that was observed in all sectors. As a result, documentation of industrial heritage is proven to be of great importance for the research of industrial archeology. This includes field techniques (site surveying methods, building recording methods, and machinery and processes recording), as well as documentary research (manuscript sources, maps and plans and pictorial sources). (Palmer M. and Neaverson P., 1998) Furthermore, the meaning of the term 'monument' also includes the pro – industrial period where an important production tradition was created in a circumferential geographical level, round the later industrial cities, which had an obvious impact on issues of know-how, working culture and business dexterity. (Agriantoni 2006) Therefore, an industrial monument constitutes a piece of cultural heritage of a place and for this reason it is essential to study, as well as to maintain and promote it.

As far as factories of the 18th and 19th century are concerned, they are considered as imposing due to their size. They present elements that belong to a specific architectural style, for example application of neoclassicism principles (magnificence, impressiveness, plasticity, voluminous composition, articulated order), connecting the aesthetics with the dynamic and imposing picture that each enterprise wished to give to its factories shaping by this way a unique form for the entire city. (Maheras G., 1986) Besides, the examination of architectural styles in urban space is of great importance as the characterization of built environment, in other words of steady manmade constructions concerning architectural style, gives important information about the character and the identity of a city, (Stefanou J. and Colleagues, 2000) in our case of the industrial city. Therefore, reformatting such buildings preserves and promotes this specific city identity.

As Rossi A. observes, architecture serves as the most important structural element of urban space, contributing to the creation of a city as a place of public memory. Monuments constitute elements that present a long-lasting picture even if they have changed their initial use and mission. (Rossi A., 1991) That is also the case today with the reuse of industrial buildings which, on one hand, are considered to be monuments, but on the other hand are used to shelter different uses from those initially planned (e.g. museums, cultural centers, public services, etc.).

Regarding Greek reality, industrial growth was not of the size or expansion of other European industrial cities, at such a point that even the use of the term "industrial revolution" would be disputed. However, industrialization did happen, changing radically the conditions in all sectors and influencing to a large extent the growth of cities. As a matter of fact, the growth of the

secondary sector presented geographic decentralization with the creation of industrial centers such as Ermoupoli, Piraeus, Patra, Thessaloniki (Kalogri P. and all, 1986) and of course Volos. As far as greek documentation is concerned, it is proven to be a rather recent process including collaboration with international organizations such as TICCIH (The International Committee for the Conservation of the Industrial Heritage). (Belavilas, 2006)

In the abovementioned cities, factories of the secondary sector, due to their volume and characteristic outline, served as reference points. In addition, according to the theory of Lynch K., (Lynch K., 1988) concerning the semiotic interpretation of space, industrial buildings could be used to "interpret" industrial urban centers: on one side, they constitute monuments that function as symbols (reference points) contributing to the establishment of public identity, while on the other, industrial buildings are assigned with notions exceeding the functionalism that they initially served. In other words, beyond productive process factories 'carry' the symbolism of an entire industrial period, the magnificence that was created because of the rapid economic growth, including social and cultural environment, symbolisms which are impressed on buildings and apparently on factories, and generally on the entirety of an industrial city (Karidis d. 1999).

Hence, industrial cities are exceptionally interesting to study, and particularly the reuse of industrial buildings constitutes an important alternative in order to maintain and support history and identity of such urban places.

Reuse of industrial buildings as a factor of accentuating city's identity and sustainable urban development

Economic changes occurring in a city as well as the completion of an industry's life cycle have obvious effects on space as well as on urban web. This happens because buildings accommodating production were located in many cases inside the urban web, remained for a long period of time inactive and consequently unexploited for various urban uses.

Through last years, rehabilitation and reuse of abandoned industrial regions was one of the proposed measures in order to attract new investments which would result to the economic reinforcement of industrial cities. It was also a practice in order to demonstrate the particular identity that characterizes a former industrial urban centre. Moreover, it is important to underline that one of the basic advantages industrial complexes have is their exceptional location within the city which allows them to be found near public services or networks of transportation. (Sousa C., 2003)

Towards this direction is the European policy about sustainable city development, in cases where rehabilitation of brownfields located inside the city net is considered necessary. (European Commission, 1998) Such practices prevent city sprawl and misuse of land and on the other hand contribute to a better arrangement of basic urban functions. Furthermore, invigoration of downgraded regions where as a rule industrial buildings are located is achieved through the reuse of brownfields.

Similar policies are adopted by the global community. According to the definition of OECD (OECD, 2000) reuse of abandoned industrial regions (brownfields) constitutes a part of a wider effort to create favorable conditions aiming at economic growth, confrontation of land-use problems in densely populated urban regions, control of urban diffusion (urban sprawl), and finally improvement of social cohesion. (Moore N., 2002)

Generally, restoration of industrial buildings constitutes an important factor in an effort to appoint the particular identity of post - industrial cities, provided that these spaces are confronted as monuments of industrial archeology (Ballesteros E.' Ramirez M. 2007). Undoubtedly, any intervention should not change initial form (internal and external) of these buildings. (Traganou – Deligianni O., 2003)

Reuse of industrial buildings as a factor for the city's third sector economy development

Nowadays, viewing the city as a united organism has led urban policy towards complete programs of urban regeneration. Practically, this suggests implementation of regeneration projects, so as a city will acquire suitable infrastructures in order to attract investments and reinforce economically. Old industrial buildings could contribute towards this direction. Hence, they should not be viewed only as elements of collective memory, in other words as 'museum' exhibits, secluded from the rest of the city, but as important zones of the city's cultural identity, offering remarkable prospective for the regeneration of urban space through the potential of architectural, urban design and land-planning. (Beriatos E., Gospondini A., 2004), (Gospondini A., 2009)

Hence, these elements should be related to the renewal of the city image and the orientation of urban economy towards third sector services, particularly of those referred to urban tourism, since it is being recognized as a remarkable factor of wealth production gaining ground, since local authorities are aiming at making their town a famous destination.

Urban tourism is a sector of tourism referring to the exploitation of cultural, natural and other resources that a city acquires. With the exception of traditional European urban destinations, a new kind of tourism is suggested: the city is viewed as a "compact" touristic product which, through suitable planning and infrastructure acquisition (athletic, cultural, etc) will lead to renewal of the city image, growth of tourist offer and attraction of new economic activities. (Moore N., 2002) (Beatley T., 2000) (Sousa C. 2003) (Murray M., 2002) This modern kind of tourism could contribute to economic growth, offering high quality services to a broad tourist market, in other words to tourists with different kind of interests. (Russo A., Borg J., 2002)

Based on the aforementioned, cities could exploit their industrial heritage in cultural ways. In a post – industrial era, accommodation of various activities in restored industrial buildings within a wider frame to promote city's identity, to upgrade public spaces and to exploit them in order to attract tourists, urban economy could be reinforced towards third sector (Xie P., 2006).

The successful promotion of a city, what worldwide is called "place/city marketing" (Page S., 1995) is proven to be of crucial importance. That is, promotion of the offered touristic product according to open market conditions and rules of marketing (market research, S.W.O.T. analysis, distribution channels, promotion of product to possible target groups). (Karagiannis St., Exarhos G., 2006) The expected result of such an organized effort is the increase of competitiveness of the tourist image of the urban space and as a result the increase of city visitors.

In conclusion, industrial heritage and its promotion mainly through brownfield redevelopment, allocates important dynamics to the urban space sheltering these venues within its web. Visitors will be facing the particular culture and glamour that an old industrial centre reveals.

Exploitation of industrial heritage in the city of Volos

The city of Volos presents similar economic and land planning characteristics to corresponding European cities since industrial decline has made old productive units inactive. Re-establishment and reuse of these installations incorporating new uses, constitutes a distinguished initiative of the city at national level, in relative as well as in absolute sizes. It is the need to preserve the particular historical identity of the city in terms of industrialization, as much as the need to cover modern functions, in a city where available un-built spaces are rare, that have triggered the implementation of this undertaking. Old factories accommodate new public spaces of sociability (university, educational and cultural buildings as well as athletic venues) constituting Volos' important reference points.

Accommodation of a variety of new uses in the renovated industrial buildings, took place because of their advantages in terms of size and location within the urban web. In particular, it concerns installations that often occupy entire building squares, with spacious constructions and internal spaces free of underpins, suitable for the accommodation of a variety of new uses (Hastaoglou V., 2002). Moreover, their geographical spreading in the urban web, as a result of the lack of urban planning not forecasting successive built-up extensions, “enclosed” former regional factories in the interior of residence regions.

The presence of current abandoned spaces is due to industrial recession, where indebted and technologically outdated industries devolved to the property of credit organisms. This was the reason for which 35 of 45 factories functioning in the city were rescued from demolition. (Hastaoglou V., 2002) Interventions in these spaces are mostly an initiative of the local government and private sector and not of central government (Adamakis, 2010). This effort dates back to 1980, with the proposal for the installation of the University in the central area of the urban web through the reuse of four old industrial groups.

After the successful materialization of the abovementioned undertakings, municipal government, in collaboration with local institutions (TEE, architecture association, 5th Board of Newest Monuments, local media), undertook the expansion of the exploitation of old industrial buildings. Specifically, the redevelopment program for 13 factories since 1988, when Spirer’s tobacco storehouse rehabilitation took place, picked within the 90’s and attributed to the city roughly 100 acres of renewed surface for public use and more than 27,000 m² of renovated buildings for public functions. (Hastaoglou V., 2002)

Currently, 28 out of 42 (70 %) industrial units are being restored, 6 factories are in the process of rehabilitation and for 5 factories conservation has been ensured, in order to get exploited in the near future. The renewed spaces are used for: 1) culture-museums 17%, 2) administration – (public) services 5%, 3) education 29%, 4) residence 5%, 5) commerce 5%, 6) combined uses: culture – commerce – entertainment 28%, 7) entertainment 12%. (Adamakis K., 2007) (see figure 1)

Tsalapata’s factory

Tsalapata’s old brick & tile factory was founded in 1925 by Tsalapatas Bros and operated successfully until 1975, when it ceased production. Twenty years later, in 1995, the Municipality of Volos bought the factory complex, in the framework of the European Urban Program (www.erih.net). The factory is located in the neighborhood “Palaia” and takes up a land of 22.650 m² within the urban web.

It is an exceptional sample of industrial complex at European level. The industrial buildings along with the Hoffmann type kiln, (it is the only one in Europe saved in its early form and without being modified) and the elements of the production chain from steam engines to modern electric engines are well conserved (www.i-politismos.gr). For this reason the Greek Ministry of Culture has characterized “Tsalapata’s factory” as a rare example of a preserved industrial complex.

The financing of the project was mostly (95%) supported by the European Union and specifically by “URBAN - I”, while the rest of the project was funded by the Municipality of Volos (www.demekav.gr). There were six other Greek cities which participated in the programme during the period 1994-1999 among with was Volos. The aim of the programme for Tsalapata’s factory was to increase urban tourism by incorporating in the urban net significant land in order to acquire public spaces, to upgrade the specific region where the factory is situated and to decrease unemployment.

As far as the architectural interferences are concerned, a matter of particular importance was the preservation of the external morphology of the buildings and the factory complex as a whole

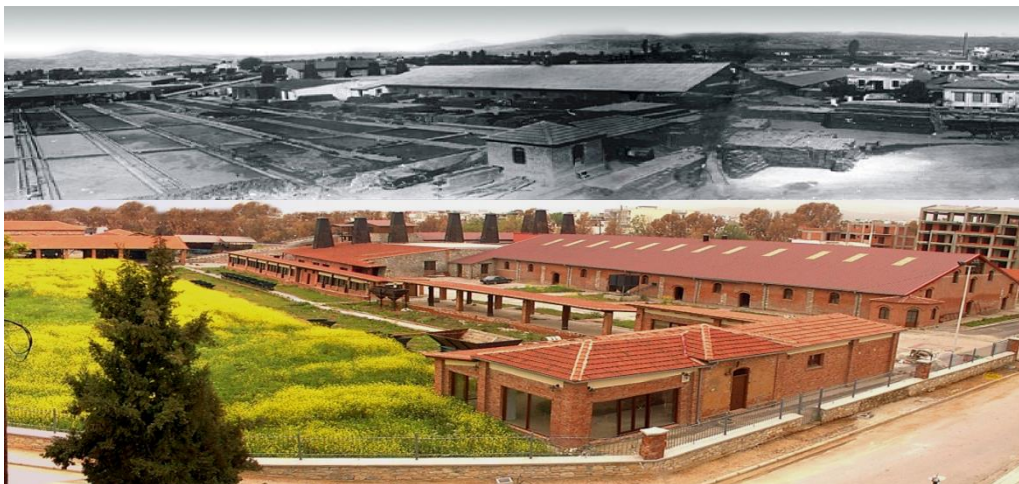
using building materials matching with the style of the factory complex (stone, wood, metal, bricks & tiles).

Moreover, the project was seen as a pilot case to help establish low energy consumption, through bioclimatic methods of architecture, using p.v. (photovoltaic) panels, methods of natural ventilation and control of temperature. Within the frame of new technologies that were implemented there was an effort to maximize the use of solar energy. The position and dimensions of windows (including roof openings) were designed in a way to maximize lightening during winter and to provide shading in the summer. Moreover, the roof is constructed in a way to supply solar energy to p.v. panels, while there was roof, floor and wall insulation. In addition, chimneys were substituted with “solar” chimneys –with solar collectors – in the interior of which natural ventilation is allowed. The results of periodic controls for energy consumption were a reduction of 70 %.

Current use of the factory includes: operation of the industrial history museum where the methods of production as well as the equipment of the factory are presented (www.piop.gr). Leisure space like restaurants, bars and a hall for cultural activities occupy an important portion of the exploited space, while a dance school and a shop of ceramic – made handicrafts are operating. Finally, offices of a construction company that is involved with today’s exploitation of the rehabilitated brownfield as well as offices of the research centre of the University of Thessaly (www.palaia.gr).

In conclusion, the rehabilitation of Tsalapata’s old brick & tile factory is the most prominent case of reuse of industrial building in the city of Volos. Its position in the urban web and its wholeness concerning the installations have comparative advantages concerning the improvement Volos’ picture, since the accommodation of new uses and the operation of a multi-functional cultural centre contributes to the sustainable development of the city. (see figure 2)

Figure 2. Tsalapatas’ old brick factory (www.demekav.gr)



Silk factory

This factory is situated in the municipality of N. Ionia (an adjacent municipality to Volos that constitute together the conurbation of Volos), at the west bank of Crafsidonas stream. It was established in 1926 and since 1930 150 tones of silk were produced annually and were channeled to Europe’s markets, while it ceased functioning in 1991. (Dimoglou A., 1998) It occupies an area of 4 acres while the buildings have total space 2.750 m

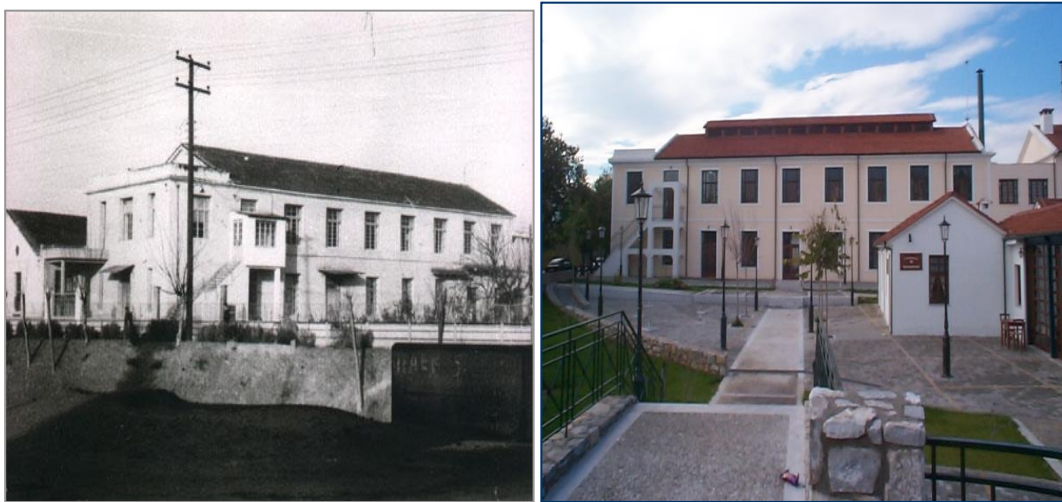
In 1995 it was declared as a protected monument and in 1996 was at the ownership of the municipality. For the design and reuse of the factory a national architectural competition has been

proclaimed, while the construction was under the municipal enterprise for research and construction (Hastaoglou V., 2002). The funding of the project came from the European programme URBAN (www.demekav.gr/metaxourgio.eng).

The rehabilitated factory was selected for the creation of a cultural and business center. Present uses involve:

- Offices of municipal enterprise for research and construction
- Cultural organisation
- Silk museum
- Cinema club (movies are played every Friday in multi-use room)
- Cultural activities (painting and photo exposes)
- The Silk Mill's courtyard accommodates a restaurant with a certain "couler – local". (see figure 3)

Figure 3. Silk factory (www.demekav.gr)



Papastrato's tobacco warehouse

The tobacco warehouse was built in 1926 by Papastratos Brothers in order for them to expand their enterprise, and operated until September 1969 when it was rented to the National Organization of Tobacco.

This industrial place is situated at the city's waterfront and has been a remarkable complex of buildings since its foundation/establishment. It consists of two buildings, (the oldest is a triplex storehouse and the other one has five floors and two notable domes) where the storage of tobacco, the mechanical treatment and the disposal to the market took place (www.uth.gr).

The reuse of the warehouse is connected to the establishment of the University of Thessaly the headquarters of which are in Volos. In collaboration with the local authorities it was decided that the university would be within the urban web, avoiding older practices, for example at the towns of Ioannina and Patra, where the campuses were in the vicinity but not a part of the urban space. However, Volos' university was created by a complex of buildings which were found primarily downtown and secondarily at the perimeter of the city. (Hastaoglou V., 2002) Specifically, the following industrial spaces were chosen:

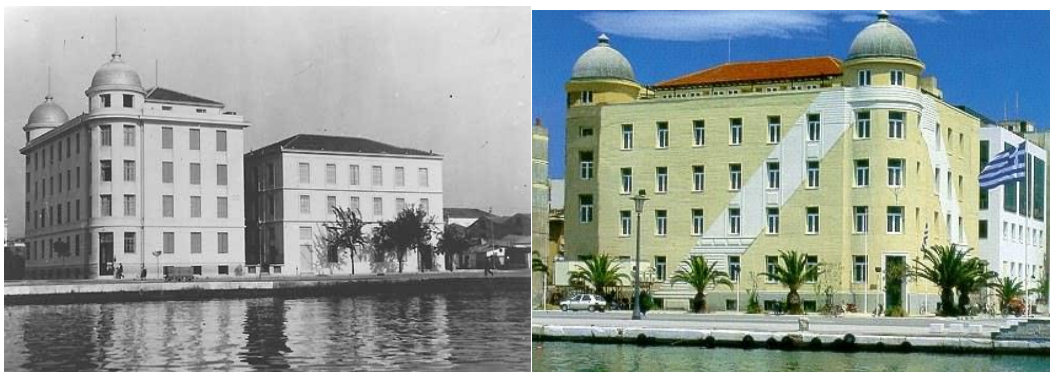
- Papastratos' tobacco warehouse at Volos' waterfront (bought in 1985)
- Papparigas' turnery situated at the west city's entry, in the "Field of Mars"
- Matsagos' tobacco warehouse in the municipality of N. Ionia
- Matsagos' tobacco factory, situated downtown but not yet rehabilitated and in use

Overall, a total of 75.000 m² cover the needs of university accommodations, 14.820 m² of which belong to the coastal complex. The financing of this project came firstly from the public investments program and followed by 2nd Community Support Framework (www.kps.gr), (Final quarterly supervision newsletter of the 2nd kps, 2002)

It is worth mentioning the architectural interventions at the coastal industrial complex which is comprised of the tobacco warehouse, the adjacent triplex storehouse and part of the next building block. The tobacco warehouse preserved its initial shell with the characteristic domes and after its renovation today the administrative services, as well as the offices of university's headquarters are accommodated. The triplex warehouse was demolished and a five floor building took its place where the following are found: a council center, classrooms and a large amphitheater. Finally, an eight floor building was built. The characteristic of these newly built edifices is that they present abstract ional features in order to emphasize the old industrial and rehabilitated unit.

We should not neglect to mention the embodiment of the small vertical road that was between the tobacco's warehouse and the eighth floor building. This road was declassified and used as an internal square – entrance having a distinguishing glass vault above it, operating as a central point of unifying of the three buildings (Hastaoglou, 2002). (see figure 4)

Figure 4. Papastratos' tobacco warehouses situated at the city's waterfront (www.diki.gr)



Spirer

The Tobacco warehouse was built according to the designs of the architecture Vilanits so as to house the Tobacco warehouse of Herman Spirer's firm. For many years 500 workers mostly from Mikra Asia (east coast of Aegean) were occupied. After the 2nd World War the building was used by the Koen's Tobacco warehouse, followed by the Tobacco Organization and finally became property of Local Transportations Company.

This building was characterized as historical and preservable construction by the Ministry of Culture in 1985 and in 1988 it became to the ownership of the Municipality of Volos. It was the first of a series of industrial units to be rehabilitated and accommodated municipal services, while the Municipal Technical Service undertook its rehabilitation. The first period of the rehabilitation was completed in 1991 and involved the conservation of the external shell as well as the shaping of the inner space.

The conservation of the west wing was made in 1995, while the renovation of the east wing was completed in 1997. In 2002 the whole building was ready for use (www.diki.gr).

This form-industrial unit is situated near the town – hall, the municipal theater and the Technical Chamber and it occupies an entire building block of 4,780 m². It is consisted of two buildings: The central edifice has three floors with a semibasement and an attic; it is angle - shaped

and is found at the north – west side of the block, while in the south-east the offices' building is situated. The architectural style is that of the British industrial buildings of the industrial revolution era, affected by neoclassic style (decorative patterns on the building face) constructed however with local materials, according to traditional methods. (Adamakis K., 2007)

Today's use of the industrial unit involves the following activities:

- East wing: municipal conservatory
- Central – east block:
 - Ground and first floor: offices of the municipal center of History and Documentation
 - 2nd floor: Committee for the Mediterranean Games 2013
 - Attic: research department of the Municipal Technical Services
 - Basement:
 - Archive of the town planning offices
 - Part of the archive of the Municipal History Center
- West wing:
 - Ground floor: Municipal Technical Services
 - 1st floor: (rented to Missouri Druri University Department)
 - 2nd floor: (municipal educational foundation)
 - Attic: exhibition gallery. (see figure 5)

Figure 5. Spirer's building (Adamakis K., 2007)



Power Company

Volos' Power Company used to be one of the biggest factories producing electricity in Greece. In 1926 an agreement with municipality of Pagason assumes to provide exclusively electricity for the city of Volos, which had for a long period of time a combined system (electricity and gas). In 1957 National Electric Organization buys the local business using its electrical installations until the decade of '80.

This industrial unit is situated downtown, along the linear park of Riga Feraiou Street and it consists of three basic buildings of a total surface of 1,185 m² in a building plot of 1,774 m². In particular: in the ground floor the main production is found, the "factory", the two floor posterior building accommodating the head office of the company until the late '80's. Later on, the building was occupied for storing materials. (www.volos-m.gr)

These three buildings were reconstructed and since 2001 they accommodated, after the necessary interventions, new uses having as the most important the Center of Musical Theater with

a stage for 300 people as well as the Municipal Dance School. (see figure 6)

Figure 6. The old electric factory (Power Company (www.diki.gr) (Adamakis K., 2007)



Conclusion

The aim of the present paper was to investigate the issue of reuse of industrial buildings in the framework of a city's sustainable development and particularly the case of the city of Volos.

From the brief presentation it becomes obvious that the reuse of industrial units has positive results in the city. Moreover, the aim of modern cities is the creation of suitable infrastructures in order to attract new investments which will result to multiplicative positive results, not only on the economic field but on the rest of the sectors of urban life. Rehabilitation of brownfields contributes to the protection and promotion of a city's identity, while specific degraded areas are improved aesthetically and quality - wise. At the same time, economy's third sector is enhanced through urban tourism (cultural, conference tourism, etc) and at last reuse of industrial spaces plays an important role to the city's normal function, as inactive areas inside the urban web are exploited avoiding thus urban diffusion.

Consequently, the practice of redevelopment of abandoned industrial spaces constitutes a policy presenting important advantages, adopted in an important number of cases where local governments sought solutions in order to accommodate various urban uses (finance, administrative, cultural etc.) inside the urban web. In particular, Volos' urban net includes a large area which ensures new public spaces in the urban web and simultaneously the districts where the factories are situated are upgraded, especially the region of "Palaia" where the Tsalapatas group is located, in which until today was marginalized.

The reuse of brownfields and the accommodation of new uses cannot be seen fragmentarily but within the framework of application of a wider strategic planning, aiming at the development of the third sector and particularly that of urban tourism. The application of strategic planning offers the advantage achieving to view the urban space as wholeness with its sustainable growth being the aim. In other words, the city is faced as a single organism and the problems or the plans of development are not fragmentary. As a result the upgraded role of architectural, urban-planning and land-planning is stressed as the basic tools to improve urban landscape and generally the quality of life.

The presentation of the particular factories refers to only few of the many industrial spaces that the city disposes. The collaboration between local authorities and institutions in order to plan all of the industrial spaces, their exploitation and their creative integration in city's life for the benefit of citizens and visitors are decisive factors for Volos' development in terms of sustainability.

Regarding the case study of the exploitation of the Tsalapatas industrial group, the operation of a multi-functional cultural centre is expected to have multiplicative positive results in the city. On the one side, it ensures the essential public spaces contributing to the renewal of the city's image, elevating it to an attractive place of destination. On the other side, it contributes to the preservation of cultural heritage and to the appointment of these spaces as important points of reference of the urban space, in other words as places of public memory.

Besides, the development of urban tourism is interrelated to the historical and cultural identity of cities, provided that those buildings that have historical importance for the city are selected for exploitation, contributing to the protection of cultural heritage. Therefore, from this point of view, the characterization of industrial group from the Ministry of Culture as preservable monument protects it from probable expropriations, while the hospitality of soft tourist uses, like the operation of the museum of industrial history, ensures its function avoiding the intensifying use of this historical place of the city.

However, the most important aspect that the case study presents, concerns the contribution of the factory to the growth of urban tourism in Volos which is going to constitute an important axis of development for the city, after the turn of local economy from the secondary sector in the benefit of services. The redeveloped brownfield is expected to cause multiplicative positive results that will be related to the improvement of residents' quality of life as well as with the increase of city's visitors.

The expected results from the development of urban tourism through the reuse of the industrial units could be summarised as follows:

- Extension of tourist period with involving increase of the overall visiting of the city by native and foreign tourists.
- Creation of new jobs.
- Improvement of the image of the city and in consequence of its competitiveness.
- Improvement of the life conditions for the residents after the concretisation of essential infrastructures (eg. improved road network).
- Increase of the income for the city.

Consequently, the critical point to strategic decision making for development is that any proposal should fulfil sustainability conditions. Practically, this means respect and effective management of historic and cultural city resources embodying them in city's modern life. At the same time, decision making ought to be long – lasting, taking into consideration exceptional resources that urban spaces have in order to ensure their renewal or at least to avoid their collapse so as to make them available to next generations. Local urban economy is already orientated to tertiary sector, for example growth of urban tourism, through the exploitation of unique local characteristics avoiding by this way wasting natural recourses and creating sustainable solutions which will lead further to urban growth.

References

- Stefanou J., Mitoula R. (2003). "Globalization, European Union and the physiognomy of Greek city", ed. PAPAZISI, Athens.
- Hutton, T. (2004). *The New Economy of the inner city. Cities*, Vol. 21, (2) pp. 89-108.
- Palmer M. and Neaverson P. (1998). *Industrial archaeology: principles and practice*, Routledge, London, p. 2 – 8, 105, 143 – 153.
- Palmer M. (2007). Industrial Archeology. *Encyclopaedia of Archeology*, p. 1511- 1521.
- Agriantoni H. (2006). Industry and city. *En Volo*, 23 issue.
- Maheras G. (1986). Industrial archeology. *Arheologia*. 18 issue.

- Stefanou J. and Colleagues. (2000). The physiognomy of Greek city. *Laboratory of Urban Design N.T.U.A.*, Athens, p.49.
- Rossi A. (1991). The architecture of the city. *UNIVERSITY STUDIO PRESS*, Thessaloniki, p.19, 21.
- Kalogri , Margariti F., Tsokopoulos V. (1986). The industrial archaeology in Greek space: a first approach. *Arheologia*. 18 issue.
- Belavilas N. (2006). Documentation of industrial heritage. *En Volo*, 23 issue (in Greek).
- Lynch K. (1988). The image of the city. *MIT Press, Cambridge 1960 and new edition*.
- Karidis D. (1999) About Hercules Program: From Ippodamus to Vitruvius. *Ten projects for the Greek City*. Scientific Direction and Coordination Karidis D. and Cassia C. (ISBN: 960-86014-0-1) p.235- 239.
- Sousa C. (2003). Turning brownfields into green space in the City of Toronto. *Landscape and Urban Planning*, Vol. 62, pp. 181-198.
- European Commission (1998). Sustainable Urban Development in Urban Union: Frame Action, Brussels.
- Moore, N. (2002). From indigenous industry to foreign finance: the changing face of Dublin Docklands. *Land Use Policy*, Vol.19 p.325-331.
- Ballesteros E. Ramírez M. (2007). Identity and community—Reflections on the development of mining heritage tourism in Southern Spain. *Tourism Management*, Vol. 28 (3). p. 677-687.
- Traganou – Deligianni O. (2003). The industrial heritage as cultural heritage in the frame of European Union. Proceedings of Conference “*The preservation of industrial heritage*”, Ptolemaida, Greece 31-3-2003.
- Beriatos E , Gospodini A. (2004). Globalising urban landscapes: Athens and the 2004 Olympic Games. *Cities*, Vol. 21, No. 3, p. 187–202.
- Gospondini A. (2009). Post-industrial Trajectories of Mediterranean European Cities: The Case of Post-Olympics Athens. *Urban Studies*, vol.46(5&6) p.1157–1186.
- Russo A., Borg J. (2002). Planning considerations for cultural tourism: a case study of four European cities. *Tourism Management*, Vol. 23 (6), pp.631-637.
- Beatley T. (2000). Green Urbanism: Learning from European Cities. *Washington D.C.: Island Press*, pp.384 – 387.
- Murray M. (2002). City Profile, Denver. *Cities*, Vol. 19, No 4, pp.283-294.
- Xie P., (2006). Developing industrial heritage tourism: A case study of the proposed jeep museum in Toledo, Ohio. *Tourism Management*. Vol. 27. (3) p. 1321-1330.
- Karagiannis St., Exarhos G. (2006). Tourism. Tourist Economy, Development, Policy. Technical Research Centre of Crete, Greece p. 295.
- Page S. (1995). Urban Tourism. *Edition Routledge*, London.
- Hastaoglou V. (2002) Volos, Portrait of the city in 19th and 20th century. “*Exploitation of industrial heritage*”. *Volos ed.*, p.208, 209, 217.
- Adamakis K (2010). “*Exploitation of Volos’ industrial heritage*”, available at: www.greekarchitects.gr/gr/αρχιτεκτονικές-ματιές/η-αξιοποίηση-της-βιομηχανικής-κληρονομιάς-του-βόλου-id3025 (in Greek).
- www.erih.net/nc/countries/detail.html?user_erihobjects_pi2%5Bmode%5D=1&user_erihobjects_pi2%5Bcountry%5D=14&user_erihobjects_pi2%5Bpointer%5D=0&user_erihobjects_pi2%5BshowUid%5D=18374&user_erihobjects_pi2%5Bregionalroute%5D=0&user_erihobjects_pi2%5BanchorOnly%5D=0&user_erihobjects_pi2%5BmembersOnly%5D=0
- www.i-politismos.gr/tsalapatas_sx_eng.html
- www.demekav.gr/tsalapatas.html
- www.piop.gr/%28FD0837CA8E3F3262CCC5E03091637D2FAD3969B91E8B8709%29/Piop_Museum.asp?ID=427&NT=18&Lang=2&MuseumID=425

- www.palaia.gr/web/default.asp?id=14
- Dimoglou A. (1998) «Metaxourgeio Etmektzoglou in Volos», *HISTORICAL INDUSTRIAL EQUIPMENT IN GREECE*, National Technical University of Athens, School of Architecture, National Hellenic Research Foundation, Institute of Neohellenic Research, university ed, Odysseus ed. P.229- 235
- Hastaoglou V. (2006) Volos, Portrait of the city in 19th and 20th century. “*Exploitation of the industrial heritage*”. *Volos ed.*, p.214
- www.demekav.gr/metaxourgio_eng.html
- www.uth.gr/genika/egatastaseis/79
- www.kps.gr
- Final quarterly project supervision newsletter of the 2nd kps, 2002, Technical office of University of Thessaly.
- Hastaoglou V. (2002). Volos, Portrait of the city in 19th and 20th century. “*The university and the new character of the city*” *Volos ed.* p.217-225
- www.diki.gr/museum/EL/city/routes.asp?building=10&route=1
- DI.KI (Municipal Center of History and Documentation),
- Adamakis K. (2007). *Critical evaluation of reuse industrial buildings in Volos*. Suggestions for the next day, 5th National Meeting, TICCIH 22-25 November 2007, Volos
- www.volos-m.gr/mun/cemth/new/2mainone2.htm
- www.ticcih.gr (in greek)
- www.mnactec.cat/ticcih/index.php
- www.monumenta.org/article_list.php?IssueID=5&lang=gr&CategoryID=1
- www.demekav.gr/index.html