

# BDC

Università degli Studi di Napoli Federico II

## 17

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### **Circular City and Cultural Heritage Interplay**



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## Indice/Index

- 7 Editorial  
*Luigi Fusco Girard*
- 11 The circular economy approach for the  
regeneration of Torre Annunziata port area  
*Mariarosaria Angrisano, Luigi Fusco Girard*
- 23 A big data dashboard architecture for a  
computable intelligent city  
*Karima Kourtiti, Peter Nijkamp*
- 35 Circular economy and cultural  
heritage/landscape regeneration.  
Circular business, financing and governance  
models for a competitive Europe  
*Luigi Fusco Girard, Antonia Gravagnuolo*
- 53 Towards a circular port-city development  
model: a pilot study in Pozzuoli, Italy  
*Francesca Nocca, Antonia Gravagnuolo*
- 83 Rapid urbanization and heritage conservation  
in Indian cities  
*Patrizia Riganti*
- 99 L'economia circolare: una sfida culturale per le  
città portuali creative  
*Maria Di Palma*
- 125 Ecosistemi urbani e cambiamento climatico:  
quali approcci valutativi?  
*Silvia Iodice*
- 141 Rigenerazione urbana e area portuale: il  
progetto di architettura per l'area ex Magazzini  
Generali a Napoli  
*Stefania Regalbuto*





## **THE CIRCULAR ECONOMY APPROACH FOR THE REGENERATION OF TORRE ANNUNZIATA PORT AREA**

*Mariarosaria Angrisano, Luigi Fusco Girard*

### **Abstract**

The UNESCO Recommendation on Historic Urban Landscape (HUL) calls for the identification of innovative models for cultural heritage conservation/regeneration.

The aim of this paper is to demonstrate how new models of the circular economy can restore cities identity, increasing the tangible and intangible values of the built heritage and reducing the costs of urban renewal.

This theory is reinforced on the one side through some case studies and on the other side by an applicative case study. It concerns the regeneration of Torre Annunziata port area, a historic city in Southern Italy, endowed with a suggestive cultural and landscape heritage.

Keywords: Historic Urban Landscape, circular economy, waterfront regeneration

## **L'APPROCCIO DELL'ECONOMIA CIRCOLARE PER LA RIGENERAZIONE DELL'AREA PORTUALE DI TORRE ANNUNZIATA**

### **Sommario**

Il "Paesaggio Storico Urbano" rappresenta un nuovo settore di ricerca per identificare modelli innovativi per la conservazione del patrimonio culturale.

L'obiettivo di questo articolo è dimostrare come i nuovi modelli dell'economia circolare possano restituire identità alle città, aumentando i valori tangibili e intangibili del patrimonio costruito e riducendo i costi delle trasformazioni urbane.

Tale tesi viene rafforzata da un lato attraverso l'analisi di alcune buone pratiche e dall'altro dalla proposta di un caso applicativo, la riqualificazione dell'area portuale di Torre Annunziata, città storica del Sud Italia dotata di un patrimonio paesaggistico e culturale di notevole rilevanza.

Parole chiave: Paesaggio Storico Urbano, economia circolare, rigenerazione dei waterfront

## 1. Introduction

Cultural heritage/landscape is a strategic resource for sustainable development, recognized by the European Union as a key economic resource in the global competition (European Commission, 2014).

The intrinsic value of cultural heritage can be exploited through the adoption of innovative culture-led business and governance models and evaluation tools (Angrisano *et al.*, 2016).

The recently adopted New Urban Agenda (United Nations, 2017) and 2030 Agenda for Sustainable Development and Sustainable Development Goals (United Nations, 2015) strengthen the idea that cultural heritage and landscape conservation/regeneration effectively contribute to make cities and human settlements safe, inclusive, resilient and sustainable (United Nation, 2015).

The UNESCO Recommendation on Historic Urban Landscape (2011) provides a guide to improve and ensure the preservation of historic landscapes. It stimulates local authorities to consider cultural heritage fundamental for territorial development policies, as well as for local planning and regeneration of historic centres.

The circular economy is here considered as a strategic approach to implement the HUL Recommendation, capable to produce positive impacts both in the economic and heritage conservation perspective.

The aim of this paper is to propose a regeneration project for the port area of Torre Annunziata, able to enhance the symbiosis between the city and the harbour. We analyse best practices (Helsinki, Paris) demonstrating how circular economy principles are able to increase heritage values and regenerate the city landscape. Then, we propose a planning strategy to improve the symbiosis between city districts, integrating different economic, social, cultural and landscape characteristic, creating the “port of Pompeii”, an entry point from the sea to the archaeological excavations, and reusing the historic buildings along the waterfront.

## 2. The HUL Recommendations and the role of the circular economy for cultural heritage regeneration. Some good practices

The definition of “Historic Urban Landscape (HUL) proposed by the UNESCO in 2011 represents the most recent contribution to the international debate on the identification, conservation, enhancement and management of cultural heritage. It emphasizes the systemic interrelationship of economic, social, environmental, cultural sectors and the dimension of the intangible heritage.

A rational recognizable, reliable, efficient and sustainable management process of change should be able to outline the configuration of a settlement system in compliance with the established values and potentials of a territory (Bandarin and Van Oers, 2014).

The challenge of regenerating and managing Historic Urban Landscapes is linked to the enhancement of urban productivity and the “density” of relationships. It requires innovative business/management models, new hybrid evaluation tools, and new funding/financial tools (Angrisano *et al.*, 2016).

Recent literature highlights that the circular economy model can be deduced from a number of basic concepts: the greening economy, the natural capitalism, the fundamental economy, the “creating shared value” principles, the resource and energy efficiency gap and the ecological transition (Ezzat, 2016).

The circularization processes and synergies, which promote resilience and creativity and then sustainability (Fusco Girard, 2010) should be transferred from a sectorial approach (e.g. approaches centred on waste management) to the whole organization of the city, its economy, its social system, its governance to improve the urban productivity (Fusco Girard, 2014).

In the “New Urban Agenda” the circular economy model is considered a fundamental strategy to manage the resources such as land, water, energy, materials and food. It is able to resolve problems tied to the emission of greenhouse gases and air pollutants (United Nations, 2017).

Some good practices of urban regeneration and adaptive reuse of cultural heritage realized in France and Finland are here briefly analysed to design a feasible ‘circular’ planning strategy for the regeneration of the port area of Torre Annunziata.

### **2.1 Paris innovative urban projects**

The city of Paris launched its urban innovation strategy focused on eco design, green constructions, urban agriculture, reuse of food waste and development of recoverable energy.

In 2014 it was launched a call for innovative urban projects, with the aim of rethinking 23 Parisian sites that represented the future of the city in terms of architecture, new usage, environmental innovation and co-construction. Each project had to demonstrate their contribution to a sustainable and intelligent city through its design, technical specificities and planning (Mairie de Paris and Pavillon de l’Arsenal, 2017). The aim was to encourage the private sector to invest in urban projects, to accelerate the urban regeneration and the adaptation to new economic, social and environmental challenges. Many partnerships have been activated for each project, among the regional enterprises, laboratories, schools, universities, stakeholders and policy makers. It stimulates positive impacts also for the social sector.

### **2.2 Adaptive reuse of the Rehafutur Engineer’s House in Northern France**

“Rehafutur Engineer’s House” is a historic building in the North of France, located in the UNESCO buffer zone. The project proposed a reconversion of the historic house into a green office, with the aim to improve the health of workers. Different eco materials have been adopted, obtained by wood fibre, flax fibre, sheep wool, loose-filled cellulose, recycled textile and cellular glass. Two marble fireplaces were removed during the refurbishment process to become ornamental features in public rooms. The hundred-year-old spruce floorboards were meticulously dismantled to make way for high-performing floor insulation. 18 square metres of multi-coloured cement tiles were reused. 350 cubic metres of rubble were stored at the rear of the house and reused to level the parking spaces and access paths ([www.rehafutur.fr](http://www.rehafutur.fr)).

The aim was to save the costs for the transportation of carrying debris/rubble to landfill.

This circular project responds to the challenge that France would apply for the historic buildings requalification.

### **2.3 The restoration of the “Brummen Town Hall” in Paris**

The “Brummen Town Hall” in Paris is an historic building restored according to the circular economy principles. The designers realized a glass roof with recycled materials,

that can also be reused in a future disassembly of the area. This project has received the 2013 Sustainable Architecture Award, especially for the modular design.

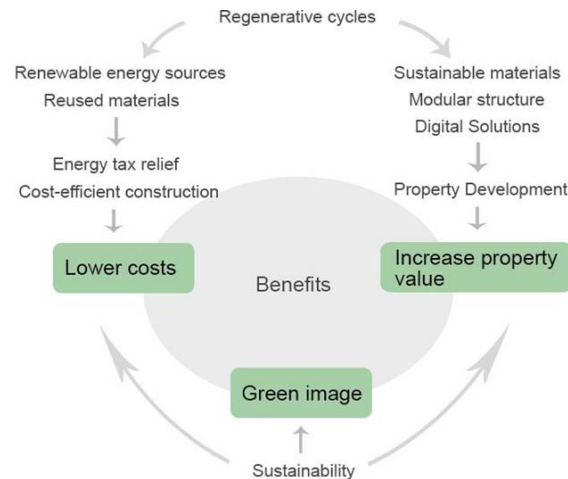
#### 2.4 Recovery of buildings in Helsinki

In the city of Helsinki, companies are working to define the concept of the circular economy in “real estate industry”, to pass the theoretical perspective framework in a more concrete way (Markkanen, 2016).

The recovery of existing buildings generates a lot of advantages, such as the lower costs of the investments and the increasing of property values.

It is possible to access funding to buy recycled materials and to use energy from renewable sources. The costs of construction and recovery are reduced and property values increased (Fig. 1).

**Fig. 1 - Regenerative cycles of buildings in Finland**



Source: Markkanen (2016)

#### 2.5 The impacts of ‘circular’ urban regeneration projects

The above mentioned projects generated economic-social-cultural-environmental impacts:

1. increase of the percentage of eco-designed products in public procurement calls;
2. development of new economic models for green construction;
3. enhancement of renewable energy;
4. set up of economic incentive mechanisms specifically for renewable energy;
5. creation of a business incubator to facilitate eco-design processes (Mairie de Paris and Pavillon de l’Arsenal, 2017).

Circular economy investments in the real estate sector are linked to the use of new technologies and innovative business models, including modular construction, 3D printing and smart management, able to lower costs for the reuse of buildings.

There are different strategies to reduce the costs of recovery of existing buildings, for example the use of renewable energy, that allows exploiting public incentives; the purchase of recycled materials at a low cost (Ellen MacArthur Foundation, 2016).

In Finland, tenants are more willing to pay for green buildings, a strategy that increases the value of properties. To realize a “green building”, costs are 2.9% higher than the usual construction practice, but it is a worthwhile investment in the long period (Markkanen, 2016).

The “environmental certifications” of buildings are an important advantage to circular re-design. They describe the characteristics of buildings, the choices of recycled materials, the energy innovation systems, the water recycling system, the choices made to reduce the consumption of soil and the principles of innovative design. Analysing these certifications it is possible to compare the characteristics of the different buildings in the city.

This is a “circular planning”, where a great collaboration between designers and companies, are activated. The recycled materials are the porcelain glass, plastics, textiles, steel, iron, green roofs.

Resource efficiency, recycling, reusing and up cycling materials have a symbiotic connection, which has been known for over a century, but not sufficiently implemented over time (Markkanen, 2016). This connection is known as industrial symbiosis.

The main idea of such symbiosis is an exchange of resources among businesses to close the loop of materials. Water, energy and services can also be exchanged within the business cluster. Waste no longer exists when the output or side-product of one company can be used as input of another company (Markkanen, 2016).

It is possible to reuse the materials that come from the excavations of other buildings.

The reuse of the buildings in a sustainable way could reduce the demand for new buildings. It is necessary an interior modular design of the abandoned buildings, promoting the use of 3D printing that can reduce the costs of construction.

The analysis of the good practices demonstrates that the investments in “new technologies” are a possible strategy to regenerate the real estate values of the city.

Circular economy for new construction and renovation projects should focus on minimization of raw material usage, removal and recycling waste from the construction process, and on designing a resource efficient, adaptable and disassemble building (Markkanen, 2016).

These good practices demonstrate that many positive impacts can be achieved in the economic and environmental dimension, if the principles of the circular economy are applied in the built environment sector, as well as the enhancement of the intrinsic values of historic buildings in the urban landscape areas.

### **3. Case studies of industrial symbioses in port areas**

The analysis of the best practices has influenced the proposal of Torre Annunziata port area regeneration, based on the principles of the “industrial symbiosis”.

The industrial symbiosis in port areas can ensure positive economic and environmental performances. The ports are the hubs where existing and new factories are located, they are the entry point of the imported materials.

The industrial symbiosis is meant as a synergistic exchange of waste, by-products, water and energy between individual companies in a locality, region or even in a virtual community. Key to industrial symbiosis is the collaboration between companies and the

synergistic possibilities offered by geographical proximity. Industrial symbiosis engages traditionally separate industries in a collective approach to competitive advantage involving physical exchanges of materials, energy, water and/or by products (EPIC, 2020).

To understand the concept of industrial symbiosis some best practices have been analysed: Norrköping (Sweden), Linköping (Sweden), Lidköping (Sweden), Helsingborg, Enköping, Stenungsund, Kalundborg (Denmark) and Avesta (Sweden) (EPIC, 2020). In all these cases, industries located in the port area collaborate and share materials and wastes, reducing environmental impacts. The variety of residues becomes feedstock in other processes. In Helsingborg, the heating system produced district cooling and electricity for the city.

The industrial symbiosis adopted in these port areas represented the theoretical framework for port regenerations in Mantova (Italy), Malmö (Sweden) and Wismar (Germany) (EPIC, 2020).

The port of Mantova is famous for being a logistic intermodal hub connecting the Adriatic with Mediterranean Sea. Along the Mincio River, the Port Authority wanted to enhance an old industrial area to revitalize the local economy, connecting the harbour with Venice and Trieste. Nowadays the most important existing activities are the metal carpentry, fossil chemistry and logistic operators. The reuse of 615 ha has just started, according to the circular economy principles, with the aim to connect the existing factories. Material flows in the port area are mapped, with the aim to create a biotech plants, a bio refinery, two-biogas plant and a composting centre (EPIC, 2020).

The port of Malmö is the heart of the city's energy production and waste management. Nowadays the aim of the regeneration project is to enhance the sustainability of the 450.000 ha of waterfront, through a symbiotic integration of the existing industries.

Along the harbor area, there are well-developed infrastructures for electricity, heat and gas, as well as for waste and water treatment. The port area also handles large flows of material and products, transported by sea or land. In the area, there are companies that sort, treat and store most waste fractions (EPIC, 2020).

The port of Wismar has a good position in the Baltic Sea and in Europe. It is famous for the wood treatment. The main imports are wood logs, wood chips, wood pellets, peat, scrap, metal, grain, wind energy components, building materials. Its main exports are potash and salt, fertilisers, wood pellets, wood chips, saw timber and fibreboards, metal and building materials (cement, concrete pipes) (EPIC, 2020). The aim of the regeneration project is to enhance collaboration among the industries. Nowadays each factory has an energy plant that burns waste and wood producing energy, hot water and steam for the city.

There is a digital platform where all data about the circular economy in the port area are shared. This action strengthens the symbiosis between the city and the harbour.

#### **4. The case study: the circular economy for the regeneration of Torre Annunziata port area**

After the study of best practices, the project for Torre Annunziata regeneration was defined. The city of Torre Annunziata is classified as a medium-large urban centre (20,000 to 50,000 inhabitants), and covers an area of about 7.33 square km and 6 square km of waterfront.

The Port of Torre Annunziata is one of the most important seaports in the Campania region,

famous for the storage of grain.

The abandoned areas along the waterfront suffered from a situation of lawlessness and turned the port into an area of trafficking. The waterfront is now perceived as a space without identity, consisting of unpaved areas, warehouses, disused factories, disorderly productive activities and residential units.

The project aims to improve the social and economic regeneration of the port area and to increase the symbiosis between the city and the harbour.

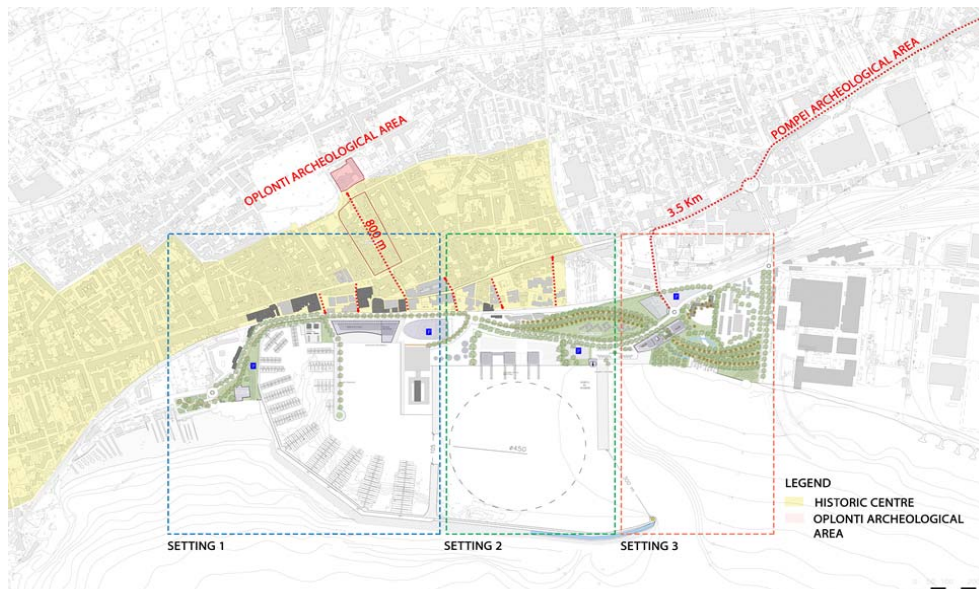
Therefore, new functions for the waterfront have been defined to enhance the social and economic regeneration of the port area and to increase the symbiotic processes between the city and the harbour.

The project foresees an overall increase in the functional surfaces relative to all port activities guaranteeing each of them maximum efficiency through: reorganisation of space and relocation of functions; improvement of accessibility and permeability port-city by replacing the small sidewalks with pedestrian-cycle paths and the ones of shipbuilding activities in the east of the port returned to the city; redesign of waterfront provision of urban services; reclamation of affected areas, project strategies aimed at reducing energy consumption and waste.

According to the principles of circular economy and “liveable” city, the project has been divided into setting areas (Fig. 2):

- Setting 1. Tourism port;
- Setting 2. Commercial port;
- Setting 3. Cruise port.

**Fig. 2 - The Torre Annunziata waterfront project**



Source: Angrisano (2016)

In the first area, a tourism port will be designed serving different functions: docks with 1,119 berths, a slipway, port authorities and executive offices, parking for sailing enthusiasts, fish market with some restaurants, sailing school for sailing sports and rowing activities. In the second setting, there will be an area for a commercial port with Solacem silos, shipyards with warehouses and wharves. The cruise port will be in the third setting. It will be divided into different functions for cruise ships, a cruise terminal, a big reception area, a trade fair centre for wine and food, restaurants, a composting centre, a logistic hub, an open-air car park, walking trails, green areas and new roads. The aim of the driveway and pedestrian road redevelopment is to connect the waterfront with the archaeological areas of Oplontis and Pompeii creating a cycle path in two-way traffic, lined with trees (Fig. 3).

This new project is based on circular economy principles. All living systems are characterised by circular processes, with no waste. They are able to conserve and reproduce themselves. Circular processes through reuse, recycling, and regeneration of components and energy, make cities regenerative. To satisfy this concept, different strategies have been chosen to build a synergic symbiosis between the city and the port (Fig. 3):

1. sustainable illumination;
2. recovery and reuse of rainwater;
3. management and recycling of waste, through the design of a composting plant;
4. uptake of marine energy;
5. electrification of the docks, cold ironing;
6. greening of surfaces and roofs;
7. use of photovoltaic panels;
8. electric mobility.

The efficiency of public illumination sector was followed through with the installation along the waterfront of 1,130 points lights that guarantee an annual saving of €135,374.

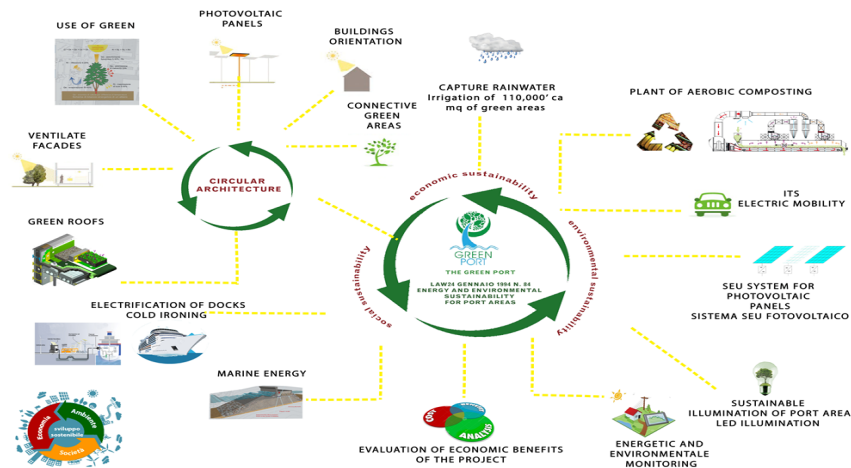
Cold ironing has been adopted as a solution for the port, as a result of other positive experiences in this sector, through the electrification of the docks using renewable sources that guarantee 43% of the energy needs of the harbour.

The photovoltaic panels will provide 2,119 families with electricity, assuming an energy requirement of 3,300 kWh/year per family. The panels will be installed on all the new buildings along the waterfront. A sustainable management of the cycle of the waters has been chosen based on the exploitation of less noble waters and on the use of high quality water exclusively where the characteristics of quality are really needed.

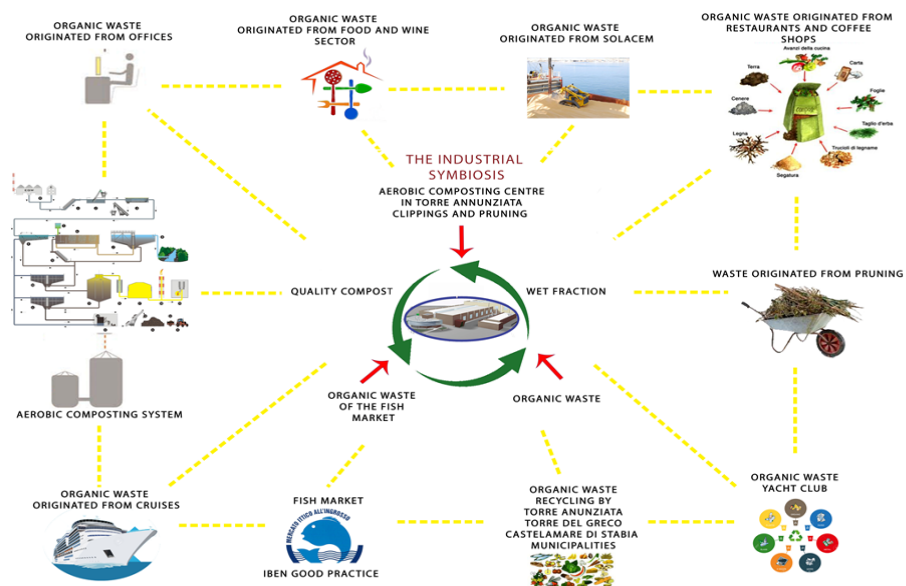
The green roofs on 110,000 square meters of buildings have been chosen to improve the environmental components (air, ground and microclimate).

A aerobic composting plant would produce consumable products (quality compost and organic mulches) using the putrescible waste from the cruise ships, the waterfront activities and organic waste from the diversified refuse collections of the municipalities of Torre Annunziata, Torre del Greco and Castellammare di Stabia. This strategy starts a symbiotic process between the city and the port. The quality compost produced will be employed as a fertilizer for the Vesuvius agricultural area and for the mountains near Sorrento and the Amalfi Coast (Fig. 4).



**Fig. 3 - The circular project for the requalification of Torre Annunziata waterfront**

Source: Angrisano (2016)

**Fig. 4 - The industrial symbiosis in Torre Annunziata**

Source: Angrisano (2016)

This project is estimated to generate positive impacts, tied to economic, environmental and social sectors. The most important result is the estimated creation of 884 new jobs, thanks to the creation of new economic activities. The estimation is based on comparisons with previously described case studies, following a precautionary approach considering the different socio-economic context conditions.

It is also possible to increase the real estate value, thanks to the reduction of recovery costs, as it happens in the city of Helsinki.

The redevelopment of this area is necessary to rebuild the historic and cultural landscape and identity of the city, according to the UNESCO Recommendation.

This project foresees the reuse of historic architectures, as it happens in Paris.

It is proposed the reuse of the old bridge railways line, the reuse of the existing buildings along the port area, the valorisation of the UNESCO site of Pompeii and Oplonti archaeological sites in Torre Annunziata, the valorisation of the existing thermal spa.

The port of Pompeii could valorise the archaeological area located in Pompeii and Torre Annunziata, linking the sea and the ancient city.

Cultural and Natural Capitals are important resources to implement the model based on the circular economy, to overcome the social and environmental fragmentation and enhance fairness, beauty and cultural and ecological diversity as a resource for economic growth and wellbeing.

## 5. Conclusion and recommendations

The cultural heritage intrinsic value can be expressed by the Social Complex Value. Here the conflicts between different values (economic, social, financial, environmental, symbolic, cultural) are very intensive and should be managed. A smart sustainable development is able to activate creative processes, through a synergistic approach. It is necessary to combine the touristic, economic, local productions activities with the cultural heritage regenerations.

The “circular economy perspective” is able to reduce economic costs, as well as environmental costs, creating new employment (jobs), while activating short-loops between the port-city and the extra urban territory.

The Historic Urban Landscape can reveal the “wealth” of the city and enhance the well-being of communities.

The intrinsic value of cultural heritage can be exploited through the adoption of innovative cultural-led business, governance models and evaluation tools (Angrisano *et al.*, 2016).

Cultural heritage conservation is a priority, but the economic resources to invest in restoration projects are limited. The demonstration of the economic benefits of conservation is extremely important (European Commission, 2014).

The waterfront project has been progressively configuring with the aim to obtain sustainable development projects that ensure economic, social, environmental and cultural positive impacts. Circular economy is able to increase real estate values and reduce the recovery costs.

## References

Angrisano M. (2015), “Economic heritage impact assessment as a tool for evaluating the impacts on the great requalification project of the coastal cities, UNESCO sites. The case study of Torre Annunziata, in the gulf of Naples”. *Territorio Italia*, n. 2, pp. 71-94.

- Angrisano M., Biancamano P.F., Bosone M., Carone P., Daldanise G., De Rosa F., Franciosa A., Gravagnuolo A., Iodice S., Nocca F., Onesti A., Panaro S., Ragozino S., Sannicandro V., Fusco Girard L. (2016), "Towards operationalizing UNESCO Recommendations on Historic Urban Landscape". *AESTIMUM*, no. 69, December 2016, pp. 165-210.
- Bandarin F., Van Oers R. (2014), *Reconnecting the city: the Historic Urban Landscape Approach and the future of urban heritage*. Wiley-Blackwell, Hoboken.
- Ellen MacArthur Foundation (2016), *Growth within: a circular economy vision for a competitive Europe*, [www.ellenmacarthurfoundation.org](http://www.ellenmacarthurfoundation.org)
- European Commission (2014), *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Towards an integrated approach to cultural heritage for Europe*, [www.europarl.europa.eu/portal/en](http://www.europarl.europa.eu/portal/en)
- Ezzat A. M. (2016), "Sustainable Development of Seaport Cities through Circular Economy: A comparative Study with implications to Suez Canal Corridor Project". *European Journal of Sustainable Development*, vol. 5, no. 4, pp. 509-522.
- Fusco Girard L. (2010), "Sustainability, creativity, resilience: toward new development strategies of port areas through evaluation processes". *International Journal of Sustainable Development*, vol. 13, n. 1.
- Fusco Girard L. (2014), "The role of cultural urban landscape towards a new urban economics: new structural assets for increasing economic productivity through hybrid processes". *Housing Policies and Urban Economics HoPUE*, vol. 1, no. 1, pp.3-27.
- Markkanen J. (2016), Circular Economy in Real Estate Investment Companies - Case Study: Suomen Yliopistokiinteistöt Oy, Kampusareena. *Bachelor's Thesis of Helsinki Metropolia University of Applied Sciences*, [www.theseus.fi](http://www.theseus.fi)
- United Nations (2015), *Transforming our World: the 2030 Agenda for Sustainable Development*, [www.un.org/en/index.html](http://www.un.org/en/index.html)
- United Nations (2017), *New Urban Agenda*, [www.habitat3.org](http://www.habitat3.org)
- Mairie de Paris and Pavillon de l'Arsenal, (2017), *Reinventing Paris - The Subterranean Secrets of Paris*, [www.reinventer.paris/en/sites](http://www.reinventer.paris/en/sites)

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