ARCHITECTURE HERITAGE and DESIGN

Carmine Gambardella

XIX INTERNATIONAL FORUM

Le Vie dei Mercanti

World Heritage and Design for Health

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ENVIRONMENT | AGRICULTURE | ECONOMY | TERRITORIAL GOVERNANCE |
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Carmine Gambardella
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Le Vie dei Mercanti
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Le Vie dei Mercanti

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Peer review

Scholars has been invited to submit researches on theoretical and methodological aspects related to Smart Design, Planning and Technologies, and show real applications and experiences carried out on this themes. Based on blind peer review, abstracts has been accepted,conditionally accepted, or rejected. Authors of accepted and conditionally accepted papers has been invited to submit full papers. These has been again peer-reviewed and selected for the oral session and publication, or only for the publication in the conference proceedings.

Conference report

300 abstracts and 550 authors from 40 countries:

Albania, Arizona, Australia, Belgium, Bosnia and Herzegovina, Brasil, Bulgaria, California, Chile, China, Cipro, Cuba, Egypt, France, Germany, Greece, India, Italy, Japan, Jordan, Lebanon, Malta, Massachusetts, Michigan, Montenegro, Montserrat, New Jersey, New York, New Zealand, Poland, Portugal, Russian Federation, Serbia, Slovakia, Spain, Switzerland, Texas, Tunisia, Turkey, United Kingdom.

WORLD HERITAGE anf DESIGN for HEALTH

The innocent eye sees nothing (Ernst Gombrich)

In this particular time characterized by a pandemic due to the expansion of the Covid-19 virus throughout a globalized world, the destinies of everybody have suddenly changed behavior, lifestyles, interpersonal relationships, production methods as well as the governing of the territory; the priority of investing in the healthcare sector has become increasingly urgent and indifferent with reference to a political management of the communities that prevents and does not suffer, as unprepared, the emergencies that increasingly afflict the community. Furthermore, in these months of “quarantine”, the Planet has shown a Resilience that makes us hope for the future. A response to the Culture of Emergency, which finds its generative ground not only in the healthcare sector but also in the governance of the territory, relates to the hydrogeological aspects, pollution of soils, air, water, illegal construction, the exploitation of energy resources faced with the use of the integral of scientific and managerial skills based on meritocracy. The XIX International Forum of Study ‘World Heritage and Design for Health’ addresses the issues related to the global pandemic in a multidisciplinary and systemic logic, as indicated by the UNESCO and the United Nations 2030 Agenda for the definition of projects and concrete actions that include the Welfare and Health of the Community. Therefore, the Forum aims to create a transversal critical dialogue, open to cultural contamination and ‘without limits’, in a logic of integration between skills that extends, and is not limited to, the following disciplines: Architecture, Culture, Environment, Agriculture, Health, Landscape, Design, Territorial Governance, Archeology, Economy, History, Sociology, Security, e-Learning. The Scientific Community of the Forum is composed of about seven thousand Professors and Researchers from one hundred Universities and Research Centers in the world, from institutional representatives, from the business sector and from the representatives of the 830 UNESCO Chairs (UNITWIN Program) thanks to the WebGIS created and managed by the UNESCO Chair at the Benecon University Consortium. The location of the Forum is of excellence. Campania Region with six World Heritage Properties, two Unesco Man and Biospheres, three assets registered on the Intangible Heritage List is one of the richest Regions in the world for cultural and landscape heritage, particularly ‘contaminated’ by Mediterranean cultures. No coincidence that the Forum takes place in Naples and Capri, with site visits and presentations of scientific research and operational projects by the Benecon University

Consortium, consisting of five Italian Universities, head office of my UNESCO Chair on Landscape, Cultural Heritage and Territorial Governance. The papers, selected by the Forum's Scientific Committee, will be published in the Proceedings of international relevance (candidate to be indexed Isi Web of Science). Furthermore, the most innovative research and projects will be published in the 'Quaderni' of the A Class international magazine 'Abitare la Terra / Dwelling on Earth'.

Prof. Carmine Gambardella
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WORLD HERITAGE and DESIGN for HEALTH

The innocent eye sees nothing (Ernst Gombrich)

In questo particolare tempo connotato da una pandemia dovuta dall'espansione del virus Covid-19 in un mondo globalizzato, i destini delle Persone improvvisamente sono stati modificati nei comportamenti, negli stili di vita, nei rapporti interpersonali, nei modi di produzione, nel governo del territorio; le priorità degli investimenti nel comparto Salute, diventa sempre più urgente e indifferibile con riferimento a una gestione politica delle Comunità che prevenga e non subisca, in quanto impreparata, le emergenze che sempre più affliggono la Collettività. Inoltre, in questi mesi di "quarantena", il Pianeta ha dimostrato una capacità di Resilienza che ci fa bene sperare per il futuro. Una risposta alla Cultura dell'Emergenza che trova il suo terreno generativo non solo nel campo della Salute ma nel governo del territorio per quanto riguarda gli aspetti idrogeologici, l'inquinamento dei suoli, dell'aria, dell'acqua, l'abusivismo edilizio, lo sfruttamento delle risorse energetiche affrontato con l'utilizzo dell'integrale delle competenze scientifiche e gestionali fondate sulla meritocrazia.
Il XIX Forum Internazionale di Studi World Heritage and Design for Health affronta le problematiche legate alla pandemia globale in una logica pluridisciplinare e di sistema, così come indicato dall'UNESCO e dall'Agenda 2030 delle Nazioni Unite per la definizione di progetti e azioni concrete che includano il Benessere e la Salute della Collettività. Il Forum si propone quindi di creare un dialogo critico trasversale, aperto alle contaminazioni culturali e 'senza limiti', in una logica di integrazione fra le competenze che si estende, e non si limita, alle seguenti discipline: Architecture, Culture, Environment, Agriculture, Health, Landscape, Design, Territorial Governance, Archeology, Economy, History, Sociology, Security, e-Learning.
La Comunità Scientifica del Forum è costituita da circa settemila Docenti e Ricercatori di cento Università e Centri di Ricerca nel mondo, da rappresentanti istituzionali, del settore dell'impresa e dai referenti delle 830 Cattedre UNESCO (UNITWIN Programme) grazie al WebGIS realizzato e gestito dalla Cattedra UNESCO incardinata al Consorzio Universitario Benecon.
La location del Forum è d'eccezione. La Campania con sei siti iscritti nella lista del Patrimonio Mondiale, due Man and Biospheres UNESCO, tre beni iscritti nella Lista del Patrimonio immateriale è una delle regioni più ricche al mondo per beni culturali e paesaggistici, particolarmente 'contaminata' delle culture del Mediterraneo. Non a caso il Forum si svolge a Napoli e Capri, con sopralluoghi e presentazioni di ricerche scientifiche

e progetti operativi a cura della Consorzio Universitario Benecon, costituito da cinque Atenei italiani, sede della Cattedra Unesco su Paesaggio, Beni Culturali e Governo del Territorio. I paper, selezionati dal Comitato Scientifico del Forum, saranno pubblicati negli Atti di rilevanza internazionale (candidati all'indicizzazione Isi Web of Science). Inoltre, le ricerche e i progetti più innovativi saranno pubblicati nei 'Quaderni' della Rivista internazionale di Classe A 'Abitare la Terra/Dwelling on Earth'.

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Green Projects: architectural design tools for nature. Planning and recovery opportunities for our cities

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Abstract
The world's urban population is growing. It is projected that by 2050, the world will be more than two thirds urban. Population growth in cities entails the need to develop new ways of design or regeneration of urban areas that consider issues such as the impacts of climate change and emissions.
Buildings, cells of our cities, and the construction sector are a major source of global rising energy use and emissions. This underlines the importance of a strategy to reduce energy demand and decarbonizing the built environment through recovery the building heritage and the design new architectures and urban planning with attention to nature aspects. A "global transformation" to a highly energy efficient and low carbon building and construction sector is essential to realize ambition of Paris Agreement.
It is important that the actions for recovery and design of architecture and public spaces must concern relationship between city and nature. Among the various design solutions there are actions, such as the "Urban Forestry" and the "Vertical Forest", which are attentive to the role of nature and the ways to incorporate it into the architectural project, demonstrating concrete and positive effects on the city and climate and environmental issues related to it. These are design challenges, highly current and oriented in the professional future, also requires attention in didactic for the formation of the architecture student and designer figure.

Keywords: Green projects, sustainable projects, Vertical Forest, Urban Forestry, urban regeneration

1. Introduction
The UN dossier "World Urbanization Prospects 2018" [1], shows that, by 2050, two thirds of the world population will live in cities, with a decline of the world's rural population. This trend is mainly driven by three countries: India, China and Nigeria. Progressive urbanization could be a positive factor. In fact, the concentration of inhabitants in the cities would make it possible to provide essential services in a more economical way and could help minimize the environmental impact on the planet. This can be an opportunity only if the countries are able to manage the flow of population displacement with virtuous policies and practices of cities governments. But at the same time, population growth in cities will be a need to develop new settlement projects on the boundary of the urbanized environment, with a recovery of urban built heritage and suburbs areas. In this context, the issue of impacts on climate change is fundamental, as underlined by 2030 Agenda for Sustainable Development. This Agenda, a plan of action signed in September 2015 by the governments of the 193 UN member countries, through economic, social and environmental principles, shows reflection and development methods to promote prosperity while protecting the planet, with attention to the cities and communities (Goal 11) and at the thirteenth Goal "Climate action".
It is evident how these two themes, cities and climate, are connected. It is the "Global Alliance for Buidings and Construction" that shows this correlation. The building and construction sector is, in fact, one of the sectors that need to be "decarbonized" to achieve the Paris Agreement commitment and the United Nations (UN) Sustainable Developments Goals.

Many architects and architectural firms, following this “commitment”, have embarked on the path of “green integration” into their new architecture design and in their actions and projects for the “re-design” and recovery of the urban built heritage.

2. Context

Buildings, “cells” of our cities, are among the major sources of GHG emissions in most countries in the world, thus playing a fundamental role in addressing challenges such as climate change and pollution. It is estimated that for many developing countries, such as the United Arab Emirates, the building stock is set to double by 2050. So, it is clear the need to improve the existing building stock, which is crucial for a sustainable transition.

The “2020 Global Status Report for Buildings and Construction” by Global Alliance for Buidings and Construction (GlobalABC) shows that global energy consumption of the global buildings sector remained constant compared to the previous years, while the global emissions (combined direct and indirect energy) from the building increased to 9.95 GtCO2 (gigatone of carbon dioxide) in 2019, or around 28% of total global CO2 emissions (IEA 2020). The building operation and construction industry energy-related emissions account for 38% of global CO2 emissions [2].

The buildings sector emission increase is due to a continued use of coal, oil and natural gas for heating, combined with higher activity levels in regions where electricity remains carbon-intensive, resulting in a steady level of direct emissions but growing indirect emissions (i.e. electricity). Electricity consumption in building operations represents nearly 55% of global electricity consumption.

The increase in emissions in the building and construction sector underlines the pressing need for a strategy to reduces energy demand and emissions: this thanks to the reduction of energy demand in the built environment, to decarbonization the power sector and to implementation new strategies on materials that reduce the lifecycle carbon emissions.

The International Energy Agency (AIE) estimates that, to achieving a net-zero carbon building stock by 2050, the direct building CO2 emissions would need to decrease of 60% by 2030. This would happen if the sector emissions reduce about 6% per year, from 2020 to 2030.

The decarbonization of the building stock and building sector by 2050 is only possible if there is the contribution by nations, trough the urgent adoption of legislative regulations, investment policies and thanks the use of intelligent technologies. An example is in European Union with his initiative announced in October 2020: “Renovation Wave”. This “plan”, for public and private buildings, has set an aim to increase the renovation rates across the EU for the next ten years. This will improve the energy performance of building heritage, improving life quality for inhabitants, reducing greenhouse gas emission and promoting digitalization and the reuse, recycling of building materials. The goal is to have 35 million buildings renovated and up to 160.000 “green jobs” created in the construction sector by 2030.

A “Global transformation” towards an energy efficient, low carbon emission of building and construction sector is essential to achieve Paris Agreement goals, that is to limit the increase in temperature to less than 2°C by 2030. To date, due to the decline in emissions due to the pandemic situation, it is easy understand how is really possible a reversal of trend, through a “green pandemic recovery” by implementing “green policies and plan” [3].

3. Opportunity for the city and nature

The growth of cities and the increase in population underline the fundamental need to change tack and fight pollution, reducing the environmental impact of urban areas.

According to report of the Green Building Council Italia (March 2020), the change can take place in actions such as: decarbonization, passing from “the zero-energy buildings” to “building with zero CO2 emissions”; adopting circular economy, through the reuse of building materials and activating platforms useful for this purpose; water efficiency, by encouraging technologies for reducing water and energy consumption; the protection of the soil and biodiversity, re-naturalizing abandoned areas. This can be possible by introducing and updating regulatory and legislative environment, financing virtuous actions and research and development projects. The imbalance between natural resources and urban environment creates the need to enhance and transform parts of cities into green areas, able to absorb CO2 and purifying the air of various pollutants such as PM10-PM2.5.

The green areas, located within the cities, help to mitigate the Urban Heat Island Effect (UHI), which thanks to evapotranspiration, are able to increase the humidity of the air by decreasing the temperature. Last but not least, there are all the psychophysical benefits that are perceptible in terms of quality of life. It is understandable how the actions for the redesign of the city must not only follow the process of building renovation but also greenery and nature aspects. A necessary combination that must enter into the conception and living in our “smart cities”.

Among the various architectural design solutions there are two modes of actions that pay close attention to the role of nature, incorporating it. These, in recent years, have proved contemporary not only in the architectural design, but also in the concrete and positive ideas and effect on the city, climatic and

environmental issues. They are the design of “Urban Forestry” and “Vertical Forest”. Urban Forestry is the planning and management of trees, forests, and related vegetation in urban areas and communities. Many countries, as in the case of UE, are developing policies for the design and enhancement of green areas. Plans are drawn up for more development of urban forestry, considering it an excellent tool for combating climate change and pollution. The forestry adapts to the territory in which it is immersed, taking the forms of urban gardens, parks and public gardens but also as roofs, green facades and the “Vertical Forest”. These planning methods are significant for new architectural projects and in the recovery operations of the building heritage through retrofitting operations.
The architecture is added to the green areas, thus improving the ecological balance of the city, leading to benefits to building itself. The concept of vertical green, a green roof or a green façade, allows the building to be in harmony with the nature and to contribute to biodiversity [4].
The building envelope and not built interstitial spaces between buildings become opportunities for expansion of nature into the built.
From Bangkok, where ten urban parks with native species were created between 2014 and 2018, to Phoenix (Arizona, USA) where three million trees were planted to “fight” the rapid expansion of the city, numerous virtuous examples can be identified. As in Lima where the reforestation of areas adjacent to the city has reduced the risk of natural disasters by stabilizing the land. Another case is in Beijing, China, where the 2004 “Forest City Program” made it possible to restore greenery to the city, by planting 54 million trees, creating 23 wooded areas such as the “Dongjiao Forest Park” (ten times larger than Central Park).
The keystone of these project is not only the role assumed by “plants” and greenery, but nature that became a design concept where, thanks to the encounter between nature and architecture, a “hybrid reality” is created.
From SITE and James Whines with his theoretical projects of the “Highrise of Homes” to the Vertical Forest of Milan, the vertical green buildings play an important role in defining a new landmark in the city, without neglecting the housing issue and its needs.

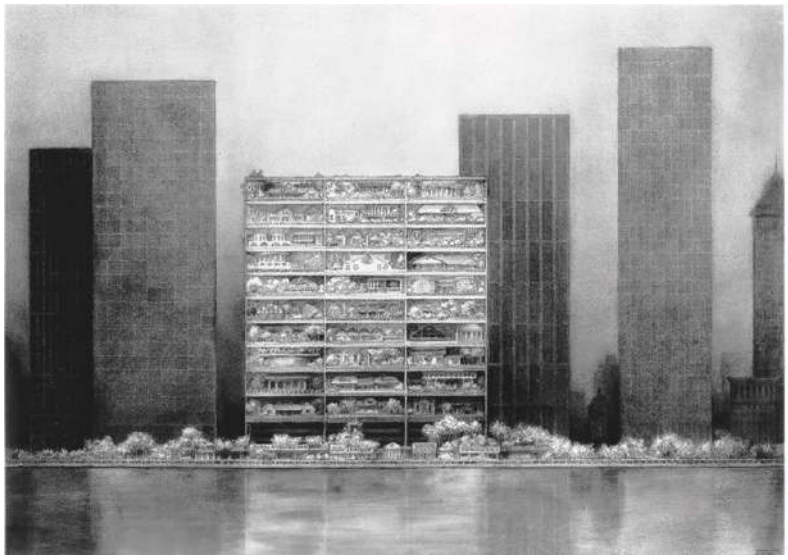

Fig. 1: On the left: Highrise of Homes - for location in a major American city – SITE, James Wines - ink, wash and charcoal – 1981 ((© SITE New York, www.siteenvirodesign.com)
Fig. 2: On the right: Highrise of Homes – Theoretical project by SITE for urban locations in the USA – 1981 – Color rendering by J. Wines showing a multi-story matrix that can accommodate a vertical community of private houses, clustered into distinct village-like communities on each floor (© SITE New York, www.siteenvirodesign.com)

3.1 Vertical Forests

Vertical Forests are “tower for tree inhabited by humans”. These buildings, often of tower type, became “anti-sprawl devices” that replace the “traditional materials” of the external urban surfaces, with the changing polychromy of the leaves of the vegetation placed on the overhangs. The architecture and its designers have the task to bring the theme of environmental sustainability to the urban scale. Many architects, such as Stefano Boeri and his SBA in Milan, design skyscrapers that represent a prototype of an architecture of biodiversity.

Fig. 3: Drawing scheme of the benefits of the union between architecture and nature.

The compromise between architecture and nature underlines the possibility of an urban recovery following the respect of nature. In this way nature is introduced into the city and making it coexist and cooperate with construction.
There are numerous examples of vertical forest.
The “Vertical Forest” (2014) by architect Stefano Boeri represents the “pilot episode” in Milan, that marks the starting point for the countless project under design or under construction, such as that of Lausanne, Utrecht and Eindhoven.
The Italian Vertical Forest is the prototype building of a new architecture of biodiversity, which connects the relationship between man, nature and other living species. A house for trees and birds, inhabited also by humans [5].
The complex, consisting of two residential towers of 112 and 80 m height hosting 800 trees, 15,000 plants and 5,000 shrubs. The equivalent of 30.000 square metres of forest and undergrowth, over an urban surface of 3,000 square metres. The building becomes an architectural “device” that promotes the coexistence of architecture and nature in urban areas, up to the creation of urban ecosystems.

Fig. 4: Vertical Forests, Stefano Boeri Architetti: Bosco Verticale in Milan, Italy (left), Wonderwoods in Utrecht, Netherlands (in the middle), Trudo Vertical Forest in Eindhoven, Netherlands (right). (© Stefano Boeri Architetti, www.stefanoboeriarchitetti.net)

Boeri’s work and its vertical forests represent a “manifesto” against the pollution of the urban environment: the plant species were positioned on the buildings to form a green filter, capable to suck in 30 tons of CO2, produce 19 tons of oxygen and absorb 80kg of fine, polluting particles every year.
The project of this green architecture is the result of the interdisciplinary work of architects (Stefano Boeri, Gianandrea Barreca, Giovanni La Varra) and botanists (Studio Emanuele Borio and Laura Gatti). Proof that Architecture and design are union of different knowledge and skills.

The vegetation acts as a green filter, from inside to outside, reduces energy consumption and pollution of the urban environment. In fact, this determining a reduction of nearly 3 degrees between outside and inside temperature and, in summer, the decrease in the heating of the facades by up to 30 degrees.
After this first practical example in Milan with a sustainable and lively high-density architecture, thanks also to its aesthetic change over the seasons for the various plant placed on the facades, it is possible to transport this experiment of forestation of social architecture. The Project of Trudo Vertical Forest in Eindhoven, under construction, is intended for social housing. The skyscraper is 75 metres with 19 floors of apartments with cost less rents. The high percentage of greenery, for each housing unit of 50 square metres, there is a terrace of 4 square metres with a tree and 20 bushes. A real ecosystem with over 70 different plant species, capable to absorbing more than 50 tons of CO2 a year, fighting pollution and climate change. The features “tree-tower” make it a reproducible and modifiable model according to the needs of the designers and the place, becoming a symbol of ecological necessity.
The various tower building projects are able to transform the physiognomy and landmark of our cities that have a high density of inhabitants and buildings.
This is the case of the “One Central Park” project by Ateliers Jean Nouvel, in the recovery of the Carlton & United Brewery area in Sydney. Two residential towers that transform Sydney’s skyline. The project starts from a new public park that extends on the façade of buildings. Each apartment is quipped not only with a balcony, but also with its own piece of park. In this way, the city has a new green element on an urban scale. The envelope formed by green walls and climbing vegetation follow the principles of sustainable architecture with attention to the reduction of energy for cooling and the reduction of atmospheric pollution [6].

Fig. 5: One Central Park, Ateliers Jean Nouvel, Sydney, Australia (© Ateliers Jean Nouvel, www.jeannouvel.com)

3.2 Urban Forestry

Regeneration of the city with the use of nature means acting effectively in reducing the impact of climate change and making the urban environment more resilient. Urban forestry is not only a central issue of environmental policies but is an opportunity for the regeneration of the city and its suburbs.
A real strategy for the government of the territory. In Italy there are a series of events such as the “Forestami” program of the Municipality of Metropolitan city of Milano and the experiences of Turin and Mantua. The most important example is the project for the urban forestation of Prato, where the green is declined both on the landscape issue and as a fundamental theme for the health of citizens. It is again Boeri who contributed to the formulation of the Operation Plan which plans to plant 190,000 trees (approximately one for each inhabitant) in the city by 2030, through actions capable of attracting funding and incentive for the regeneration of the city. An effective environmental compensation tool that finds its implementation in the regulatory body of the Operational Plan. In fact, the strength of this Plan is given by incentive for green regeneration of abandoned areas by offering volumetric bonuses, with the request that a part of the surface be used for greenery.
Boeri’s “Prato Urban Jungle” project shows the concept of a green space in the city, where nature is an active tool for the health of citizens.
Through this project the city obtains a renewed urban quality, which becomes sustainable and contributes, through the Urban Forestry, to a redevelopment of the urban fabric, in particular in the neighborhoods on a social and community level. Particularly important is, in fact, the design of Prato Social Housing both in terms of regeneration through nature and for the creation of social spaces that are determined.

Fig. 6: Prato Urban Jungle, Stefano Boeri Architetti, Prato, Italy. (© Stefano Boeri Architetti, www.stefanoboeriarchitetti.net)

The areas and the urban fabric, redesigned with high density vegetation, are returned to community as natural and "demineralized" soil. There is transformation of paving into permeable surface, and public spaces in are capable of absorbing numerous tons of CO2 and increasing the well-being of the inhabitants of the city.

4. Design tools for the didactic

The topicality of the theme of urban regeneration through the use of nature within the city is increasingly oriented towards the near professional future. For this reason, even in the academic field, attention to urban recovery and new construction issues that look at the combination of architecture and nature is increased and studied in the experiments of university laboratories.

An example is the project for the recovery and "redesign of the limit" of the old city of Potenza (1). The space around the Guevara tower becomes an opportunity to insert a public green space in the dense historical fabric of the city. The study provides the first step the elimination of a school building that is now abandoned and without any architectural value and which denies the view and the transition from the main street of the old town to the tower. An urban park is designed around it, consisting of urban gardens with many tree species and vegetation. This allows for the growth of the ecosystem and biodiversity. A new balance is established in the relationship between built space (on which a retrofitting intervention is applied) and nature. Important are the increase in permeable surfaces in this part of the city and the creation of new social spaces. An Urban Forestry operation that would give the city a new environmental and urban quality.

Another theme dealt with in a thesis workshop is that of the recovery of a public housing building from the 1960s, located on the outskirts of the city of Potenza, and of the urban space adjacent to it (2). The aim of the project is to establish a new balance between built space and nature, and to regenerate a residential area of the city.

The architectural retrofitting operation consists in adding a volume to the facade that allows the construction of loggias and terraces, also improving the interior spaces of the apartments, and offers a direct relationship with nature placed on the buildings and in the urban park.

Fig. 7: Project ideas and graphic elaboration of the architectural retrofitting and urban forestry (1)

Fig. 8: Project ideas and graphic elaboration of the architectural retrofitting and urban forestry (2)

These types of operations, especially on social housing buildings, are capable of triggering revitalization processes that affect the entire neighborhood and the city [7]. The increase in green permeable surfaces and the creation of vertical and horizontal green surfaces, with the improvement of the buildings' energy, thanks to the new envelope and the shielding of the vegetation, restore a renewed environmental and urban quality. The design choices were guided by the desire to reconnect a portion of the city to the urban fabric, where the new urban park connects with the unused green areas around it. In this way, the project intervenes both on a social and environmental level, with the ability to reduce, break down and absorb pollutants, such as fine dust and CO2, giving this place a role in attracting community.

5. Conclusions

Large portions of our cities, especially those that refer to social housing, consist of architecture that no longer conforms to current architectural standards. A minor building that needs a reinterpretation and a redesign capable of interpreting the new needs of contemporaneity. The need for urban regeneration and architectural recovery policies is clear, without neglecting the issues that refer to the "environmental question".

The analysis of the case studies underlines the successes of architecture in representing a valid tool for addressing issues of eco-sustainability, climate change and pollution. The experiences described and the didactic exercises show that the introduction of nature into the urban fabric and architecture produces both effects in reducing the impact of climate change and on the social level, improving the reliance of places and communities. Environmental issues are closely related to the theme of contemporary living.

Green architecture, in the acts of the Vertical Forest and Urban Forestry, related to architectural retrofitting, can be considered a suitable tool for a concrete opportunity for the redesign of the existing architecture and to plan new settlement methods that aim to create places that are attentive to environment and social aspects [8].

Notes

(1) This study was partially treated in thesis project: SABATO, Daniela. *Dal rilievo alla riqualificazione dei centri storici. Il Parco Urbano della Torre Guevara a Potenza.* Tesi di Laurea in Ingegneria Edile-Architettura, Relatore Prof. Ing. BIXIO Antonio, Università degli Studi della Basilicata

(2) This study was partially treated in thesis project: ZOZZARO, Marialuisa. *La Rigenerazione Urbana di Via dell'Edera a Potenza: dalle previsioni del Regolamento Urbanistico all'idea di progetto.* Tesi di Laurea in Ingegneria Edile- Architettura, Relatore Prof. Ing. BIXIO Antonio, Università degli Studi della Basilicata

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