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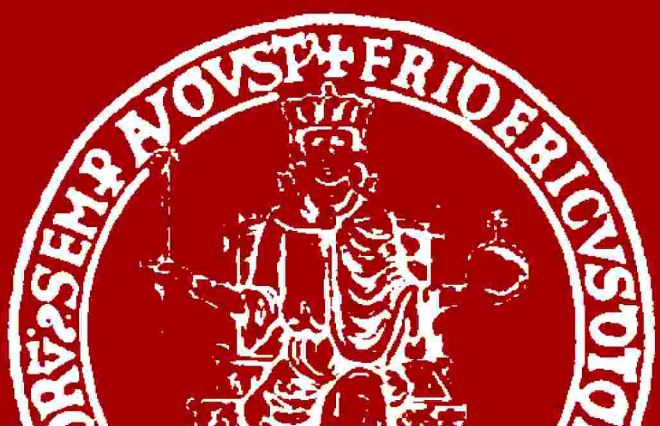

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New Green Deal: Towards Ecological and Human-centred Urban Development Strategies

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IMPLEMENTING THE CIRCULAR ECONOMY: THE ROLE OF CULTURAL HERITAGE AS THE ENTRY POINT. WHICH EVALUATION APPROACHES?

Luigi Fusco Girard

Abstract

The adaptive re-use of cultural assets is proposed as the entry point for implementing the circular city, that is the specific spatial/territorial aspect of the circular economy. The circular re-use contributes to implement the "city of the human being and of nature", in which the nature is considered the most important infrastructure. The paper discuss the ways in which adaptive reuse can be implemented, starting from some fundamental problems and the approach taken, and that determines the differences with other approaches about heritage assets reuse, in which the key attention is about the attractiveness and its multidimensional impacts and in which the economic, environmental, social, cultural dimensions are interpreted as having the same weight. The perspective is to search in the adaptive reuse new solutions able to re-integrate economy into ecology and into the human paradigm using new tools: from new management models to new evaluation decision support systems.

Keywords: adaptive reuse; integrated evaluation; circular economy

L'ATTUAZIONE DELL'ECONOMIA CIRCOLARE: IL RUOLO DEL PATRIMONIO CULTURALE COME PUNTO D'INGRESSO. QUALI APPROCCI VALUTATIVI?

Sommario

Il riutilizzo adattivo dei beni culturali è proposto come punto d'ingresso per la realizzazione della città circolare, cioè l'aspetto spaziale/territoriale specifico dell'economia circolare. Il riuso circolare contribuisce a realizzare la "città dell'uomo e della natura", in cui la natura è considerata l'infrastruttura più importante. Nel paper si discutono i modi in cui il riuso adattivo può essere realizzato, a partire da alcuni problemi fondamentali e dall'approccio adottato, e che determina le differenze con altri approcci sul riuso dei beni del patrimonio, in cui l'attenzione principale è rivolta all'attrattività e ai suoi impatti multidimensionali e in cui le dimensioni economica, ambientale, sociale, culturale sono interpretata come aventi lo stesso peso. La prospettiva è quella di cercare nel riuso adattivo nuove soluzioni in grado di reintegrare l'economia nell'ecologia e nel paradigma umano utilizzando nuovi strumenti: dai nuovi modelli di gestione ai nuovi sistemi di valutazione di supporto alle decisioni.

Parole chiave: riuso adattivo; valutazione integrata; economia circolare

1. Introduction

Climate change, interpreted as the greatest threat of this century, is a process that makes human life on Earth more and more uninhabitable: it makes the relationship between the Earth's ecosystem and humanity increasingly insidious and difficult. If the health of the ecosystem is no longer guaranteed, the health and well-being of mankind of this and future generations is at risk and the same health of the economy becomes problematic.

The IPCC has long stressed the causes of the increasingly accelerated climate change. A fundamental cause is the way in which economic wealth is produced and distributed. The economy organized according to the capitalist logic, while producing economic wealth, produces also ecological poverty and social poverty (increase of marginal actors, inequalities, etc.) (IPCC, 2018; Porter and Kramer, 2011; Lovins *et al*, 1999).

The last Report of World Economic Forum (2020a) underlines that 2020 is a critical year to face the challenge of climate change: the connected risks (till the permafrost crisis, the change in the Gulf current, etc.) are recognized the more relevant for the human kind in the short, medium and long horizon in our time.

The reduction of the speed of climate change even becomes the precondition for the achievement of other social objectives, from the right to health/wellbeing to equal opportunities for all.

Is absolutely necessary a transition towards a configuration in which, first of all, the rhythms of the economy of nature (i.e. of the ecology) are less in conflict with the rhythms of man's economy and in general with the rhythms of current life, thus reducing the production of entropy. It is necessary to accelerate the transition towards a circular economy model, as a kind of *nature-based* economy.

Well, we fight climate change by building a more ecological, greener world: characterized by renewable energy sources, by a strong conservation and regeneration of natural resources, with a drastic reduction of waste, which are recycled/regenerated as much as possible, transformed into resources (thus reducing the amount of extractions from the natural ecosystem) and making sure that the outputs return to the natural ecosystem as much as possible[1].

We can face the climate change recognizing that the "good life" of human beings depend on the "good functioning" of natural eco-systems.

Here we propose the adaptive reuse of cultural heritage at micro and macro scale (historic district) as an entry point for the implementation of circular economy strategies in the city/territory system of European Union.

Surely there are other approaches such as the one focused on the productive system of companies, or the transport system or the recycling of materials, etc. to implement the circular model. But the reuse of cultural heritage is configured as a perspective that intercepts and crosses all these other approaches, directly and indirectly: that is, it is configured as a much "richer" perspective.

In other words, *we introduce an ecological perspective into the strategy of functional reuse of cultural heritage.* The reference to Patrick Geddes' (1915) thought is evident, as well as to that of the Lovins (Lovins *et al*.,1999). The perspective is to search "nature-based"

[1] The consumption of natural materials is growing exponentially, at twice the rate of the population. Today only a percentage not exceeding 8.6% comes from recycling.

solutions in the adaptive reuse, which can mimic natural circles, minimizing the consumption of virgin resources, re-integrating economy into ecology (Zeleny and Hufford, 1992).
The circular economy suggests a shift towards a new ecological model and we take this perspective on board.
The functional reuse of cultural heritage is proposed here as the entry point to the circular economy. It introduces, at the same time, a social/human foundation and a cultural foundation to the New Green Deal. Therefore, the reuse no longer becomes only *green*.
The above in order to better take into account *all the values* involved when intervening on cultural heritage: starting from the ecological ones, on the basis of a systemic perspective and therefore an integrated approach. In the above systemic perspective, any change in the physical-spatial-functional structure determines positive and/or negative multidimensional impacts, in the light of existing interdependencies, and therefore a variation of well-being for people.
Water, for example, is considered as a very precious resource, that generates the life in all ecosystems. It cannot be wasted, but recycled an indefinite number of time. Water self-sufficiency should be the characteristic of every re-use. Energy self-sufficient is another key characteristic of reuse, through renewables energies from the sun, the wind or the Hearth. The last characteristic is the bio-mass investment, for sequestering pollution and particulates, thus regenerating clean air.
The "ideal" project of re-use and thus the main goal of reuse-regeneration is to transform a (in general) dead site into a living system, to be managed as a living organism, i.e. an organism capable of continuous adaptation to a changing/dynamic context, through learning, re-organizing, repair, self-regulating, and therefore capable of resilience.
This paper highlights the general framework assumed about circular re-use of the heritage assets, which is not only an issue of waste management. It discuss the ways in which adaptive reuse can be implemented, starting from some fundamental problems and the approach taken, and that determines the same differences with other approaches about heritage assets reuse, in which the key attention was about the attractiveness and its multidimensional impacts (CHCFE Consortium, 2015), and in which the economic, environmental, social, cultural dimensions are interpreted as having the same weight. Focusing on ecological dimension we introduce, as central, the health of nature and thus of human beings health/well-being/happiness. The aim is to underline the "comprehensive" productivity of the adaptive reuse at micro and macro scale considering its capacity to implement the transition towards the green and digital transition, shaped by a human/social vision.

1.1. The general framework

For achieving the above-mentioned goal, we assume the new Green Deal of the European Union as the general context of reference. It turns the challenge to climate change and the resulting ecological transition into an extraordinary opportunity to trigger a new development model: the circular model. In particular, we assume:

– the *Circular Economy* as the economy which mimics nature economy(ecology) sharing that symbioses (as cooperative/mutual relationships between different organism) are a key characteristic of life; as the hybrid integration of the men economy into the economy of nature, by recognizing in particular that economic values are grounded on ecological/ ecosystem values, as already underlined by Ecological Economics (Costanza *et al.* 2014;

Serageldin, 1993). As an "impact economy", it also suggests that it is possible to do more with less, learning by the nature wisdom. Its pillar is the recycling circles;

- the *auto-poietic* capacity and the *symbiotic* capacity of the ecosystem, as the source of *generative capacity* and as the general principles for transforming a (in general) *died site into a living system,* to be managed as a *living organism, (able to learn, adapt to its context, self-organize)*;
- the *human-centered approach:* the human beings (included future generations), and their wellbeing, quality of life, health, etc. are the ends of the development, and thus guaranteeing the "human flourishing", the "good life" (stressing the importance of employment as a key element of human needs/rights achievement);
- the key role of *social-civic sector* (of social finance, of social / cooperative enterprise etc.) to be coordinated and in cooperation with for-profit enterprise and with other public institutions, able to generate micro-communities, being particularly attentive to long term horizon, to cooperation and to intrinsic values;
- The important role of intangibles values: in particular, the role of the "intrinsic value", as the soul, spirit of a site: as driver for the human scale city development/human centered approach;
- the central role of new functions in the re-use (beyond tourism and/or residential functions and traditional social functions, but in coherence with the intrinsic values) linked to the *innovative/creative* functions for promoting a self-sustainable ecosystem[2], to be managed through a circular organization and closed loops, mimicking natural processes.

In this perspective, the Green Deal Strategy of EU is here strongly assumed. But we re-interpret and re-shape it in the human/social and dimension, stressing the role of the key components for the human scale of development: the cooperative capacity ,able to stimulate synergies and symbioses through circular relationships, thus transforming the cultural assets into ecosystems of economic-socio-cultural integration, that is into *self-sustainable* ecosystems (characterized by a circular organization/structure) able to sustain they self, reducing or without external supports from public, private or social institutions.

Transforming a site "lacking vitality/life" into a *living organism* is our interpretation of the functional/adaptive reuse, considering the centrality that the ecological dimension today assumes. Adaptive reuse must become a producer of primarily ecological/environmental values. The site object of re-functionalization must be transformed into an ecosystem that can also contribute to the vitality of the local context, involving other subjects and activities especially in management, possibly generating other ecosystems.

New activities in the reused cultural assets produce goods and services for the external bodies, but also they re-produce the own production processes, regenerating themselves through the production of new knowledge and innovation. An adaptive management is required, able to continuously react to internal and external forces and to generate resilience. This cultural asset ecosystem should be able to capture the needed energy for its functioning from the sun/wind/geothermal sources and able to implement a new metabolism which mimics the one of nature. Cooperation and competition strategies are integrated in this model

[2] The notion of ecosystem was introduced by Odun (1953) as a dynamic, complex and interactive system composed by living and not living components, connected in a set of multiple dynamic interdependences.

(Zeleny and Hufford, 1992), able to regenerate itself from bottom up. More and more the digital technologies unable the above behaviors of the re-used assets.
Indeed, the traditional strategy of recovery of cultural heritage is generally indifferent to green needs. For example, it is often emphasized the greater direct/indirect employment capacity in the redevelopment phase, compared to other investments.
But the organization/management of a reused cultural asset is the critical issue. It should be interpreted in a way similar to the nature organizational structure. The example of trees is very simple: they receive the energy from the sun for their functioning, and are characterized by a perfect metabolism.
Thus, the analogy with trees instead allows to imagine a functional reuse that contributes as much as possible through the renewable energy from the sun to lower pollutant and climate-changing concentrations, purifying the air even with the appropriate planting, generating oxygen, carbon dioxide, dust, combustion residues, mitigating heat islands and thus helping to improve the local microclimate as well as providing fibers, fruits and wood, managing with care water as a very precious resource.
This interpretation of the functional reuse of cultural heritage in the perspective of circular economy follows the introduction of the lens of bio-ecology. The functional reuse then becomes the opportunity for the realization of a living system, characterized by a particular metabolism that imitates that of nature as much as possible. Adaptive reuse is necessarily placed in a systemic perspective that connects in a mutual relationship built environment and natural environment, manufactured capital and natural capital with human and social capital. This means attention also to a correct landscape insertion, to conserve the permeability of the land, the capacity to use the natural lighting, to increase the environmental performances of the physical asset.
Reuse, especially in its management phase, can be defined as the promotion of a *complex, dynamic and adaptive system*, because it is constantly changing in a dynamic context, with an unstable balance that must be continuously rebuilt with an innovative management effort, taking into account the high density of interdependencies between the economic, social, ecological subsystems and the positive sum strategies that can be triggered.
Such management is achieved through choices that are particularly complex because they require first of all recognition of the multiple dimensions in which the value of cultural heritage is expressed. It possesses values of use and values that are independent of use, i.e. instrumental anthropic values. But it also possesses intrinsic anthropocentric and non-anthropocentric values that complement (and counterbalance) the former. It is necessary to recognize each other in the choices related to reuse.
The above implies interdisciplinary models for decision making, with a transdisciplinary approach, able to include many kinds of knowledge, from social to economical to ecological etc. in the evaluation.
On the other hand, the reference to the ecological foundation of the economy and the reference to the human center strategy leads to changes in current evaluation practice, with the need to identify new evaluation approaches, new criteria and new indicators.
The "reintegration" of the economy into ecology (Zeleny and Hufford,1992) as well as the centrality of the ecological dimension that characterizes the New Green Deal (European Commission, 2019) is totally coherent with the WHO Manifesto for facing the post Covid19 challenge (WHO, 2020). It makes explicit the impacts of climate change and pollution of the city/territory system primarily on health and thus on people's perception of well-being.

Health is in fact a value with respect to which there is a general consensus (regardless of culture and geography) with respect to other interests.
The (multiple) activities to be located in the cultural heritage re-functionalized in the perspective of the Heritage ecosystem must be managed over time as a living organism, i.e. following a circular organizational strategy. In other words, this means that the activities should be interdependent with each other and with the external context, first of all promoting new, more efficient metabolisms, possibly generating other autopoietic/generative/ osmotic processes. For example, for productive activities, it occurs that over time new entrepreneurs add to pre-existing ones, generating new business. These tend to reorganize themselves in new networks of interdependencies, in which the relationships of complementarity multiply, with mutual convenience. The total productivity tends to increase, at least until the interdependencies begin to rarefy and to dissolve with the time. Then phenomena of decline emerge, which, however, can also be a source of localization of new investments, by new entrepreneurial subjects that take advantage of them and that (localizing themselves) generate new opportunities/activities, and therefore new value and employment.
The different conditions for the effective functioning of a Heritage ecosystem range from the decentralized organization, in which each component self-organizes, to the metabolism that imitates that of natural ecosystems, avoiding any form of waste and enhancing all complementarities, to the ability to close the loops, to the adaptive capacity over time with respect to changes in the context.

1.2. The notion of circular economy

The circular economy model is interpreted here as a *hybrid model* between the economy of nature and the economy of man: between economy and ecology. But also between competition and cooperation between market economy and social economy. The symbioses are the characteristics of the circular economy, as the interactive /mutual relationships between different organizations, that in particular crisis time establish (through associations) to survive or to become more productive. Real life is rich of symbiotic processes with dynamic and changing relationships between receiving and doing, with different levels of efficiency in the metabolism. Circular economy is attentive to conservation of existing ecological values in the production of new created tangible and intangible values. It requires attention to instrumental values based on the utilitarian approach (values of use and independent from direct use), but also to intrinsic values, based on a non-utilitarian approach: to ecosystem values, "in itself and for itself" values.
It also requires, in order to be implemented, a rigorous technical evaluation, but also a participatory evaluation processes by the users, for the comparison between the pursuit of intrinsic values and instrumental values, and therefore between intrinsic values and opportunity costs.

1.3. The notion of circular economy proposed in CLIC research project[3]

Ecological economy inspires the circular economy, underlying that economy depends on the capacity to conserve the health of ecosystems.

[3] CLIC Horizon 2020 Research Project, financed by European Union in 2017, www.clicproject.eu

In nature every living organism not only consumes resources/energy but in turn, being related to other living organisms, contributes to nourishing their life, providing a flow of services to them. It's characterized by an effective metabolism, made perfect during millennia, that allows to recycle every by-product avoiding any waste and sustaining new vital processes.
The notion of circular economy is characterized by many existing definitions: Kirchherr *et al.* (2017) recognize 114 different definitions. Essentially, circular economy is the economy that mimics the nature economy in its circular processes: thus, it is a *re-generative economy*, and for this reason able to become generative of multiple impacts.
It is, in any case, a model inspired by nature wisdom, imitating nature organizational structure, characterized by: closure of loops, reduction of their scale/dimensions and sped of loops, slowing of loop processes are other linked characteristics underlined by some researchers, together with minimization/elimination of waste; self-organization/self-reproduction/self-regenerative capacity (Turner, 1993; Fusco Girard and Nijkamp, 1997; Zeleny e Hufford, 1992; Maturana e Varela, 2001; Costanza *et al.*, 2014). It is a co-evolutive model. It inspires an ecological conversion of the current economy and the search of nature-based solutions in design/planning the re-use of heritage assets (green /blue infrastructures).
More in particular some characteristics are:

- it is the economy attentive not only to short, but to medium and long time, putting attention to maintenance, repair, refurbish, recover, recycle, regenerate materials, resources and goods to prolong the life circle through new use values, which adapt to new needs:
- it de-couples the economic growth from the resource consumption and negative environmental impacts, reducing entropy (Georgescu Roegen 1971, 1976);
- offers a new perspective to generate values and profits through symbioses, reducing production costs, natural resources consumption and greenhouse gas impacts, generating in the same time new employment;
- it is grounded on cooperation, collaboration, synergies, integration between multiple subjects and activities: on transforming differences and heterogeneity into synergies. Circular economy is interpreted as the *relationships economy.* It is based and it requires an economy of relationships, in which economic values co-exist and co-evolve with ecological values and with social ones. Examples of relationships are the ones between different complementary enterprises in the industrial symbiosis; between industries and the city (with the exchange of specific waste with hot water/air); between the city and its territory (with the exchange of food and nutrients etc.);
- it is interested to produce services to be consumed instead of good to be appropriated (through property rights), beings interested to use values more than to market values of goods;
- it is the economy grounded on ecology and ecological values: on primary/glue values;
- the circular economy suggests the approach to sustainability as self-sustainability. In the circular economy the notion of value is a complex and systemic one: economic, social and ecological value. Instrumental values are considered also in relation to intrinsic values Thus, the circular economy model enriches the notion of value in the perspective of a complex economic, ecologic and social value (Complex Value) (Fusco Girard, 1987; Fusco Girard and Nijkamp, 1997);
- it reduces the trade-off between economic productivity and ecological conservation (and social goals);

- it is "attentive" to roles between state and market, between public and private: it is attentive to the civic sector (third sector) between public and private. Social economy, civil economy, cooperative economy can be considered as "part" of the circular economy, being characterized by circular loops of offering, receiving and giving back;
- it is attentive to all interdependences between economic, ecological and social dimension, so that avoiding that a solution characterized by maximization of the impacts in one dimension can generate unacceptable impacts on other dimensions;
- it is attentive to avoid under-use and waste of all kinds of capital: not only of natural capital and man-made capital, but also of *human capital and of social capital*. These forms of capital are very important. The city often is not only characterized by a great quarry of waste or discarded elements, but also by the quarry of discarded people: unemployed, marginal /poor people etc. Circular economy should be focused to avoid also this under use/waste of the human capital: of the human beings' capacity, intelligence, knowledge, abilities, creativity, self-entrepreneurship;
- the concept of complementarity becomes essential in the Circular Economy (CE). It expresses the relationship of mutual benefits between different components: the presence of an element leads to an increase in value for the benefit of other components due to the specific interdependencies. It is not enough *to reduce, repair, recycle* or to use natural resources for becoming more productive for the implementation of the CE. The essential aspect of the circular economy is the successful search of the *complementarity*: between different functions/activities/subjects on the basis of reciprocal exchanges of benefits (the use of by-products that become productive inputs for other activities). Thus, in the Circular Economy approach, single elements should be transformed into «components of a system». The more is the heterogeneity of the different components, the higher probably is to identify complementarity relationships. This characteristic to re-generate relationships is one of the key aspects of the circular economy, as a re-generative economy.

In this perspective, each subject receives and in turn offers a range of resources/services in a process of systemic reciprocity, for the benefit of all in a win-win perspective: each partner receives net benefits in a reciprocal process which multiply produced values, and which could not be achieved alone, that is without cooperation.

The overall effect of these complementarities is the vitality of the whole system, in which production and consumption are facilitated by geographical proximity and increased by symbiotic relationships, also through digital technologies.

In the same time, Circular Economy integrates market and public institutions cooperation and competition, tangible and intangible values. It can be interpreted as a Hybrid economy, that is neither simple combination nor mix, but it has an additional production capacity, thanks to complementarity. This is the reason why the circular economy model incorporates and integrates all the new forms of economy: the "we-economy", the social economy, the humanistic economy etc. Circular Economy interprets the economy through the lens of bio-ecology, thus combining ecological and humanistic paradigm.

In conclusion, in the Circular Economy/model, each economic activity is integrated into a systemic perspective with other activities (being this the more important characteristic of the Circular Economy model).

Circular Economy is based but also "offers" a new culture, a new way of thinking, a mindset which differs from the narrow economic conventional one, because it is not based on utility

maximization research but on identification of multidimensional satisfying solutions. It is characterized by a *relational rationality*, that assumes the *rationality of cooperation*, by identifying effective nature-based solutions for development through agreement, pacts, partnerships.

2. Circular economy and values: the "intrinsic" value of natural ecosystems and of cultural assets

2.1. The circular economy and the notion of "complex value"

The New Green Deal suggests to recover the notion of values highlighted in Ecological Economics (Costanza, 2014), and in particular the notion of "primary" or "glue" value. Economic values are grounded on ecological ones. They play a specific role in the circular economy model achievement.

The circular economy, inspired by the circular functioning of natural ecosystems, is oriented to the co-evolution between the men economy and the nature economy. The men economy is the economy of use and market values: of instrumental values. The nature economy is the economy founded on ecological "intrinsic" values of natural ecosystems.

Natural ecosystems have "intrinsic" and instrumental values (economic values). They are due to the fact that the nature produces services to the industry, tourism sector, forestry, leisure, food industry, fishing, pharmaceuticals, chemistry, etc. The eco-systems services approach can highlight the above (De Groot *et al*., 2010; UK NEA, 2005; 2011)

The Circular Economy being attentive to instrumental *values* together with "intrinsic" values is careful to not damage/compromise this systemic or "glue" value (Turner, 1993; De Groot *et al*., 2010, Ehrlich and Roughgarden, 1987), which reflects in the ecosystems their functioning.

The emerging notion of value in the circular economic model is a notion of "circular value" in the sense that use values are put in a set of relation of interdependences with the exchange values, and also with the "intrinsic re-generative value". The notion of complex value in the circular economy expresses the "relational value" that generates and regenerates connections, in a dynamic reciprocal process.

The value notion in the circular economy is not based on the consumption of a resource over time, due to the intensity of use, but on conservation, co-evolution and self-reproduction. Also the "intrinsic value" should be included in choices regarding the circular adaptive re-use: to understand the perspectives through which the *essential* values can be conserved and valorized.

2.2. The autopoietic characteristic of the eco-bio-systems: intrinsic versus instrumental values

A *complex notion of value* is suggested in ecological economics (Costanza *et al.*, 1997): a complex of economic, social and environmental values. It combines *value in itself* (which is the value independent from use) with use values. In particular introduction of the notion of "intrinsic value" is suggested in implementing the circular model. The adjective "intrinsic" does not matter with objectivity, quantitative, numerical assessment of a resource. It does not concern to opposite subjective/perceptive to objective evaluations or to share consensus. In this perspective, subjective is linked to ordinal assessment by people and objective is linked to expert knowledge, to the numerical assessment of experts.

The notion of intrinsic value is linked to *bio-eco systems behaviours*: to their self-regenerative capacity, and their capacity to sustain the life of other subjects through specific services.
A bio-ecological system has a value in itself that reflects its auto-poietic, self-production and self-organization capacity (Faber *et al.*, 1995; Turner, 1993; de Groot *et al.*, 2012; Ehrlich and Roughgarden, 1987).
They are, in the nature, different well-known processes of self-organization/regulation: self-regulation of air composition, of solar energy photosynthesis, of biomass re-production, etc. They have an intrinsic value.
An autopoietic system has also another role, that is to provide services and goods for supporting the life (in its various forms) for other subjects. This heteropoietic aspect is linked to the use values recognized by the human beings.
Thus, the autopoietic capacities of an eco-bio system highlights its ecological value, that is its intrinsic value or its non-use/ independent from any use. Heteropoietic capacities are linked to many possible use values and in general to economic generated values.

2.3. Intrinsic values

The intrinsic, non-monetary and non-instrumental values of nature are due to the fact that they guarantee, by the autopoietic processes and effective metabolism, a slowdown in energy dispersion (a reduction of entropic degradation processes), clean air and water, temperature regulation etc., and thus the maintenance of all living species in their respective ecological "niches".
This intrinsic value reflects the essential structure - capacity of a system, as the condition for structuring other components end/or sub-systems to reduce entropy, to increase order.
In other words, the intrinsic value of a living system expresses the re-generative systemic capacity, which is the condition of the generative capacity (of external effects etc.) and also of the symbioses and resilience.
Turner (1992) stressed the need to recognize a "primary value" to the autopoietic system (and therefore to the biotic and abiotic components linked by interdependent relationships) in terms of "glue" capacity: to the capacity to take together, to unite different elements and components in a set of dynamic /reciprocal interdependencies.
This "primary value" is the condition for the system to provide useful functions and services to human beings. It is the value of the latent functions, underlying those generally observed, expressing the value of the entire system, which produces flown of services also to others.
This intrinsic value is the ground of use values and market values. There can exist intrinsic values without instrumental values. But if intrinsic value dissolves, economic values can collapse (Turner, 1992).
In conclusion, the autopoietic approach gives rise to a notion of value that is intrinsically "complex": it is an ecological, social and economic value.
Ecological, because it reflects the recognition that some value exists also independently of the human exchanges and uses, being connected to the purposes, to general aims and to the organization in itself of the natural system.
"Social" because it suggests to take into account the multiplicity/plurality of flows of services for many group users: (direct, indirect, potential and future ones) and producers, and their complementarities.

Economic, because it reflects the capacity to generate use values, market values and externalities (or instrumental values) for other subjects.

2.4. The complex value of the manmade/cultural heritage: towards the "intrinsic value" of the cultural heritage/landscape

2.4.1. The characteristics of the heritage asset

Can we recognize a re-generative capacity to heritage assets, to better organize the adaptive re-use of a site? To help not only to identify a coherent (with its history) functional reuse for certain cultural heritage/site, but above all to orient local development, both in its tangible and intangible components, thus combining the conservation of roots with a dynamic/evolutive and innovative perspective?

An autopoietic system is a system recognizing the multiplicity of components, that "sees" each component moving in relation to the others (with an interaction that is both cooperation and competition). This means that each component is "open" to a reciprocal and overall coordination, coexisting individual utilities and not exclusively individual utilities.

In the case of cultural/monumental heritage, it is not possible to consider strictly an "intrinsic value" related to the bio-ecological vitality of the natural ecosystem, that is related to the capacity to maintain its stability, its resilience over time, its autopoietic capacity

But the notion of the intrinsic value can be extended - within certain limits - also to cultural/monumental resources/heritage, for which the instrumental values are able to express only some components of value (and not all values). In particular, the "intrinsic" value for cultural heritage can be justified considering these argumentations, also if the cultural assets are not a capital characterized by a bio-ecological vitality in the strict sense.

2.4.2. Towards the notion of "intrinsic value"

The notion of "intrinsic value" has been proposed by Ruskin to the artistic/cultural/monumental heritage (Ruskin, 1860). Riegl proposed a notion of "essential meaning" (Riegl, 1903).

Historically, the intrinsic value of the cultural heritage can be traced back to the sense/meaning that the culture of sacred/religious places in particular recognizes to certain sites. For example, in the Hindu religion is associated with a spirit of places that "lives" in nature, and which represents the foundation of its intrinsic value (Framarin, 2012).

In Buddhism there is a reference to the intrinsic value of nature (James, 2003). In Taoism it is possible to recognize that the economy of man is one aspect of the more general economy of nature.

In the Shintoism tradition nature is associated with a value in and for itself (Sato, 2017).

Recently in the literature it has been recognized for natural resources both a non-anthropocentric intrinsic value (i.e. a value that a natural resource possesses independently from the evaluation of an evaluating subject) and an anthropocentric intrinsic value, identified by man/community (Hargrove, 1992).

The "intrinsic value", reflecting the specific, unique, irreproducible character and meanings/ significance/identity and beauty of a place, determines a sense of "connection" between different subjects and between the community and the natural capital. There is a "circular" relationship among them: a "circular value".

The intrinsic value referred to the cultural heritage comes from an evolutionary process over a long period of time, similar to what happens in ecosystems. It refers to what has been preserved as a permanence in the continuous dynamics of the city/territory as the result of the recognition of value (over a long time) by the people.
Heritage assets are *order structure* for the city development, which were able in the history to orient the city growth towards a specific direction (Fusco Girard and Vecco, 2019).
But it is an intrinsic value that differs from that of natural ecosystems because it has been produced/created/recognized by people over a very long history.
In a certain sense we can speak of "subjective" intrinsic value (Callicott, 1985; Elliot, 1992) and not objective, because it is a value recognized or created by certain subjects through their capacity for critical discernment. So, it does not exist in itself, that is, independently of the subjects who have recognized it and recognize it as such, because of its uniqueness, specificity, irreproducibility, beauty, meaning (even spiritual).
Well, this subjective intrinsic value does not require a bio-centric or eco-centric vision/approach. It remains anchored to the anthropocentric approach. Therefore, the useless dichotomy between anthropocentric values and eco-bio-centric values is eliminated. The intrinsic value is compatible with a relational, i.e. interpersonal, community, collective approach because it is recognized from generation to generation.
While the instrumental value is compensable in some way so that a loss does not occur in the end, the intrinsic value is not replaceable or compensable (Callicott, 2006). From the irreproducibility that is connected to the non-substitutability and in turn to the authenticity/integrity and the exceptionality, that are recognized in particular to the artistic production, derives a particular value assimilable to a value independent from use. A value that every (and also future) generations can recognize during future time as time-less/eternal.
Certainly, values are socially constructed. They are dynamic in the time and in the space. But for the art heritage it can be recognized a value that tends, at limit, to be recognized during the long (or without end) time, from one generation to other generations.
Future generations have the right to dispose of this cultural capital, even if at the present time it is absolutely devoid of any demand for use, that is even if the use value is currently nil. It is this "essential" value, that is independent from any use, that characterizes and differentiates this cultural manmade capital from other man-made assets, capable of generating a similar activity (economic/financial flows, as a supermarket etc.).
This value that goes above and beyond all other extractive and not extractive values can be interpreted as an "intrinsic value" (Fusco Girard and Vecco, 2019).

2.4.3. Autopoietic capacity and "intrinsic value"

The "intrinsic value" can be understood/interpreted in a sense, more directly linked to the autopoietic approach.
Their vitality is represented by the way in which its presence and use influences the stability of the context and its resilience. In fact, they interact with the living components of the socio-economic-urban ecosystem, that is, with the past, present and future community.
The intrinsic value is the essential significance/capacity of an asset/space/site which was (and should be) able to remain in the urban system as a permanence in the continuous dynamic changing context: which is recognized from one generation to another one. But also had the energy to give a direction to the city or the site development, as a telos of the living systems (Faber *et al.*, 1995).

In short, just as every organism has its own *tèlos*, that is, a fundamental purpose that characterizes it, and that orients it in a certain direction instead of another, so some components of urban cultural heritage have offered a direction of development throughout history. This capacity represents the intrinsic value of cultural heritage. The vitality of the heritage assets depends on their ability to adapt themselves to the often tumultuous change, due to external pressures, and at the same time to maintain the permanence of some elements that characterize its specificity, identity.

Cultural assets have had the capacity to bring together and to be elements of social stability. The "intrinsic value", reflecting the specific, unique, irreproducible character and meanings/ significance /identity and beauty of a place, determines a sense of "connection" between different subjects and between community and manmade capital (monuments). There is a "circular" relationship among them.

Cultural heritage is the element in which a community can recognize itself today and in the future. They are a source of local identity, integration, cohesion, community awareness, shared common values, specificity towards a homologating culture conveyed by mass-media technologies. Cultural heritage "tells us" where we come from; it gives us a homeland without which we would be lost stateless persons; it helps us to recognize our roots, our identity. Cultural heritage is a relational element of reference, an "anchor" in a period of rapid transformation, in which the identity of a community, its memory, its genetic heritage, are expressed as well as representing the instrument with which each generation communicates with all the others.

This intrinsic value is interpreted as the essential significance/meaning of the built heritage, as the reflection of the way a community lived and worked, organizing itself though its knowledge, culture, wisdom, thus becoming able to conserve itself in a continuous regenerative process. In the same time, it generates other use values, in a changing context.

Thus, it is possible to transfer the notion of intrinsic value from ecosystem heritage also to cultural heritage: to "places". The intrinsic value becomes the "spirit of places" (Norberg-Schulz, 1980). The intrinsic value certainly expresses the "spirit of places", being connected to the permanence of tangible and intangible elements over the long time and to cooperative behavior.

The set of instrumental anthropocentric and intrinsic values represents the overall systemic value of a cultural site or a historic urban landscape.

Therefore, the intrinsic value becomes a further tool/argument for its preservation also in economic development plans, in urban planning projects, in urban/territorial regeneration strategies, because it becomes something inherent to places, to their "statute", to the landscape and as such it deserves respect, care, attention and enhancement.

In essence, recognizing to certain assets/resources an instrumental and intrinsic value, it is better to justify the conservation/care than an economic/instrumental approach, that is only historical/cultural/aesthetic.

Certainly, there may be situations in which intrinsic and instrumental values differ dramatically. For example, a very marginal ecosystem from a territorial and economic point of view has only an intrinsic value, but no instrumental value. And vice versa.

It may happen, for example, that the instrumental value and the intrinsic value are compared with each other. The intrinsic value can then be sacrificed compared to the instrumental value, or vice versa. This is not a technical decision, but reflects the culture, the worldview, the

priorities of a community/society. It may consider certain costs intolerable/unacceptable from a certain threshold onwards.
In conclusion, the intrinsic value proposal seems justified both because it is consistent with the human centered paradigm and also with the ecological approach.
The human centered approach gives and obliges a particular attention to the cultural dimension. In particular, to the fundamental value of trust as an "attractive force to ensure social cohesion. Moreover, the human centered approach must necessarily include future generations and therefore the attention to their well-being.

3. The human-centered city paradigm

3.1. The human-centered development notion

The Human centered approach[4] is the approach that (in particular today) needs to be promoted in order to face the current growing social crisis that also affects future generations. More and more the interdependences between biodiversity and the quality of life/human well-being are identified: the biodiversity is the condition for the good functioning of ecosystems, that guarantee directly and indirectly the human well-being.
The Covid19 pandemic here we want to underline the necessity to "correct" the ecological approach, stressing the introduction of the humanistic paradigm.
It is based on the promotion of the full capabilities of the human being (Anand and Sen, 1994), repositioned as the very purpose of development and economic dimension, and not as a means, such as in the current interpretation of economic growth. This humanistic paradigm is based on the search for the conditions that can guarantee the implementation of the principle of *human dignity* as the *supreme value* in many different cultures: that is, as a value in and for itself. A value in itself is an intrinsic value. According to Emmanuel Kant (Kant, 1784) an intrinsic value, that is an "inner value", that is a *value in itself and for itself*, that characterizes all human beings. It is connected already in its vision to the dignity of the human person, which must be absolutely respected.
Indeed, the inner value of the dignity of the human being represents the center of the humanistic paradigm, with all consequences in terms of human-social rights implementation.
Therefore, the ecological approach and the humanistic approach have a common element: the recognition of the "intrinsic values" to the natural ecosystem and of the human person.
From the above comes the possibility to avoid any reductionism, any one-dimensional vision and any individualistic/egoistic interpretation, but enhancing the relational dimension of the human beings.
This relational dimension is a second common element between the ecological vision, that is grounded on systemic interdependences, and the humanistic vision.
The human vision evokes the culture dimension.

[4] Many documents of EU put the attention on the human challenge. For example, in the Action Plan for the Circular Economy is evoked the Social Economy (§5), on the base of Madrid Declaration (25/5/2017). The social economy includes Cooperatives, Associations, Social Enterprises, Ethical Banks, Foundations which concur to an inclusive economy, grounded in the society. Another EU Document is the European Pillar of Social Rights, evoked also in the European Green Deal (11/12/2019, at § 2.1) (European Commission, 2019) and the New Industrial Strategy for Europe (10/3/2020) which assumes the social rights for orienting the required transition. In a Report commissioned by EU the human centered approach is strongly stressed.

Culture is the excellent specific product of human beings; through which they shape their relations with the Hearth/Nature. Culture shapes the world vision, the interpretation of reality and behaviors in relation to others.
Humanization is linked to the capacity to produce and share ideas and cultural values linked to a vision of life not only as a competitive struggle for existence, but also as cooperation, collaboration, coordination, able to reduce social fragmentation, towards a long-term future. In other terms, it is linked to see that in nature and in the real world "all competitions take place in a broader context of cooperation, involving countless forms of partnerships" (Capra and Pauli, 1995) so that cooperative relationships are essential components of the real life.
On the other hand, the beauty of urban places stimulates a mindset opened to dialogue, to collaborative approaches. City arts and amenities become strategic assets for implementing the human scale, as many cities are experimenting.
The human-centered city development approach re-shapes the city project towards a project that unites, generating and multiplying relationships and bonds, in the space and in the time: between human beings, between people of this and of future generation, but also between people and nature (the Mother Earth).
This last is the specific characteristic of the "New Humanism" compared to the traditional interpretation of the Humanism: the need of a symbiosis between people/humanity and Nature/Hearth. In particular, it assumes relationships between the health of the eco-systems and the health of human beings.
The human centered approach underlines in particular the importance to guarantee for all the right to human health conditions and its priority in relation to other rights achievement: to adequate housing, services, work, etc.
Human centered development and green development are interdependent, because the health of nature is the condition, being a *global common good*.

3.2. The humanistic perspective between anthropocentric and post-anthropocentric vision

Culture, as the knowledge, skills, abilities, way of organizing the life and the work is the true wealth of a community, which guarantees its resilience.
The humanistic approach is first of all a cultural issue. It interprets the new technical digital urban landscape not in the perspective of the "smart city" (all referred to advanced technologies, to short horizon, to rent of the real estate as a development engine, etc.) but to the achievement of the "good" for as much as possible people. It overcomes the risks of arrogant interpretation of anthropocentrism (Steffen *et al.* 2007; Kopnina, 2020) in its different (strong or weak) versions (Peterson, 2015).
The anthropocentric vision has characterized the western humanism, spearing the human being from nature, being managed through technology. The human centered and the anthropocentric visions can be seen as close together. But today the humanism is no more associated with instrumental use of nature, and with the instrumental rationality between means and ends proposed by the mainstream economics. It is necessary to recognize the strong relationship between the health of the human beings and the health of nature. Hannis (2015) proposed the human flourishing as the approach able to reconnect and to regenerate the relationships between men and nature. Weak and post-anthropocentrism are proposed to better conserve nature. But a new highlighted humanistic and non-anthropocentric vision is needed today.

This interpretation is strictly linked to the capacity to orient all innovative technologies (IoT, AI, robotization, sensors, screens, new bio-materials, etc.) not towards surveillance and control but towards goals that reflect the human dignity. For example, towards creating local communities grounded on local relationships.
The third sector, between state and market (Social enterprise, Associations, Voluntary organizations etc.), is the bearer of these relational values and gives an increasingly important role in the search for the human scale of the economy, overcoming the traditional vision (from Marx, to Darwin, Freud etc.) in which the engine of development is only competitiveness and conflict.
The human scale is linked to adequate housing access, to sanitation, to social services.
Historic districts "contain" an extraordinary equilibrium that is the secret which justifies the attractive force of the European city. Human life needs this equilibrium that balances the disorder of the industrial city and/or of peripheral neighbor-hoods.
In addition, the adaptive re-use in the perspective of the humanistic paradigm is interested to contribute to reduce poverty, inequalities, with strong attention to relational and distributive impacts, and to promote social inclusion.

3.3. The circular human-centred adaptive re-use of cultural heritage

The *circular re-use* is (ecologically) regenerative: a re-use that contributes first of all to implement the transition towards a de-carbonized local economy; towards an ecological economy, thus facing the more important issue of our time, that is the climate change. Circular re-use of the heritage asset becomes an important entry point and a way to face the warming of temperature/climate[5].
Circular adaptive re-use is organized assuming the natural system functioning through circular processes as its perspective. Thus, adaptive reuse minimizes waste and negative environmental impacts and ecological footprint; reuses/recycles waste are transformed into resources (for example as fertilizer, etc.). Circular reuse extracts most of its resources, materials, energy from the (surrounding) territory; it re-uses existing natural materials, meteoric and gray water; it uses as far as possible renewable energy, thus reducing the conventional energy consumption and carbon emissions. It valorizes the natural lighting and ventilation. It promotes the use of green surfaces (walls, vertical gardens, roofs, urban areas for agriculture, urban forests etc.) for contributing to local micro-climate, together with water management. It recovers the heat coming from other specific activities, avoiding the lost in the atmosphere.
In this way it contributes to transform the linear metabolism of an asset into a circular one, imitating the wisdom of nature and thus it contributes to regenerate the ecosystems services on which the human activities and the wellbeing of people depend.
The health of natural ecosystem guarantees not only the quality of the landscape, but also the health and wellbeing of people, through the improvement of air quality, of micro-climate etc. This is the first important contribution of the circular adaptive re-use to the human scale of development.

[5] IPCC consider that the climate crisis is accelerating faster than expected generating chains reactions which can create damages to ecosystems, society and economy. Also, the NASA Laboratory, the WHO, the Lancet-Countdown etc. are monitoring through specific indicators the growing sped of climate change all over the world, with their impacts on health, wellbeing.

3.4. The socio-cultural dimension in the adaptive reuse

But the above are only some of the attributes of the above circular re-use.

Circular *human centered* reuse integrates these eco-characteristics/performances with other ones, linked to social and cultural dimension.

The circular re-use is the re-use able to regenerate the financial resource for functioning during the time. Thus, the circular reuse is able to generate positive impacts in terms of attractiveness of new activities localization, new specialized skills, new revenues etc., generating also new direct, indirect, induced jobs.

The capacity to generate employment is a key characteristic and a second contribution of the *circular human centered* reuse of cultural assets, coming from closing loops.

On its turn, some of above externalities come back to heritage, contributing to sustaining it and producing new works.

Work represents the instrument through which a subject enters into a relationship with society and the world. Work is the bridge between Us and I, between the self and the Others. From work comes the recognition of the dignity of the human person, the access to other rights.

Certainly, the construction sector continues to be characterized by a high capacity for employment and in particular, the recovery of the existing building heritage is able to ensure the greatest capacity for employment. But it is a short-term job and must be integrated with induced employment with management.

Being the work a critical element/condition for the human centered strategy, the re-use of the heritage can contribute to employment in particular if the new functions are oriented towards innovative and creative activities, stimulating private and social entrepreneurship and self-entrepreneurship[6].

3.5. The community and the new life of the heritage asset

As already just underlined, the *community generation* is another key characteristic of the circular - human scale regeneration.

A common feature of the circular and human centered reuse is the search for synergies/cooperation between different subjects or groups of subjects and between these and the institutions. This characteristic reflects and nourish the social capital. Cooperation is the secret engine of adaptive reuse practices, because it multiplies synergies, and thus the social capital, the community.

The circular human centered re-use is characterized by the capacity to generate a *heritage community*, which on its turn, takes care of the heritage, in a virtuous circular process. People should perceive an emotional sense of connection with a place, a sense of belonging /attachment to a specific area creating a “meaning relationship”.

In conclusion, the circular reuse of the cultural heritage should be interpreted and managed in ecological terms, in the perspective of the Green Deal of European Union and the climate

[6] For the first time in human history, it is not clear today which sector will guarantee work in the future. In the course of human history, in fact, employment has “slipped” from agriculture to industry (with the industrial revolution), and then from industry to services (with the post-industrial era). But in the age of robotization, of the ego, it is not very clear which sector can absorb work in the future. It is necessary to promote functions that can stimulate self-entrepreneurship, do it by yourself and so on (Zeleny, 1999).

challenge. But also as a way to improve the immaterial social infrastructure of the city, generating micro-communities through the management itself of the heritage as a common, characterized by a specific value, (an "intrinsic value", that reflects the value that has been connoting over centuries and millennia). A living heritage reflects and generates the existence of a living voluntary community, which identifies the rules to conserve, valorize and manage the common resources. In this way, the re-use becomes able to stimulate co-operation, co-fruition/ inclusion, multiplying relationships.
The circular human centered re-use, characterized by synergies/symbioses and cooperative activities (which increase the comprehensive productivity) is impossible without trust. Local connections that improve local relationships and local community are necessary, but they are not enough. The knot is cultural.

3.6. The general conditions

The general conditions for the success of the *circular-human centered adaptive re-use* can be summarized into the re-generative capacity, the symbiotic capacity, the generative capacity and. They determine the *transformation of a dead asset into a living system: into a "place" to be managed, in its turn, as a living organism.*
The *re-generative capacity* of different values is interpreted in ecology and in *ecological economy* as the auto-poietic capacity (Turner, 1993; Zeleny e Hufford, 1992; Maturana e Varela, 2001; Costanza, 1991; Costanza *et al*., 2014; Faber *et al*., 1995). It reflects the capacity to maintain the organizational structure of a system during the time: its identity and profile, characterized by a perfect metabolism, made more and more effective during the millennia.
The *symbiotic capacity* guarantees integration, adaptation and thus the durability of the re-use during the (long) time. It is linked to the material and immaterial relations between the heritage asset and the context: it guarantees the dynamic contextualization of a site to its surrounding spaces, as in the natural eco-systems, where relationships are source of life. Thus, the re-use of heritage assets in-forms, shapes, re-shapes its surrounding environment (which is in its turn re-shaped and deformed).
When relationships decay during the time, the vitality itself is compromised. As in nature, symbiosis guarantees resilience and co-evolution. It is based and it stimulates complementarity and thus integrations, inter-actions and co-operations.
This re-generative and symbiotic capacity generates also the capacity to produce multiple values: the *generative capacity* (for example between trees and mushrooms etc.).
The generative capacity depends on the self-generative system to sustain also other subjects or components.
A simple example in nature is the tree, (or woods) which through its circular processes is able to sequester CO_2 and particulate, producing O_2, fruits, fiber, shadow for people etc. It depends also on the symbiotic capacity.
Generative capacity is the multidimensional utility which an eco- system "offers" to its context, multiplying its relationships. Positive externalities are the outcome of this generative capacity. For example, through the adaptive re-use, emission of greenhouse gas can be reduced in coherence with the priority of this goal recognized by European Union. Also, the soil consumption is avoided, while the production of material waste is reduced.
But another important impact can be generated, linked to employment and to community generation, through the heritage ecosystem. The *heritage ecosystem* should be the outcome

of the "ideal" reuse of cultural assets, in which common spaces for sharing experiences, ideas, knowledge are proposed, also for testing new solutions, thus attracting new skills, researchers, entrepreneurs, investments. *The Hub of heritage-led circular regeneration* should be the reference general image. The reused asset, organized and managed as a living eco-system, become able to re-organize itself, in relation with the changing conditions of the context. The realization of this heritage ecosystem also as a platform that facilitates the meeting between supply and demand, allows processes of continuous regeneration, generation and symbiotic exchange in the context. Material and immaterial infrastructures determine the accessibility/connections of the heritage to its comprehensive environment.
That is, it allows to consider the adaptive reuse more and more in the ecological perspective that characterizes every living organism.

4. Human-centred circular adaptive reuse and governance/management: the evaluation role in transforming a dead site into a living system

4.1. Tools for improving governance and management

This circular human-centered adaptive approach has implications in terms of governance and management, and therefore in terms of tools for improving the governance/management itself.
Governance and management have a common characteristic. They both require and are implemented through the co-coordination of actions/choices between multiple subjects. Partnerships between public, private and also social bodies (PPP, PPPS) are fundamental tools. Evaluations are useful to find satisfying solutions, able to balance interests, objective and values of different subjects, each of them having different priorities. Public institutions, universities/research centres, social/civic bodies, financial institutions, professionals, economic subjects are more and more involved. The instruments of different forms of governance/management are many: but at the end they are grounded on Pacts, Agreements, Contracts, etc. They are all based on the in deep evaluation of mutual net benefits.
The circular governance, which interprets the reuse first of all in the ecological perspective, but re-shaped in the cultural and social dimension, is attentive to generation and inter-generational justice and urges not only dense interpersonal relationships but also strong and positive relationships of care and respect between people and between people and the natural ecosystem (Mother Earth).
The tools to realize human centered adaptive circular reuse strategies are multiple and reflect many interpretations of governance/management. Governance/management today associates different adjectives: collaborative, participatory, adaptive, responsible, experimental, innovative. But it basically indicates the ability to coordinate between many subjects, so as to promote a synergistic, cooperative, symbiotic approach also in uncertain conditions.
In any case, here we want to emphasize that "good" governance/management is based on a capacity for a "good" evaluation. It should take on both quantitative and qualitative metrics, combining quantitative economic, social and environmental indicators with subjective/qualitative indicators of perception. Good governance/management replaces independent and competent evaluation in terms of formal consistency with an evaluation of the results achieved. It also should introduce "participatory processes" in evaluation, for achieving the highest possible level of consensus among the various stakeholders.

Here we are interested to focus on "collaborative" governance/management, which is also a governance/management based on experiment and creative/innovative and evaluation capacity, also in the growing uncertain conditions.
In particular, the management in the re-use should be first of all an "adaptive", characterized by the capacity to learn from experiences(best, good, worst practices), to become more and more flexible in relation to complex and changing dynamic of the context, able to make good evaluations of alternatives(also in term of critical interpretations), able to monitor outcomes of activities, to make new fee-backs, and to improve the dialogue with all involved subjects.

4.2. The evaluation for transforming a dead site into a living system

The evaluation expresses a relationship between a subject and an object in a particular context. It serves to communicate, that is to interact, and to act, that is to make choices**.** It should be recognized that evaluation is linked to a theory of values: values and impacts are interdependent.
In particular, the outcome of every evaluation is the identification of priorities. A first issue is: which are the priorities between investments in reuse of cultural heritage compared to transports? Or, more in general: why the reuse of cultural assets is a better driver for implementing the circular economy? Why it allows to better achieve the human scale of development, through its economic, social and environmental added values in comparison with other investments?
Evaluation is grounded on a dynamic comprehensive impact analysis. Impacts can be positive/negative, quantitative/qualitative, short/long time, direct/indirect, primary/secondary.
It is important to assume a systemic perspective through which to interpret the real context, and thus the multidimensional dynamic impacts. This means to go over the traditional linear model of cause/effects, and also to face all interdependences. Economic activities have impacts in the short and long time, in the social and environmental dimension. Socio-ecological activities have economic/financial impacts. It should be necessary to overcome the existing divide between social, environmental and economic/financial performances, indicators and evaluations, to become more effective for stimulating investments/choices.
The evaluation in the perspective of the circular economy has implications on the evaluation processes first of all because it recalls the centrality of specific environmental/ecological indicators, (for example related to savings in energy consumption, natural resources, reduction of climate-altering impacts) in addition to the economic ones that are generally introduced, that are useful to understand the change and its intensity in relation to the status quo.
For the built environment transformation, a well-known evaluation tool is the LEVEL(S) (European Commission, 2019; 2020b), useful for searching de-carbonized solutions.
The evaluation respecting the human centered approach requires in turn to consider more specific approaches, and therefore the availability also of other types of data and indicators. It requires assessments of the different impacts in term of variation in well-being as perceived by the various subjects/social groups: in terms of change of their perceived quality of life. It is important to understand not only the intensity of impacts, but also their distribution between people and between areas: for whom impacts are positive or negative? This is a key aspect of the evaluation approach of human centered re-use.

The intrinsic value recognized to each human being requires specific quantified/qualitative indicators to be focused on. In particular, perceived impacts in terms of variation in well-being/health/quality of life require subjective indicators of perception that must be appropriately integrated with quantitative objective indicators. Health impacts have been the subject of attention in the Health Impact Assessment (HIA) proposal. Specific indicators are required for understanding the implications of a change of air quality, soil/physical environment and water quality.

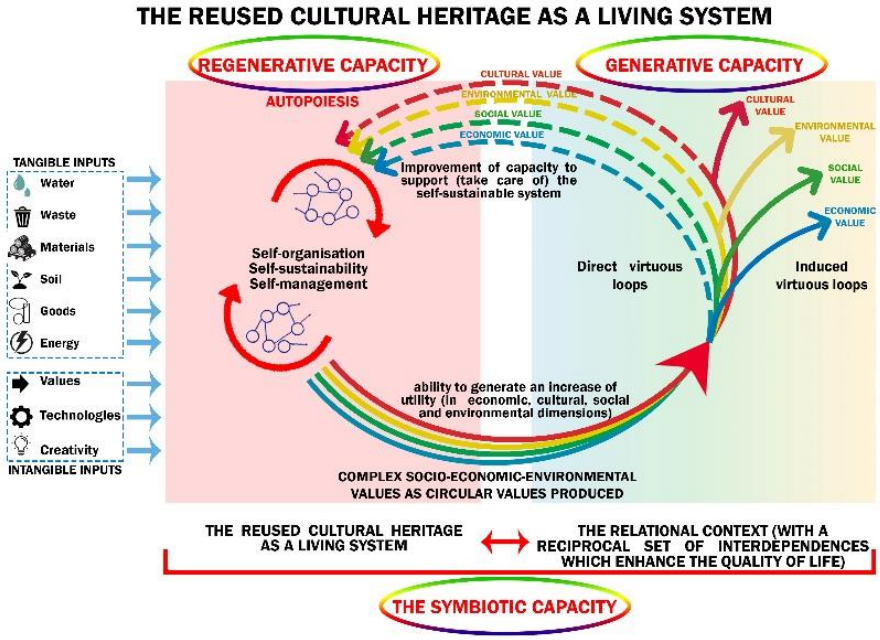
In the "real" circular approach also the emotional connections between people and between people and places (as a particular emotional experience), should be assessed (for example, through a Likert scale). The interpretation of symbols, soul, spirit of places becomes relevant. Similar considerations can be proposed about the reflection of the notion of intrinsic value of natural ecosystems, in order to assess their health.

In addition, the evaluation in this context of circular economy necessarily requires a long-term approach; it requires to consider costs and benefits not only economic-financial. The evaluation of externalities (positive, negative, direct, indirect, induced, in the short, medium and long term) becomes absolutely central.

The set evaluations that refer to autopoietic, to symbiotic, and to generative processes of external effects must be focused on (Fig. 1).

Of course, the reference scale (building, neighborhood, city, territory) determines different needs for data/ indicators.

Fig. 1 – Autopoietic, to symbiotic, and to generative processes related to the reused cultural heritage



Source: Fusco Girard (2019), CLIC Project Workshop, London, 2019.

This diagram distinguishes evaluations in the re-generative processes, in generative steps and in reciprocal /symbiotic exchanges with the context. It distinguishes intrinsic values (in the self-organization, in the right side) and multidimensional generated impacts (in the left side), some of which can come back to the ecosystem for reinforcing it, through virtuous loops.
This diagram underlines the ecosystem organization of a heritage asset, with externalities and the relevance of symbiotic processes in the comprehensive ecosystem and out the ecosystem (the externalities on the landscape). It suggests that, for the reuse, the functions should be chosen so that some of them can sustain themselves and also can support some other activities. For example, in the reuse of an industrial site, residential and commercial functions are justified if they support social, cultural, civic ones, coherent with the intrinsic value of the asset. So that a long-term perspective is ensured.
The diagram can help to distinguish between linear impacts and nonlinear impacts, characterized by feedback loops, reciprocal integration, systemic interdependences which can transform virtuous processes into vicious ones, starting from a specific threshold. Among these, for example, it is necessary to consider also the intangible/intrinsic/ecosystemic values (the spirit of places, the sense of belonging, of attachment of a community to a certain space, etc., which are reflected in the notion of "complex social value") and which determine the "attractiveness" of a space. The evaluation of this attractiveness (as well as adaptive) of a site with respect to external investments, new functions, visitors, etc. and the evaluation of the "repulsive capacity" of a site in conditions of degradation, unused, decaying, etc., represents concrete questions in terms of evaluation. They find a solution with participatory evaluation procedures, also based on dashboards and visual models/versions.
Among the impacts related to generative processes should not be overlooked the multidimensional ones on the historic cultural landscape .Also the implications on the real estate market ,resulting from the processes of functional reuse, the reduction of unused / underused areas (that reduces real estate yields in central areas, due to the redistributive effects), from the greater functional flexibility in building production and therefore the greater adaptability to changes in use (that determines a real estate surplus value)should be assessed together with the evaluation of landscapes (for example of waste-landscape).
The assessments of energy efficiency (savings on energy bills), Lifecycle analysis (LCA), Metabolic impact assessment as well as the assessment of synergies in the form of lower costs (production, transport, supplies, etc..), the assessment of environmental benefits of circular production cycles, the long-term assessment, in an intergenerational perspective, etc. should be focused.
The evaluation with respect to the circular model requires first of all to focus on the dependence of economic processes on ecosystem services and how these relationships may change as a result of a transformation project. It requires to consider a specific set of environmental/ecological indicators, i.e. related to the well-being of ecosystems and therefore to the health and well-being of people.
It should be recognized that also the value linked to intangibles, emotions, local culture, cultural memory etc. cannot be resolved on the basis of WTP: different procedures are needed, based on the approach that also considers intrinsic values. These can be evaluated through *evaluation processes of a completely different nature: through participatory evaluation processes.*
Through participatory evaluations, an intrinsic value estimate can be constructed in a consensual way.

In other words, the *evaluations* developed on the basis of a utilitarian/anthropocentric approach, i.e. on the instrumental value of goods and services (i.e. on their economic value, use value and also non-use value) are solved through a multiplicity of evaluation procedures based on Willingness To Pay.
But since immaterial, cultural, philosophical, symbolic, spiritual, religious values are also involved it is necessary to integrate these evaluations on the basis of *a non-utilitarian approach*.
The integration of the approach based on instrumental values and intrinsic value improves the choices.
Well, the *Complex Social Value* expresses the above integration.
Therefore, the evaluation of the intrinsic value of natural and cultural heritage and of human capital is the result of ***a*** social evaluation, about a complex value (Fusco Girard, 1987; 1997).
The approach by instrumental values and the one by intrinsic values obviously requires two different metrics: the former are related to the economy, the latter to the cultural dimension.
The procedures for the deduction of these values are constructivist, being based on participatory/deliberative arenas or forums, in which we try to deduce values on the basis of the widest possible consensus.

4.3. Evaluation versus interpretation

Recently, a tool to realize human-centered strategies that is becoming more and more widespread is represented by *Policy Labs*, represented by collaborative platforms for the production of knowledge and for the creation of effective and operational innovative solutions.
Policy Labs assume as general objective the fight against poverty, social malaise, environmental degradation, respect for human rights, starting from the analysis of the specific contexts as a starting point for hypotheses of transformation involving different public, private and social subjects, and verifying the results. Processes of co-creation, co-planning, co-design are stimulated by exchanging skills and experiences etc. on the basis of a hybrid approach that combines deductive approaches with inductive approaches, based on good practices.
Evaluation processes, or rather co-evaluation grounded on communicative capacity, also through images, drafts etc., are introduced : citizens are stimulated as active users and not as passive spectators, able to propose new ideas and hypotheses for solving specific problems stimulating the critical thinking, to distinguish, to put in relation, to identify shared priorities based on facts and not opinions, to hierarchize needs and issues, to stimulate creativity and future oriented mindset.
Thus, participative evaluations are particularly applied to *prototypes***,** including not only short-term impacts but also medium and long term impacts. The general objective is to improve the choices, i.e. to bring about a positive transformation, through interviews, workshops, forums, deliberative forums, arenas, brainstorming, modeling, visualization of available solutions, re-elaboration of prototypes, empirical verification, re-evaluation of results.
The above is particularly evident when is involved the third sector, between state and market.
This valuation requires processes of deliberative type (Jacobs, 1961) being interpreted as a process of construction of values not already given, but precisely constructed (Sen, 1995; Knight, 1947; Buchanan, 1954), on the basis of a shared knowledge and the public debate of

good reasons that are opposed to other good reasons, making the strongest ones win. The result is characterized by the achievement of a satisfactory level of consensus.
This evaluation is elaborated on the basis of a social and cultural perspective, i.e. linked to the local culture, to the world view, the symbolic, spiritual, intangible values of the people and not only on the expert knowledge of the technicians.
The intrinsic value allows and stimulates the circular human centered reuse, because it reflects the culture of a community/site. It reflects the autopoietic capacity of heritage in a socio-ecological context, and also the generative capacity in term of community generation and employment increase.
The intrinsic value requires particular attention to the natural/ecological system of a site, and to safeguard its health, on which human health itself depends. It also involves the enhancement of the landscape, which becomes all the more qualified the more it is safeguarded in its dynamic ecosystem equilibrium. And also, the above contributes to the psychological and physical well-being of people, as evidenced by several recent studies (Sacco and Teti, 2017; Sacco, 2018).
Fragile or insubstantial social relationships determine a lower quality of life and generate less resilience.
The process of identification, interpretation and evaluation of the intrinsic value represents a cultural and social/community construct, which can be realized with interactive and iterative participatory processes, with subsequent approximations, through iterations/interactions steps. It helps to orient the reuse of cultural assets.
These qualitative evaluations should be characterized by a level of consensus that is as high as possible in different contexts, so that they can be satisfactory, and therefore intersubjective and replicable.
Once this intrinsic value has been defined, it must be placed in relation to the opportunity costs that result from the preservation of this value. If the opportunity costs assessed are too high, i.e. they go beyond a certain threshold tolerable/compatible with a series of constraints that the specific context determines, the cultural site / landscape characterized by the above-mentioned intrinsic value will not be preserved in coherence with the intrinsic value. In other words, conservation intervention will be acceptable if the proposed changes reduce opportunity costs to a reasonably acceptable level. Of course, the threshold of tolerability/compatibility is also subject to evaluation and interpretation by the community.

5. Evaluations in the management of reused heritage asset as a living organism

5.1. Evaluations at micro scale

The adaptive reuse is characterized by a dynamic adaptation of the heritage asset to its changing context, as a living organism behaves. This means, first of all, that the multidimensional impacts are to be assessed.
The Material Flow Analysis (Haberl *et al.*, 2004) and the Life Cycle Analysis (Scheepens *et al.*, 2016) are useful and necessary in this scale to improve effectiveness. Evaluation of the indoor quality of air, and of the wellbeing conditions of employed subjects in the firm is required.
But they are not sufficient.

The choice of new use values is linked to the specific typology of the heritage asset (civic/public building, industrial asset, castle etc.), to the localization, to the kind of property and management.
In the easier case of adaptive uses for example for a dismissed church, possible uses are: cultural, library, museum, art production, music performances, bar-cafeteria, museum, restaurant, school, hospital, residential, residential for low income groups, hybrid residences, tertiary, advanced tertiary (research etc.), educational, sport events, hospitality, social dialogue, tourism services, art craft production, commercial, digital services, heritage platform for connecting producers and users, meetings, start-up activities, incubators, industry 4.0 activities, health services, wellness, social enterprise.
So, the assessment also of the intrinsic value helps, together with all impacts, to identify the more coherent new use values.
The evaluation compares alternative solutions, in terms of "comprehensive" productivity, to identify the more satisfying investment through an *economic/financial, ecological and social balance sheet*.
These choices can be faced not only as technical issues, but more and more as the outcome of participatory processes, in which the comparison and the evaluation about coherence with the intrinsic value and the new use values are analyzed, discussed and compared by the community involved.

5.2. Evaluation at the city level

At the city level, the challenges are to demonstrate the added value of cultural heritage re-use in relation to other investment in mobility/transport sector.
The evaluation is necessary to convince first of all public bodies that cultural heritage is important for implementing the circular economy. The above requires a quantitative assessment of costs and benefits, also if not all aspects can be expressed in terms of WTP (Fusco Girard and Nocca, 2019; Angrisano *et al*, 2016).
The evaluation is required to assess the impacts of the reuse in the cultural/visual dimension (ICOMOS,2011). The evaluation of the attractive capacity of the beauty of a place should be here incorporated, together with the evaluation of human wellbeing and health (WHO, 2018).
The Metabolic Assessment is an example of evaluation at the city/territorial scale (Kampelmann and De Muynck, 2018). It analyzes the flows of urban inputs as water, energy, food, natural materials etc. and the outputs which exit from the city/territorial system. This allows to understand the city territorial support that make the city sustainable (or not sustainable). Many different indicators have been proposed, starting from the ones identified by Wackernagel and Rees (1996). The evaluation of ecosystem services is another required exercise.

5.3. Circular business models in managing the heritage ecosystem as a living organism

Conventional business models are responsible of many negative impacts, from climate change to pollution, to destruction of environmental and landscape wealth, to reduction of human wellbeing.
More sustainable re-designed business models are required, attentive first of all to interdependences of relationships, partnerships. Cooperative relationships and symbioses are characteristics of nature wisdom and of the real world. They should "orient" new business models.

New business models are attentive to the needs of the "others", and not only of the enterprise. New business models become co-evolutionary, because they are not yet disconnected from the community and from the environment, but they should be re-designed imitating the circular patterns of nature.

In the logic of circular economy, they are tools of a new management that incorporates the logic of nature, through a *community-oriented* and *nature-oriented* approach. Thus, the ecological balance sheet and the social balance sheet integrate the economic balance sheet. More in general, new circular business models are also people oriented, nature oriented, future oriented, conservation oriented, for achieving a greater productivity.

The new business models for managing heritage assets as living organism should be grounded on multidimensional values, incorporating both *instrumental and intrinsic values*, for making choices about adaptive reuse and in management choices.

It is well known that the traditional business model serves to highlight:

- the key partners, i.e. *with whom* to produce, through which networks;
- *how* to produce (key activities-key resources, *technologies* to produce, digital tools, etc.);
- *which values* to create (Value proposition);
- with *which relationships* to connect production and fruition (consumer/users relationships, and thus establishing new alliances between firms, public institutions, social bodies, etc.);
- *for whom* to produce (costumers/users);
- *with which net benefits.*

New business models are becoming more and more positive-nature oriented, modifying or destroying the "business as usual" approach. They pose the key question: the role of nature in its interdependences with business, in particular with the Covid stress.

The decay of natural resources is a growing risk also for business. Nature is going to be considered as central in every decision, because here it is recognized a "nature emergence" (in terms of biodiversity loss, non linear growing impacts, etc.).

New business models are required, opened to "new nature economy". Nature needs to be conserved through specific nature-based initiatives, able first of all to multiply nature surfaces, etc.

This means to become able to assess not only the financial/economic health of the firm/activities but also their impacts on environment and society. A canvas which reflects the circular model should refer to the notion of complex value, (i.e. complex social value), considers the long term, the future generations, the capacity to generate services/fruition experiences (which can remain fixed in the memory of the users, generating on their turn new demand); to the health of those persons/actors involved; to the cooperative/collaborative capacity of stakeholders; to the transition towards a decarbonized economy. It should be able to assume the de-materialization of products as the future new demand (instead of the property). The digital connections should be considered absolutely strategic for the success.

This means to refer to the new canvases, for example to the Triple Layered Canvas (Joyce and Paquin, 2016). This makes explicit the socio-ecological conversion of business models, with explicit references to the creation of economic, ecological and social total value, and how these values are combined/defined. This canvas stimulates a more "value oriented" approach for managers/entrepreneurs and also for a better involvement of stakeholders and users/costumers. And stimulates also specific questions. The "value of Nature" suggested by the WHO Manifesto as the source of the human health/well-being (WHO, 2020) is

incorporated or not in the value proposition? In which way? The intrinsic values of existing ecosystems are conserved or damaged with the introduction of new use values and transformations? The intrinsic value of cultural/natural heritage is promoted or reduced or compromised? The dignity (as the intrinsic value) of the human beings (employed, first of all, etc.) are included? The value for the community is increased or not with the new functions? The new use values are coherent or conflictual with the intrinsic values?

There is a growing interest in recognizing that business models depend directly and indirectly on ecosystem services, and that the decay of them increase the risks level for business. In other words, there is a growing ecological conversion in new business models, searching more nature-based solutions. The idea is that the future of nature and the future of business are interdependent, so that it is necessary to promote a transition towards win-win-win solutions: for benefits of people, environment and enterprise. This means that nature and social needs are going more and more to be introduced in choices for management.

The pandemic has accelerated the above approach, showing the fragility of the traditional divide between financial/economic balance sheet and the socio-ecological balance sheet. And this requires the capacity to asses not only the financial/economic health of the activities but also their impacts on environment and on society.

Therefore, in light of the above, the canvas related to adaptive reuse in an ecological perspective should take into account:

- the phase of realization of reuse, distinct from the management phase;
- the reference to the medium-long term time perspective;
- the reference to the use of local resources, of recovered/ reused materials;
- to the saving in the consumption of materials (the different R) both in the phase of realization and in that of management;
- the capacity of maximum resilience over time, that balances the search for profit;
- cooperation between different subjects as the heart of the new model.

The value purpose is based on the creation of value not only economically, but also socially and ecologically. This shifts the attention to the limits of ecological thresholds, and to intrinsic/ecosystemic values. In fact, the above attention was already present in some sustainability-oriented business models (Schaltegger *et al.*, 2016; Antikainen and Valkokari 2016).

In the same time, the social canvas encourages the manager to embrace the social objective, going beyond the maximization of profit, for creating values for the society, thus opening new perspectives.

A comprehensive canvas is not represented by the aggregation of the three different canvas, but by capacity to correlate them into in an integrated evolutionary scheme. Evaluation processes in the management should be able to transform as much as possible ecological and social impacts into economic/financial ones. In this way also the communicative processes between all involved subjects is much more effective. The capacity to assess as far as possible environmental and social impacts in economic/financial terms, is well-come, because it avoids the traditional distinction between economic, ecological and social indicators. Connecting directly the socio/environmental impacts to economic/financial ones underlines that there are not separate independent variables/indicators, but interdependent and causal ones.

The above approach is important, in particular, for investors, because they can more easily understand the convenience of an investment in their specific “language”.

Evaluations can differ between public, private and social institutions. For example, the third sector is partially interested to long term impacts, to intrinsic values, to social impacts.
Digital technologies have a high potential to contribute in implementing the circular canvas model.
In the transition from the production of goods to the creation of platforms for the meeting between supply and demand calls for new business models, the value created is not in the products but in the relationships between producers and consumers/users, through suitable connections with digital infrastructures.
The new business model of the new platforms is characterized by the reference to the production of intangible services, with the research aimed at avoiding the underutilization of resources (the car used only for 5% of its useful life, the holiday apartment, etc.), to share between many users the services which is combined with the reduction of costs and prices, which in turn generates new demand, in a circular process that tends to feed itself over time[7].
The digital technologies can also improve the resilience of ecosystems of more fragile social groups (young, aged, etc.) but also can facilitate the creation of a digital local community, etc. The "digital re-use" can stimulate this local digital community, through spaces of co-working, together with spaces for meetings, events, etc., as many good practices can demonstrate.

6. Conclusions

The adaptive re-use of cultural assets (because of its multiple cross-section dimensions) is the entry point for implementing the circular city, that is the specific spatial/territorial aspect of the circular economy. Thus, the circular re-use contributes to implement the *city of the human being and of nature*, in which the *nature is considered the most important infrastructure*: for satisfying the needs of this generation (also of marginal social groups) and of future generations. It offers also the occasion to introduce a "reset" the relationships between people, nature and ecosystems.
In the bio-ecological perspective, the adaptive re-use is oriented towards nature-based solutions, for contributing to air quality, landscape, temperature regulation, water conservation, energy self-production, land saving, thus reducing the environmental/territorial fragility.
In the humanistic perspective the re-use is attentive to new employment in repair, recycle, regeneration activities and new productive activities and services. And also, to reduce the cultural fragility.
The "ideal" project of a re-use in the circular ecological and human centered adaptive perspective is an issue first of all linked to the choices of new use values, so that they can be combined to become integrated, in coherence with the intrinsic values, and not requiring external supports. The social enterprise is particularly attentive to new environmental, social economic and governance indicators. This is a management issue that requires new circular business models. All choices should be characterized by some specific elements, overcoming the narrow point of view of the traditional designer, planner, entrepreneur/manager, becoming able to transform ecological/social variables and impacts into financial/economic ones.

[7] Each year the user pays a fee for the access to the platform; or a financial percentage of the transactions is transferred to the manager of the platform.

In conclusion, the new approaches that implement the eco-social conversion of the economy in the adaptive reuse in design, planning and managing:

- are based on the ability to incorporate external effects;
- are based on the centrality of the collaborative/ synergistic perspective of the different subjects involved, even institutional ones, also on the basis of new forms of agreements/contracts;
- are able to incorporate long-term impacts;
- attach importance to the values of use, compared to exchange values;
- are characterized by a systemic logic, which takes into account multiple interdependencies.
- are useful to avoid/minimize the different forms of underutilization of resources;
- are attentive to all technological innovation, and in particular to digital technologies to improve overall productivity;
- are attentive to the use of local resources (material, energy, human, social, ecological, etc.);
- are aimed at the production of intangible services, rather than material goods;
- are interested in ensuring long-term relationships with buyers and users;
- are interested in using fewer natural resources;
- are attentive to the flow of ecosystem services that are derived from natural resources and support human activities;
- are attentive to the circular closure of processes (as Mother Nature teaches), so that each output is as much as possible reused as input to produce other goods;
- are attentive to the well-being (and the variation of well-being) on the part of the subjects, which is also linked to qualitative and perceptual aspects.

Few but effective indicators should be identified that take into account the above and in particular all the fundamental principles assumed here. For example, a project that proves to contribute to the process of decarbonization of the local economy; that it succeeds in becoming financially/economically/socially self-sustainable over time; that proves that there is an effective demand for the new functions envisaged, including through temporary experimentation; that is able to fit in the existing natural and built landscape ; that uses natural light; that re-use waste; that use renewable energies, conserving the permeability of the land and the employment of persons becomes preferable to be in financed.

Evaluation plays a key role if it is interpreted in a comprehensive way: as a technical and participative process, able to manage instrumental as well intrinsic values.

Instrumental values (market, use, independent of use values) are assessed through many tools based on WTP. But they do not consider the needs of future generations and of poor people. They undervalue the resources/impacts. The evaluation of intrinsic values is complementary: it is necessary but not sufficient. They both are required in the in choices of adaptive reuse of heritage assets, in coherence with the conversion of current economy.

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