City networks and sustainability

The role of knowledge and of cultural heritage in globalization

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Abstract Sustainable development has clearly taken on a global dimension, even if in recent years it has increasingly been acknowledged that there is a close mutual interaction between local and global processes. Politicians, economists and practitioners have realised that regional differences and particularities have become very important for building a people-based development which is not only goods-based. Thus, some new keywords for endogenous self-sustainable development are: networks, knowledge and local milieux. The integration of sustainable development aspects in spatial planning, territory governance and development has become stronger and stronger, combined with a spread of local knowledge and the preservation of both the cultural and environmental heritage. This paper considers all these factors and tries to explain these types of relationships, starting from the idea of city network as a basis for global competition, and moving on towards discussing the role of universities and scientific parks as institutions for knowledge production and dissemination. Finally, the important role of cultural heritage in a territory is investigated, as tool for building a culture-based growth that should increase social cohesion, local identity and equity. Although largely descriptive, this analysis is of special use to those teaching courses in the fields of architecture, planning and civil engineering, where a broader knowledge of city networks offers a more solid basis upon which awareness of sustainability may be built.

Culture industry and globalization: the network model as an interpretative theory of reality

Over the last 25 years, relevant economic changes have happened at a global level: in particular, the passage from national economy, based on production (“Fordist economy”), to the necessary insertion of every country and every business in a global market has taken place (Harvey, 1990).

The scarcity of studies on the relationship between globalization and “territory”, intended as a diffuse network of resources and as a cultural palimpsest, is testimony of the multiple problems which this line of research poses, such as the scale of analysis which varies from world level to local level and the need to define new models of the territorial setting which are representative of the differing realities which oscillate from the concentration in large urban areas, to dispersion in entire urbanised regions.

For this reason, the hypothesis that the relationships between the phenomena of globalization and territorial organisation can be effectively assessed using a network paradigm is assumed. It is, in fact, a model which lends itself to the current realities represented by the dynamic relations
between organisations, and which can be extended to all scales and to all fields of study. In particular, in the field of territorial studies, the network paradigm is used with different meanings, such as:

- **Urban-geography**, which refers to the organisation of settlements (city networks). From the theory of localisation to the present day, the concept of the city as a simple market area has become notably more complex (at the level of complex urban system, the city becomes the node of a trans-territorial network of relationships and transactions) and, even though a certain negligence of economists for the spatial aspects is always noticeable, it is clear that the subject has reached a notable level of de-territorialisation: the city becomes the node of a circuit of relations and has a link with the territory of a non-traditional nature. A principle of organisation as a network runs alongside a principle of spatial organisation which we can call territorial (gravitational model and hierarchical model) (Camagni, 1993).

- **Economic-territorial**, which refers to the organisation of the productive units (business networks). Also considering the changes which have come about the productive system, including the process of production of culture, the network paradigm represents a more adequate model for describing the new characteristics of the market (fragmentation of demand, segmentation of the market, increase in the non-vertical interactions, etc).

If urban functions are examined, it can be noted that they give rise to cultural, political and economic relations which define territorial settings of various dimensions. Some of these (in particular, those of the local functions) do not leave the limits of the agglomeration, while in the area of exporting functions they extend outside it until reaching, in certain cases, the entire planet. This is the angle on which architects, urban planners and managers see sustainability and where they focus their efforts in working towards the sustainability cause.

Considering, for example, the city of Naples in Italy, there are within the city functions such as those of hospitals (with a range of influence between provincial and regional), of a university (with a range up to the national level) and of museums, libraries and the arts, which have certain exceptional cultural and economic functions, and which are of global relevance.

Starting from these observations, certain concepts which were formulated in the area of regional and urban geography may be defined (Dematteis, 1993). Above all, that of area of attraction or of gravitation which refers essentially to the functions of a city able to generate commuting movement of populations from other localities, or from marginal neighbourhoods towards central neighbourhoods of the same city.

The area of attraction of a locality is generally delimited, dividing the territory in many portions, usually denominated “complementary urban localities”. By “complementary urban localities”, one means all the places of the territory originating habitual flows of persons towards other localities.
possessing whatsoever capacity of attraction, the latter being denominated “central urban localities”.

For simplicity and taking into account the work of Dematteis (1993, 1995), we may also call these latter “poles”, and the former may be called “satellites”. It is clear that in a territory, on any scale whatsoever, the satellites are much more widespread and frequent than the poles and, obviously, between the poles themselves there must be a sort of hierarchy, which can be measured calculating the area of attraction or gravitation of the respective poles.

While the dimension of the area of gravitation depends on the radius of action of the function from which it is generated, its shape and articulation depend on the type of function. In the case of functions which are addressed to the vast majority of the territorial subjects (families, businesses, etc) the shape and the dimension of the area depend principally on accessibility, which can, as a good approximation, be measured by the distance (in length or time) which separates the places of origin of the flux from the destination.

In the presence of an optimising behaviour of the consumers or users of the services offered, the areas of attraction of each pole are separate and do not overlap; in reality every pole has a surrounding restricted area where it exercises an exclusive attraction, then an area where its attraction is exercised along with other poles of attraction, but where it prevails over the others. With the growth of the distance, eventually, this prevalence stops and finally there is found some satellite which does not gravitate at all on the pole considered and this is the maximum limit of the area of gravitation of this pole. This limit is called range and identifies exactly the maximum radius of the area of attraction of a pole, which is quite different according to the pole which is considered. It can be claimed, paradoxically, that the range of a cultural good is infinite, from the moment that the attraction that it exercises is above all an influence of the cultural and ideological type: one may consider the almost two million visitors “attracted” every year to the archeological area of Pompeii, coming from all over the world. We find ourselves dealing with an urban locality in possession of a maximum range central function, in that it “requires” an area of exploitation of the services provided coincident with the entire human population.

On the other hand, when we consider the particularly specialised functions, which are addressed exclusively to certain categories and subjects, the concept of range tends to partially lose validity. In these cases, the areas of gravitation are rarely exclusive, the distance factor is often no longer decisive, while the fundamental economic, cultural and social characteristics of the locality of origin become fundamental. Considering the urban dynamic, the concept of the city as a network has already been stressed. Being principally based on internal relationships of interdependence and on exchanges with the outside, the systemic concept brings about a definition and a territorial delimitation of the city which is far from the image of the city as a continuous constructed space. It has already been seen that the physical expansion of the city has forced modifications of this traditional image through the concept of the conurbation,
agglomeration and metropolitan area. Up to this point it still concerns a sort of extension of the old way of considering the city as a densely constructed and inhabited space.

It is necessary, therefore, to come to a multipolar or polynuclear territorial organisational structure, in which a set of poles, each with its own satellites, is linked together by a series of horizontal and non-hierarchical relationships (or of relative flows). Such a relationship can link together cities with different and complementary specialisations, or similar cities with the same specialisation: in the first case we speak of a complementarity network; in the second of a synergic network. The fundamental importance lies in the relationship of the poles on a local scale (that is, inside the same city), which gives rise to complementarity subnetworks and those at a territorial scale (that is, between city limits), which gives rise to synergic subnetworks.

There are two levels of network, which trace invisible maps on the territory, the first of which is provided with a linear and direct relationship between cities, the second with “transversal” relationships between parts of them. The local systems are nothing other than the nodes of the superlocal network. In the first case, one may imagine a consortium between all the cities of a portion of the territory having the same specialisation or at least the same vocational calling (synergetic network); in the second, a consortium between all the productive or tertiary activities making part of different cities, so vast as not to possess a single specialisation (complementarity subnetwork).

In the case of complementarity networks and subnetworks, the advantages for the single urban centres are the advantages deriving from specialisation and from the territorial division of labour, realisable through economies of horizontal integration between the productive units (the so-called “district economies”) as well as the vertical integration through the precise “forms” of specialisation. In the case of synergic networks, founded on cooperation, the advantages are made up of the so-called “network externality”, which is enjoyed exclusively by those belonging to the same productive sector, whether this is the production of goods and services or culture.

The conservation of the historical centres (intended in terms of recovery and revitalisation) and the development of the cultural heritage is always seen as a restriction to development (negative interdependence) while the analysis of the economic impact of care has shown a certain complementarity (positive interdependence) between conservation and economic development (Fusco Girard and Nijkamp, 1997).

The territory as a cultural palimpsest: towards the “cultural district”

Truly sustainable management of the territory implies a new development model centred on the resources of the territory itself, which is able to transform the “objects” of the territory of cultural and environmental interest into “active” heritage capital (Fusco Girard and Nijkamp, 1997). Operators in the territory have always been aware of the fact that the monuments and cultural heritage,
the landscape and the environment, “produce economy”, in the sense that their presence directly influences prices, earnings and levels of return on investment (Mossetto, 1992). This first reflection leads, therefore, to the necessity of considering the care and development of heritage and environment as a theme fully integrated into the norms of planning and of intervention; the current situation still appears distinguished by a difficulty in perception of the territory, in favour of specific approaches which start and finish on a single piece of heritage, without having significant repercussions on a local scale.

The above question of a correct territorial dimension for study and planning is certainly addressed by starting from an integrated medium- and long-term programming vision of the objectives of governing the territory. An ever closer link has been established between two aspects of this same theme, on different scales: between sustainable management of the cultural resources, that is to say a modality of management which exploits the potential for development without eroding its foundation, and the role that the cultural resources have in the sustainability of systems of which they are an integral part.

There can be two extreme methods of putting this problem: one can be to pose the fundamental objective of a development policy as a maximum level of conservation of the goods accompanied by a level of exploitation which brings a barely acceptable direct economic benefit, and almost no indirect economic benefit; on the other hand, it is possible to pose an objective of maximising the economic benefit linked to exploitation compatible with a level of conservation considered acceptable. It is difficult to establish if there is a greater number of cases of underuse of cultural heritage or of overuse, in the sense of an abuse, or anyway of an uncontrolled use or a use not totally compatible with conservation. It is certain, instead, that in both cases there is a distorted use of the heritage because it is not placed in a territorial context.

Evidently, different value dimensions of the heritage come about from the different function attributed to the heritage from one time to the next by the political subjects. These may have dominating themes, according to the case, of their capacity of generating earnings, of generating employment, of educating, of nourishing the community identity, of bowing to the needs of beauty, of speaking to us of our fathers and of us to our children. The development process must, therefore, manage to follow a plurality of contemporaneous objectives together, and avoid the use of trade-offs.

The objectives, considered from the viewpoint of cultural consumerism are fundamentally the following (Valentino et al., 1999):

- **objective of exploitation**, to be met through the production of values of use able to satisfy the immediate and induced needs of the demand;
- **objective of care**, allowing forms of “consumption” of heritage (and environment) which do not prejudice the possible consumption of future generations; and
- **objective of conservation**, undertaken guaranteeing the repetition in time of the process of production of values of use, like those of consumption.
These primary objectives may be amplified with the pursuit of favouring growth of expenditure and of increasing the earnings and the local employment. In such a way the limits of the process of development are amplified so as to include the entire territory, and it is clear that a territory particularly rich in heritage able to activate this process will draw greater advantage from this extension.

Thus, the territory becomes a palimpsest of signs of the past overlaying each other, cancelled over and refound, and must be considered as a complex structure of heritage goods (Carta, 1999) and its components become the invariants figuring the places and the characteristics of the community and the matrix for a historic and contextualised evolution. For this reason the care and development of heritage can be an essential instrument for local development: separate development from the social context is destined to be mere economic growth. In this sense, the perspective value of the heritage, able to translate the signs of the past to the present and to confer on these the relevance for the construction of the future, is already present in the Amsterdam Declaration on European Architectural Heritage, of 1975, where the need for a strong link between the policies on heritage and the governing of the territory is explicit: the cure and the development of the heritage change from being the finality of development policy, to becoming the operational instrument for the construction of a local identity, the departure point for the activation of an endogenous and autopoietic process of development. Besides, for the effectiveness of policies of care and development, the importance of the decentralisation of territorial government in the construction of a territorial cultural system is stressed.

**Some practical applications**

The earlier sections of this paper have provided a theoretical background on which the links between sustainability, planning and architecture have been explained. In this section, examples of recent developments are presented, which put the information provided so far into a more practical context.

In 1997 the European Union financed a network of research on cultural identity, denominated “CIED – Cultural Innovation and Economic Development”, and formed by the municipalities of Palermo in Italy, Volos in Greece, Cardiff Bay in the UK, Galway in Ireland and Leipzig in Germany. The CIED project, starting from the analysis of the opportunities for local economic development offered by cultural policies, took on a number of objectives of general order. Some of the more significant ones are:

- to learn to use and not disabuse the cultural heritage and the production of culture in general, for economic development;
- to encourage the representation of culture in peripheral and disadvantaged areas; and
• to re-evaluate the role of culture in planning through studies of cultural impact.

Also, the recent document of the European Union about the production of the *Schéma de développement de l’Espace Communautaire* (Scheme of Development of the European Community Space), on policies for territorial development in Europe explicitly indicates, among the development factors, the launch of policies for cultural heritage aimed at educating the local population to regard the cultural heritage both as a factor of local identity, and as an element for the construction of a heritage-based development.

From experience in the field of territorial planning in the countries taking part in the production of the SDEC, some guiding principles emerge. The principles, knowingly taken on at the base of the choices of construction of the analytic and proposing apparatus, are:

- **Sustainable development.** To define the sustainability of the choices in the local context, it is necessary to introduce the cultural dimension. Together with technical evaluations (economic, ecological) the definition of sustainability derives from the principle of an ethical nature, which depends on a more refined way of evaluating the environmental question and the socio-economic questions by citizens (Pearce *et al.*, 1989). The principle of sustainability is therefore combined with the capacity of attributing values and collective meanings, of institutional hierarchies which guide choices in relation to cultural and political values, and by pursuing the goals of equity, quality of life and extended social safety (Fusco Girard, 1993).

- **Subsidiarity principle.** On the basis of the subsidiarity principle, different institutional subjects act according to the modality of government and by a coherent intervention on the territory, without overlapping. The roles of these subjects is thereby to overcome the hierarchic “cascade” definition of the competencies (from the centre towards the periphery), taking on a logic of functionality of role with respect to the objective instead (Brecher and Costello, 1995). The general objectives are those of efficiency in decisions (which are therefore taken by the organisation most competent with respect to the theme) and the efficiency of the realisation process (the decision is made by the organisation closest to the object, and adequate from an organisational point of view). In general terms, subsidiarity guarantees the maximum flexibility and plurality in management of the territory.

- **Principle of inter-institutional cooperation.** Cooperation and solidarity, in dealing with the territory, are commitments which every individual/community must undertake in relation with others, so as to reach an understanding aimed at optimising public action on the territory. This means: acting according to the needs of their own community, looking after its interests and promoting development without bringing negative
effects to the territory and/or conditioning the economies of the neighbouring areas. The application of this principle is aimed, therefore, at the construction of a “shared vision of development” (Carta, 1999). Solidarity here means coordinating all those local actions which are by nature of general interest and which generate effects at the local level.

The objective of specialising the economy in the area where the cultural heritage is situated is, in an ample sense, substantially a process of development to create an economy of agglomeration, or rather of urbanisation since the evidences deriving from activities which are part of the cultural “mould” are typically in an urban or periurban setting. One must consider creating, to paraphrase Marshall, a cultural atmosphere, able to achieve a positive economic impact on the local economy.

Conclusions
In recent years, a wide variety of changes has come into being: technological innovations, new spatial dynamics, bottom-up social and economic restructuring, and the like. Urban complexity has greatly increased in recent years as a result of many changes in the institutional, spatial, economical, environmental, social and technological spheres. Yet, urban complexity is not regarded as a matter well understood and this lack of understanding prevents long-term progress in the field of sustainability in an urban setting.

If it is true that cities are nowadays compelled to behave in a logic of competition, it is also true that a new way of competing is needed, given the increased interdependencies between activities and actors that are part of the urban environment. With the acceleration of economic and financial integration, many European metropolitan cities become control and command centres. Knowledge is the main good and value, and cities are the places where the world’s invisible production chains interlink. Synergetic effects have become much more important than accumulative ones and this shows the value of well-planned teaching and research programmes tackling the complexity of urban issues and relating that with sustainability in the broadest sense.

An innovative milieu in research and education and an innovative milieu in business, without forgetting the links between them, may be the two cornerstones for urban sustainable development. Thus, the role both of universities and of scientific parks in the shift from goods handling to information handling is essential: they are the main institutions for knowledge production and for knowledge dissemination.

In fact, industrial, technological and business parks are mushrooming throughout Europe and provide some interesting examples of public-private partnerships for turning areas of blight into healthy spaces and areas of positive environmental and economic profit (Castells and Hall, 1994). The university structures, in fulfilling their tasks in the production of ultimate services (research) and of intermediate services (teaching), usually draw from the local market the input they need.
One of the most important aspects, which illustrate the university presence on the local system, is the training of human capital. The presence of a university in loco, which is particularly oriented to the specific needs of a certain area or territory, reflects on the availability of highly qualified personnel. Another significant aspect related to the very presence of a university in a regional context is that the presence of human capital plays a role in the decision of companies to be based in one place or another (Quintavalla, 1999). On this subject, Brunet and Grasland of the Maison de la Géographie in Montpellier have been the first to talk about the diffusion of innovation process, defining it as percolation, which is a filtering machinery that allows innovations without leaving them on the surface (Brunet et al., 1988; Brunet, 1990). In the urban reality this metaphor shows the way a territory, in which a university or a scientific park lies, is able to make easier the filtering of innovations into the territory itself.

It is the view of the author that the sustainability debate should take into account all these factors: the view of the city as a complex network, the role of knowledge and the influence of cultural heritage in globalization. This may ultimately lead universities to consider which kind of relationships they may want to develop in the region in which they are located, an area where Italian universities – which are very sensible of the above matters – excel. It is perceived that the governance of the city and the territory, which depends on the strong idea of “integrated development”, emphasises the strategic role of both innovation and knowledge in understanding the environment, the milieu, the cultural policy, the human capital and, in only one word, the habitat.

References
Brunet, R. (1990), Le territoire dans les turbulences, Gip Reclus, Montpellier.

