

THE QUADROTER PROJECT: AN ECOSYSTEMIC READING OF THE ITALIAN TERRITORY

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The Quadroter Project is a "strategic" research project sponsored by the CNR in collaboration with the Ministry of the Environment aimed at the construction of a "Territorial Framework of Reference for Environmental Planning", relative to the Italian territory.

The purpose of this report is to illustrate briefly (a) the scientific premises of the construction of the Quadroter, which are also the foundations of an ecological equilibrium between human activities and the territory or natural environment; after this will be indicated (b) the lines of direction of an urban policy inspired by the above-mentioned foundations of ecological equilibrium; then (c) the project configuration of the urban eco-systems for the Italian territory will be drawn- the result of the first Quadroter research tasks; and (d) examples of the above results will be given for certain areas of the country, in particular for the Milanese and Sicilian areas; finally (e) we will look at the nature and limits of the Quadroter as an instrument of territorial policy.

1. The foundations of ecological equilibrium between human activities and territory

It is common place today to affirm that a serious policy of environmental safeguards must aim to prevent environmental damage *ex ante* rather than intervening when the damage has already taken place. In

order to pass from a strategy of cure to one of prevention it is necessary to make sure that the pressures and impacts on the territory and the environment occur according to modalities, positions and conditions that are "preventive", ie planned *ex ante* so as to control their effects and hoped-for absorption. This "environmental" planning of interventions (of any type of intervention) on the territory must permit the simulation of the overall territorial and environmental impacts and keep the possible effects under control.

This type of planning in order to serve its purpose must have in the first place an appropriate time frame; ie it must be *long term*.

In the second place, rather than seeking, case by case, the conformity and environmental impact of each type of intervention, it should establish "a priori" a series of guidelines and territorial and environmental constraints for all types of intervention, in such a way that, right from its conception, we know how and where an intervention can take place without environmental damage (or with the minimum of damage); and at any rate in such conditions that it is assured that the pressure is rationally managed or absorbed ("metabolised").

The land-use destination of the territory, understood not as an abstract system of constraints, but as implemented by the plans, in consideration of real emerging land-use needs, is the most efficient way of exercising environmental control over a territory: on condition that "appropriate" territorial ambits are identified and defined in order to manage the equilibrium (inevitably quantitative) between territory *demand* (usage needs) and *supply* (geophysical characteristics, pre-existences etc.).

If the container (the territory or the environment) is overloaded with contents (activities), the resulting *disequilibrium* can be compensated for by a spill-over of the surplus. But in order that this spill-over happens in a non-chaotic way, it is necessary to predetermine the ways in which it can and must be channelled; and we must also predetermine the ways in which this chaos can be avoided, directing the activities within ambits (containers) that have sufficient capacity to sustain the activities *in equilibrium*.

This is the true essence of feasible, rational territorial planning: the maintenance of equilibrium in the best possible way between the supply and demand of the territory in the medium and long term¹.

It is not the case that the overloading of activities occurs throughout the territory: there are some parts that are largely unused and others that are in danger of degradation out of neglect. What is lacking is an opportune and rational "territory organization", which represents the

¹See other works on this subject by the Author (Archibugi, 1988 and 1991)

essential condition for the prior avoidance of overloading, and thus of environmental harm.

But what is the "appropriate" optimal ambit for the evaluation of the anthropic/ecosystemic relationship: activity/environment, or demand/supply of territory? In what ambit can one manage this relationship entirely from the inside, without unloading externally possible disequilibria and without throwing out of balance other equilibria.

It is common knowledge that there is not one single appropriate ambit in which one can rationally manage an ecological equilibrium. Any activity and any pressure on the territory has its particular impact area, and thus its particular appropriate ambit for evaluation and management.

For example, many activities that are linked to the production and consumption of energy or chemical products (atmospheric emissions) or of wood products (deforestation), wherever they take place on the earth have an impact on a *planetary* scale; they produce effects such as the earth's warming or the reduction or breaking up of the ozone layer. In these cases the decisions necessary in order to evaluate, measure, and manage the equilibrium between the causes and the effects of the phenomenon have their appropriate ambit on a world scale and management is inconceivable without a certain degree of cooperation and authority on this scale.

Likewise, other world-scale phenomena of pressure and pollution have reduced impact areas, only *continental* (the case, for example, of acid rain), or only for *water basins* (in the case of the release of urban effluents into rivers and streams). In such cases cooperation and/or authority have the continent or three water basins as their "appropriate" ambit.

But the majority of human activities that produce pressure on the territory and environment, are linked to *urban* settlements, are of an "urban" nature, and have the city as their exclusive ambit of ecological impact (we could call it the "urban basin").

Apart from some energy-producing and industrial activities and apart from those activities connected to touristic land consumption, almost all human activities are connected to the urban life of the citizens which is "daily" and functionally limited to the daytime. They take place in the "urban basin".

In such a case, the "appropriate ambit" for the measurement, evaluation, and management of the impact phenomena is the same as that of the urban activities; it is the urban basin. Obviously, by city impact area or urban basin and by "urban" activities, we mean that which is connected not to the simple physical delimitation of the urban fabric (even if the occupation of such a space has a very important role in determining the ecological disequilibrium of the sort mentioned above) but rather to the *city functions*, ie to the functions that the citizens carry out in the city. The

space occupied by these functions is much more vast than that of the continuous fabric (consider the development of commuting between the place of residence and the place of access for many urban services and jobs). But such a space has however a theoretical limit: that given by the daily acceptability of the commuter activity, which is expressed in a given temporal (or isochronic) access distance².

This "system of urban functions" - or more simply *urban system* - which is a system of relations, constitutes the "appropriate" sought-for space for the measurement, evaluation, and management of the demand for (or the pressures on) the territory and environment deriving from urban activities. The search for equilibrium in urban functions is identified with that for the equilibrium between territory supply and demand. The urban system is identified in an "ecological" urban system - an "urban ecosystem". Consequently the best organization of the urban systems on the territorial scale constitutes the best way of preventing ecological disequilibria.

Thus, so-called territorial planning is identified in so-called environmental planning and viceversa. One, if different from the other, means that the other one is lacking; and is therefore bad planning. The first without the second does not pick up one of the most important "effects" of bad management of the territory; the second without the first does not pick up one of the most important "causes" of environmental disequilibrium (pollution and degradation).

2. The urban system as a more appropriate place of ecosystemic measurement, evaluation and management

The urban environment crisis due to ecological disequilibrium, ie to the disequilibrium between territory supply and demand, is of the utmost seriousness both for the fact that today the vast majority of the population lives and works - at least in the West - in cities, and for the fact that it is presumable (and indeed to be hoped for, in a political conception of equality of social and economic conditions for citizens³) that soon the *entire* population (again at least in Western countries) will live in towns or cities, ie in an "urban" living condition.

It is true however that, as the urban living condition becomes hegemonic, the dualism of urban/non-urban life will be changed; the concept of the city will be transferred to include use of the non-urbanised territory (on the part

²In "Progetto 80" this isochronic value-objective was fixed, if I remember rightly, at 60 minutes a day.

³In fact "total" urbanization may become an aim of public policy.

of the urban users). In other words the geographic and conceptual "confines" of the city⁴ will change and the conception of the urban system or (the same but more precisely) the "urban ecosystem" will be put forward.

If this happens, clearly the concept of urban environment will have the opportunity for a new and more functional natural-anthropoc integration; with only the distinction remaining to characterise the various effects of the obviously anthropic action on the elements of nature and on the socio-economic conditions.

In the Quadroter the concept of the "urban ecosystem" is understood to mean a system that in general "riassumes" the effects and conditions of the anthropic action on the environment; and this concept has been used as a reference scheme for the measurement, evaluation, and management of the anthropic impacts on the natural environment as well but originating from urban activities.

We have assumed the definition of the urban ecosystem (as already proposed elsewhere⁵) as that of a complex of functional relationships of a determined community that develop in the territory in relation to the daily residence of the citizens. Since it is with regard to such residence that people today manifest the greater part of their consumption and activity needs, it is in relation to this residence that the parameters of the requisites of urban living and of the well-being or malaise that may derive from urban living are established.

On the other hand - as for any system - the "urban system" as well is a complex of relations that are in fact or potentially in equilibrium; like an organism that is, or tends to be, in equilibrium. Where such an equilibrium is not achieved or cannot be achieved, the urban system not only enters into crisis (as in the cases when it existed but is overloaded), but also is not produced (as in the cases when desired urbanization processes are not activated).

If we identify in the *equilibrium*, the optimal relationship of the conditions of urban life, we can say that the achievement of the equilibrium, ie the structuring of the urban system is a condition for the creation of a satisfactory system of urban conditions.

Without the realisation of an urban system, or the insertion of whatever

⁴On this subject it is symptomatic to observe that some considerations made on the concept of the city earlier in the century by Wirth (1938) are still valid. These were updated by me some time ago in a paper on the "city idea" (Archibugi, 1966) .

⁵On the concept of the "urban system" a wide treatment may be found in my work on "urban systems policy" (Archibugi, 1986); for its adaptation to the concept of the "ecosystem" see a more recent contribution to the preparation of the Green Book of the European Community (Archibugi, 1989).

condition of human settlement in an urban system, the postulated conditions of urban well-being is not achieved; the essential equilibrium between the complex of relations mentioned is not produced.

There are many factors that may determine urban well-being: social relations, physical accessibility (transport) and economic accessibility (levels of income) to determined urban services and satisfactory working conditions, the variety of work opportunities, recreation, culture etc., physical-environmental conditions (quality of the air, of the landscape, etc.). It is therefore the correct *mix* of these factors that produces urban well-being, which is to a large extent environmental well-being, since humanity for the most part aspires to live in urban conditions.

In fact it is in the city that the various imaginable objective factors of personal and social well-being are thrown into the melting pot; since ways of living different from the urban type are inexistent or undesirable, or simply marginal.

By "correct mix" is meant therefore an optimal synthesis of such factors, in such a way that the presence of one does not damage that of another; in brief the various factors of well-being should co-exist and be compatible.

The reciprocal "incompatibility" between the various well-being factors manifests itself in various ways. Amongst the most evident and most felt today there is that (above mentioned) of the relationship between demand for space or territory, that is essential for user accessibility to certain services and uses, and the scarcity of such territory. For example, making access easy to urban services implies the maximum diffusion of the individual car; but this well-being factor is incompatible with the scarcity of spaces and territory (streets, car-parks, etc.) available to accommodate the necessary number of cars. Obviously some superior urban services can only be concentrated in the territory and this makes the availability of space particularly scarce. Nevertheless, still by way of example, the location of services can be adapted to respect the efficiency constraints of these services with the needs of accessibility that demands as well that certain constraints are respected (for example, not exceeding certain access times or certain thresholds of atmospheric or traffic pollution etc.). The task of planning (in this case of territorial planning) is to find a technically possible trade-off between the two constrained objectives.

But in order to establish the optimal requisites for the urban system it is necessary above all to identify its dimensions: of surface, users (population), activities.

For example, at a particular level of development of habits, consumption, available income, a certain "critical mass" of users, a certain "catchment area" (limited by access constraints) are indispensable for the

existence of the services that produce the so-called "urban effect".

Below such a user critical mass, every effort to produce an urban effect is destined to fail. Probably in such cases (below the urban effect) the best conditions from the environmental point of view are produced. According to a survey carried out by Censis it seems that in Italy the most "liveable" city from the ecological and social viewpoint is Macerata⁶: but without the urban effect - which may bring with it some environmental imbalance but is nevertheless sought for by the citizens (perhaps the youngest or most demanding) in their habitation - the level of "liveability" in Macerata is completely irrelevant; the town will lose its "brains" and opportunities in favour of the agglomerations that are more attractive from the point of view of the urban services offered. In Italy, if one casts a glance at the conditions of urban values and their hierarchies - despite the proclaimed "crisis" of the metropolitan areas; despite the would-be "de-urbanisation" (based on the loss of inhabitants on the part of the largest municipalities in favour of the smaller ones which are in any case close to the large metropolitan centres); despite the marvels of "diffuse" development and the information technology that sustains it; despite the undoubted positive effect of regional administrative decentralisation which should have developed the urban effect in many regional capitals etc. (phenomena about which many learned territory analysts have held forth) - there is still the impression that "urban values" are even more concentrated than they were in the past and that the image of many cities that were once the centres of important urban activities (culture, theatre, publishing, finance, entrepreneurship, international relations, etc.) is fading because of the loss of functionality and dimension.

An alleviation of the environmental pressure caused by the overloading of the more intensely urbanized areas, includes the possibility of developing alternative areas that reach, nevertheless, the "critical mass" conditions for the development of the urban effect outside the areas that are to be alleviated⁷. If these size constraints are not respected in areas that are losing urban values, these areas will not be able to constitute valid alternatives to the "metropolitan" areas, and any attempt to resist in time (with a suitable programme of territory use orientation) the negative effects of overloading will be wasted.

Any intervention would be curative and to a great extent ephemeral as opposed to being preventive; it would not correspond to the foundations of

⁶A medium-sized city and provincial capital of central Italy.

⁷On this point see the Author's contribution *A Strategy for New Public Spaces and Centralities*, a report given at the Eec conference on "The Future of the Urban Environment in Europe", Madrid, 29-30 April 1991 (Archibugi, 1991a)

ecological equilibrium (as argued in the preceding paragraph).

3. A reorganization by "urban ecosystems" of the Italian territory

Adopting these foundations for ecological equilibrium, the Quadroter proceeds to a reading of the Italian territory and its present disequilibria.

The main object of this reading was the actual distribution of urban settlements and their relative density, that which is called the *urban framework*; this same distribution, as mentioned, constitutes the principal factor in the overloading and degradation of the environment.

Then is evaluated the territorial distribution of the "*superior*" *urban services*, those that produce the "*urban effect*"; the services that are in fact the principal factor in the future evolution of urban settlements. The general strategy adopted has been to design a reorganization - for the future - of urban settlements in order to avoid further concentration in the already overloaded urban areas (the "metropolitan" areas); and this in order to realize a feasible reorganization of the presence in the territory of the superior urban services, that are, as mentioned, the principal factor in the evolution of the urban settlements.

The "feasibility" of such a reorganization consists in the fact that these services cannot be distributed "diffusely" in the territory without any sort of constraints. But rather they need in order to be economically justified (and not create - as is the case of the public services - a serious waste of resources) a certain *critical mass*, and a certain user *threshold*, that is often in inverse relation to another aim constraint that territorial planning must bear in mind: the *temporal access* constraint for the same critical mass or user threshold.

For the overloaded commonly called "metropolitan" areas, the strategy consists of creating alternative polarizations to those of the monocentric historic centre, to the predetermined user critical threshold (the "access" constraint in these cases is in reality more than respected, and certainly improved with the improvement of traffic congestion factors that could diminish travelling times and thus access to the superior urban services). The critical user threshold constraint means that, in order to be really alternative these polarizations must be at least as important as the monocentric one they would oppose; and avoid the risk of dispersion in "decentralizations" that do not have sufficient strength to constitute a real alternative, and would create a further "peripherisation" that would be costly and chaotic.

For the areas of diffuse settlements (in particular for the medium-sized urban centres), the strategy consists of creating polarizations that are able

to hold in check - by reaching the necessary user thresholds - the persistent attraction of the metropolitan areas. In this case, the problem is often posed of the best trade-off between the critical user threshold constraint and that of access time.

For some areas (that are in fact very numerous in Italy) of particular environmental and historical-cultural interest, which are affected by metropolitan and urban development marginally but still with devastating results, the strategy consists in designing a "special" development, based on particular ad hoc functions, of a conservational and protective nature, and keeping them away from a generic and destructive development.

On the basis of these strategic criteria, born out of reading of present urban settlements and the territorial distribution of the superior urban services together with the series of "strategic" aims of urban policy (included in the elaboration of the "Ten Year Plan for the Environment" produced by the Ministry of the Environment at the same time (1992), the following aims have been assumed in common as for an Urban Environment Policy:

- the design of alternative centres to the single historic centre, for the metropolitan areas (and this in appropriate size and number to each identified metropolitan system);
- the design aimed at the requalification of the metropolitan peripheries (an aim that is a corollary of the preceding one);
- the planning and management of urban transport as regards the depolarization strategy of the historic centres of the metropolitan areas (this too is a corollary of the first aim);
- the recovery and restoration of the "historic" centres in the metropolitan areas;
- the design of new "systems of cities" for areas with diffuse or low urbanization (in order to achieve suitable polarizations for the sought for "urban effect");
- the qualification of non-urban areas, as "territorial units of historical-cultural and environmental recovery" (Utras in Italian).

On the basis of these aims, the Quadroter project has proceeded to design a reorganization of the urban framework for the medium and long term, whilst obviously bearing in mind the constraints represented by present urban settlement that cannot be easily ignored. This reorganization is based essentially on:

a) the reorganization of 10 "metropolitan" cities, with as many "plans" of territorial and environmental recovery ("eco-plans"), that propose, for each

city, alternative centre strategies that are, we repeat, in ratio to the size and problems present in each. For example: for Rome there has been suggested the creation of 4-5 alternative centres to the historic centre, to which will go parts of the catchment areas of the Roman and metropolitan population; for Naples, besides two other alternative centres, integration has been proposed with a third centre (that of the city and district of Caserta); for Bologna, the creation of a single alternative centre; and so on;

b) the organization of another 26 "*systems of cities*" throughout the national territory, in which will be grouped and integrated - with an appropriate transport strategy and distribution of superior urban services - a great number of medium-sized and small towns and cities, that by themselves would not reach the necessary urban effect and that - despite their apparent revitalisation - represent a constant risk of persistent gravitation to the metropolitan areas, and certainly not a factor of alleviation of the same in the growth of urbanisation. Some influenced by the relative territorial diffusion of settlements and by levels of economic activity, believed that they could or had to "theorise" a certain growth by "network" or by "diretrices"; it is a question of an interpretive reading that is "pedestrian", and therefore a bit trite, of that which is taking place under one's eyes (as in other cases that have happened in the past, when the phenomenon of metropolitanisation has been overrated, the evidence of vast built-up areas called "megalopoli"). As regards the significance of the phenomenon it is a superficial reading. The network or diffuse distribution or that by "directrices", does not change the need for "centrality" in the urban phenomenon; and it is from this "centrality" (from its public spaces, its superior urban services, and its social and "imagerial" quality) that the "urban effect" is born; and not from the sum of physical facts that create only environmental damage without creating the city;

c) finally, the organization of a large number of "territorial units of historical-cultural and environmental recovery" (UTRAS, in Italian) distributed through all the territory, (and belonging - for the superior urban services - to the ecosystems mentioned above; some of which cross over between the said systems, the regions etc.). On a first reading, the Quadroter has identified *over 270*.

The Quadroter project has also outlined a reorganisation of the national system of transport (both of passengers and goods) that is coherent with that, above mentioned, for urban settlements: it is fundamentally aimed at a functional separation between "*inter-systemic*" transport - by means of the identification and organization of "*pluri-modal*" corridors on a national

scale (in accordance with the "General Plan for Transport" already devised and brought up to date by Cipet - the Interministerial Committee for the Economic Planning of Transport) and the "*infra-systemic*" transport - those aimed at serving specifically each urban ecosystem, in the above outlined strategic characteristics (of "de-polarisation" or "polarisation").

In **Map 1** is delineated, cartographically, and very summarily, the design of this reorganization desired by the urban framework, as has emerged in the first instance from the Quadroter project; and also the design of pluri-modal and inter-systemic "corridors" as deduced by the General Plan for Transport (the Quadroter has not yet verified the coherence of the Transport Plan with the design of the new urban framework).

4. Exemplification of the Quadroter for the Milanese and Sicilian area

On the scale of each urban system, the Quadroter project, as mentioned, has arrived at proposing a reorganization of the territory, bearing in mind the present settlements, the problems of overloading (or of "underloading") that it noted, and the need to ensure future development aimed at the riequilibrium of territorial loads.

Here we will try to illustrate the logical procedure of the research, with its application to two cases: the Milanese area and the Sicilian area, two areas of the national territory that are very different and that have diverse problems.

4.1. The reorganization of the Milanese and Lombard area

One of the most obvious disequilibria, which has been much studied, in the Italian territory, between anthropic pressures and territorial and environmental resources, is that occurring in some parts of the Po valley, in the Lombard area in particular and even more so in the Milanese area.

Here there is such a "historic" congestion of productive and economic activities, and consequently urban and residential settlements, that the whole area has reached (and with it all the natural resources of the area: water, soil, air, woodland etc) the highest risk level in Italy.

The coefficient of the coming together of industrial risk and urban residential pollution is at its highest in the Milanese area, which has reached a level of maximum pressure saturation and is extending its congested area of influence more and more to the Lombard territory and to the adjacent

regions.

The Quadroter project, because of its long range territorial vision, which is by nature multi regional in character, has examined the possibilities of a territorial strategy of recovery of the tendency towards the compacting of the Lombard area, and towards the environmental degradation that ensues, according to a non-regionally limited optic (meaning by these those that are not constrained by regional administrative borders). Naturally the vast and irreversible presence of "pre-existences" that must be borne in mind, constitutes an important constraint for a multi-regional optic.

One of the factors, as mentioned, of maximum effect in environmental degradation, is the great and often useless concentration of urban activities (those that produce the "city-effect") in restricted portions of "historically" occupied territory, towards which there ends up gravitating a user quantity greatly superior to that strictly necessary to allow the same activities to economically survive. This is the case of the city of Milan, the superior services (universities, theatres, business centres, specialized health care, culture, sport, publishing etc.) of which serve an excessive catchment area, that gravitates from areas that, if well organized, could justify the development of such services with much easier and convenient access. In other words, if in general these superior urban services need a quite high user threshold, and thus have to concentrate themselves, in the case of the Milanese and Lombard area, however, this threshold has been crossed over by a long way, thus priming a process of "scale diseconomies", with respect to those scale economies of the first phase of urbanization.

A good organization of the Lombard territory could create "centralities" or alternative polarities to those of Milan, with the effect of lightening the Milanese area from an overload of functions, and of managing on a more decentralized scale the entire load of activities of the population, which would benefit from the systems of territorial access to the activities themselves.

For the Lombard and Milanese areas the Quadroter has explored a form of territorial aggregation and, at the same time, disaggregation that will satisfy as well as is possible the double opposing demand:

to respect the threshold constraints (and as a consequence of concentration) for the supply of the superior urban services;

to maximise the decentralisation of the urban functions in the territory, and thus lighten the Milanese area of its excess of functions, and free the adjacent areas from a role of "dependency", with elevated access and management costs.

One has tried to apply the concept of urban eco-system, as illustrated in the previous paragraphs. It has been realised that the Milan area, obviously

in its "metropolitan" dimension, which corresponds approximately to the territory of the administrative province, needs to be greatly decongested, ie to be freed from the gravitation from the adjacent areas that could be "served" by other alternative centralities, and that it needs also a territory of "expansion" for those "endogenous" development activities (linked to the pre-existence and to the demographic settlements already installed) that cannot be transferred to "other" urban systems.

So on the one hand *alternative urban systems* to those of Milan have been projected, that are capable of polarizing the territories now polarized on Milan. And on the other hand, within the Milanese system, *alternative centralities* to that of the historic centre have been projected .

The alternative systems on a regional and multi-regional scale are:

a) a system of *Northern Lombardy*, (or *City of the Lakes*), of a transversal character, unifying the territories of the provinces of Varese, Como, Bergamo, Lecco and Sondrio). To this would refer an overall catchment area of about *two and a half million people*, who today gravitate to Milan and its centre, with serious environmental and social costs;

b) a *City of the Po* system that integrates the territories of the Lombard province of Cremona with those of the Emilian province of Piacenza in a single alternative territorial system to the polarization on Milan and its area (a system that reaches the critical threshold of about *700 thousand users*);

c) a *City of the Garda* system that integrates the Lombard territories of the provinces of Brescia and Mantua with the Venetian ones of the province of Verona, in a single system that is likewise alternative (at least as far as Brescia is concerned) to polarization on Milan (with a critical user mass of more than *two million inhabitants*).

In this overall picture of the territorial lay-out, the territory of the province of Pavia, constitutes an element in the strategy of depolarization within the Milanese system; it would remain aggregated to "Greater Milan", but would become the seat of one (and perhaps the most important) of the *alternative centralities* to the historic centre of Milan, thus creating an essential bipolarism and an area of internal growth of great environmental scope. As also within the Greater Milan system it would be necessary to identify *two or three alternative centralities* in which to strategically locate the superior urban services and to which will refer, by quota, portions of the Milanese catchment area.

The Quadroter has also identified for each of the urban systems proposed,

besides the *structural components* of the same systems (the *supporting axis* of three different grades, a *halo* of the supporting axis, a *service centre*, likewise of three grades, and - finally - the *Territorial Units of Historical-Cultural and Environmental recovery*, (*Utras*, in Italian), the strategy of urban-metropolitan transport tht is coherent with the strategy of the territorial lay-out as well (attached is a map (Map 2) illustrating summarily the urban eco-systems of the Milanese and Lombard areas, as far as the structural components are concerned; for the other themes it is necessary to refer to the Quadroter volumes of research⁸).

4.2. *The reorganization of the Sicilian area*

The Quadroter project, with its inspiring principals and its methodological bases, has also provided indications for the reorganization for the territory of Sicily (indications that were adopted by the recent "Regional Development Plan" prepared by the Sicilian Region (1991) and currently under discussion in the Regional Parliament).

The general aims of the Sicilian Regional Plan in coherence with socio-economic aims of the same, have been identified as three "priorities" of the plan:

1. the requalification of the metropolitan areas;
2. the qualification of the "internal areas";
- 3.the strengthening of the transport and communication network.

The requalification of the metropolitan areas is seen "both from the point of view of the quality of urban life and from the point of view of providing evolved services for development". In essence it is therefore the improvement of urban quality that is assumed as an aim; in that it is from this improvement that it is hoped that there will be economic and social development. In fact the Regional Plan takes its cue from the conviction that the most important factor to induce investment and employment in Sicily is that of elevating the *urban values* present in the region; and that without this elevation it is doubtful that other efforts and other interventions aimed at elevating the level of economic activity could be successful.

Urban values in Sicily have somewhat deteriorated in recent decades, even if the general conditions of urban life have not worsened absolutely. In the context of the national urban framework, Palermo, and to a lesser

⁸See the edition for the first group of Quadroter research (Ministry of the Environment-Cnr, 1991)

extent Catania and to an even lesser extent Messina, were cities that had during the first half of the century an important cultural role. They were the centres of important tertiary activities and they developed a noteworthy "centrality". Undoubtedly the "distances" and the mobility that was possible in the first half of the century with the transport technology of the time on a national scale, favoured the conservation of the urban values of these centres and a certain local immobility, especially in the professional and executive categories. From the end of the last war, urban quality reached in all the Western world standards never before known. The requisites for urbanity (the presence of cultural and recreational services in adequate quantities and of a suitable quality, the exchange and intensity of relations, the presence of opportunities, etc. ie all the essential factors for the city-effect) have increased: for example purely demographic user thresholds, in order to achieve adequate superior urban services; and in general the thresholds of pro-capita income have increased in the families that are able to activate the urban market area and ensure adequate frequency of use for the survival of those services. In Italy, as elsewhere, this increase in urbanity requisites has privileged only the more dense and important

urban agglomerations, the cities defined as "metropolitan" because of their dimensions: Rome, Milan, Turin, Naples (even if this latter is handicapped by structural backwardness). Even historically important centres in Northern and Central Italy (such as Genoa, Bologna, Florence, Venice) have not benefited from the growth in the urbanity requisites, even if a noteworthy development of "economic" settlements has given them the possibility of elevating the standards of common and medium urban services, but not that of keeping up with growing urban requisites. In brief the exodus of "brains" and business and cultural activities has been greater in the post-war period than it was in the first half of the century.

For Sicily, the deterioration of urban quality has been even more linear and total. Here, at the time of the great migrations towards the North (in the '50s and '60s) which obviously affected more the small agricultural centres, the most important cities gained sufficiently to maintain or develop the urban values relative to the past in order to keep up with the times. And later (in the '70s and '80s) there was not in Sicily the turnaround in urbanisation that took place in the Centre-North: the urban centres continued to grow - although not in an overwhelming way; and the centres of the so-called "internal areas" continued to decrease - albeit moderately. And the values for urbanity have continued to decrease greatly.

The aim is to recuperate at least the urban values that the more important centres of the region possessed in the recent past, in the context of the urban values of the country. Naturally such an effort must be

planned within the limits of the available demographic, environmental and economic resources. And therefore this effort must be made - in order not to be simply fanciful - by choosing, between alternative possible solutions, those which minimise costs and maximise the achievement of the aims.

The second aim is the qualification of the "internal areas". In the Sicilian Regional Plan strategy, for this aim a strategy of research has been adopted with the setting up of the "Territorial Units of Historical-Cultural and Environmental Recovery". It is without doubt that the environmental protection of these internal

areas - that are often hit by degradation caused by neglect and sometimes (although this is rare in Sicily) by a chaotic invasion of territory without discernment and without criteria due to the overloading of the urbanised areas - is one of the priority needs for these areas. But the need has been felt nevertheless that those urban centres that do not belong to the internal areas or the metropolitan areas find a new placing in Sicily.

These centres are numerous in Sicily; amongst the most important are: Siracusa (79 thousand inhabitants), Marsala (79), Gela (74), Trapani (71), Ragusa (64), Caltanissetta (61), Agrigento (51), Vittoria (51), Modica (47), Mazara (43), Alcamo (42), Licata (41) and so on.

Such centres have no possibility by themselves, or for themselves, of improving their urban quality, in the sense expected (which is already difficult for the few "metropolitan" areas in Sicily). And on the other hand they may be centres of multiple integrated activities, that would exclude them from a "mere" recovery of a special type: environmental or historical-cultural as considered by the Utras. These centres are of exceptional importance (it is enough just to think of Siracusa). As a whole (including their satellite centres) they include more than a third of the total population of Sicily.

In the integrated territorial strategy for the region (both in the Quadroter and in the Regional Plan) a role and function has been assigned to them that is coherent with the aim of an improvement of urban quality. Such a role - that is not only compatible but also synergic - has been that of including overall in the "metropolitan" areas, widening the limits, the functions and concepts of such areas to those entities defined as "urban-systems", or rather urban ecosystems that are capable of achieving the common objectives and levels of urbanity.

The strategy of the urban Systems, as illustrated above, has consisted in the Sicilian area of exploring aggregations and disaggregations and proposing four urban territorial systems:

a) a system of *Western or Tyrrhenian Sicily* founded essentially on the bi-pole of Palermo-Trapani, in which to integrate in some way the minor

centres of the two provinces (Alcamo, Marsala, Mazara, etc.); this includes a critical user mass of *1,600,000 inhabitants*;

b) an *Eastern (or Ionic) Sicily* system, based on the Catania-Siracusa bi-pole in which to integrate other minor centres (with a potential catchment areas of *1,400,000 inhabitants*;

c) a system *of the Straits*, incorporating the Sicilian territories of the province of Messina and the Calabrian ones of the province of Reggio, that are capable of consolidating, on the shores of the Straits of Messina, a city with two hinterlands that would have a potential catchment area of *1,200,000 inhabitants*;

d) finally a system of *Southern or Central Sicily*, by nature very difficult to achieve and looking far into the future, but that deserves to be hypothesised as the fourth territorial urban unit, taking in the territories of the provinces of Agrigento, Gela, Caltanissetta, Ragusa and Enna, and able to not marginalise and render peripheral a still important part of the regional settlements; such a system of medium and small-sized towns and cities includes overall *1,200,000 user inhabitants*.

As for the Milanese and Lombard area systems, there is here attached a Map (Map 3) that schematically shows the four territorial systems of Sicily and their hypothesised "structural components" (supporting axis, "halo", service centres, support directrices). For further themes it is necessary to consult the results of the Quadroter research⁹.

5. The nature and limits of the Quadroter as an instrument of territorial policy

Having illustrated the research for a construction of a "Territorial Framework of Reference for Environmental Policy" (Quadroter), and its ecological foundations, we will conclude with some notes about the functionality of the Quadroter as an instrument of the policy of the territory and of the city.

The Quadroter was conceived, in fact, as an instrument of "programmatic orientatation" for any type of *operation of land utilisation* that at various levels of responsibility - sectorial or spacial - authorities and public bodies and also private bodies will want or will have to undertake in

⁹See note 8

the future (plans, programmes, projects etc.).

As such the Quadroter is - from the institutional point of view - an instrument of dialogue, of further study and negotiation between various institutional actors: ministers, public bodies, Regions and other local bodies with their plans and projects. Thus the Quadroter is also an instrument subjected to a permanent action of verification, up-dating and modification.

The Quadroter has assumed an ecosystemic reading of the Italian territory, orientated towards *programming*, ie aimed at conceiving and proposing *alternative ways of territory organization*, with respect to present and predicted evolution. The way in which the minimum cost and maximum social benefit may be realised; and the ways that are *feasible*, ie essentially "compatible" with the overall needs and inevitable development of social and economic activity. Feasibility and rationality become in this sense synonymous.

The Quadroter from the methodological aspect is not very innovative with respect to the research developed for the territorial projections of "*Progetto 80*" (1969), which laid the foundations of one of the four "social projects" of Project 80 itself: that dedicated to the "Environment"¹⁰. It is very innovative, however, from the aspect both of the available information and evaluations and of the programmatic contents (for example, the growth of economic availability and income per capita, by increasing the frequency of use of the superior urban services and in general the catchment area, has lowered the minimum thresholds of use, expressed in user units, that are indispensable for their existence).

But it is without doubt that the Quadroter, in its guidelines on the future use of the territory, will be able to be subjected to periodic revision, with respect also to the way in which the operators have followed (or not followed) it in mind.

In a document of reflection prepared in 1989 for the Minister of the Environment, in which the construction of the Quadroter was advocated, it was said that:

the role of the Quadroter is essentially that of expressing the use objectives of the territory (and therefore of the environmental resources) so that the socio-economic activities (the actions, interventions, projects, works, of private or public origin) that concern it, always conform to these objectives; and so that their importance is evaluated and their results predicted - in terms of environmental damage or even benefit - having as a

¹⁰See Ministry of Budget and Economic Programming (1969) and the Planning Studies Centre (1971 a & b)

permanent point of reference those objectives.

The acceptance of the strategic guidelines of the Quadroter would render therefore more coherent amongst themselves and more coordinated to their purpose the multiple lines of intervention that emerge from the national, regional or local initiatives of public and private bodies. This is why the conformity or not to those strategic lines would be the means for the evaluation of the efficiency of the instruments that put into effect with respect to the objectives of environmental protection and ecological equilibrium that have been assumed. The function of the Quadroter would be therefore that of an instrument of indicative and "cognitive" planning available to all the decision-makers in the exercise of their prerogatives, and not lastly to central government that has instruments of intervention for the orientation of the choices of the other decision makers; whether public or private, towards solutions that are as much as possible rational and coordinated.

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