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**Fifth Joint Conference on
Agriculture, Food, and the Environment**

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Università degli Studi di Padova
Dipartimento Territorio e Sistemi Agro-forestali

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**SESSION VII: SUSTAINABLE DEVELOPMENT OF AGRICULTURE IN
METROPOLITAN AREAS**

**PAPER 1: SUSTAINABLE DEVELOPMENT IN METROPOLITAN
AREAS: AN INTRODUCTION**

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FOREWORD

This volume contains the papers presented at the Fifth Joint Minnesota/Padova Conference on Food, Agriculture, and the Environment held at Abano Terme, near Padova in Italy, June 17-18, 1996. This conference was organized by the Center for International Food and Agricultural Policy at the University of Minnesota and the Dipartimento Territorio e Sistemi Agro-forestali at the Università degli Studi di Padova (University of Padova) under their international collaborative agreement, along with the Agricultural Development Agency - Veneto Region, the University of Perugia, and the University of Bologna - CNR. The first Joint Conference was held in Motta di Livenza, Italy in June 1989, the second in Lake Itasca, Minnesota in September 1990, and the third in Motta di Livenza in June 1992. The Fourth Joint Conference was held in September 1994 at the Spring Hill Center in Minnesota.

This conference focused on topics of mutual interest in the areas of (1) agricultural and resource policy, (2) land markets, (3) the food and agricultural industry, (4) agriculture and the environment, and (5) agricultural production and environmental quality and sustainability. Although the conference was not intended to provide a comprehensive coverage of all the issues, this volume hopefully represents a useful contribution to current understanding and debate in the areas of food, agriculture, and the environment.

Judy Berdahl, secretary for the Center for International Food and Agricultural Policy at the University of Minnesota, assisted with these Proceedings.

Benjamin Senauer
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SUSTAINABLE DEVELOPMENT IN METROPOLITAN AREAS: AN INTRODUCTION

by

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Fifth Joint Conference on
AGRICULTURE, FOOD AND THE ENVIRONMENT
held at the University of Padova, June 17-19, 1996.

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This paper has the main purpose to offer a conceptual and an operative introduction to *sustainable development in metropolitan areas*, with specific reference to Italy and to the Bologna area.

Sustainability is the basic *guide-line* of the paper.

After the well-known definition given by the Brundtland Commission (1987), and by other authors (¹) "sustainable development is really not a difficult issue. The difficult issue is in determining what has to be done to achieve sustainable development, assuming it is a desirable goal" (Pearce, 1996) in resource allocation.

More specifically, the Brundtland Commission stated: "sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony".

According to these relevant statements, the content of the paper has been structured in three parts.

First of all, land use planning has been considered in its evolution over time in Western Europe, focusing the distinction between "environmental sustainability" and "socio-economic sustainability". Their possible combination is then examined within the planning process in Italy, giving a scheme of operative tools.

The second part deals with the metropolitan areas in Italy, according to the recent legislation, and their diversification within the national territory.

The Metropolitan Area of Bologna (MAB) is dealt with in the third part, considering:

- the "network" system of Emilia-Romagna as a typical expression of the NEC (North East - Center) model of "integrated" economy;
- the specific agreement between the city of Bologna and the Communes associated to the MAB;
- the agricultural planning based on a project of sustainable land use model for periurban areas.

Final remarks on the planned investments, their impacting effects and the correlated approaches to (e-)valuation procedures conclude the paper.

¹ Among various definitions, Batie (1989) pointed out that «the capacity of the environment to assimilate pollution from human production and consumption activity is the ultimate limit to 'economic growth'». According to Ruttan (1994) «*Sustainable development* is a concept that implies limits, both to the assimilative capacity of the environment and to the capability of technology to enhance human welfare».

1. LAND USE PLANNING

1.1 Evolution over time

Land use planning can be described in several ways. Basically, it consists of activities, which may determine future land uses, or of improved management policies for future allocation of land and natural resources, influencing the behaviour of the community involved.

Land use planning has been evolving over time. Figure 1st offers a tentative scheme of evolution, based on adjustments registered over time in various European countries.

- I) "Physical Planning" is related to policies aimed at deciding what type of land use activity should take place and where, mostly through *zoning*. According to such policies or plans the future land uses are grouped together and restricted to a certain area for each land use type (Fusco Girard ed., 1989). For example: new urban subdivisions, new industrial areas or infrastructure; restrictions imposed by zoning, such as the size of buildings, the intensity of farming, etc.
- II) "Land (re-) Modelling" follows physical planning in most cases. Examples of such land use planning are the land reallocation projects implemented in rural areas, such as land consolidation and farm enlargement (e.g. trading of land between farmers to reunite scattered land); the defragmentation and improvement of farms, and the changes in field sizes which took place in various European countries in the '60s, followed by the "farm development plan" (EEC directive 1972/159). At an urban level, the construction of green belts and the recovery of historical centres became new targets.
- III) "Land Use Management" refers to new methods on how to manage land and natural resources in a context of *integrated land uses*. The protection of landscape and the needs of outdoor recreation require an increasing concertation between agriculture and other types of activity (industrial, commercial, etc.). Furthermore, as envisaged by the Mac Sharry reform (EEC 1992 regulations no. 2078 and no. 2080), professional (and/or residential) agriculture has to fit environmental goals through *agreements* focused on farm practices, "set-aside" programmes, forest management. Aside from agriculture, local authorities should pay more attention to the appropriate location of infrastructures.
- IV) Sustainability as defined by the Brundtland Commission is a new societal goal for *land use planning* in rural areas, where many processes and developments take place.

Given the relationship between social and economic development and the availability and access to natural resources in the countryside, a distinction is often made between environmental and socio-economic sustainability (van Lier, 1994).

This distinction gives the notion of sustainability an extra dimension, when applied to the countryside. Where environmental resource sustainability is to be achieved at the cost of socio-economic sustainability, the question arises of how economic losses can be compensated.

First of all, monetary compensation can be seen as an intermediary step to arrive at resource compensation at a site, involving property rights. But compensation agreements for environmental damage can also be sought in the project itself, i.e. by imposing environmental improvement and mitigation measures on the project (Voogd, 1994).

Sustainable land use planning, as shown in figure 1, can be defined as consisting of "Instruments to set land use policies, to implement these policies for the right location of the various land uses and for the improvement of the spatial and physical conditions of the rural areas for an optimal use and protection of the natural resources on the long term while meeting the needs and aspirations of the present generations" (van Lier, 1994, p. 10).

Therefore, the optimal use and protection refer to the environmental sustainability (protection of the natural resources), while meeting the needs of present generations refers to the socio-economic sustainability (figure 2).

This kind of conceptual issues may affect the **planning process** as evolved in Italy after the innovations introduced by the EEC directive 1985/337 on EIA procedure and by subsequent national legislation on the use of resources for public investments.

1.2 Considerations on the planning process

Planning can be defined as the process by which the development objectives of a territory as well as its appropriate uses are determined, also including the identification of the ways for achieving such objectives. Four interlinked levels of action can be identified in Italy with regards territorial planning, namely: *national Government*, *regional authorities*, *local authorities* (provincial, metropolitan, municipal) and *public agencies*. At a still higher and more general level, the role of *EU authority* should not be overlooked.

Planning is still basically carried out via a sectorial approach. In other words, the territory is the subject of a number of stratified plans aimed at achieving specific objectives. Presently, these objectives need to be co-ordinated, at least at the metropolitan area level.

Furthermore, objectives represent not only finalities, but also starting-points, as their function is to define the actions which need to be undertaken. They should therefore be defined during the preliminary stages in order to correctly identify from the start the actions which require to be made.

This is rarely the case as objectives are subject to continuous redefinition and modification over time, also as a consequence of information gradually acquired. Objectives are *polyfunctional* and often *conflicting* (as is clearly the case when one considers the objectives which are commonly taken into account in most planning processes, such as income formation, income distribution, levels of employment and environmental protection).

Such diversity causes an internal conflict with regard to the choice of priorities. Moreover, different groups have specific interests, which represent external conflicts. This entails that the various sets of objectives must be collected and ranked (weighed).

Planning requires the harmonious composition of various inter-related decisions into a general integrated scheme, such as long-term master plans, which lay down the general objectives. A reductionist approach needs to be taken for formulating short- and medium-term sectorial plans which specifically lay down the actions to be undertaken (CNR-IRIS, 1989).

Past experience suggests the need for making *continuous horizontal connections* between the different plans (i.e. sectors) and *vertical connections* between successive plans (i.e. over time). This entails working out a *circular strategy* as shown in figure 1, which can be conceived of as a process for collecting and interpreting data and information aimed at defining appropriate schemes of action based on a *feedback mechanism* accompanying the process at all levels. It is only under these conditions that any planning process can in fact be considered dynamic and properly integrated so as to ensure as much as possible, under present conditions, a harmonious combination of *socio-economic development* and *environmental protection* in a context of overall sustainability (figure 2nd), with explicit reference values (Bazzani et al., 1995).

Objectives and schemes of action must then be verified in terms of tools to become practically operative.

Figure 3rd offers a "simplified" set of objectives and tools by which the planning process may be visualised in Italy as a system of Chinese boxes (Antonietti, 1982).

2. METROPOLITAN AREAS IN ITALY

2.1 Evolution of legislation: Law no. 142/1990

"Vast Area" (V.A.) planning has only recently acquired specific definition in Italy through Law no. 142/1990 dealing with the reform of local authorities ("autonomie locali")⁽²⁾.

The scope of V.A. planning is to focus on several topics on natural resources and cultural values, combining the public interests involved in general planning at a Regional level with those of the land use decisions at a Communal level.

This kind of linkage is committed by Law no. 142 to the "Territorial Plan of Coordination" (T.P.C.) to be set up by the Provincial Authority.

The main task of the Provincial T.P.C. is to supervise:

- i) *urban plans*, i.e. general rules within the town and country planning; specific land use options and projects;
- ii) *oriented plans* (some of which are governed by National legislation), i.e. land reclamation, basin plans, transportation networks; water management, waste disposal, watershed control; equipped parks, protected areas, etc.

To implement the innovative role and the functions of the Provincial Authorities in this context, Law no. 142 has identified nine Metropolitan Areas considered as "reference areas" within the Italian territory.

This acknowledgement is consistent with the issue of a sustainable socio-economic development, as the planned activity promoted by each Provincial Authority in the same Region should have as its point of departure and reference the Metropolitan Area itself.

Even if the application of the Law is still in its initial stages, a tentative effort at a more integrated approach based on a systemic management decision process, may already be observed, which is a way of overcoming the watertight compartment approach of the former planning process.

² According to the analysis made by Forte (1994), the "vast area" planning has had some reference experiences at the national level, through:

- Law no. 431/1985 concerning the protection of areas of peculiar environmental interest, through the "landscape plans";
- Law no. 183/1989 concerning soil conservation and management, through the "basin plans" (Grillenzoni et alii, 1990 and Bazzani, 1991);
- Law no. 394/1992 concerning the protected areas (Grillenzoni and Ragazzoni, 1995).

2. 2 **Diversification of the Metropolitan Areas**

Figure 4th shows the location of the nine Metropolitan Areas.

Already at a first glance many socio-economic aspects of diversification may be easily identified in each Metropolitan Area, as Italy is characterised by "micro-environments". Specific literature (Bagnasco, 1977 and Merlo, 1988), taking into account several socio-economic indicators, suggests the following groupings:

- 1) NOW (North West), including the cities and the surrounding territory ⁽³⁾ of Torino, Milano and Genova;
- 2) NEC (North East - Center), including the cities and the surrounding territory ⁽⁴⁾ of Venezia, Bologna and Firenze;
- 3) SOC (South-Center), including the cities and the surrounding territory of Roma, Napoli and Bari ⁽⁵⁾.

A few words suffice to explain the diversification between the above mentioned groupings and, even, within the cited cities. Namely:

- NOW represents the "historical" triangle of industrialisation; the main business centers are fairly similar to those of the Central Europe;
- NEC shows a model of more recent development, based on integrated activities at an intersectorial level and on a decentralised settlement of the residential population;
- SOC includes a "mix" of the colourful "Mezzogiorno" with peculiar aspects of disparity and/or specification: i.e. Roma, the State administrative capital, includes many Latin/Catholic points of cultural and touristic interest, but also a fairly well developed industrial district; Napoli is known as a city of outstanding culture, but the socio-economic conditions of the crowded periurban areas show strong contrasts of development/underdevelopment; Bari is a reference city of a region of good potentiality, where agricultural, industrial and commercial activities are more or less developed.

If a certain degree of diversification is acceptable, the desirable goal of sustainable development should become a priority, which means achieving a more efficient and

³ Mostly identified with the provincial territory.

⁴ The Friuli- Venezia Giulia and the Marche regions may also be included within the NEC characterization.

⁵ Another important city of Southern Italy, Palermo, is not included in the metropolitan system, since it belongs to the Region of Sicily, which has an autonomous statute.

equitable regional and metropolitan economy, removing - as far as possible - the existing disparities and conflicts of interest related to land use management.

3. THE METROPOLITAN AREA OF BOLOGNA

3.1 The "network" system of Emilia-Romagna

Before discussing the specific agreement within the Metropolitan Area of Bologna (MAB), a brief preliminary description of the network system of the Emilia-Romagna region is useful (figure 5th).

This *network* is a typical instance of the NEC model, with an integrated economy spread out all over the regional territory, featuring several cities and towns located along the Roman "Emilia Road" (from Piacenza to Rimini) which represents a directrix, and a cluster of qualified urban/rural centers connected by a good transportation system.

The scattered settlement of the residential population has reduced urban congestion over time and favoured the solution of contrasting situations between urban and rural areas. The consolidation of agricultural and agri-business systems, of industrial districts and related trading activity, of touristic and cultural attraction centers are the outstanding features of this integrated economy ("economia diffusa") (Merlo, 1995).

The characterisation of the Emilia "network" may be enlarged to the Veneto, Toscana and Marche regions, to which Emilia-Romagna (and more specifically the MAB) is linked by a fairly efficient transportation system, which is due to be upgraded in the near future.

3.2 The specific agreement of the MAB

Despite the fluctuating situation still characterising most Metropolitan Areas, a definite point stated by Law 142 is the power conferred upon the Regional Government to delimitate the territory and to define the functions of the Metropolitan Area, assigning the Provincial Authority the task of promoting agreements between the main city and the Communes located in the same province.

As far as the MAB is concerned, a preliminary agreement was reached between the Commune of Bologna and other 49 Communes of the province (over a total of 60) at the beginning of 1994.

The major points of the MAB agreement may be listed as follows:

- i) to define general rules of collaboration and co-operation among the participants;

- ii) to set up a "Conference" to function as a governing body;
- iii) to assign the functions and related spheres of action.

More precisely, the functions, managed by the Province Authority, require prior approval of the Conference on the following issues:

- territorial plans;
- viability and transportation;
- waste disposal;
- mining plan;
- public housing policy and funds;
- professional education programs.

The connected spheres of action are grouped as follows:

- economic-territorial area;
- socio-cultural area;
- administrative area.

Each of these areas are managed by a technical committee. As far as the *economic-territorial area* is concerned, where diversified investment issues and land use decisions are focused, the committee is aided in its activity by different qualified departments, among which the following may be mentioned:

- the integrated observatory on employment and economy;
- the environmental impact evaluation (EIA) department;
- the air pollution monitoring system department; etc.

Such an agreement has been formally ratified by Regional Law no. 229 (dated March 2, 1995) through which the power and the functions of the Provincial Authority are transferred to a new local Authority (or Agency) named **METROPOLITAN CITY of BOLOGNA**.

3. 3 Agricultural Planning within the MAB

Limiting the consideration to the economic-territorial area, the Provincial Authority of Bologna, specifically through its Territorial Planning Dept., has devised a *Pegaso Project* within the "Program LIFE 1995" subsidised by the European Union.

The project has the general objective of testing a new *process-tool* ("processo-strumento") to be used by the local Authorities with a view to optimizing sustainable land use planning for the periurban areas in a metropolitan context.

In particular, the project is aimed at re-defining the planning options, in terms of sustainability, and promoting new environmental functions in relation to productive activity and connected infrastructure location, by testing a new concerted tool of policies oriented to the integration between land resource planning and environment protection.

This kind of "concertation" is based on negotiations and agreements between public administrations, private operators and users of the territorial system within the MAB.

As far as agriculture is concerned, a basic distinction is needed between:

- i) "professional" agriculture (northern part of the MAB), characterized by structured farms and by intensive agri-techniques in the plain areas, the latter only recently adjusted toward a more environment-friendly ones in compliance with the 1992 EEC regulations (⁶);
- ii) "residential" agriculture (southern part of the MAB), managed by part-time or hobby farmers, most of whom, often employed outside the agricultural sector, prefer to maintain the residence in the hilly part of the MAB.

Certainly the former type of agriculture, because of the lower costs of urbanization, is more strongly oriented towards urban and infrastructure uses.

As Thiene has well pointed out (1995) in relation to the general problems of agriculture in metropolitan areas, traditional urbanization still causes more damage to periurban agriculture by the way in which it expands through its buildings, which destroy the soil structure and the system of agricultural organisation, rather than by taking away land as such (Gentile, 1978).

The Pegaso Project, by taking into account the conflicting situation of these periurban areas, has the purpose of testing the aforementioned process-tool within territorial units named *agricultural wedges* ("cunei agricoli").

The Ge.S.T.A.-CNR Center at the University of Bologna is presently engaged in a study of the agricultural wedge of the northern-east part of the MAB (⁷).

In our opinion, socio-economic sustainability should represent the guide-line of such a process-tool to be applied to the most suitable and productive land in plain areas.

⁶ See the Ragazzoni - Canavari paper presented at this Conference.

⁷ G. Bazzani and M. Bradascio will illustrate the general framework and the preliminary results of the study related to that specific area.

Viceversa, environmental sustainability should be at the bases of the general goal pursued for the latter type of agriculture, since most of the area involved is already included in a protected area (⁸), according to the regional landscape plan system.

4. FINAL REMARKS

These new approaches to a sustainable land use planning procedure might be worth of attention for other metropolitan areas or, at least, for other "vast areas" having a certain similarity with the MAB.

It should be noted that the entire MAB is going to be involved in public works in the near future for the technological upgrading and development of the transportation system (railways, highways and freeways) (figure 6th).

The planned investments will be strongly impacting, indeed, and require the application of a mix of resource (e)valuation methodologies (BCA - Benefit Cost Analysis, MCA - Multicriteria Analysis) finalized to an "ex-ante" evaluation within the EIA procedure (Grillenzoni et al., 1990 and 1995).

Furthermore, diversified methods of "ex-post" valuation should also be adopted for monetary compensation in the condemnation procedure and/or for other types of damage compensation related to natural and farmland resources affected by the complexity of the above mentioned investments on the rural-urban fringe and on the surrounding territory of the MAB.

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⁸ Namely "Parco dei Gessi e dei Calanchi dell'Abbadessa".

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Figure 1 EVOLUTION IN LAND USE PLANNING

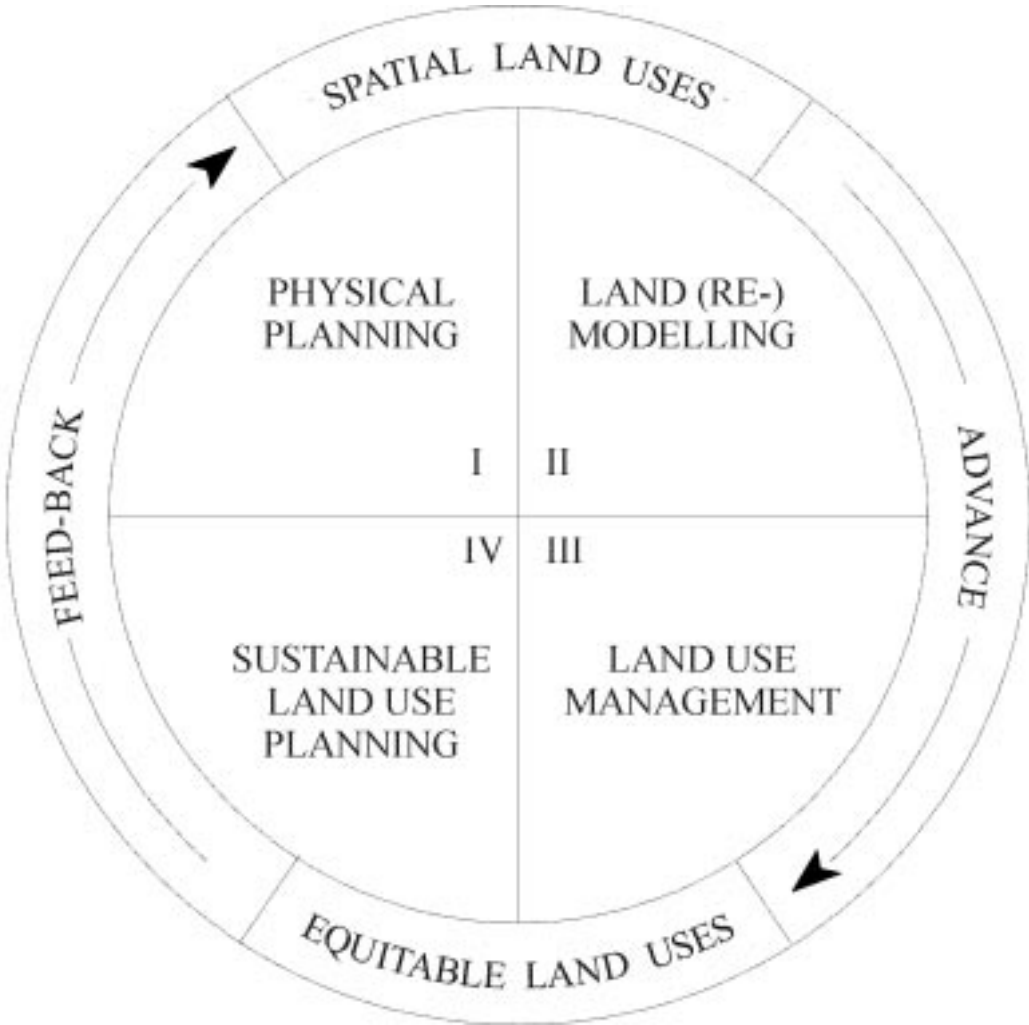
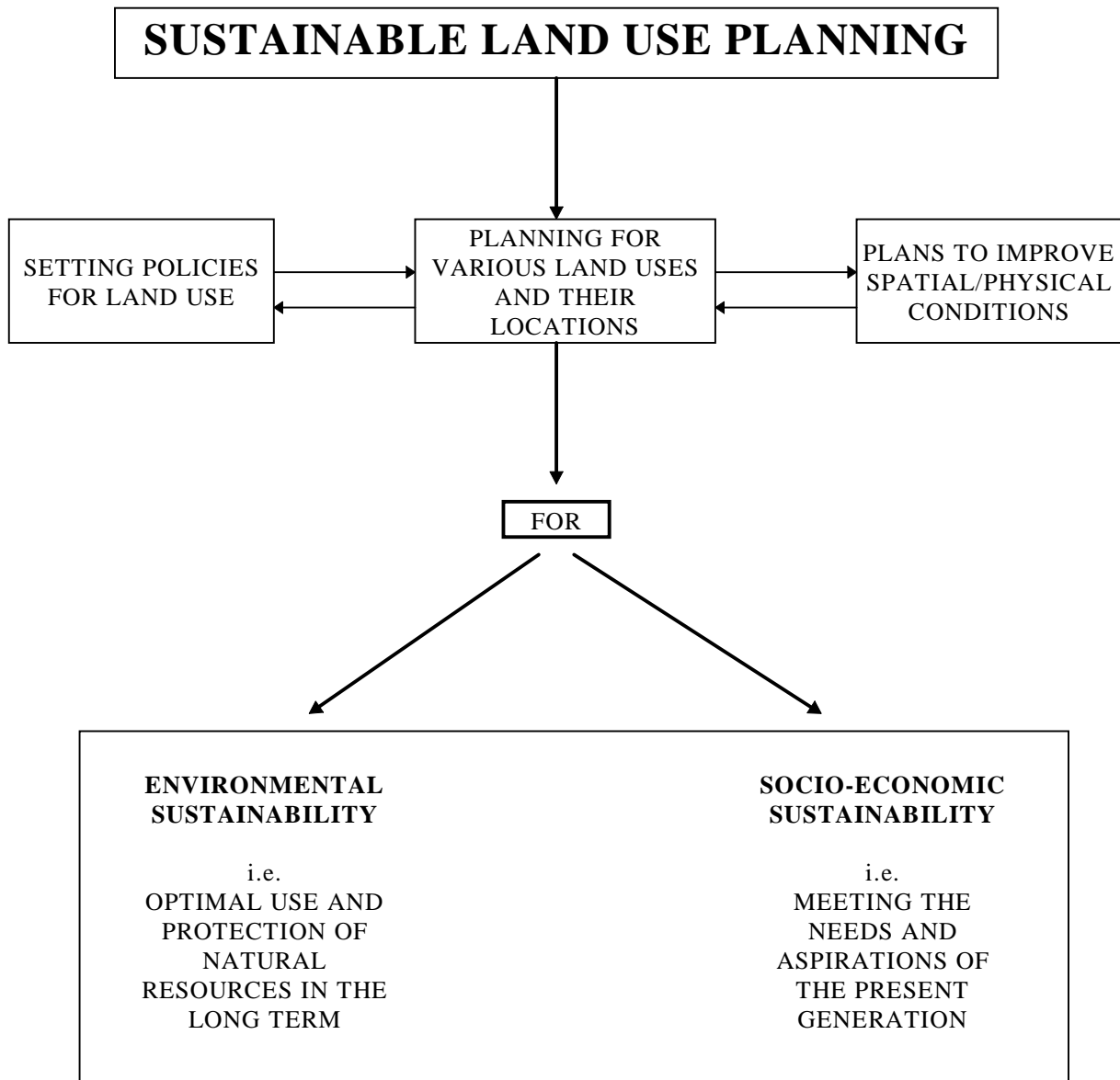


Figure 2 **SUSTAINABLE LAND USE PLANNING IN ITS CONTENTS**



Source: Adapted from van Lier (cit. 1994)

Figure 3

OBJECTIVES AND TOOLS WITHIN THE PLANNING PROCESS IN ITALY

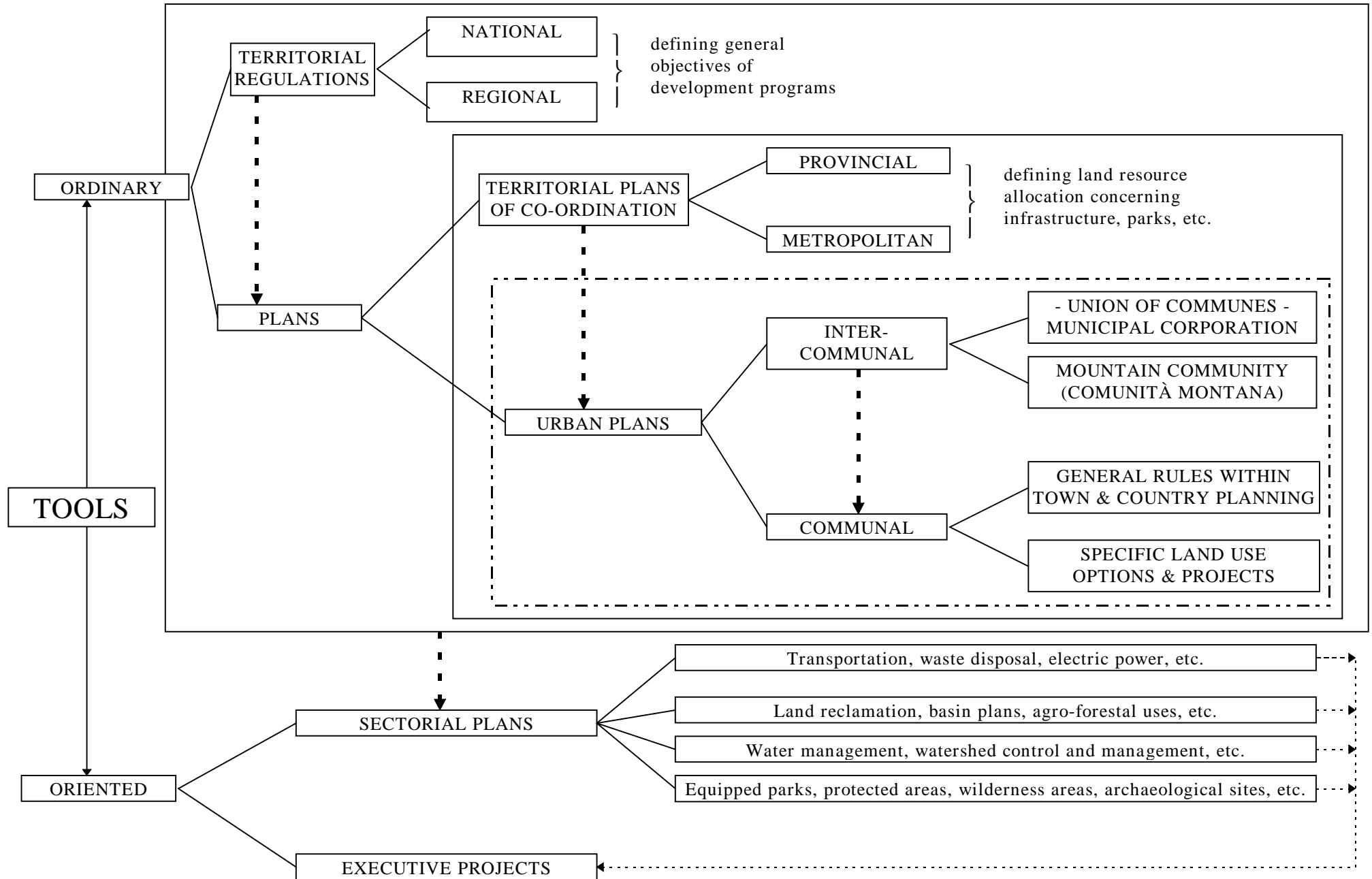


Figure 4 THE NINE METROPOLITAN AREAS IN ITALY

NOW: Torino, Milano, Genova
NEC: Venezia, Bologna, Firenze
SOC: Roma, Napoli, Bari

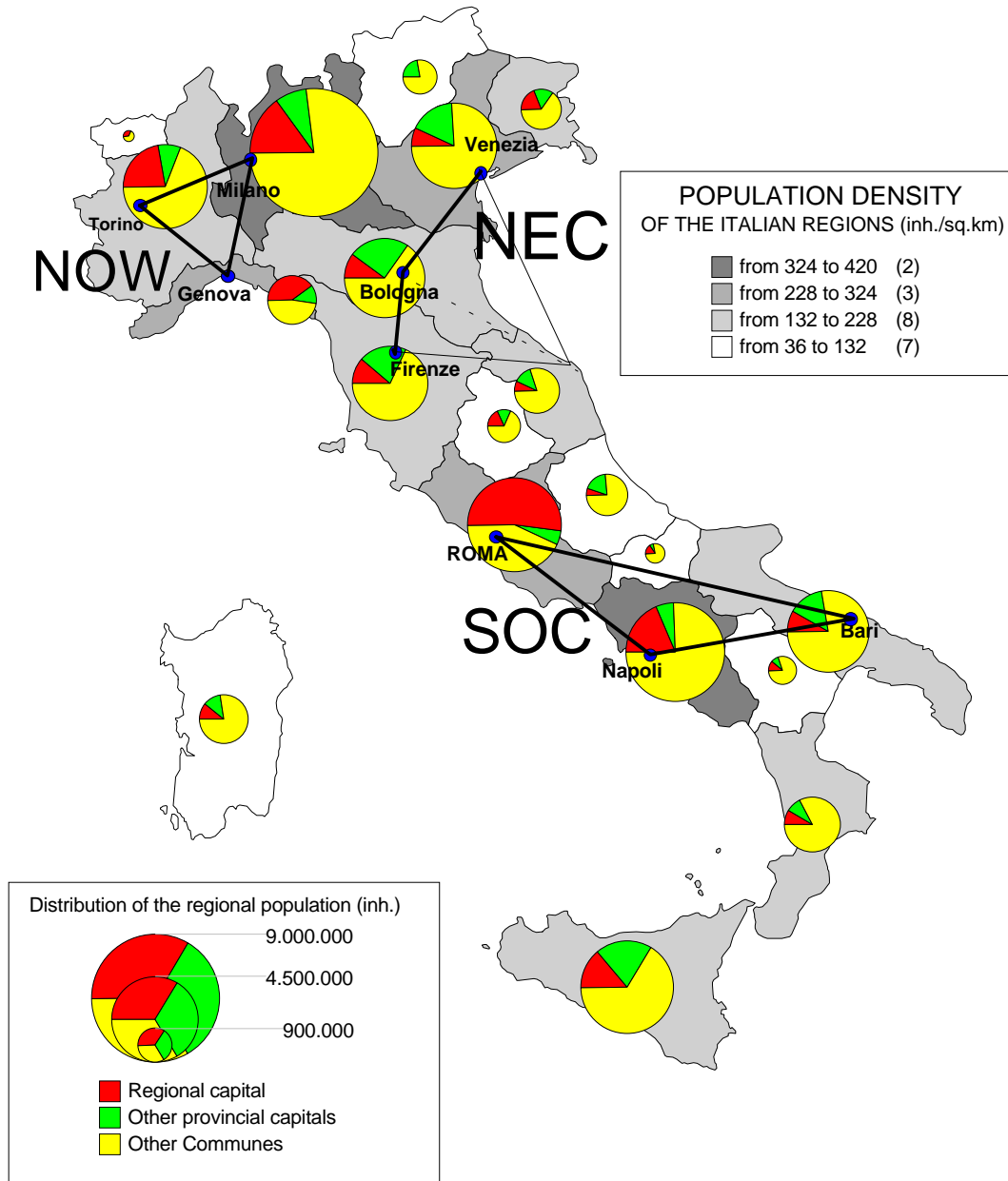


Figure 5 THE "NETWORK" SYSTEM OF EMILIA-ROMAGNA

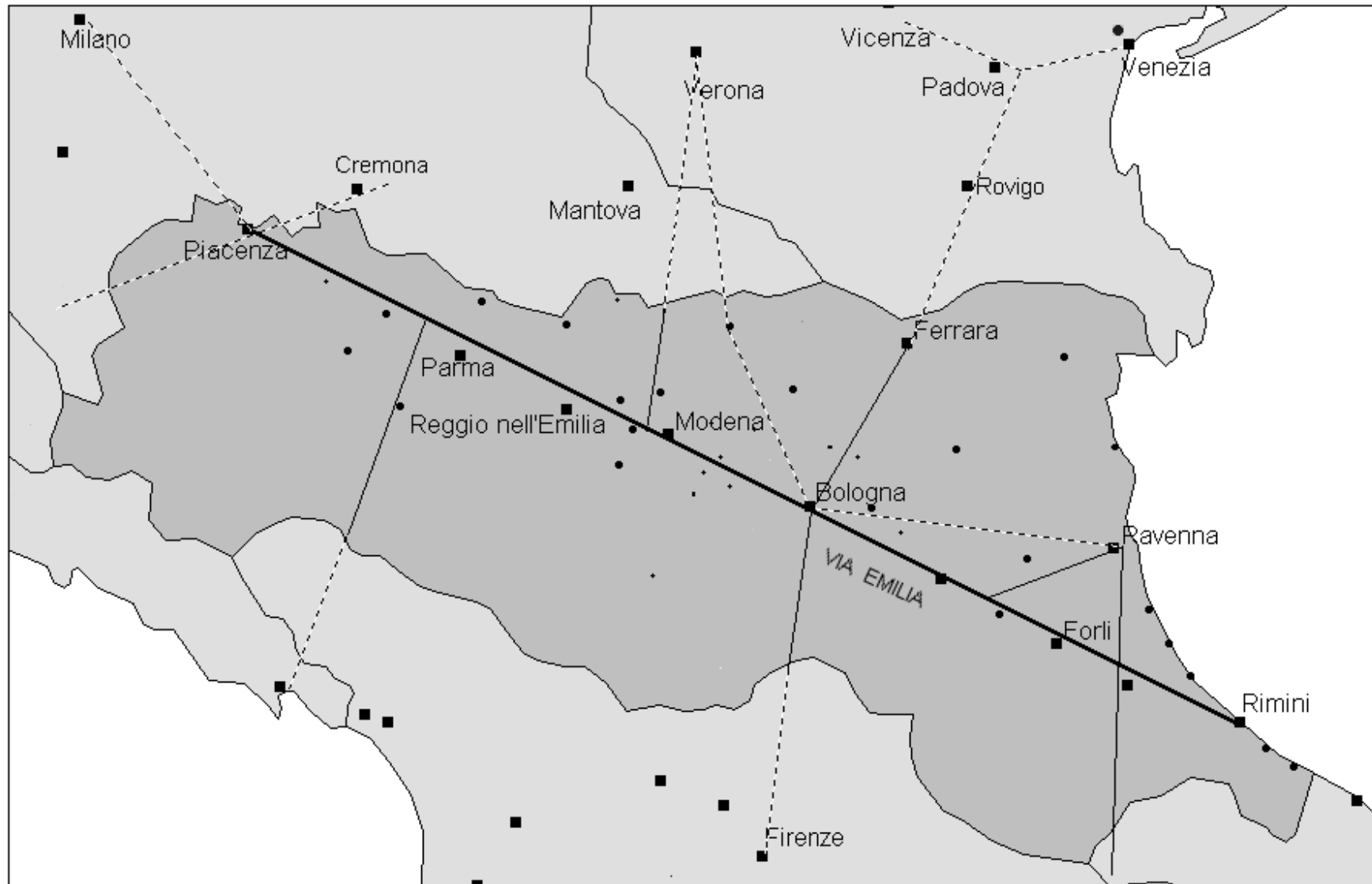
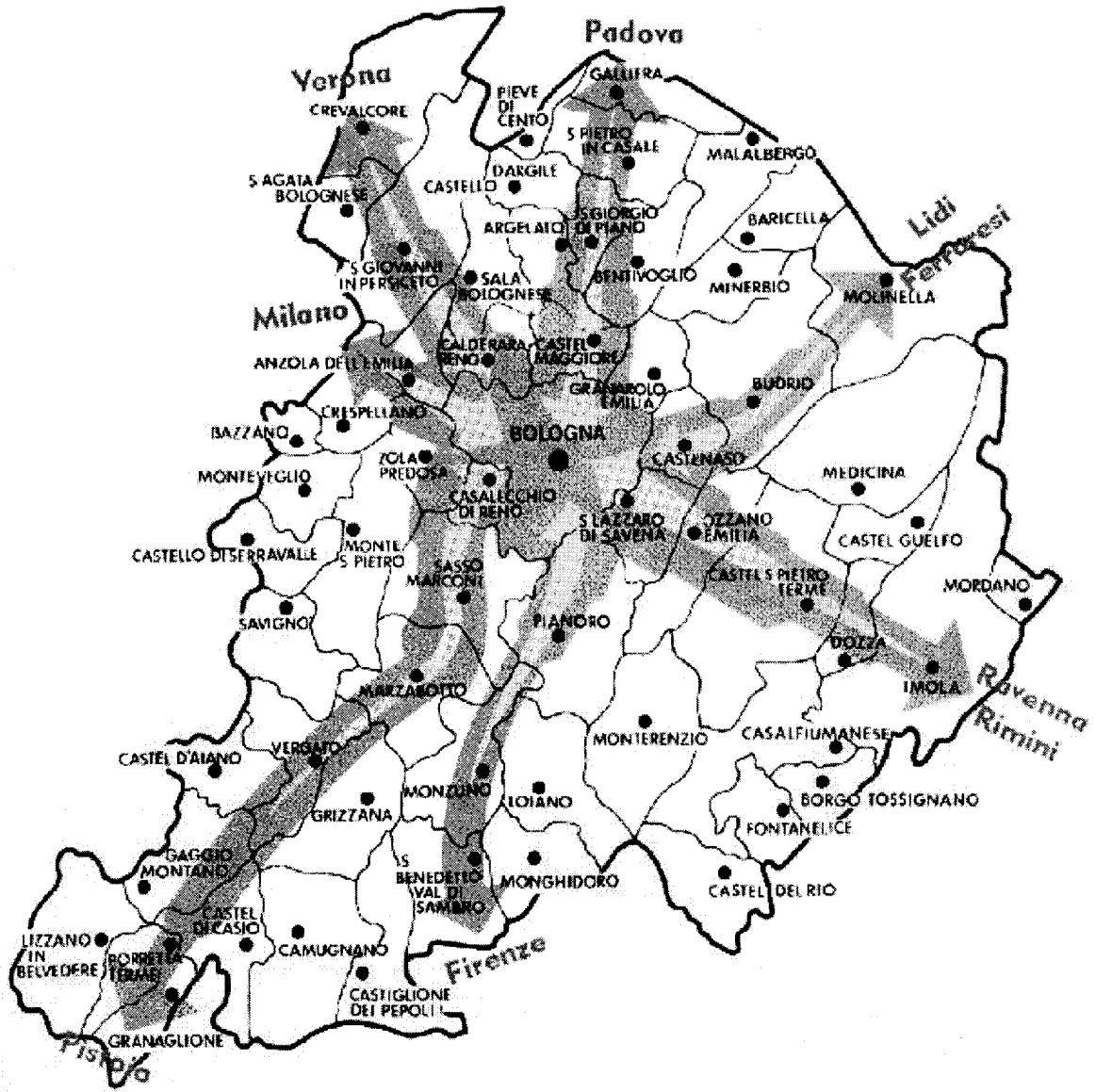


Figure 6

MAIN TRANSPORTATION DIRECTRICES THROUGH THE CITY OF BOLOGNA



Source: Città Metropolitana di Bologna, 1995.