

Settlement patterns between Lombardy and Ticino Canton 1900-2010: a thematic map comparison

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1. Foreword¹

Urban sprawl and peri-urban landscapes are spatial issues of the *peri-urbanisation process*, a relatively recent settlement pattern, started in the second half of the 20th century². That occurs in many places in the world, and of course in Lombardy and Ticino, with very different spatial issues from the previous phase of suburbanization, in the first half of the 20th century, triggered by the transformation and the development of the industry³. At the contrary peri-urbanisation represents the various newer forms of urbanization of rural areas, primarily for residential purposes. Most often characterized by individual housing, this residential pattern spreads with the increase of population flows from urban areas and inner suburbs to new housing areas in the outskirts of the traditional settlements, or to the recovery of ancient and rural buildings for residential purposes. In Lombardy this phenomenon triggered an extension of the urban sprawl ('città diffusa') that began in the late '70s, through the improvement of living standards and the development of mass motorization, and the contemporary start of the decline of the fordist industry⁴.

How to represent and 'measure' these changes in the urbanization process, that implies also different spatial relationships between man and space? Within the research activities of the *Observatory of spatial development* of the Ticino Canton (Ost-TI), at the *Accademia di architettura* of Mendrisio⁵, we attempted to represent these phenomena of space occupation through a simple experience with thematic maps depicting the increase of municipal residential density during the 20th century. This paper synthetically presents the outcomes of this short experience which first purpose was to compare settlements changes between Southern Switzerland and Northern Italy with basic demographical data.

2. The thematic map: model, metaphor and symbolic mediation

The thematic map is an abstract model of the geographical space, that allows to visualize events or phenomena that are not directly visible in the landscape, such as the aging of the population or the unemployment rate. It is just a model and nothing else: it helps us if it is correctly used but it can also be misleading if it is overused (Torricelli, 2011, p. 23-38). However, it may be useful for urban research to try to visualize the increase or the diffusion of population in space and time. So, we tried to build as well,

L'obiettivo dell'articolo è di mostrare e comparare i cambiamenti della struttura insediativa in Lombardia e Canton Ticino (Svizzera) nel tempo. L'analisi è stata modellata con l'aiuto di mappe tematiche che rappresentano i cambiamenti di densità della popolazione per comune nel ventesimo secolo e nella prima decade di questo secolo. Per ogni specifico periodo le mappe aiutano a capire e descrivere i cambiamenti storici della struttura insediativa della popolazione dell'area di confine: polarizzazione, peri-urbanizzazione (sprawl urbano) e metropolizzazione. Alla conclusione del paper vi è un'analisi del bilancio demografico dei comuni del periodo 2006-2010 che mostra notevoli similarità tra la Lombardia e il Canton Ticino

Parole chiave: mappe tematiche; densità; Lombardia

for this border area between Lombardy and Ticino (*Insubria region*), a simple and easy to read cartographic model allowing the visualization of the patterns of the settlement between Italy and Switzerland and its changes over time. Two 'classical' models of thematic map, based on statistical analysis and mapping of the municipalities of the Italian Provinces and Swiss Cantons close to the border⁶, were designed: *Choropleth Maps*, variations in population density of the municipalities and *Symbol Maps*, changes in absolute values of the municipalities population.

3. The *Insubria Region*, between Milan and the Alps

This area, between the Alps and Milan (and the whole Western-Central Po Valley), although crossed by the international border is characterized by cultural similarities and also differences; we speak the same language and similar dialects, albeit with different accents and inflections. The boundary established from the beginning of the Sixteenth century, has always allowed intense trade and cultural relations, almost never interrupted, even in times of war and crisis. Today between Switzerland and Italy we also have a certain 'economic osmosis', accelerated by the Free Movement of Persons (result of the bilateral agreements between Switzerland and the EU); in late 2013 in the Ticino Canton counted over 59,000 cross-border workers (more than 30% of the cantonal labor market) (fig. 1).

For some years the surge in recruitment of border workers, even for the effect of the strengthening of the Swiss Franc against the Euro (and the wage differential between Italy and Switzerland), causes social problems and political controversies. Considering only the areas affected by the border (Ticino, Varese, Como, Lecco, Verbano-Cusio-Ossola and Novara), the *Insubria region* concerns about 2.7 million people (2010). The area that appears in the maps, which also include Milan, Bergamo, Brescia, Sondrio and the Eastern Piedmont, concerns a little less than 2,000 municipalities and almost 10 million inhabitants (fig. 2).

4. Settlement patterns from the beginning of the 20th century through choropleth maps of the population density changes of the municipalities

How to show the growth (expansion or contraction) of population in space, starting from the base of the municipal grid? Growth in absolute terms? In percentage values? Or, as a function of the space occupied by people and then in terms of density relative to the surface of the municipalities? The latter seems to be the most relevant, but let's see an example: the comparison between the densities of 1900 with those of 2010. Showing static density models for different periods, as in the following figures (3a and 3b) is evocative but not very successful to identify the settlement patterns of the area.

But, if we try to represent the changes in the density of the municipalities, always in terms of inhabitants/sqkm, the graphic result is much more interesting in relationship to the settlement patterns. It should be noted that increments or decrements of the population according to the space allow to identify effectively the most intensely areas affected by population growth and the limits of human pressure on space and the spatial limits of the urbanization process (and to set off the effective urban areas). We can see in the figures 5 to 10, a series of *choropleth maps* of

the density changes of the municipalities in a few key periods from the beginning of the Twentieth century: 1900-1950, 1950-1980, 1980-1990, 1990-2000 and 2000-2010. As the periods are of different duration, the data was calculated on the average annual balance with the same classification in 10 classes.

1900-950: slow growth and polarization (fig. 4a)

During the first 50 years of the twentieth century, the population growth is slow marked by the two world wars and until the 30s, by the overseas emigration of the rural and mountainous population (Argentina, United States, Australia, etc.). This phase represents a long urban concentration process, with the increase of industrial activities, often where the population density is further increased: it is the polarization implicating the cities and towns of the region, which is matched by the progressive depopulation of rural and mountainous spaces.

The map allows to effectively recognize the spaces where urbanization is more intense that leads to the increase of density. It grows mainly from the center, from Milan and the first urban crown expanding fan out to the north. A compact spot appears where population growth tends to focus, it is the area north of Milan, in particular axes Milano-Varese, Milan-Como-Ticino and Milan-Bergamo-Brescia (while in the south of Milan the growth appears slower), showing the grow of the suburbanization process in these 'first crowns' around the main centers.

What are the effects of the border? The political border is not the most apparent: in this case the most significant border effect is the large amount of mountain communities that are stagnating or more often lose population. The Alpine reality shows only 'lights spot', by small centrality as Brig, Domodossola, Locarno, Bellinzona and then Chiavenna, Morbegno, Sondrio. Then there is another boundary, that we will see in subsequent periods, constituted by the Ticino River which divides Lombardy and Piedmont and makes visible two different types of historical demographic behavior. But we do not observe significant differences between Lombardy and Ticino, whose urbanization is configured (in a small scale) with the same pattern of polarization.

1950-980: the post-war economic boom and the rise of the metropolitan area (fig. 4b)

The French call this period 'the 30 glorious years'. These are the years of the economic boom, based on the fordist industry in the first crown and then at Varese and Como, characterized by a high rate of immigration (from the rural and mountain areas, but also in large part from Southern Italy) and the continuation and acceleration of the construction of the suburbs and new residential districts, often large urban ensembles to accommodate the new population. We can also call this phase the Italian fordism, situated mainly in Northern part of the country, with the mass production and relationships between workers and owners of the means of production regulated by the State. These were also the years of mass motorization and construction of highways. During this phase, in the Ticino Canton the 'border industry' – which occupies massively border workers (in 1980 there are approximately 30,000 commuters coming every day from the other side of the border) – has been developed.

Considering the settlement, we can observe the acceleration of the previous pattern of the polarization⁷, based on the attraction of the city, where the population growth widens the gap

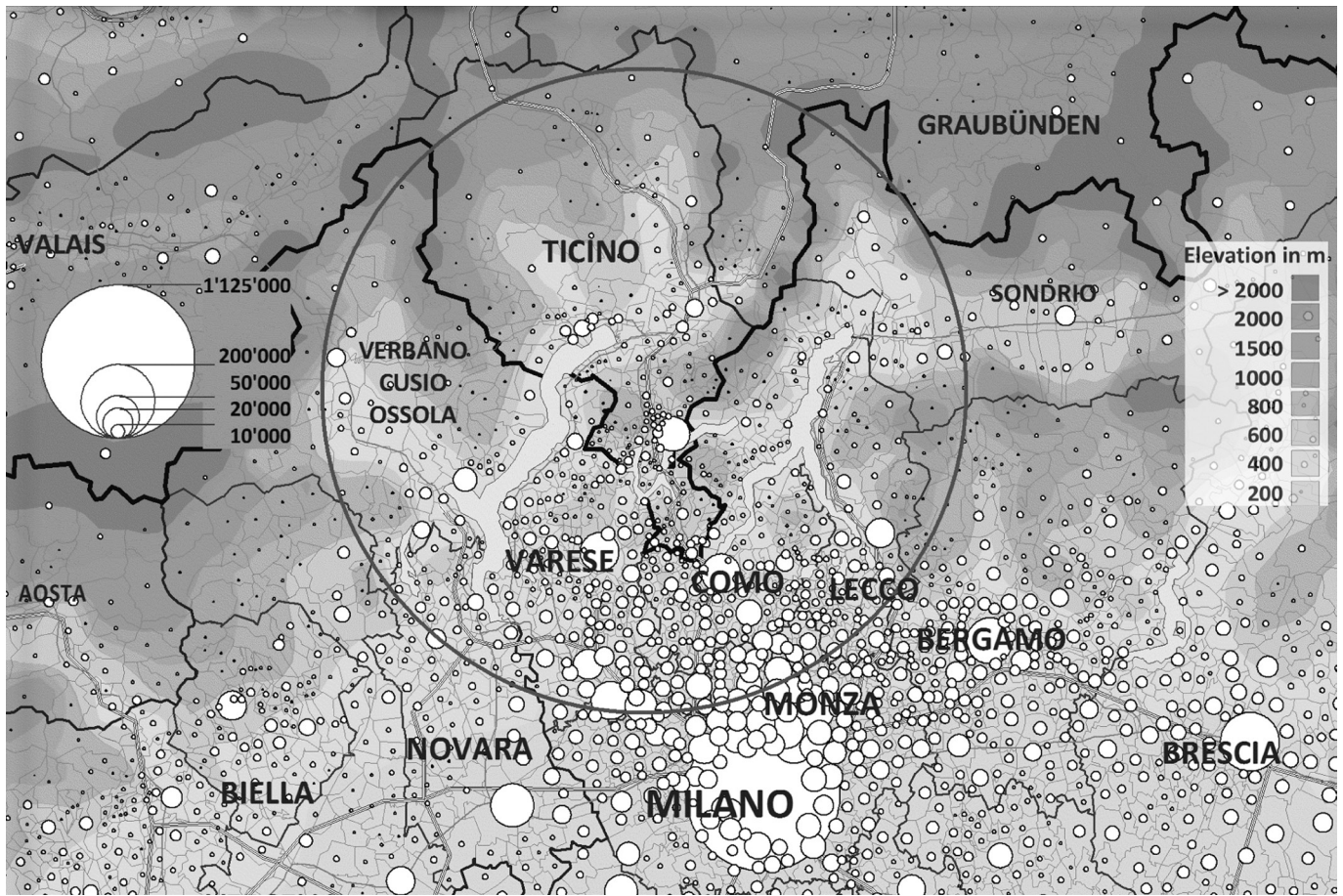
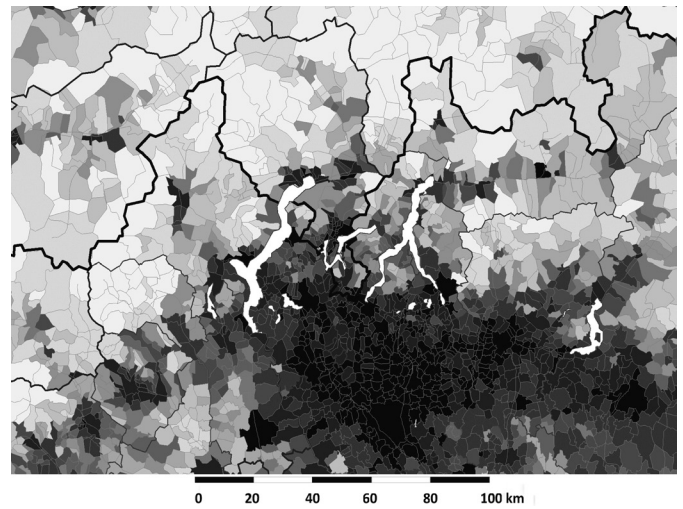
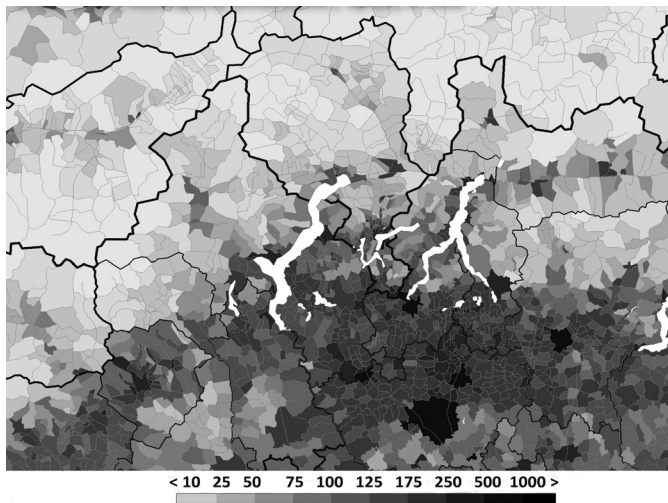


Fig. 1 – Population by municipalities, 2010

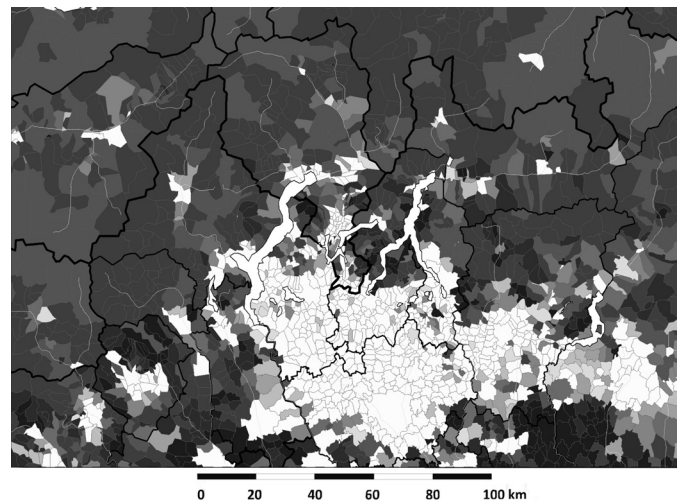
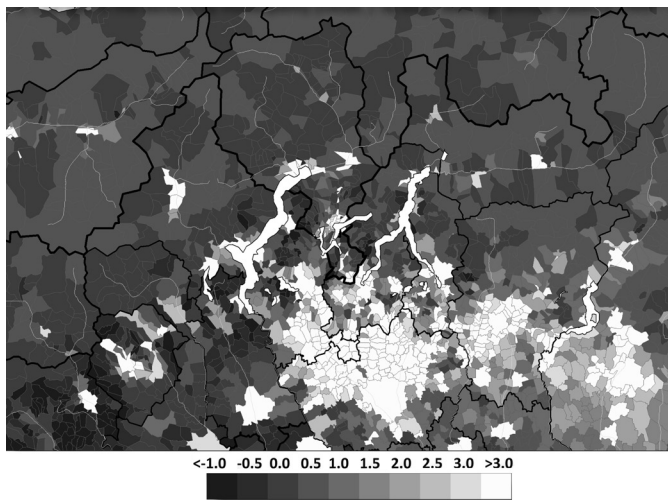
Source: Bfs, Neuchâtel; Istat, Rome

Fig. 2 – Peri-urban landscape, from the Swiss part of the border between Lombardy and Ticino

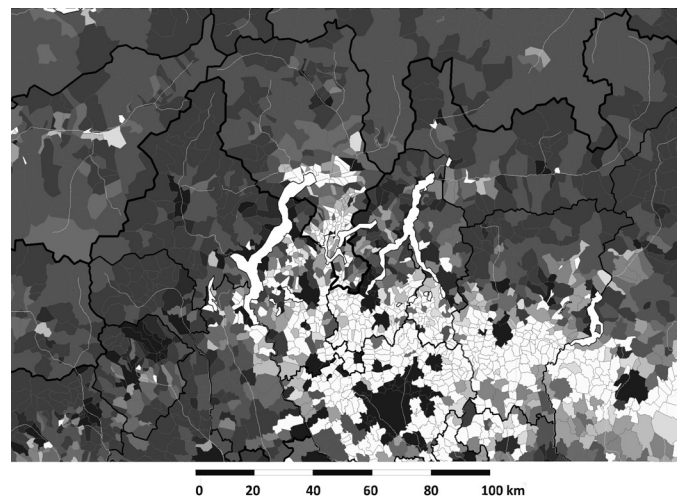
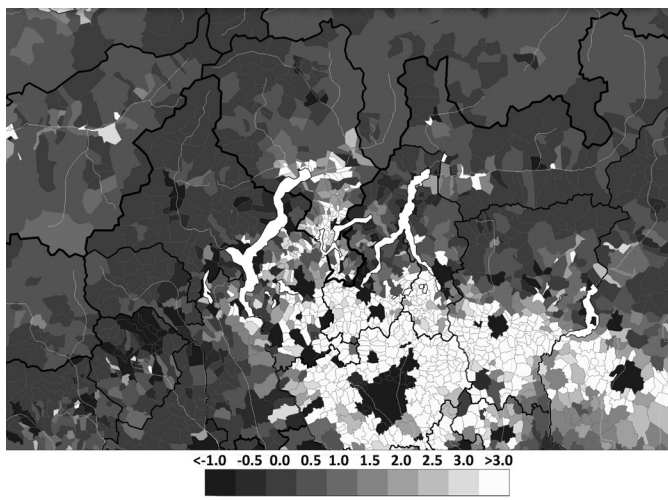
Source: © Ost-TI, 2012



Figg. 3a-3b – Density by municipality (inhab./sq km) in 1900 and in 2010
 Source: Bfs, Neuchâtel; Istat, Rome



Figg. 4a-4b – Changes in the density by municipality (inhab./sq km). Average annual balance 1900-1950 and 1950-1980
 Source: Bfs, Neuchâtel; Istat, Rome



Figg. 5a-5b – Changes in the density by municipality (inhab./sq km). Average annual balance 1980-1990 and 1990-2000
 Source: Bfs, Neuchâtel; Istat, Rome

between center and margin: the centers (and the first crown) grow strongly, but the rural spaces (and valleys) experienced a strong demographic decline. The process materializes the rise of the metropolitan area of Milan and of the small urban agglomerations in Ticino Canton: an urbanization that looks like an extension to the north of a very dynamic metropolis.

1980-1990: urban sprawl (peri-urbanisation) (fig. 5a)

The exit from the '30 glorious years' proposes a very different settlement pattern compared with the previous decades. In this period the population increase is substantially reduced and the urban sprawl appears: the 80s are those of the leakage of the population (part of it) from urban centers, large and small, and the creation of new living neighborhoods around Milan, but also in the outskirts of the intermediate centers such as Varese, Como and the small cities of Ticino Canton.

The economy seems to hold in Ticino (the number of border workers reaches 40,000 in 1990), while in Lombardy and Piedmont turns: big industrial plants tend to decline in favor of a new small specialized industry, that relocate in the new suburbs, further and further away from the major centers (Dematteis, 1983; 1988; Emanuel, Dematteis, 1990). As a result, however, the heavy motorized traffic grows substantially. The suburbs of large housing developments are now more rare, and increase the individual housing or most often blocks of smaller size in areas far away from the major urban centers; in the Ticino Canton there is a strong push of speculative building, often with Italian capitals. The deprivation of the mountain intensifies and also the urban areas in Piedmont stop growing, while between Ticino and Lombardy seems to prevail the pattern of urban sprawl. Also in this case the border do not prevent the simultaneous change of settlement patterns.

1990-2000: economic stagnation and more urban sprawl (fig. 5b)

In the 90's we find a similar pattern to the previous decade, but more contrasted. The map makes it possible to imagine that the metropolitan front, or rather urban sprawl, has finally crossed the (river) Ticino, while in (Canton) Ticino urban expansion appears also strong in the Alpine agglomeration of Locarno and Bellinzona. There is a clear acceleration of peri-urbanisation process, but there is also a significant barrier to the settlement made by the Alps. After 1995 there is a wave of restructuring (and partial privatization) of public enterprises (railways, telecommunications, etc.) that causes a certain stagnation in the labor market, especially in the small centers. In Ticino the border industry is in crisis (border workers decreased substantially in the second half of the decade), while Milan, simultaneously with a violent de-industrialization process, knows a boom of the service sector: in much of what remains of the old fordism became semi-abandoned brownfields or it turned into commercial activities, the real estate sector explodes, while the small specialized industry spreads in the territories of the urban sprawl⁸.

The pattern of settlement, however, appear once again relatively similar between Ticino and Lombardy.

2000-2010: from urban sprawl to metropolization (fig. 6)

Beginning in the 2000s, settlement patterns still seem to change: if in the first part of the decade, metropolitan growth remains strong, in the second half literally explodes and this, once again,

on both sides of the border. Now part of Lombardy shows a compact growth of the density and some towns of mountain areas (as in Valtellina or Valcamonica) seem to recover demographically, while the metropolitan front moved beyond the Ticino river. In this decade, thanks to the Swiss-EU bilateral agreements and favorable fiscal conditions, many industrial and service companies have been established (or grow) in Ticino, the resident population increases thanks to the pressure of migration abroad and the number of border workers share grows to reach 50,000 at the end of 2010. Since 2008 in the border area have been established new differential, due to the financial markets crisis (and sovereign debt in the Euro zone) and then to the revaluation of the Swiss franc as a safe haven (and this is also reflected on the attractiveness of industrial or tertiary location of Ticino, which grows in turn).

The maps look like the one of the 30 glorious, but the comparisons would be dangerous. This shows us the limit of the method, which has allowed us to point out, with regard to patterns of settlement, the historically rooted ties that exist between Lombardy and Ticino, but it seems to be necessary to consider other data. How we characterize the new settlement pattern?

During the 20th century we observe, first, a long period of highest concentration of population (polarization on the cities and rise of the first urban crowns) that lasted until the '70s, and followed by a phase of diffusion and decentralization of the city (peri-urbanisation or urban sprawl), then during the most recent period, at a time when the strong growth of the centers overlaps the process of peri-urbanisation, which continues even with stronger intensity than in previous periods. In this new phase, human settlement is accelerated in delimited areas, particularly in the main centers and large crowns in peri-urban areas around Milan, to the provincial capitals on foothills and Ticino agglomerations: this is likely to be a central aspect of a more complex phenomenon of metropolisation⁹, which assigns to the metropolitan centers a key role in the management of the surrounding areas.

Now we can ask why the centers resume growth so strongly in recent years. We struggled to identify, in conclusion, the factors of growth considering the demographic balance of the municipalities between 2006 and 2010.

5. Some evidence with the demographic balance of the municipalities 2006-2010 (with symbol maps)

The natural balances (the difference between births and deaths)

The natural increase of the population in Ticino constitutes less than 2% of the population growth between 2006 and 2010; in Switzerland, this part is greater: 17.6%; while the Lombardy it is around 10%.

As can be seen in the following map especially cities in Lombardy (and Piedmont) have strongly negative natural balances, only the suburbs of Milan and of the provincial capitals appear with positive balances (in Piedmont prevails a negative balance, even in the peripheral spaces). By contrast in Ticino there is virtually a zero balance between births and deaths, slightly negative in Locarno and in Mendrisio, slightly positive instead in Lugano and Bellinzona and their agglomerations. Ultimately also in the natural increase more similarities appeared between Ticino and Lombardy than between Lombardy and Piedmont (fig. 7).

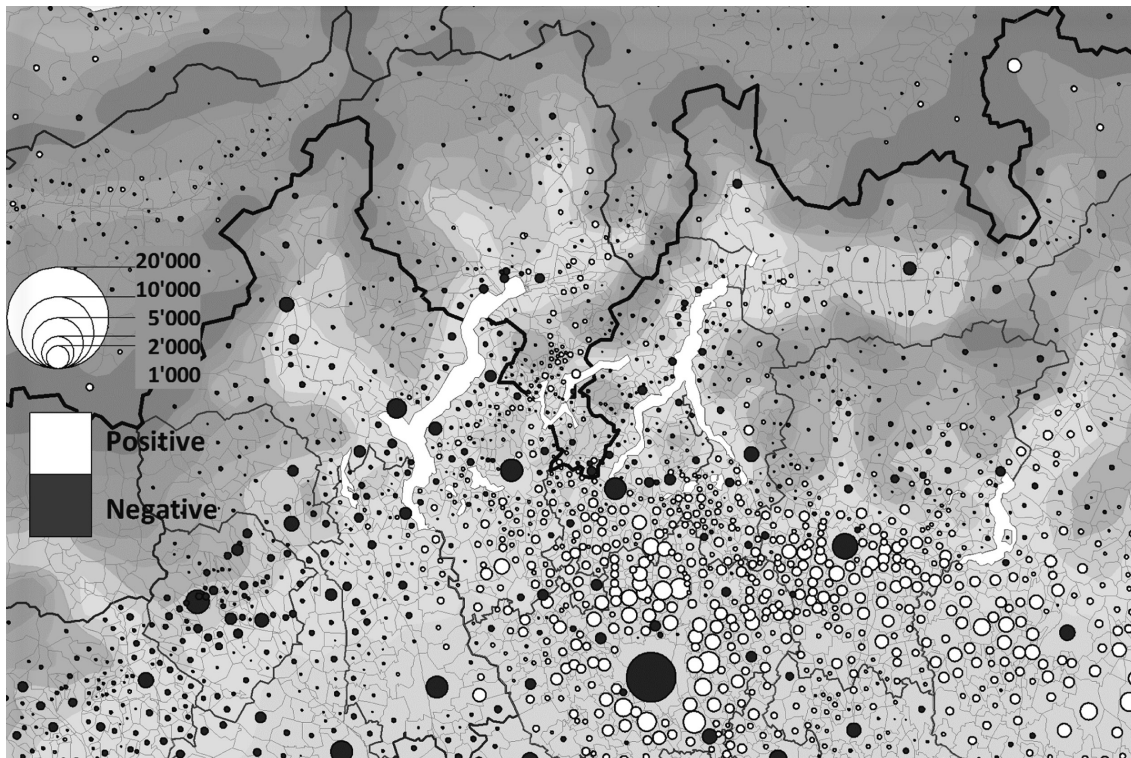
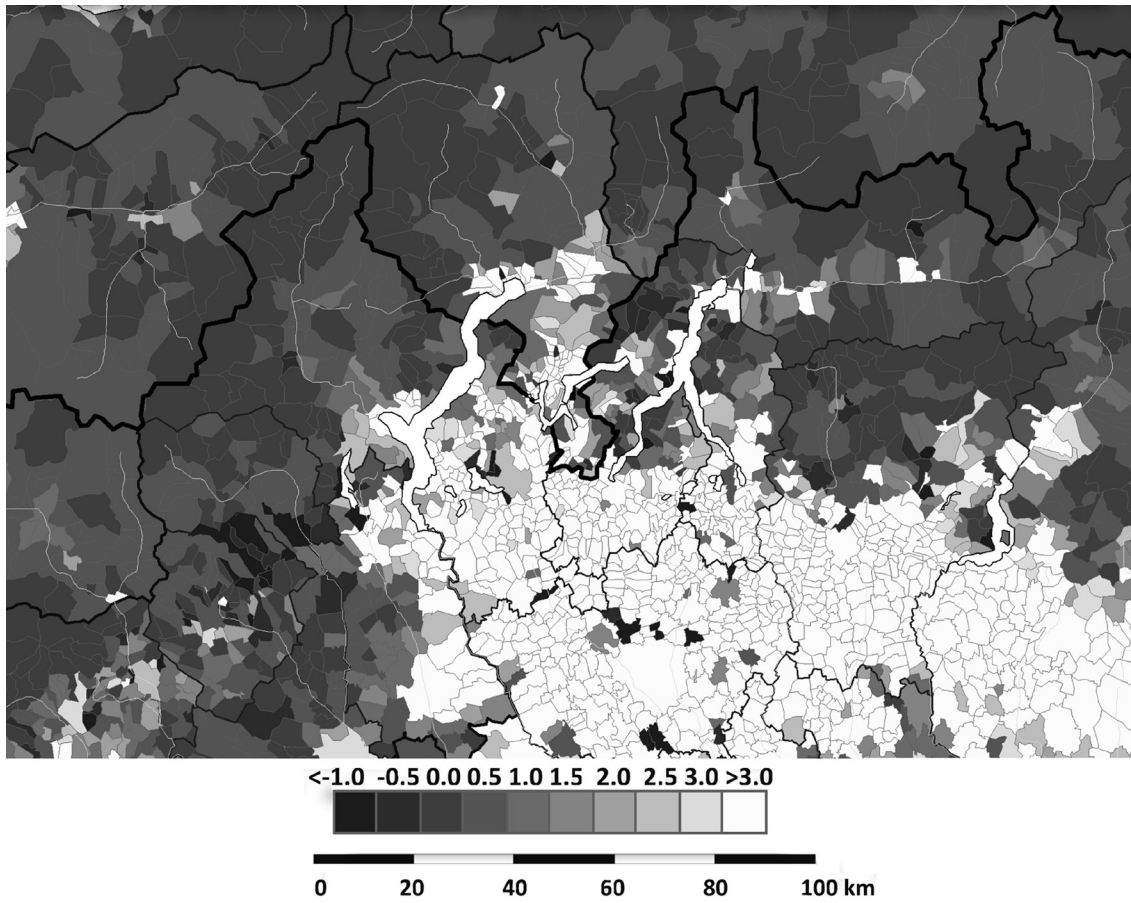


Fig. 6 – Changes in the density by municipality (inhab./sq km). Average annual balance 2000-2010

Fig. 7 – Demographic natural balances 2006-2010

Source: Bfs, Neuchâtel; Istat, Rome

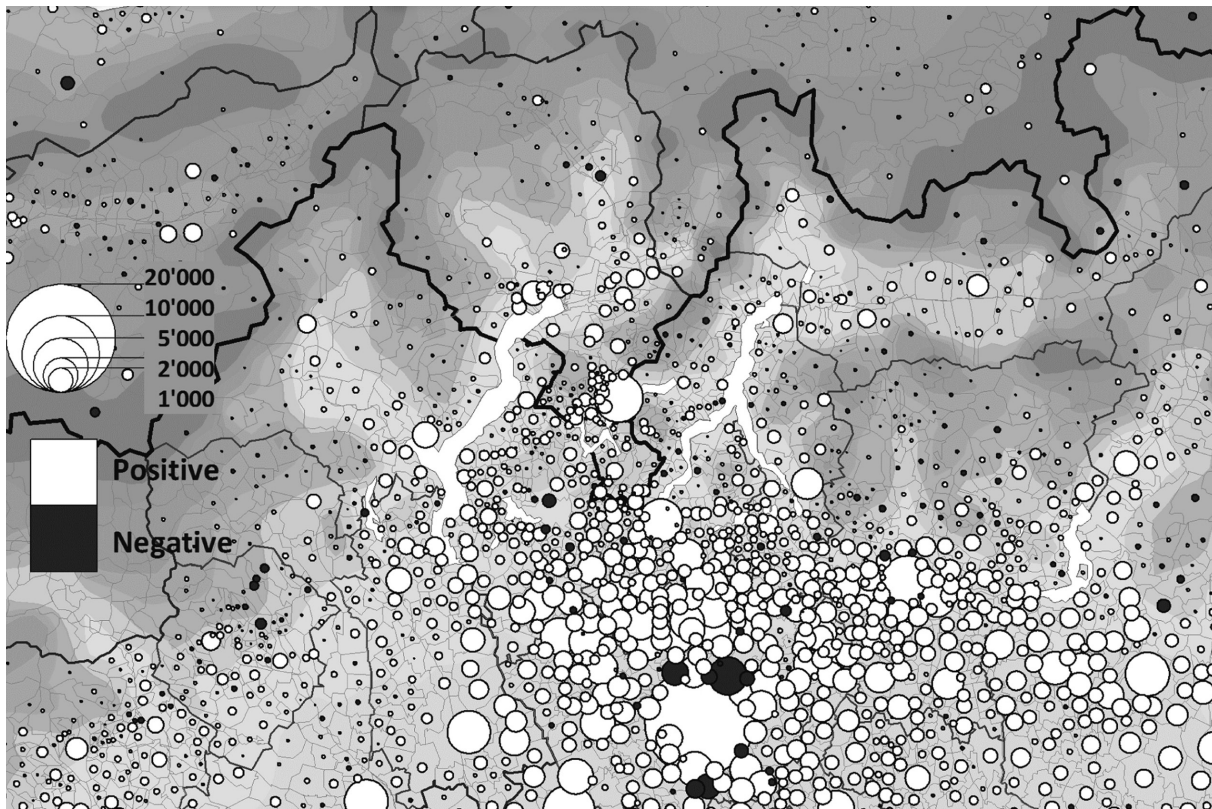


Fig. 8 – Migratory balance (net migration) 2006-2010
 Source: Bfs, Neuchâtel; Istat, Rome

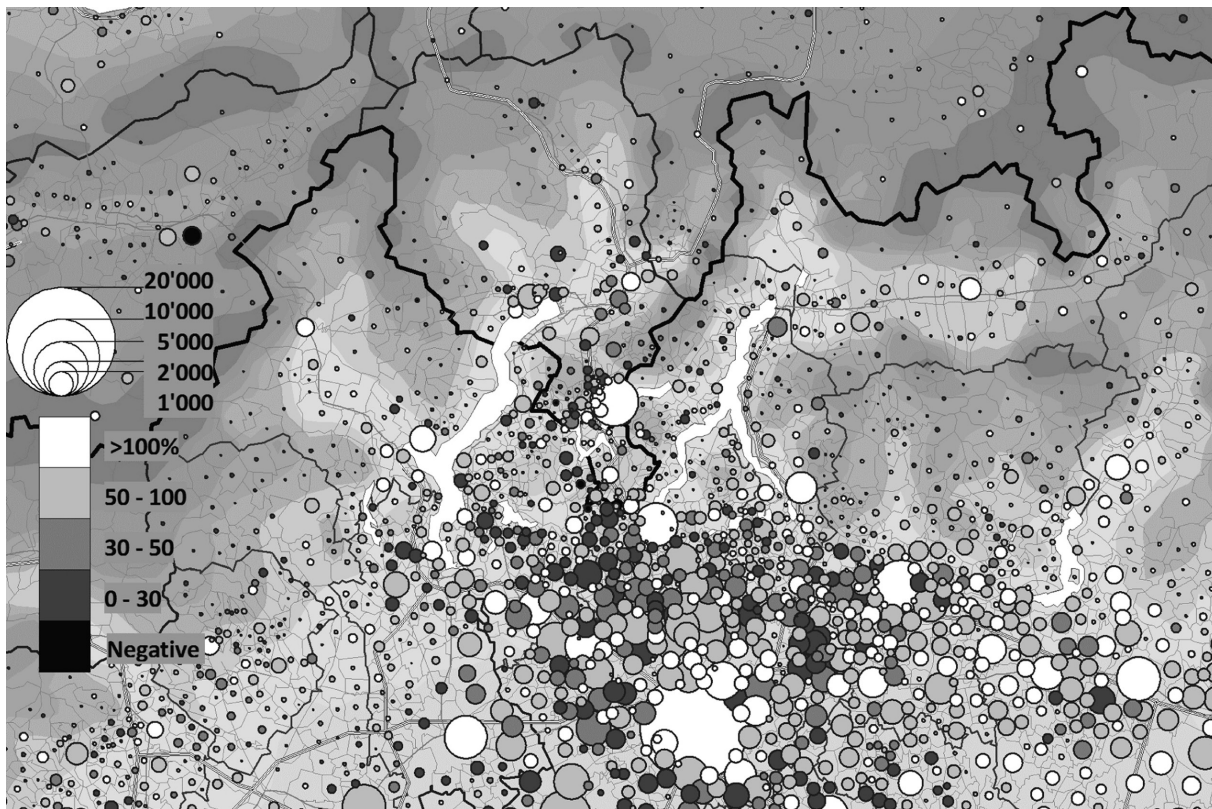


Fig. 9 – Part of the foreign migratory balance (% of net migration) 2006-2010
 Source: Bfs, Neuchâtel; Istat, Rome

Tab. 1 – Natural and migratory balance and population growth. Contribution of the foreign migratory balance 2006-2010 (Source: Istat, Rome; Ust, Neuchâtel)

	<i>Natural balance 2006-2010</i>	<i>Migratory balance 2006-2010</i>	<i>Population growth 2006-2010</i>	<i>% natural balance</i>	<i>% external migratory balance</i>	<i>% internal migratory balance</i>	<i>Resident population 2010</i>
Swiss Cantons							
Zürich	21,347	79,033	100,38	21.3	79.0	-0.3	1,368,822
Luzern	4,822	16,58	21,402	22.5	60.7	16.8	375,418
Graubünden/Grigioni	-263	5,341	5,078	-5.2	163.7	-58.5	192,702
Ticino	336	18,16	18,496	1.8	91.7	6.4	339,946
Vaud	12,129	49,877	62,006	19.6	80.4	0.1	711,818
Valais	2,443	19,668	22,111	11.0	72.7	16.3	311,985
Lombardy Provinces							
Varese	2,013	32,666	34,679	5.8	80.6	13.5	890,079
Como	2,555	25,58	28,135	9.1	65.3	25.6	600,576
Lecco	2,049	12,923	14,972	13.7	81.9	4.5	336,341
Sondrio	-636	4,038	3,402	-18.7	147.6	-29.0	183,831
Milano	22,509	114,784	137,293	16.4	134.6	-5.10	4,021,774
Bergamo	14,444	50,604	65,048	22.2	80.9	-3.1	1,109,868
Brescia	16,194	57,494	73,688	22.0	98.2	-20.1	1,296,465
Switzerland	75,498	352,520	428,018	17.6	84.4	0.0	7,864,012
Lombardy	46,155	380,688	426,843	10.8	104.0	-14.8	9,756,898

The net migration

Most of the population growth is represented by net migration, which are between 2006 and 2010:

- 92 % of the increase in Ticino;
- more than 100% in Lombardy (the net migration 2006-2010 of Lombardy with the other Italian regions is negative);
- both in Switzerland and Lombardy, arrivals from abroad tend to concentrate in the centers giving the immigration surplus in almost all cities (figg. 8, 9 and tab. 1).

6. In conclusion, what lessons can be learned from this short experience?

This simple experience shows that the thematic map can be effectively used, starting from elementary data, such as demographic balance and the surface of the municipalities, to show the human pressure on space and to allow a discourse about settlement patterns (and of course peri-urbanisation) at the regional scale. This still does not say anything about peri-urban agriculture, but this allows a possible deepening and comparison between different peri-urbanized places in Lombardy and Ticino. The continuity and the changing patterns of settlement occurs simultaneously on both sides of the border, despite the different national legislations regulating the planning and local management practices of urbanized areas, that are not always comparable. In the Ticino Canton sprawl has been able to develop thanks to the wide availability of building zones (even in areas far from centers) defined with the introduction of the Regulatory Plans

(PR) in the 80s, with the cantonal law enforcement to Urgent Swiss Federal Decree of 1972¹⁰. Also in Italy since 1972 the Regions are responsible for planning; in Lombardy the old Prg (general zoning, also very generous in regard to the buildable areas) was not so different compared to the PR in Ticino Canton, even the new territory governance plans (*Piano del governo del territorio-Pgt*) in force of Regional Law (*Legge regionale 12¹¹*) since 2005 does not appear very different from those defined by the new Cantonal Law on spatial development (*Legge sullo sviluppo territoriale/Lter*, 2011¹²). But although the regional and cantonal plans (in Lombardy the *Piano territoriale regionale-Ptr*, the Regional Master Plan approved in 2010; in Ticino the *Piano direttore cantonale-PD*, Cantonal Master Plan of 2009) are trying to push municipalities to cut sprawl, the limitation of the built and save soil are difficult to put into practice. On both sides of the border.

Finally, that reveals – throughout the course of the 20th century – a great homogeneity of demographic behavior and settlement patterns between Ticino and Lombardy. In the first decade of the Twenty-first century, with the emergence of the phenomenon called *metropolization*, the similarities not only do not disappear, but they seem even to be more evident. The process of globalization is implemented in the metropolis, by radiating management and stronger administrative and command functions, at national and international level; Milan is no exception. It is so easy to imagine – starting from these simple cartographic models – the growth of its influence on the surrounding spaces in many fields, including likely for the development of a new urban agriculture.

Notes

1. Thanks to Luisa Pedrazzini for the invitation at this seminar and to Simone Garlandini for the reading of the text.
2. See, among others, Wikipedia, the free encyclopedia: <http://en.wikipedia.org/wiki/Peri-urbanisation>.
3. It was characterized by the mass arrival of new residents and by the shift of the production equipment from the urban centers to the new city sectors that were constructed in its immediate neighborhood (i.e. the 'first crown' of Milan, but the it was also true for many other cities of the area), new living quarters and new industrial areas, often well connected by train or tram lines to the main centers.
4. See, among others, Bonomi, 2008.
5. Osservatorio dello sviluppo territoriale (Ost-TI), Accademia di architettura, Università della Svizzera italiana, CH-6850 Mendrisio (Switzerland) (www.arc.usi.ch/ost).
6. Cartographic bases adapted and updated from: Torricelli, Thiede, Scaramellini, 1997.
7. To learn more about the polarization process: Friedmann, 1972, pp. 82 e ss.
8. To learn more about the changes of the 90s: Soja, 2000; for the Italian case: Dematteis, 2005.
9. To learn more about the metropolization process: Sassen, 1997; Scott, 2001; Torricelli, 2007, pp. 12-22; Veltz, 2002.
10. *Decreto federale su alcuni provvedimenti urgenti nell'ambito della pianificazione del territorio*, approved by the Swiss federal parliament in 1972 pending the new law (which will be approved in 1979 and which will leave a wide margin to the Cantons in planning).
11. Legge regionale per il governo del territorio, 11/3/2005, n. 12, cfr. *Bollettino Ufficiale, Regione Lombardia*, 24 aprile 2008, Milano.
12. Legge sullo sviluppo territoriale (Lst) del 21/6/2011, in force since 10/1/2012, *Bollettino Ufficiale, Cantone Ticino*, Bellinzona, BU 2011, 525.

References

- Bonomi A., 2008, *Milano al tempo delle moltitudini*, Bruno Mondadori, Milano.
- Dematteis G., 1983, *Deconcentrazione metropolitana, crescita periferica e ripopolamento di aree marginali: il caso dell'Italia*, FrancoAngeli, Milano.
- Dematteis G., 1988, «La scomposizione metropolitana», in Mazza L. (a cura di), *Le città nel mondo e il futuro delle metropoli*, Electa, Milano, pp. 33-42.
- Dematteis G., 2005, «I sistemi territoriali in un'ottica evolucionista», in Dematteis G. e Governa F. (a cura di), *Territorialità, sviluppo locale, sostenibilità: il modello SLoT*, FrancoAngeli, Milano.
- Emanuel C. e Dematteis G., 1990, «Reti urbane minori e deconcentrazione metropolitana nella Padania centro-occidentale», in Martellato D. e Sforzi F. (a cura di), *Studi sui sistemi urbani*, FrancoAngeli, Milano.
- Friedmann J., 1972, «A General Theory of Polarized Development» in Hansen N.M. (ed.), *Growth Centers in Regional Economic Development*, Free Press, New York, pp. 82 e ss.
- Sassen S., 1997, *La città nell'economia globale*, Il Mulino, Bologna.
- Scott A., 2001, *Le regioni nell'economia mondiale*, Il Mulino, Bologna.
- Soja E., 2000, *Postmetropolis*, Blackwell, London.
- Torricelli G.P., Thiede L., Scaramellini G., 1997, *Atlante socioeconomico della Regione insubrica*, Casagrande, Bellinzona.
- Torricelli G.P., 2007, «Nuove centralità metropolitane: Milano e il Ticino», *Gea, Paesaggi Territori, Geografie*, n. 22, pp. 12-22.
- Torricelli G.P., 2011, «La carte (2.0): une médiation symbolique», in Walser O. et al. (dir.), *Les Sig au service du développement territorial*, Presses polytechniques et universitaires romandes, Lausanne, pp. -23-38.
- Veltz P., 2002, *Des lieux et des liens. Politiques du territoire à l'heure de la mondialisation*, Editions de l'Aube, Paris.