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# INTERNAL MIGRATION AND REGIONAL POPULATION DYNAMICS IN EUROPE: POLISH CASE STUDY

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## CONTENTS

**ABSTRACT**

The report analyses population migration and change in Poland over three periods 1980-1990, 1984-1994 and 1990-1994. The analysis is conducted for communes and municipalities, the finest administrative division for which population and migration data are available. The results of the investigation show substantial changes in population migration and dynamics over time. The most important changes between the eighties and the nineties are the reduction of outmigration from rural areas, the increase in the number of communes and towns suffering from structural depopulation and the decrease of the role of largest urban agglomerations as population growth poles. The suburbanization process, visible in already in the eighties, has been reinforced, but no trace of counterurbanisation can be detected. The pattern of the upward hierarchy migration (from rural areas to towns to cities; from areas with higher unemployment to areas with lower unemployment) is still visible, but not as evident as in the past. Migration patterns of males anf females differ, females being keener to move upward hierarchy, males being more selective. Some similarities between migration and population development in Poland now and in some West European countries in the past have been identified, leaving, however, a lot of room for Polish specificity.

## LIST OF TABLES



## LIST OF FIGURES

## ACKNOWLEDGMENTS

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# 1. CONTEXT

The enormous political, social and economic changes in Central and Eastern Europe that we have witnessed in the last decade present a substantial challenge to the international community. For wealthy old Western democracies the challenge is to help to integrate weaker Central and East European democracies into the Western World. For the former communist states the challenge is to develop their economies and political systems to make them compatible with the Western style democracies. This process goes on on at many levels and in many different places. Project on *Internal Migration and Regional Population Dynamics in Europe* initiated by the Council of Europe and financed jointly with the European Commission is an example of the contribution to the process of mutual understanding, adjustment, and learning from each other.

One of the important aspects of the project has been to collate a database on migration and population change on a subnational level for the member states of the Council of Europe. Existing statistical publications of the Eurostat provide valuable data for the European Union for NUTS (Nomenclature of Territorial Units for Statistics) level 1, 2 and 3 (Eurostat 1995), but they do not cover non-EU member states. The excellent demographic yearbook produced annually by the Council of Europe (see for example Council of Europe 1995) covers all Europe (both Council of Europe member and non-member countries) but on the national level. The assembling of the most of the data remained therefore in our hands. The results of our activities were twofold: the database itself and a network of collaborators and experts in academic and governmental institutions all over Europe.

An important aspect of the data collection, not addressed by ourselves, is the comparability of definitions adopted and operational methods used for the data collection (Poulain 1994). Being well aware of this limitation we have to accept it as is. Bringing the demographic data in Europe to a common denominator by standardising definitions and collection procedures is a major task for intergovernmental and international cooperation for the next decade. The success of such a task is doubtful as in each country demographic data collection is to a large extent driven by

administrative requirements and the legal system. The existing differences do not invalidate our conclusions even when they make direct numerical comparisons difficult.

## 2. INTERNAL MIGRATION AND POPULATION CHANGE REVIEWED

Poland witnessed a population explosion in the post war period. In the 1950's the natural increase of population was over 450 thousand per year and in the period 1953-58 exceeded the half million mark. This phenomenon has been attributed to the post-war demographic compensation process (Rosset 1975). In the sixties the increase of population almost halved in comparison to the fifties and recovered in the seventies, oscillating around 340 thousand per year. From the mid eighties we have observed a rapid reduction in the natural increase: from 371 thousand (10 *pro mille*) in 1983 to 95 thousand (2.5 *pro mille*) in 1994. These changes were very different in urban and rural areas, which have reached below 10 *pro mille* natural increase threshold in 1962 and 1984 respectively, almost twenty years apart, with massive rural-urban migration acting as a balancing factor. The importance of the migration has reduced dramatically over the last twenty years: net gains of urban areas reached a quarter of a million in 1975 and shrunk in 1994 to 39 thousand, that is to slightly over 15% of the 1975 value.

As a result of these processes the population of Poland has been growing over the entire post-war period. It stood at 23.8 million in 1946 and reached 38.5 million in 1994. However this growth was solely due to the growth of urban places. In fact rural population decreased from 15.6 million (66% of total population) in 1946 to 14.8 million in 1980 and 14.7 million (38% of total population) in 1994. The urban growth was due not only to migration and natural increase but also to changes of administrative boundaries.

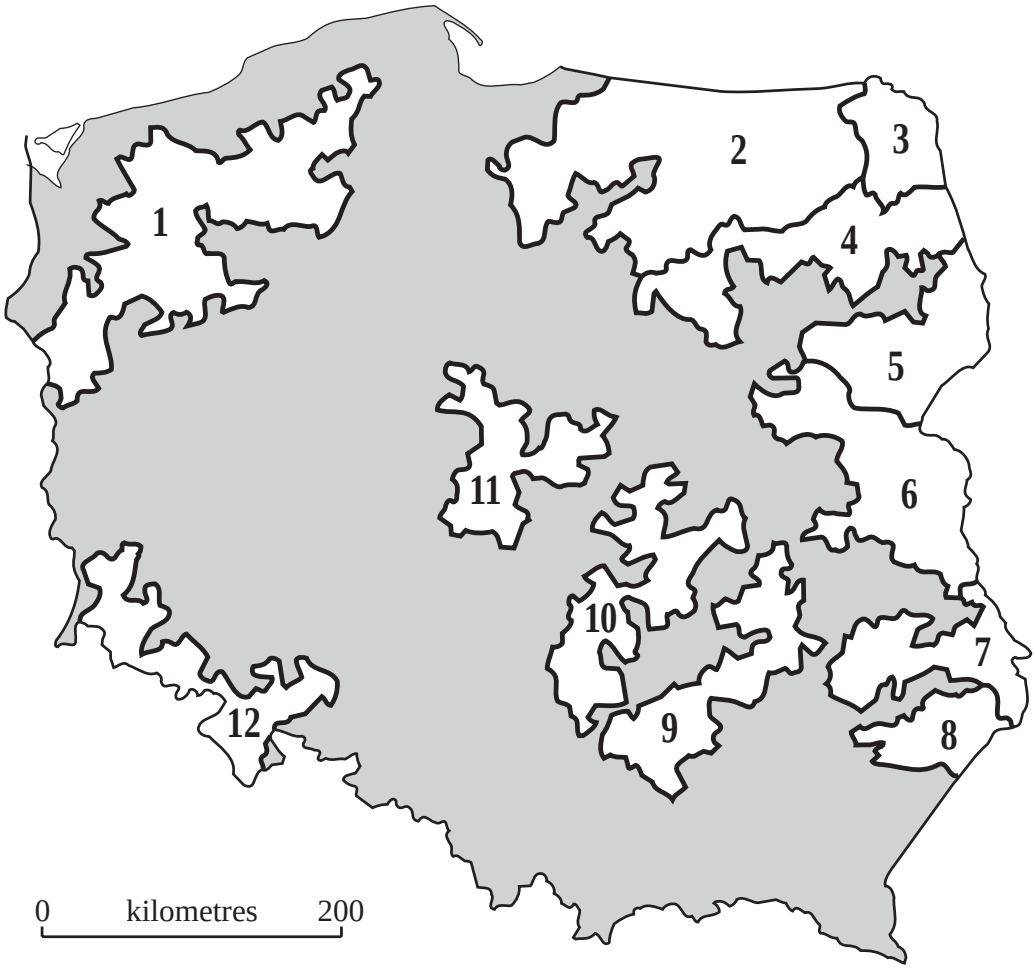
The population change has a distinctive geographical dimension which can be fully examined only using small spatial units. A fundamental analysis of this process over time was given by Eberhardt (1989). Starting from the result of the National Census and administrative division in 1978 he went back as far as to 1946 recalculating the results of all post-war National Censuses (i.e. in 1946, 1950, 1960 and 1970) to the administrative division in 1978. As a result he obtained a time series of populations for each commune and municipality in the unified spatial framework. This allowed for the classification

procedure aiming at a delimitation of persistently depopulating (Figure 1). An extension of Eberhardt's study for the period 1978-1986 can be found in Stasiak (1990) and for the period 1980-1990 in Kupiszewski (1992). The findings of both studies confirm the observation that a substantial part of rural Poland has been continuously losing population. In this study we will examine if this still happens and to what extent. There is a number of studies analysing the problem of depopulation at the regional scale (49 units), but they will not be discussed here as, in our view, this scale is inappropriate for any meaningful geographical examination of population change.

So far attention has been paid to rural areas, particularly those losing population. Traditionally this population has migrated to towns, cities and industrial centres increasing population concentration there. This was in particular the case over the period from the end of the World War II till the late eighties when urbanisation driven by industralisation attracted rural population. As an excellent example of this process is the Katowice region, to which massive industrialisation attracted migrants from the most distant regions of Poland (Dziewonski and Korcelli 1981). Jerczynski and Gawryszewski (1984) described the changes in the urban settlement subsystem of Poland in the second half of the seventies. Extension of this analysis till mid eighties has been offered by Jerczynski (1989). According to their findings the significance of migration in the dynamics of urban growth has been decreasing over time. The role of small towns has diminished and the role of medium sized towns has grown. This was confirmed by Korcelli who noticed that highly urbanized regions with big cities (Korcelli 1990) as well as big cities themselves (Korcelli 1989) have been loosing their importance as concentration foci. This study will examine if there is a continuation of the process outlined above.

The insight into the demographic characteristics of the process of population change has been provided by Rakowski and Rakowska (1990) who constructed Webb typology of population change in all rural communes in Poland in 1976, 1980, 1983, 1986, 1987 and over the periods 1976-1980 and 1981-1985. As the authors did not recalculate the data to one common set of administrative division their results are burdened with much less accuracy then Eberhardt's, Stasiak's and Kupiszewski's studies mentioned earlier as well as the present study. This refers in particular to the most interesting typologies encompassing longer periods of time rather than a single year. This study will examine the Webb typology for 1994 and see whether there are any substantial modifications of historical patterns.

Figure 1. Depopulation regions in Poland after Eberhardt (1989)




Regions according to EBERHARDT:

1 Zachodnio-Pomorski
2 Warmińsko-Mazurski
3 Suwalski
4 Kurpiowsko-Biebrzański
5 Górna Narew
6 Podlasko-Nadburzański
7 Janowsko-Hrubieszowski
8 Roztocze
9 Nadwiślanski
10 Napilicki
11 Środkowej Warty
12 Sudecki

*Source: Adapted from Eberhardt (1989)*

# 3. METHODS USED AND DATA EMPLOYED

## 3.1 Geographical scale and geographical units

The spatial scale was in fact predetermined by the availability of the data. The investigation was conducted for communes and municipalities for the analysis of population change and sex structure, interplay between natural increase and migration, and migration inflow and outflow. The investigation was conducted for 3030 communes and municipalities, which is roughly speaking an equivalent of NUTS level 5. All data were recalculated to the administrative division as in 1994. Some references are made to regional level (49 units called *wojewodztwa*) which are comparable to NUTS level 2. Later on in this study *wojewodztwa* will be referred to as regions.

## 3.2 Variables

### *3.2.1 Population and population change data*

Stocks of population for communes and municipalities in 1984 and 1990 were recalculated to the administrative division in 1994 and compared with the stock of population in 1994. The method of recalculation was based on the computation of areas of communes and municipalities resulting from the changes of administrative boundaries, and relocation of populations attributed to these areas. An assumption of homogenous distribution of population in space which was adopted in these operations is adequate for most rural areas. For urban areas, in particular when a new urban administrative unit is created by division of a rural unit into two units, one of which is urban and the other one is rural, the method may introduce errors. However, the number of divisions described above is very limited and the error introduced does not invalidate the results. The full description of the procedures used is given in Kupiszewski (1992).

We identified that in some, very few, cases this approach gave unreliable results, generating either very high or very low population change. This is mainly due to the fact that the assumption of homogeneous distribution of population or other variable over the space of administrative unit does not hold. Sometimes population is

highly concentrated, what may lead to wrong results of the recalculation. These errors are few (for the recalculation of 1990 population data to 1994 administrative boundaries there were 10 units for which we thought the results were suspicious) and do not have any impact on the identification of the overall trends.

The data employed in the study are based on the National Population Censuses of 1978 and 1988 respectively and adjusted with the information obtained from annual population account tables based on the registration of demographic events (deaths, births and migrations) in each spatial unit (communes and municipalities). Such tables are constructed every year by the Central Statistical Office.

Official statistics overestimate the population in Poland, and in consequence population of regions, communes and municipalities, as they do not take into account migration losses due to unregistered international migration. It is difficult to assess the magnitude of these losses. Rather cautious estimates have been offered by Korcelli (1992). Kupiszewski (1993, Table 1) shows that the discrepancy between the outflow of Poles reported by the Central Statistical Office over the period 1987-1990 and the aggregated inflow of Poles reported by selected countries over the same period differs by as much as 1.24 million. For 1987-1988 the difference was 420 thousand. The results of the census of population held in December 1988 allowed for a slight correction of the count of resident population. The correction has never been widely publicised but may be traced indirectly by the comparison of half-annual increases of population. The population increased by 183 thousand in the first half of 1988, by 9 thousand in the second half, when the Census took place, and by 132 thousand in the first half of 1989. In the second half of 1988 the total increase of population calculated as a sum of natural increase and net international migration was in the region of 27-30 thousand. That means that the Census corrected the population count by 130-180 thousand. But still over the three years period well over 200 thousand has not been accounted for.

**Table 1: Types of population growth in Poland in 1994.**

| Description of type of growth | Class name (see **Error! Reference source not found.**) | Population change | Number of units in each class |
|---|---|---|---|
| Positive natural increase exceeds negative net migration | A | Positive | 766 |
| Positive net migration is smaller than positive natural increase | B | Positive | 476 |
| Positive net migration exceeds positive natural increase | C | Positive | 362 |
| Negative natural increase is smaller than positive net migration | D | Positive | 119 |
| Negative natural increase exceeds positive net migration | E | Negative | 46 |
| Negative natural increase exceeds negative net migration | F | Negative | 63 |
| Negative natural increase is smaller than negative net migration | G | Negative | 235 |
| Positive natural increase is smaller than negative net migration | H | Negative | 816 |
| Unknown\unclassified | | | 145 |

Source: Webb 1963 and computation from the data provided by the Central Statistical Office.
Note: to keep the description of classes short a simplification has been made. Whenever we refer to relations between variables with different signs we refer to relations between their absolute values.

The Central Statistical Office must not be blamed for this difference. To blame is the political system which existed in Poland in the late eighties. It forced people to hide the fact of emigration. This was done by neither reporting long term absence of a member of family during the Census nor registering migration with the administration. Discussions of the reasons of this behaviour have been offered by Okolski (1991) and Kupiszewski (1993).

### *3.2.2 Migration*

On the commune and municipality level only data on inflow and outflow from/to each commune was by sex available. After aggregation of the data into unemployment bands, density bands, distance bands and population size bands, the full matrices of flows for males and females between the bands was estimated using biproportional fitting technique. This allowed for the construction of the matrices of net migration between bands and calculation of the effectiveness of migration.

### *3.2.3 Births and deaths*

Data on births and deaths in 1994 have been provided by the Central Statistical Office. for communes and municipalities. They were used to construct Webb typology of population change for each commune and municipality.

### *3.2.4 Unemployment*

Data on unemployment expressed as a percentage of unemployed in the total labour force by commune and municipality in 1992 has been taken from the publication of the Central Statistical Office (GUS 1993) and recalculated to the 1994 administrative division of the country. As in the case of population an assumption was made that unemployment characteristics are homogeneous in each of communes.

## 3.3 Key indicators

In order to make findings for over 20 countries comparable it was necessary to use simple and easy to compute indicators which are meaningful virtually everywhere. The indicators used in this study are population density, unemployment and distance to the nearest urban centre.

### *3.3.1 Population density*

Population density indicates the intensity of human settlement. It was calculated in persons per square kilometer and constitutes an index which is probably the most comparable for all European countries. However, differences in spatial organisation

and above all differences in altitudes, land cover and morphology may have an impact on the comparability of population densities in various countries.

### *3.3.2 Unemployment*

Unemployment data by communes and municipalities in 1992 have been published by the Central Statistical Office (GUS 1993). They were recalculated to the administrative boundaries as in 1994 in the same way as the population was recalculated. The rate of unemployment is perceived as an indicator of the performance of local labour market. It may be even used as a crude indicator of the health of local economy. The direct comparability of unemployment rates between countries may easily lead to misunderstandings. Certainly unemployment in the very liberal, on European standards, United Kingdom economy means something different than unemployment in highly regulated economies of France or Poland which in turn will differ from unemployment in a planned communist-type economy of Bielarus.

### *3.3.3 Distance to the nearest urban centre*

The distance to the nearest urban centre may be interpreted as a crude measure of the accessibility to higher level services. The distances between communes and towns and cities were defined as the distance, measured in kilometers, between their centroids, that is their geometrical centres.

## 3.4 Mapping methods

Mapping methods have been described in Rees, Durham and Kupiszewski (1996). The rules set out there are used in this study.

# 4. SPATIAL PATTERNS

## 4.1 The pattern of population change: 1980-1990, 1984-1994 and 1990-1994

The spatial patterns of the changes of population of Poland over the period 1984-1994 and (see Figure 2 and Figure 3) are very similar to the pattern for the period 1980-1990 described in Kupiszewski (1992) (Figure 4) and is very similar to the ones presented in publications mentioned in section 2. Therefore sections 4 and 5 will be based to some extent on Kupiszewski (1992).

In one sentence one may say that in the last fifteen years the population redistribution in Poland consisted of two simultaneous phenomena: rural depopulation and urban concentration. However, both the process of urban growth and the process of rural decline vary depending on the size of town or commune and its geographical location. In certain cases we deal with urban decline rather than urban growth and rural growth rather than rural depopulation. A substantial part of rural Poland has been and still is growing - sometimes as an effect of the process of formation of urban agglomerations, sometimes because of high natural increase. There is also very clear change of the trend over time: in the mid eighties the rural urban migration was a quite profound phenomenon and the resulting depopulation was quite rapid. The mid nineties witnessed only a marginal outflow and in consequence the reduction of the rural depopulation. The geographical patterns of the change will be discussed below.

Both in the period 1980-1990 and 1984-1994 the majority of the territory on which rural depopulation occurred might be quite liberally delimited with a line drawn from Frombork to Opole, then along upper Vistula and San rivers and the state boundary. Inside the territory delineated above the depopulation process has a patchy pattern. It may be easier to identify territories which have been growing. Almost all such patches are located around large cities i.e. ring of communes around Warsaw, extending to the South-East as far as to Kozienice and Deblin with a kind of an appendix around Lukow and to the South of it. Similar, but much smaller rings are around Kielce and Radom, to the North and North-West from Lublin as well as in the Northern Poland: crescents between Olsztyn and Ruciane-Nida or around Ostroleka. It is clear, that these clusters either form urban

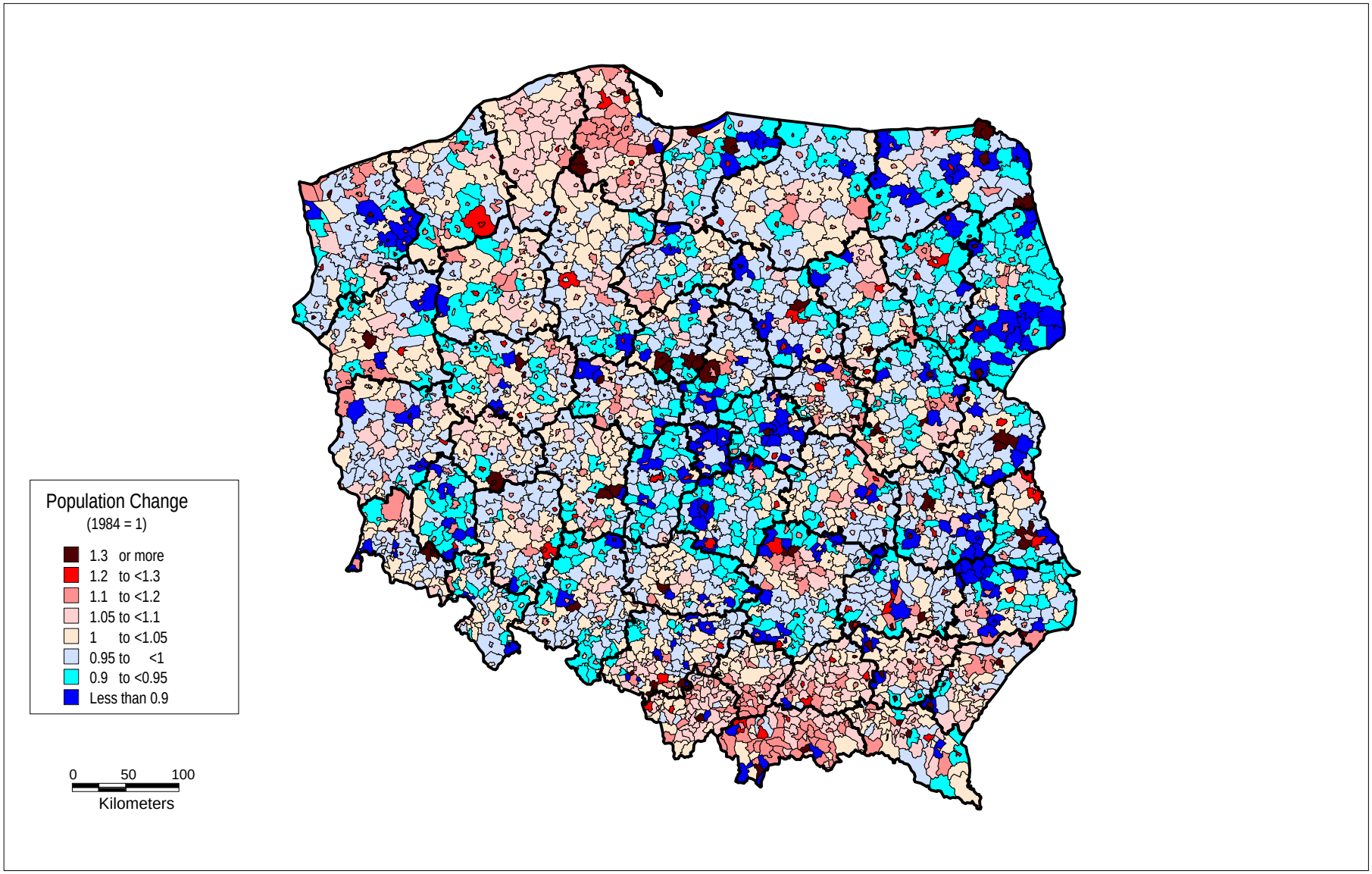
agglomerations in various stages of maturity or at least grow in the vicinity of medium size towns, often new (since the administrative reform in 1975) region capitals.

Both for the periods 1980-1990 and 1984-1994 the areas suffering the most from rural depopulation are located in Bialystok and Suwalki regions. Simultaneously, in these regions are located towns which experienced a very high growth (in some cases more than 30% over the decade 1980-1990): Bialystok, Bielsk Podlaski, Siemiatycze and Suwalki. Only the latter two of these towns maintained this speed of growth till 1994. As Dziewonski (1990, Figure 3.3) has shown these towns have grown on the expense of its rural hinterland. The extent of rural depopulation on the North-Eastern and Eastern boundaries of Poland is much larger than these two regions. In the period 1980-1990 all except 5 rural communes adjacent to the state boundary with the former USSR and located between Frombork on the shore of Zalew Wislany up to Wielkie Oczy in the South-East (Przemysl region) have lost population. Their number increased to 9 for the period 1984-1994. The term "Eastern Wall" has been coined, denoting the stagnating and depopulating East of Poland. On the regional level all regions which constitute the Eastern Wall were characterised by a negative migration balance of their rural population and positive (with the exception of Bialystok region) natural increase. Only in south-eastern regions of Przemysl and Krosno were migration losses of rural areas compensated with natural increase.

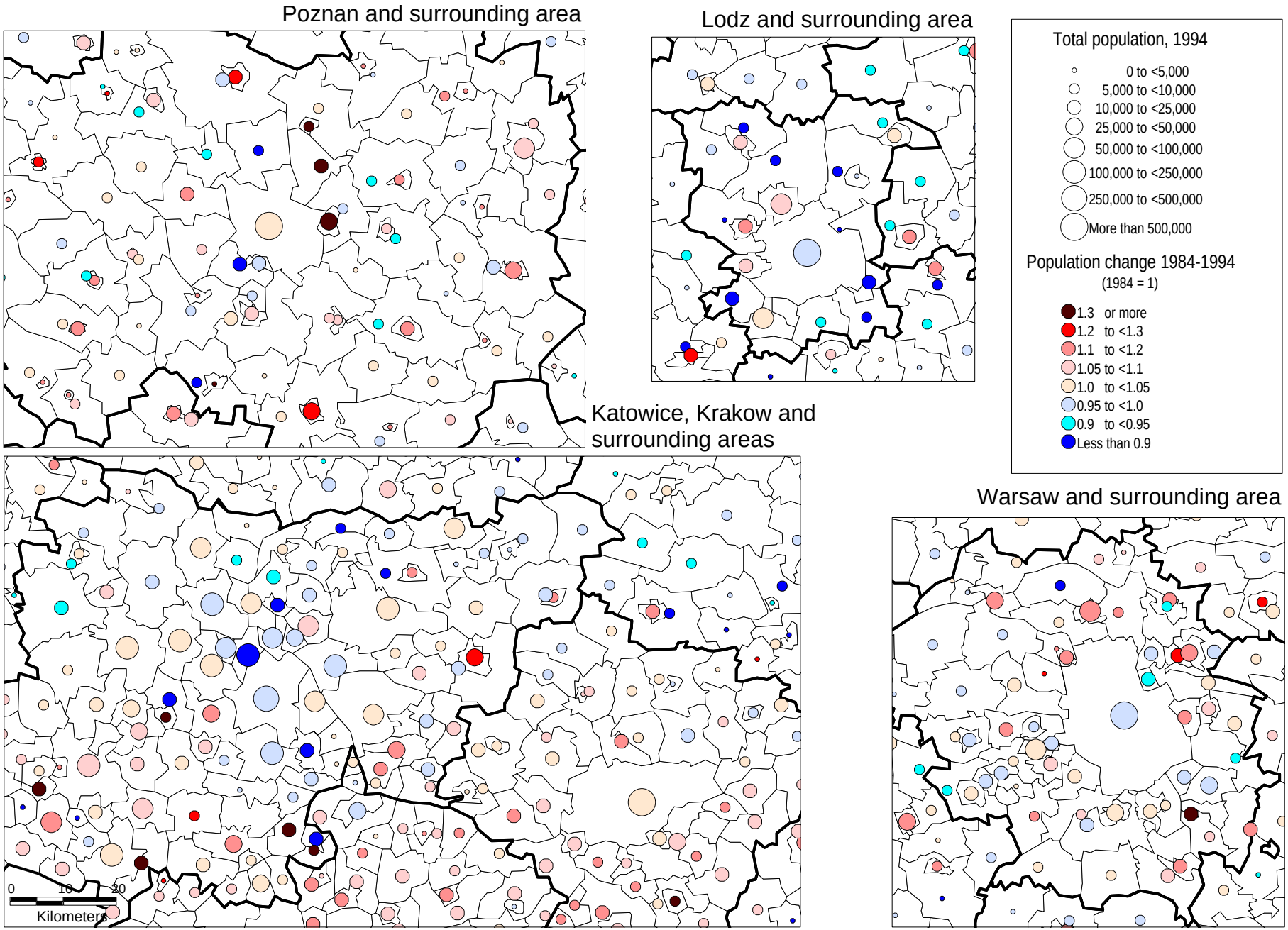
There is another significant cluster of communes loosing population in the Lodz region and in the ring of regions surrounding it. Lodz itself gained population over the period 1980-1990 whereas in the period 1984-1994 was a loser, mainly due to high natural losses and a migration balance close to zero. The Western part of Poland presents a mosaic of growing and declining communes. It is possible to identify depopulating areas in Gorzow Wielkopolski, Koszalin and northern part of Szczecin and Pila regions. Depopulation occurs also in the Lower Silesia in the Northern part of Legnica regions as well as to the South from Wroclaw and in the belt between Otmuchow and Kietrz.

There are also rural areas with a prominent growth of population. The most important two are located in the North of Poland in Pomorze Gdanskie, in particular in Pojezierze Kaszubskie (Gdansk region), but also in Slupsk and Elblag regions and in the South in Carpathian Mountains and at its foothills (roughly speaking in Bielsko-Biala, Nowy Sacz, Krakow, Tarnow and part of Krosno regions). These regions combine high fertility with either migration gains or moderate losses.

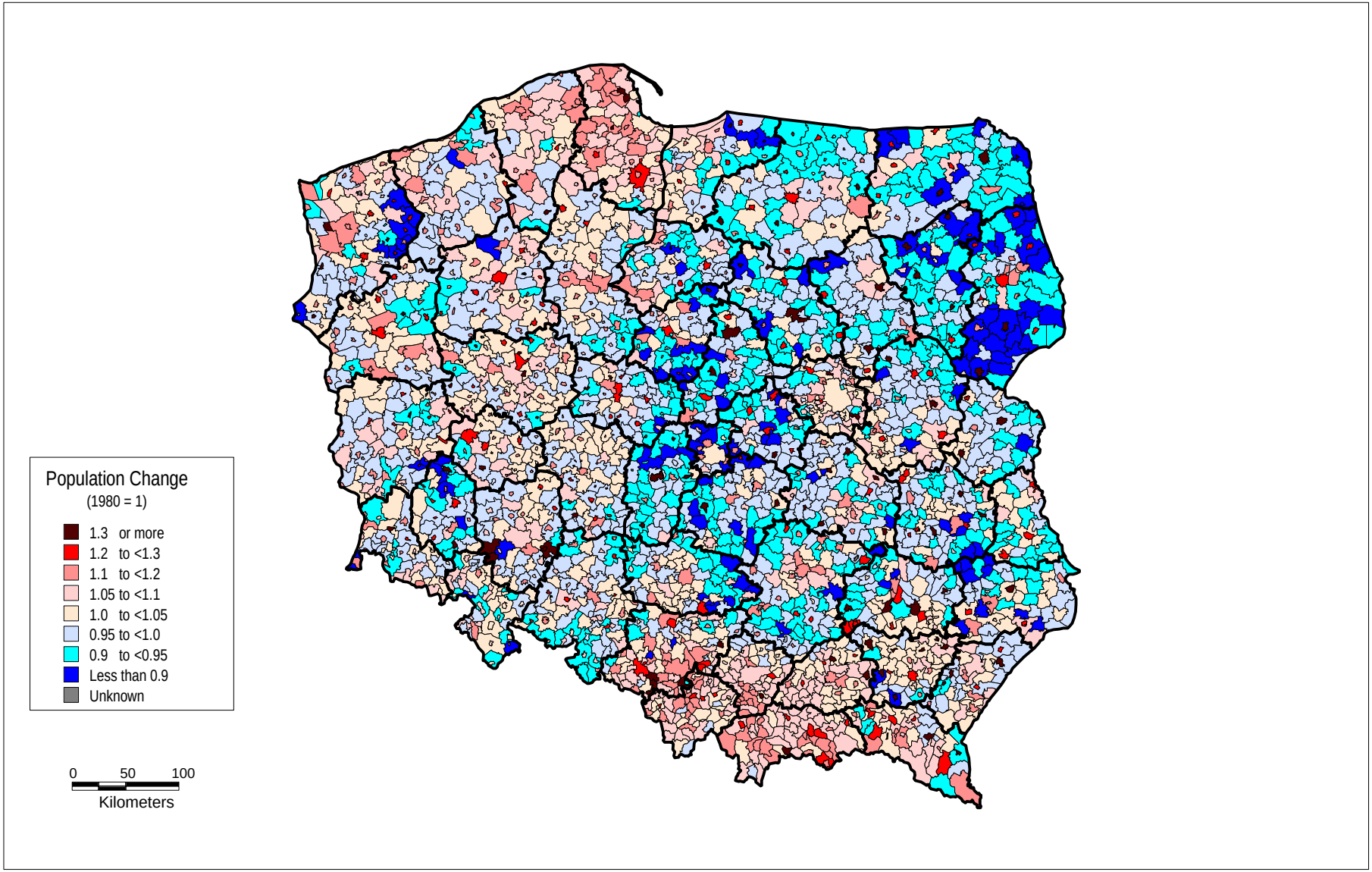
## Figure 2: Population change in Poland by communes and municipalities, 1984 - 1994



# Figure 3: Population change in major urban agglomerations, 1984-1994

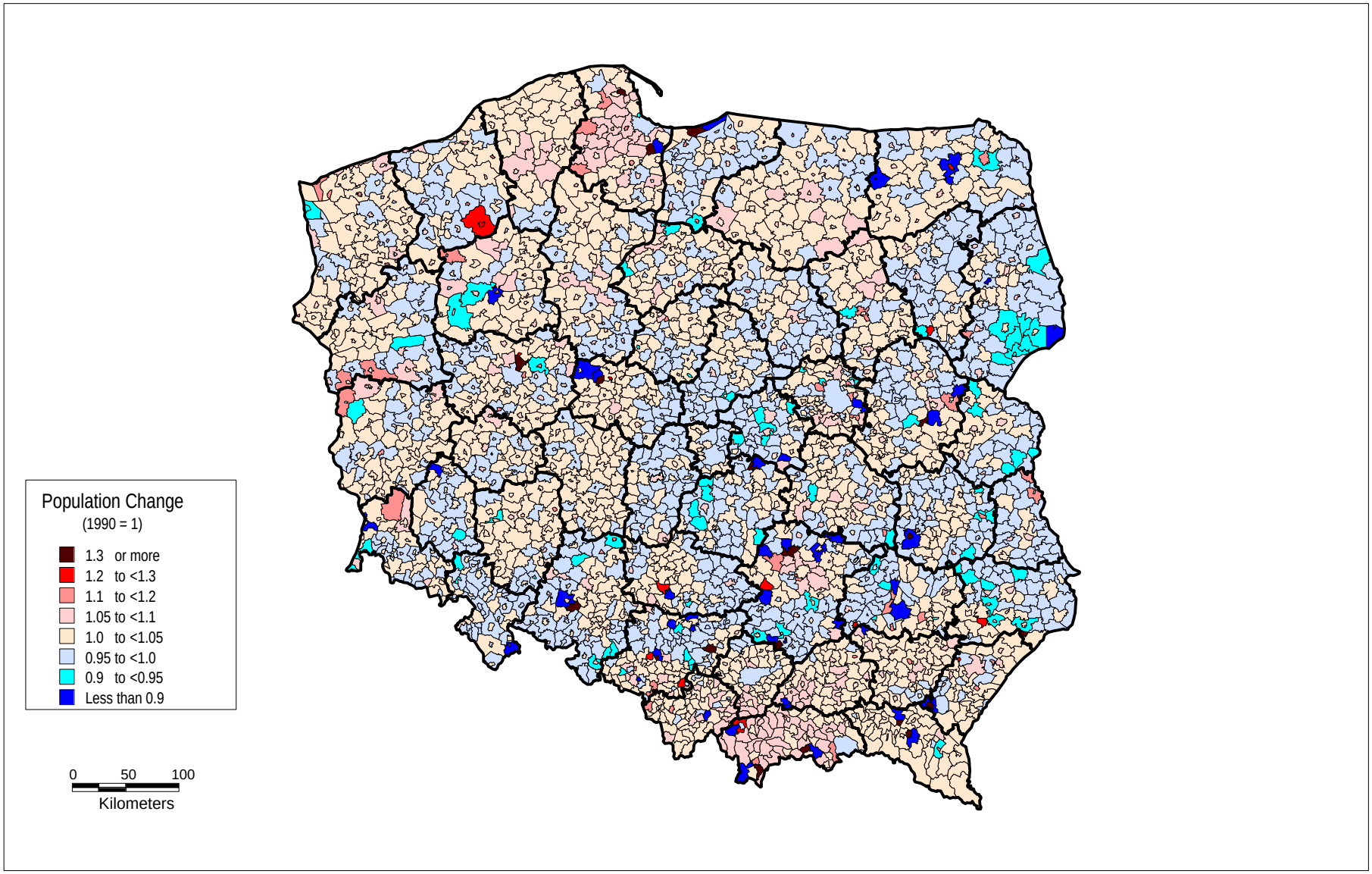


## Figure 4: Population change in Poland by communes and municipalities, 1980 - 1990

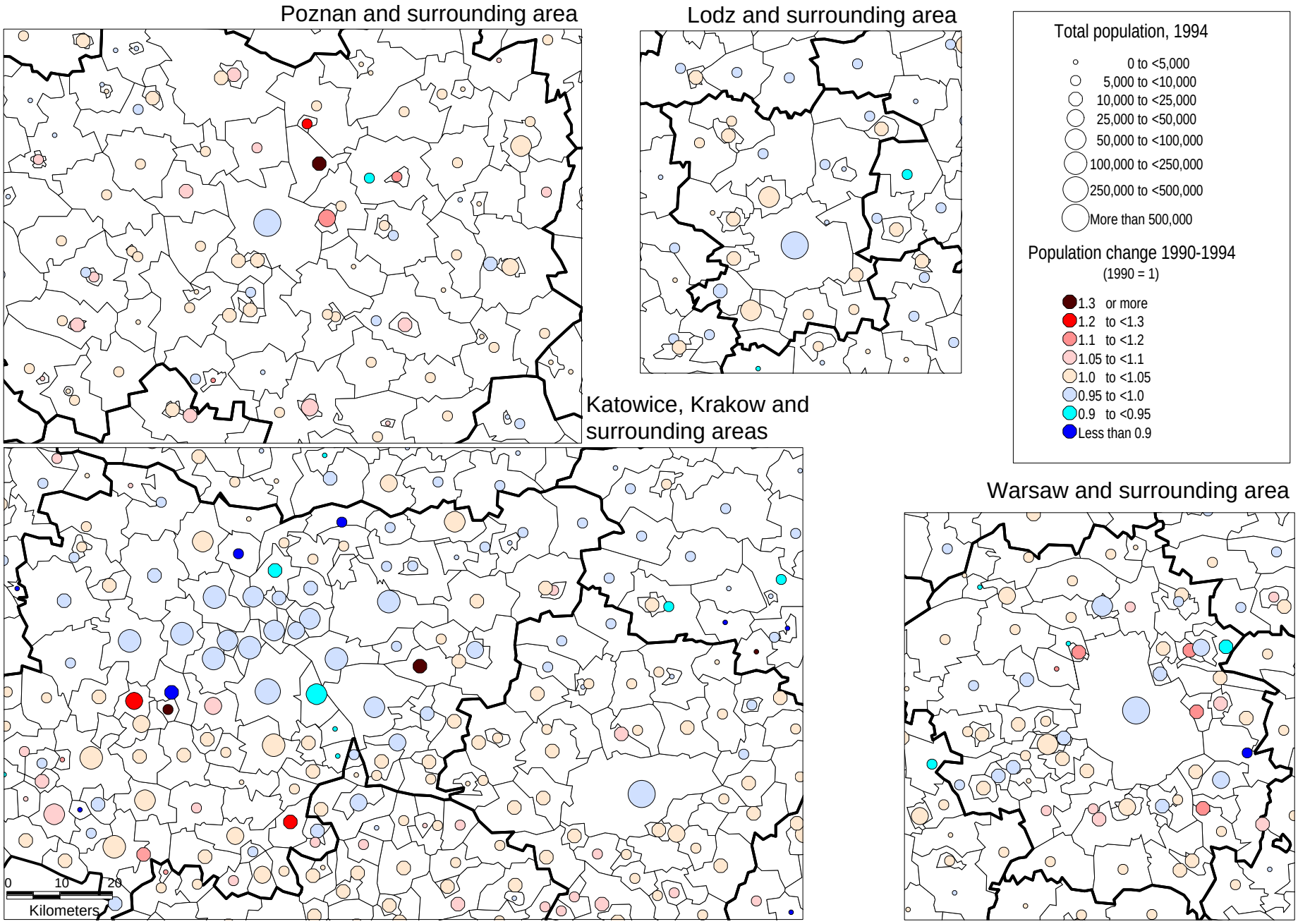


The differences between population change over two decades 1980-1990 and 1984-1994 suggest that in the period 1990-1994 there were some important changes in the pattern of population redistribution. This hypothesis is supported by the marked changes in overall migration. It is also interesting to check whether there is any impact and if yes, what is it, of the political and economic changes started by Balcerowicz after the fall of communism. To examine it, maps of population change between 1990 and 1994 were prepared (Figure 5 and Figure 6). The comparison will be made with the changes over the decade 1980-1990, that is the period of a rapid degradation of the planned economy in Poland. The first observation is that the number of units losing population reduced substantially from 1281 over the period 1980-1990 to 1061 over the period 1990-1994. The most marked changes occurred in Olsztyn and Suwalki regions in the North-East and in Piotrkow region in Central Poland. The number of communes loosing population in these regions in 1990-1994 reduced rapidly in comparison to 1980-1990. The maps of intensity of changes (not shown in this repport; calculated as population change ratio per year) also differ. In the eighties the changes were faster than in the nineties, even if their geographic distribution was similar. The slow down of population redistribution may be attributed to the more difficult economic situation of households in the nineties and the shrinking labour market. Large cities, which in the eighties were all gaining population turned into losers in the first half of the nineties. The increase of medium towns slowed down. The changes in the population redistribution may suggest that Poland evolves in the direction which many developed Western countries went in the seventies and eighties: parallel processes of urban concentration and suburbanisation. So far no trace of the counterurbanisation may be identified.

## Figure 5: Population change in Poland by communes and municipalities, 1990 - 1994



## Figure 6: Population change in major urban agglomerations, 1990-1994



### 4.2 The pattern of net internal migration in 1994

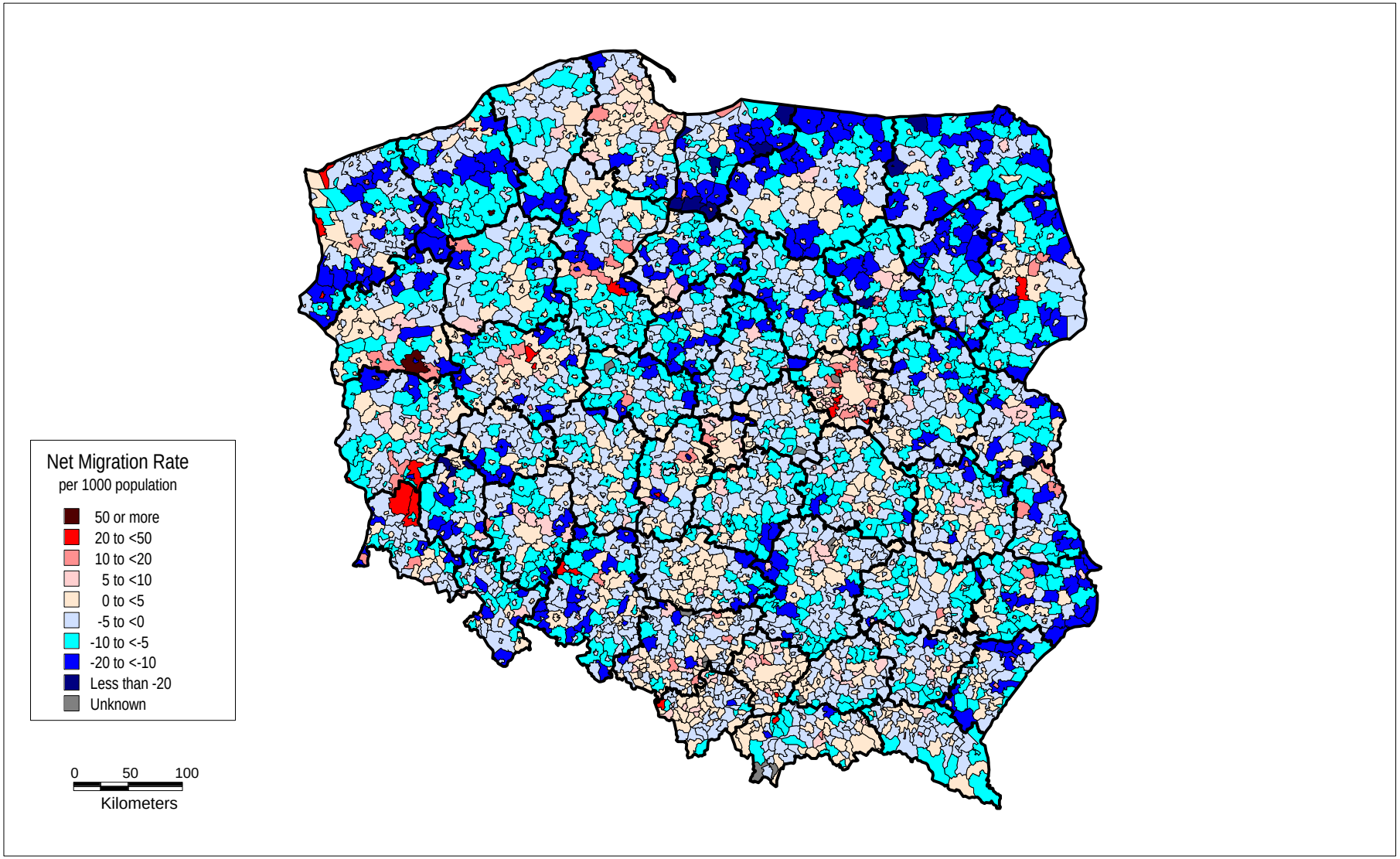
The interpretation of the net internal migration poses a lot of problems. For example positive net migration may be due to inflow of skilled and unskilled labour attracted by an investment project or due to inflow of opulent elderly attracted by mild climate and good amenities. The net migration resulted from both processes may be similar but their economic and social meaning very different. Classical economic equilibrium theories link migration gains or losses with the economic attractiveness of a region, often measured as the GDP per capita and unemployment rate. This interpretation, however weak, may be useful in the situation when mainly demographic information is available.

Figure 7 and Figure 8 show the pattern of net migration rate in Poland in 1994. Such a measure is quite volatile due to a short period of observation and general instability of migration. Its accuracy is high as no estimation was involved in the calculations.

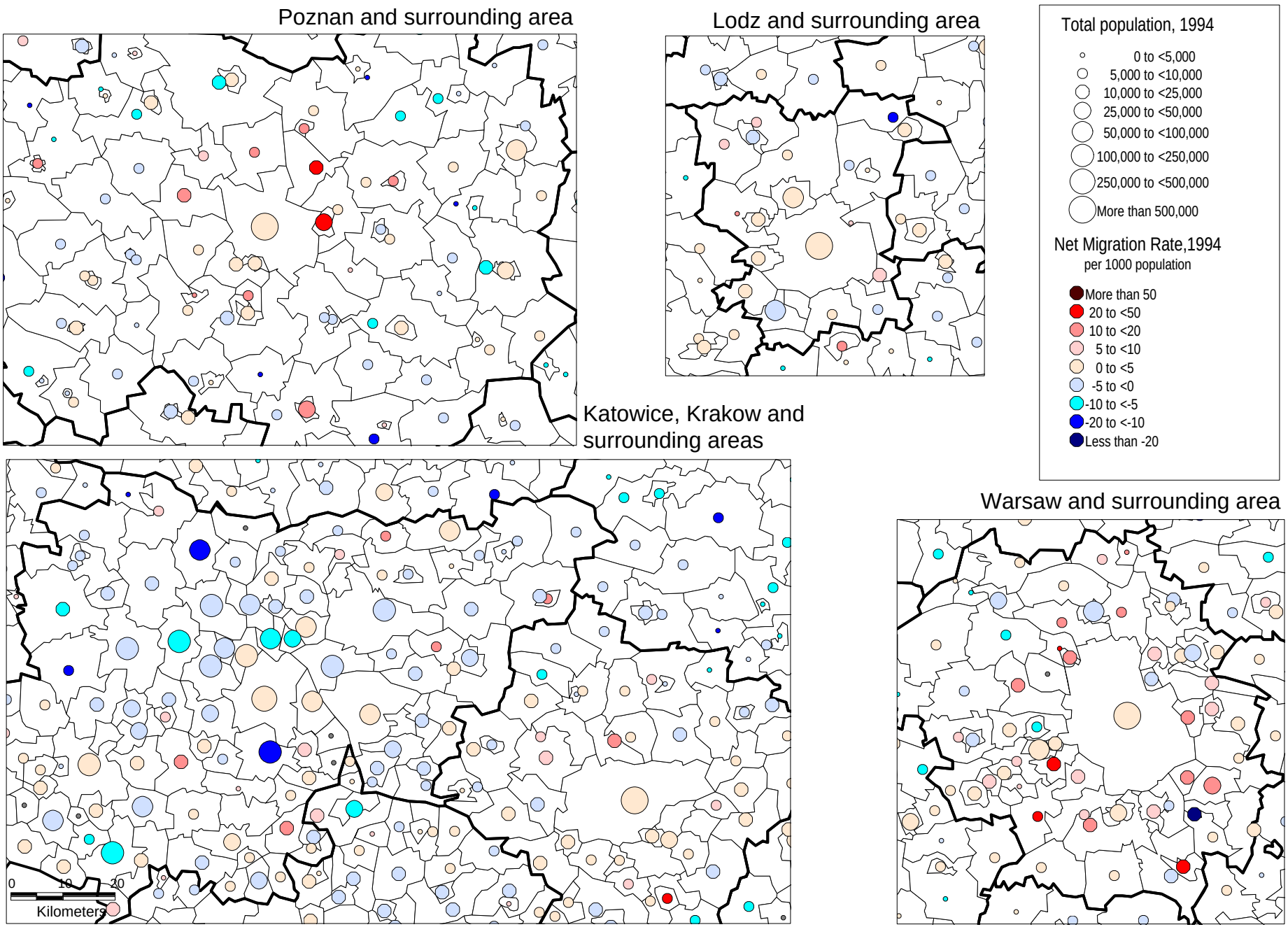
One third of communes and towns in Poland suffered migration losses below five persons per thousand population. Another third suffered from losses larger than that and the remaining communes gained population. Negative net migration dominates rural Poland. This is a pattern prevailing everywhere except Kaszuby and rural communes surrounding urban agglomerations. In the latter case the classifications of these communes as rural is often disputable: many of them serve as areas of outmigration from core cities and enjoy the infrastructure and functionality of smaller towns.

Large towns are all gainers. Medium size towns in most cases follow this pattern, with three classes of exceptions: new (after administrative reforms in 1975) regional capitals: Tarnow, Krosno, Piotrkow Trybunalski, Gorzow Wielkopolski, Radom and Koszalin; monofunctional industrial towns linked with the development of 'socialist investments', such as Pulawy, Kedzierzyn-Kozle (chemical industry), Stalowa Wola, Starachowice, Tychy (metal and automotive industry), Pabianice (textile industry); and towns linked with mining and heavy industries: Ruda Slaska, Swietochlowice, Jastrzebie Zdroj, Bytom, Piekary Siaskie, Raciborz, Dabrowa Gornicza in Upper Silesia as well as Walbrzych and Lubin. The latter two classes show that the governmental policy of subsidies randomly distributed to various gigantic socialist enterprises does not prevent population outflow.

**Figure 7: Net migration rate per 1000 population in Poland by communes and municipalities, 1994**



# Figure 8: Net migration rate per 1000 population in major urban agglomerations, 1994



If we accept the oversimplified interpretation that migration gains or losses demonstrates the economic well-being and quality of life of a places, we will have a picture of attractive Poland of large cities and suburban communes as well as of medium and small size towns and unattractive rural Poland and medium sized industrial towns.

### 4.3 The demographic sources of population change

The spatial redistribution of population presents integrated effects of natural increase and mobility in each commune. The interplay of these factors will be examined in detail based on 1994 data. A long term historical perspective can be found in Rakowski and Rakowska (1990).

A look at the rural population change in more global terms shows, that till the early 70's the migration losses had been compensated by natural increase. In 1970 for the first time the rural population reduced and the annual losses reached a peak in 1975 of 74.1 thousand but the negative migration balance stood in this year on 251.1 thousand. This decrease was therefore solely due to huge rural emigration in the Gierek era. The total losses of rural areas in the eighties was about 111 thousand. In fact, only between 1982 and 1985 has the rural population been growing. An evident speed up of the process of decrease started in 1986. It was predominantly due to decrease in fertility, as mobility was relatively stable on the lowest level since early seventies. The trend continued till 1992 when unexpectedly the rural population increased by 158 thousand. The check of .the population accounts shows that in this year 167 thousand of inhabitants of rural areas were not accounted for by demographic events (fertility, mortality and migration) and occurred either due to changes of administrative boundaries or due to some undocumented corrections introduced by the Central Statistical Office. It is therefore justified to state that we have witnessed a decade long decrease in rural population.

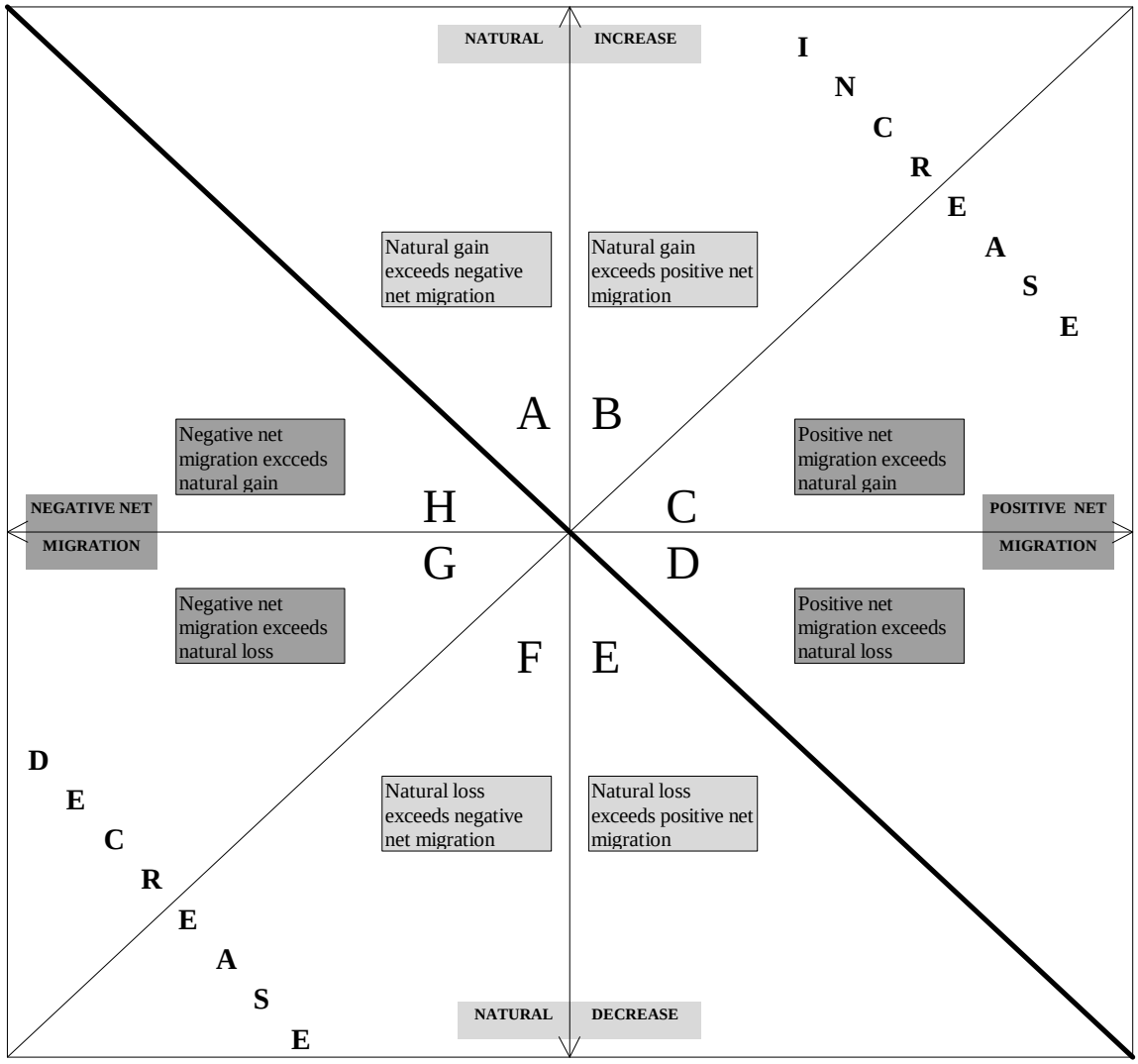
The pace of growth of urban population declined almost sixfold between 1980 and 1994. It was due to dramatic reduction of net migration and fertility and slight increase in mortality. In 1994 birth rate of urban population stood at 10.9 *pro mille*, death rate at 9.4 and internal migration gain at 1.6 *pro mille* totalling to a growth rate of a meagre 3.1 *pro mille*. After deduction of net international migration losses it was reduced to 2.4 *pro mille*.

An analysis of the interplay of natural growth and net migration on commune and municipality level has been conducted using Webb classification. This classification has been first proposed by John Webb (1963), an American geographer who invented it to study population change in England and Wales in the years 1921-1931. The very simple classification is based on relations between natural increase and net migration (see Figure 9). As both net migration and natural increase may be either positive or negative and resulting total increase may be either negative or positive, it is possible to create eight classes described in Table 1. One of the problems with Webb classification is that it does not cater for cases where net migration or natural increase equal to zero nor for cases where the absolute values of the two are equal. Hence a large number of unclassified units (see Table 1 and Figure 10).

The classification used allows for an immediate identification of the direction of population change, sign of net migration and natural growth and the leading force behind the population change. As Table 1 and Figure 10 demonstrate, majority of communes in Poland (60% of classified) grew in 1994. Of them 766 grew due to positive natural increase higher than negative net migration (type A). A vast majority of these communes is located in the North and North-West of Poland, inhabited by younger than average population, and in the South, which has traditionally high fertility.

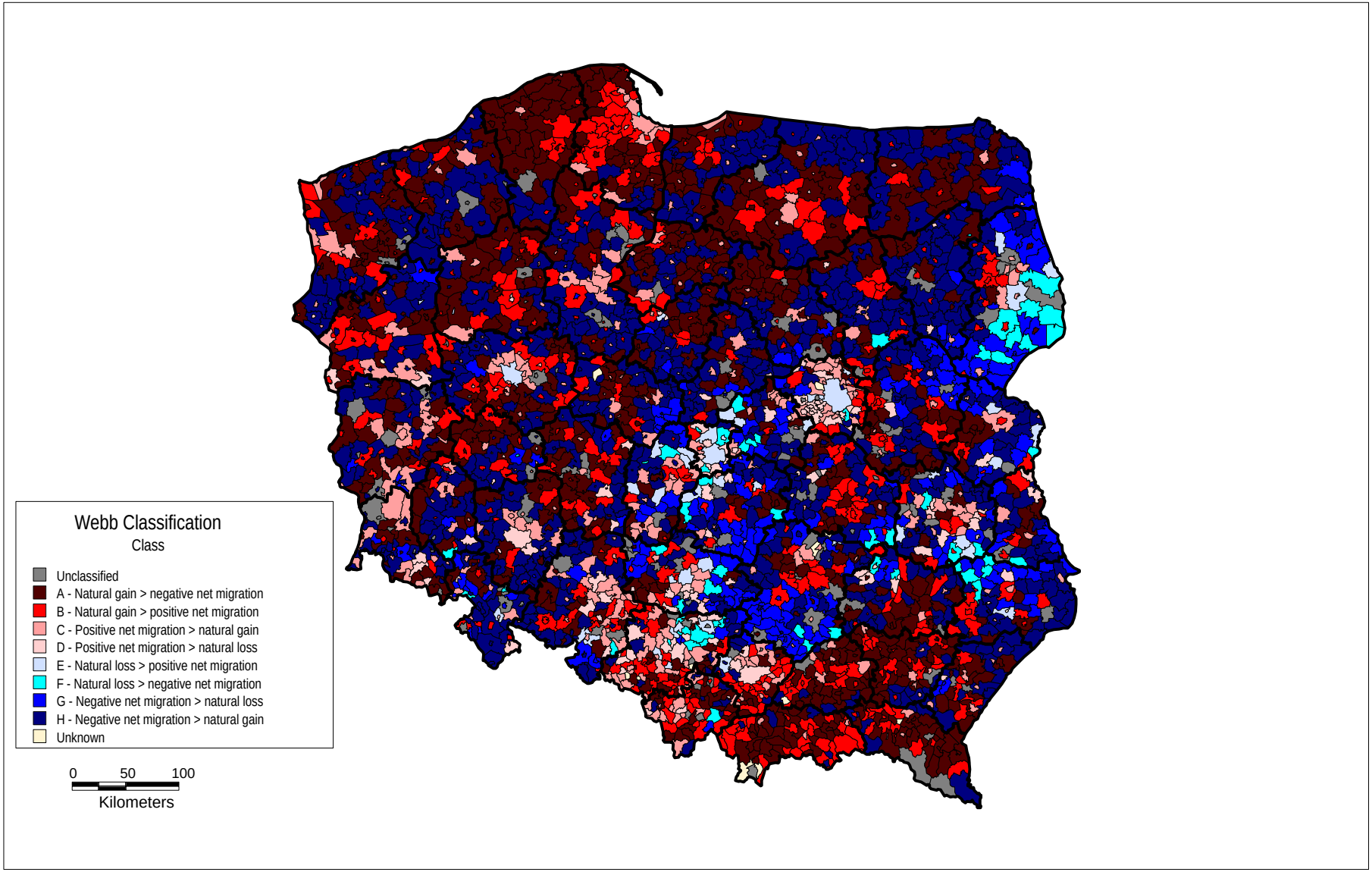
The communes which have positive both natural increase and net migration (types B and C), and therefore sound demographic growth are quite numerous (838 altogether). The former type of communes (B), dominated by natural growth are located in Kaszuby, Southern Poland, an what is interesting nearby large and medium size cities: they surround Kielce and form semi-circles East of Warsaw, East, South and West of Radom, South of Krakow, West of Bielsko-Biala and South-East of Poznan and East of Tarnow. This pattern may indicate a process of concentration of younger, procreative population around cities and may be linked with the economic activity and relative prosperity of this population allowing for both the investment in offspring and settlement in more favourable environmental conditions. This hypothesis should be tested in separate research. The latter type of communes (C), with the growth dominated by migration is characteristic for medium size cities, such as Gdansk, Gdynia, Torun, Bydgoszcz. Quite often they form crescents around large cities, such as Warsaw, Poznan, Lublin, Katowice.

# Figure 9: Webb Classification




Source: Adapted from Webb (1963)

## Figure 10: Webb classification of communes and municipalities in Poland, 1994



If one looks at the combined pattern of the spatial distribution of these two classes the most striking is that the communes encircled towns and cities of various sizes and located all over Poland, with notable exception of South-Western Poland.

Communes where positive net migration offset negative natural growth (type D) are located South from the line linking Poznan and Warsaw, and are often close to large cities as Warsaw, or are surrounding them, as in the case of Lodz.

The most frequent reason for loosing population was the negative net migration exceeding positive natural increase (class H, 816 units). To this class belong mainly rural communes located all over Poland except Pomorze Gdanskie and infrequent in Southern Poland.

Much more worrying are these communes where both components, net migration and natural growth are negative (type F and G). There are 428 communes belonging to either of these types. They are mainly rural, located in the former Russian partition (regions Bialostockie, Siedleckie, Piotrkowskie, Kieleckie, Czestochowskie). A cluster of towns in Upper Silesia (Swietochlowice, Siemianowice Slaskie, Czeladz, Wojciechowice, Dabrowa Gornicza, Sosnowiec, Slawkow, Ogrodzieniec, Pilica) fall into one of these classes, showing that environmental, economic and social problems translate directly into demographic problems.

Class E, to which belong units where negative natural increase exceeds positive net migration are not very numerous. It is interesting to note, that large cities and towns such as Warsaw, Poznan, Lodz, Czestochowa and Zgierz fall into this category.

The overall pattern of population change in 1994 shows that in comparison to the previous years the most alarming pattern - population decrease due to both negative natural increase and net migration is rapidly growing. There were 18 such communes in 1976, 103 in 1987 (Rakowski and Rakowska 1990) and since 1987 the number more than quadrupled. This rapid increase is not unexpected. It is a consequence of decades of rural depopulation and resulting from it, the distortion of age and sex structures: There is a deficit of females (see section 4.4) and an aged population (Gawryszewski 1989). A new phenomenon is the decrease of the population of large cities. It remains to be seen if this is a short lived fluctuation or a long term change of population distribution.

### 4.4 The impact of migration on the distortions of demographic structures

The sex structure of population is mainly the result of selectivity of the mobility of population. In general, female population is more mobile than male. In particular, this is true when we examine the migration patterns of the rural population in Poland. There have been a long lasting, strong outflow of female population from rural areas (Gawryszewski 1989). It has reduced in the nineties. In 1994 the difference between outmigration of males and females reduced to bare 1 per thousand. Most rural areas experienced below national average (which stood at 51.3% in 1994) share of females (see Figure 11). Gawryszewski (1989, Table 3) demonstrates that depopulating rural regions have less females per 100 males than regions which do not suffer from depopulation. In Northern and North Eastern Poland this imbalance is particularly strong. The area suffering the most from the lack of women are in the Gdansk, Slupsk, Koszalin Szczecin, Suwalki, Bialystok, Lomza, Ostroleka, Ciechanow, Olsztyn and Elblag regions with the share of female under 49% in many rural communes. Quite severe distortion of the sex structure is observed in the South in mountainous communes of the Krosno and Nowy Sacz regions.

Female population concentrates in towns and cities. In fact it is very unusual to have more males than females in a town and it does not happen in cities. Even areas dominated by mining and heavy industries are female-dominated, as are large agglomerations of Warsaw, Lodz, Poznan, Krakow and Wroclaw.

As the migration process is highly age sensitive it is interesting to examine if there is any particular disproportion in sex structures in specific age groups. This must be done on regional level as data on the age structure of population on commune level is not available. Two clusters of regions which demonstrate particularly strong depopulation patterns have been selected: North -Eastern (regions: Bialystok, Ciechanow, Elblag, Lomza and Suwalki) and Central Poland (regions surrounding Lodz regions, Lodz region itself and Piotrkow, Plock, Sieradz and Skierniewice). Age groups 20-34 and 65+ are examined (see Table 2). To avoid unusual differences in the proportion of males and females all values were standardised to the average value for Poland (right panel of the table). The female to male ratio for all ages, shown on Figure 11, does not reveals all truth. If we inspect sex structures in the age groups which are the most important from the point of view of marriages and procreation, i.e. between 20 and 34 years the picture would be much more serious. In all North - Eastern regions there are fewer that 85 women aged 20-34 per 100

men at the same age. In Bialystok, Lomza and Suwalki regions this translates to less than 90 percent of value for rural Poland. Somewhat surprisingly this distortion of sex structure extends to the old age group.

In the other cluster, centred on Lodz, it is difficult to identify any substantial distortion of sex structure. In Lodz and Plock regions the number of females per 100 males expressed as a percentage of the value for rural Poland exceeds 100% in the 20-34 age group. In Piotrkow and Sieradz regions the deficit of females is clearly visible. Apparently in this area the process of depopulation does not have that strong impact on sex and age structures. This may be due to a different degree of "ruralisation" of rural areas, accessibility to facilities and cultural factors.

Obviously the distortion of the balance of the sex structure has not only demographic, but much more important social and economic dimensions. It hampers the process of formation of families due to a lack of suitable female candidates for marriage. As the agriculture predominantly relies on family-run farms with traditional division of tasks between male and female members of family it also causes various fundamental problems in running farms. Leopold and Manteuffel (1982, p. 72) noted that on the average 17% farmers remain single, the value going in purely agricultural areas to as high as 30%.

**Figure 11: Sex structure of population by communes and municipalities in Poland, 1994**

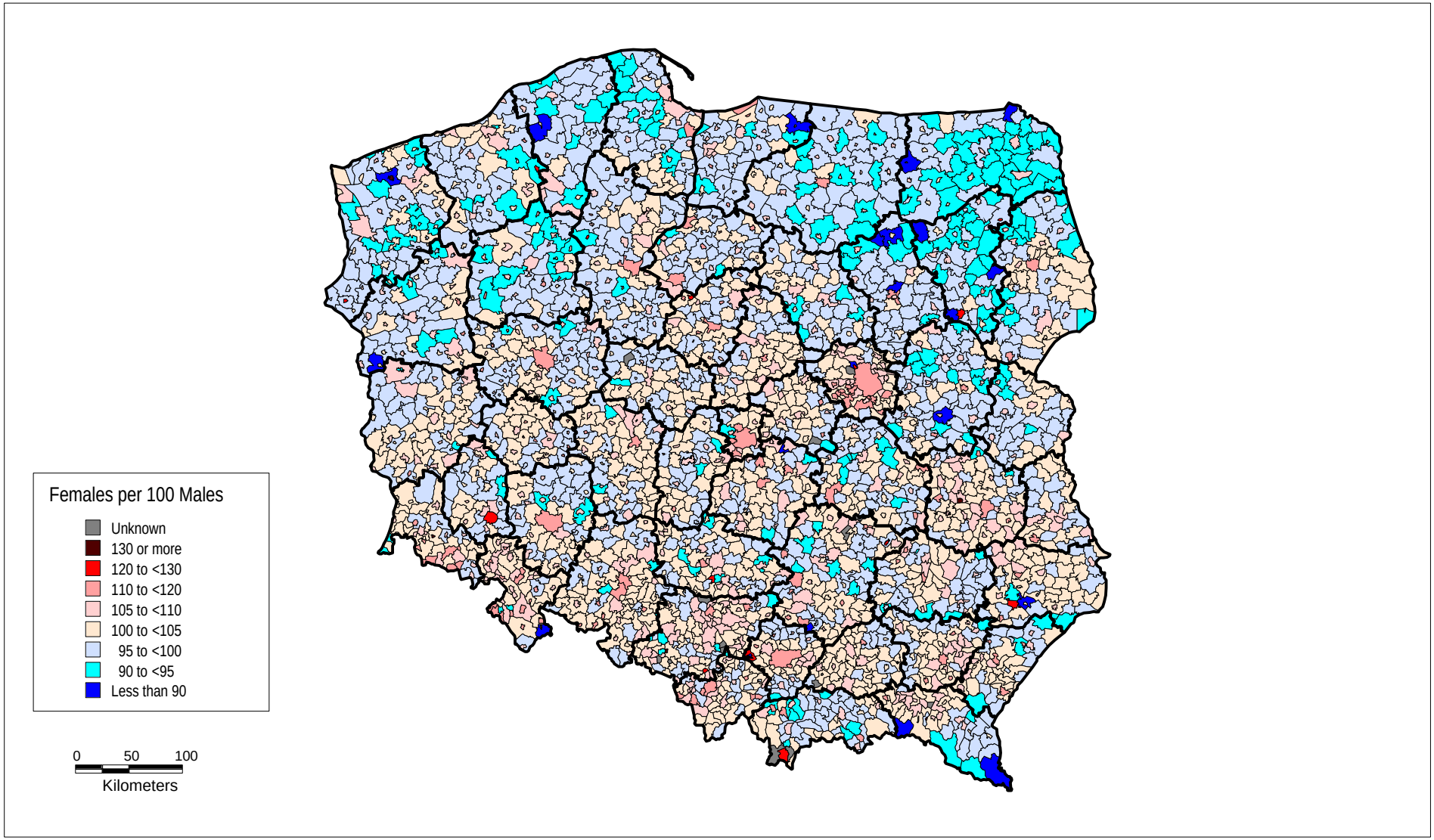


**Table 2: Age structure of rural population in selected regions, Poland 1994**

| Region | Age 20-24 | 25-29 | 30-34 | Total 20-34 | 65-69 | 70+ | Total 65+ |
|---|---|---|---|---|---|---|---|
| | | | | Females per 100 males | | | |
| North-East | | | | | | | |
| Bialystok | 84 | 71 | 77 | 77 | 131 | 152 | 144 |
| Ciechanow | 89 | 82 | 82 | 84 | 135 | 165 | 153 |
| Elblag | 86 | 84 | 82 | 84 | 146 | 173 | 161 |
| Lomza | 85 | 71 | 77 | 78 | 125 | 152 | 142 |
| Suwalki | 82 | 74 | 80 | 79 | 129 | 157 | 145 |
| Central | | | | | | | |
| Lodz | 94 | 94 | 90 | 93 | 122 | 159 | 144 |
| Piortkow | 88 | 83 | 81 | 84 | 133 | 166 | 154 |
| Plock | 91 | 89 | 88 | 89 | 130 | 170 | 155 |
| Sieradz | 88 | 87 | 81 | 85 | 128 | 164 | 151 |
| Skierniewice | 92 | 88 | 84 | 88 | 130 | 160 | 148 |
| Poland | 91 | 87 | 86 | 88 | 136 | 171 | 157 |
| | | | | Females per 100 males in per cent of the value for Poland | | | |
| North-East | | | | | | | |
| Bialystok | 91.9 | 81 | 89.3 | 87.6 | 96.4 | 89.3 | 92 |
| Ciechanow | 97.2 | 93.7 | 95.3 | 95.6 | 98.9 | 96.6 | 97.4 |
| Elblag | 94.8 | 96.7 | 94.9 | 95.4 | 107.6 | 101.4 | 102.8 |
| Lomza | 92.9 | 81.9 | 89.3 | 88.4 | 91.7 | 89.3 | 90.4 |
| Suwalki | 89.7 | 85.5 | 92.9 | 89.5 | 95 | 92.1 | 92.6 |
| Central | | | | | | | |
| Lodz | 102.8 | 108.4 | 105 | 105.2 | 89.3 | 93.1 | 91.8 |
| Piortkow | 96.3 | 95.1 | 93.9 | 95.2 | 97.8 | 97.5 | 98.1 |
| Plock | 99.5 | 102 | 101.7 | 101 | 95.7 | 99.8 | 98.6 |
| Sieradz | 96.3 | 100 | 94.5 | 97 | 94.3 | 96.1 | 96.3 |
| Skierniewice | 100.6 | 101.3 | 97.3 | 99.7 | 95.6 | 93.7 | 94.5 |
| Poland | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Source: Computed from the data from GUS 1995

**Table 3: Population growth of towns and cities by size class**

| Size class | Population growth over the period (%) 1980 -1990 | 1984 -1990 | 1984 -1994 | 1990 -1994 |
|---|---|---|---|---|
| 500 000+ | 5 | 1 | 0 | -1 |
| 250 000 - 500 000 | 9 | 5 | 5 | 1 |
| 100 000 - 250 000 | 12 | 4 | 5 | 1 |
| 50 000 - 100 000 | 19 | 9 | 12 | 3 |
| 50 000 -25 000 | 18 | 8 | 12 | 3 |
| 25 000-10 000 | 19 | 8 | 13 | 4 |
| 10 000 - 5 000 | 14 | 8 | 12 | 4 |
| Under 5 000 | 10 | 7 | 10 | 3 |
| All cities and towns | 13 | 6 | 7 | 2 |

Source: Computed from the data provided by the Central Statistical Office.

Note: for the period 1980-1990 the growth rates were calculated based on sizes of urban units as in 1990, for other periods based on sizes of urban units as in 1994

# 5. RELATIONSHIP TO THE URBAN SYSTEM

## 5.1 Gaining and losing urban systems

As was mentioned above the vast majority of the growth of population has occurred in urban territories. Increase in the urban population over the period 1946-1994 was on average 310 thousand per year (calculated as a difference between end of year and start of year population to accommodate changes in administrative status of localities as well as changes of administrative boundaries). In 1975 it peaked at 543 thousand but from 1991 it stood below 150 thousand per year with the increase in 1994 by a meagre 60 thousand. This is partially due to a marked slow down in the increase of total population of Poland, partly due to marginalisation of the significance of migration gains in recent years. Jerczynski and Gawryszewski (1984) and Jerczynski (1990) noticed that this growth has not been distributed uniformly among all categories of cities and towns.

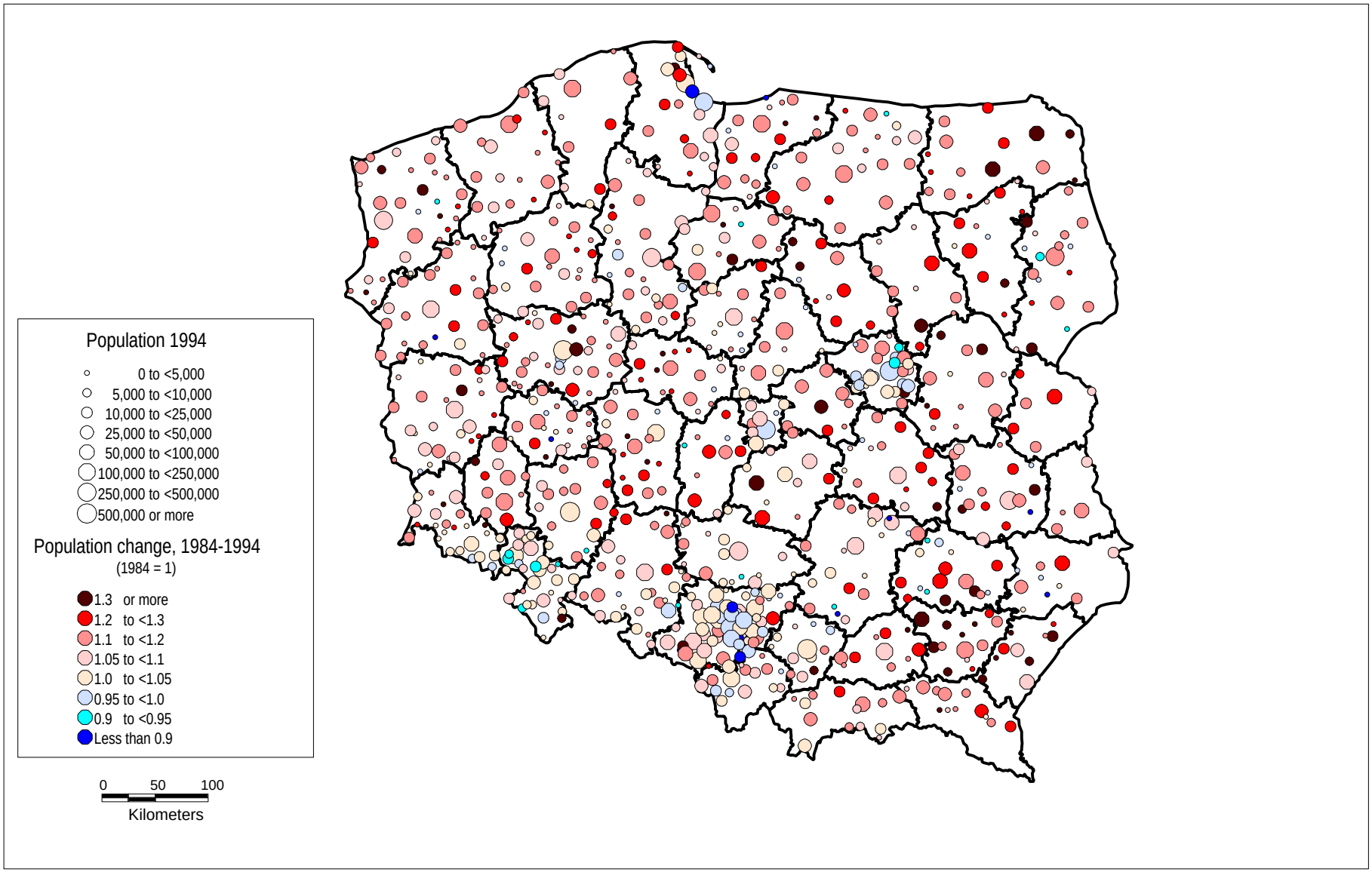
Table 3 shows the growth of towns and cities by size in the following categories: under 5000, 5000-10000, 10000-25000, 25000-50000, 50000-100000, 100000-250000, 250000-500000 and over 500000 inhabitants over periods 1980-1990, 1984-1994 and 1990-1994. The changes for 1984-1994 and 1990-1994 are mapped Figure 12 and Figure 13.

The pace of the growth of the largest cities (over 500 000) is the slowest. In a longer perspective of 10 years from 1980 till 1990 all large cities show growth. However, some of them, such as Lodz (since 1988) and Katowice (since 1987) have been losing population. In the period 1984-1994 all cities over 500 thousand showed slower population increase, comparing to their position in 1980-1990. Lodz and Warsaw marginally lost population over this period. The last four years of the analysis brought further changes as Warsaw and Poznan started to lose population. Wroclaw is the only large city whose population was growing in the mid nineties.

The second and third categories - cities with populations between 100 000 and 500 000 - show a similar pattern: almost all of them noted a lower growth rate over the period 1984-1994 than over the period 1980-1990. Gdansk, Katowice, Sosnowiec, Bielsko Biala, Kielce, Tarnow, Walbrzych and a host of smaller towns have been losing population at some time after 1990, which resulted in a growth of 1% in the last period of the analysis.

Towns in the brackets between 10 000 and 100 000, which all grew in the eighties at almost 2% per year more than halved their growth rate in the first half of the nineties. It is symptomatic that the towns from 5 000 to 25 000 are the fastest growing categories in the nineties. The distribution of the overall growth of Poland broken down by type and size of localities ( Table 4) shows that the majority of population growth over the period 1984-1994 - as much as 61% - was intercepted by towns between 10 and 100 thousand population. The share of population of these towns in total population is only 26%. Largest cities' share of growth is marginal.

# Figure 12: Population growth of Polish towns and cities by size, 1984 - 1994



# Figure 13: Population growth of Polish towns and cities by size, 1990 - 1994

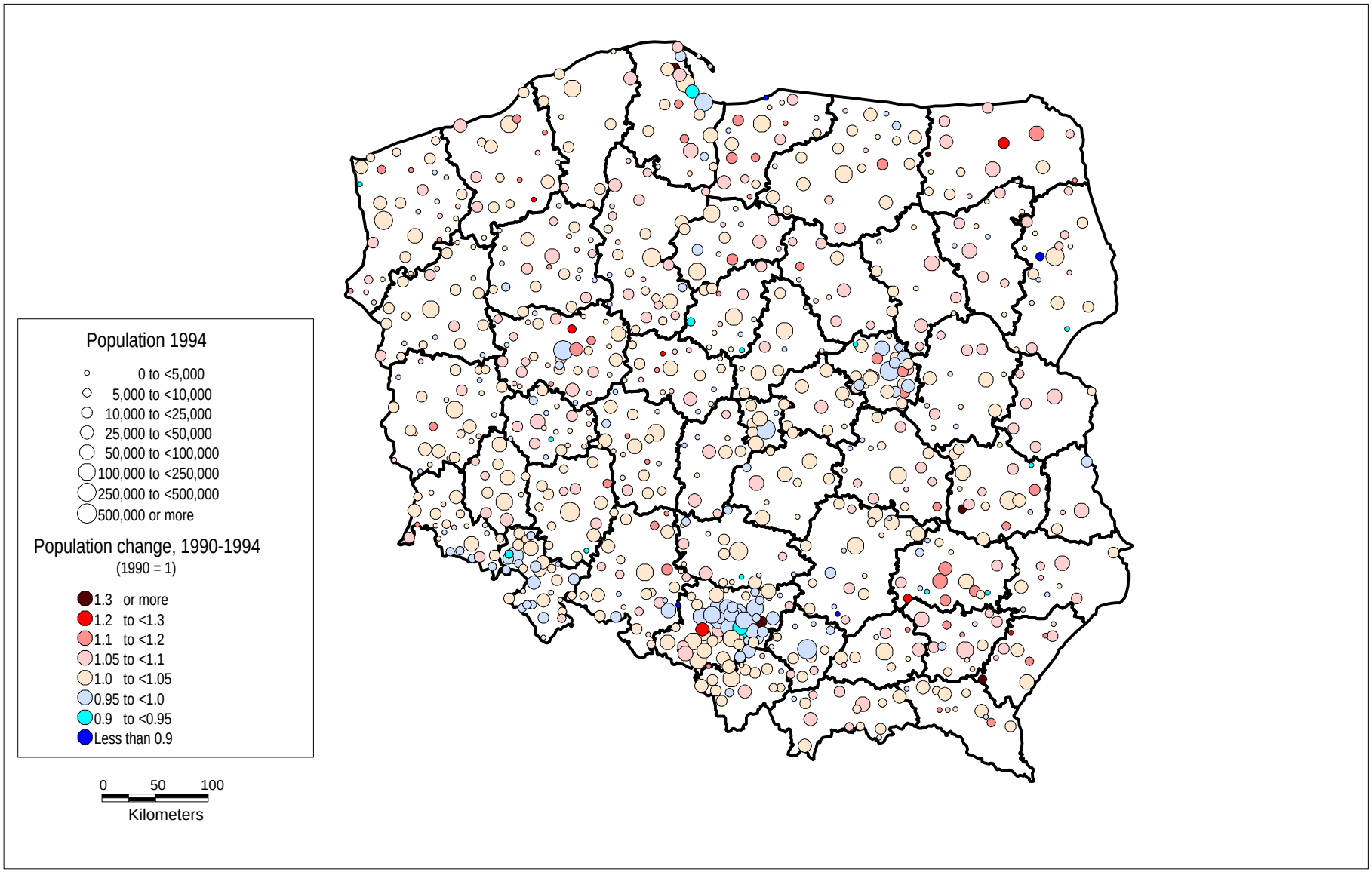


**Table 4: Distribution of population growth 1984-1994 and net migration in 1994 by type (rural vs. urban) and urban size classes, Poland**

| | Distribution of population growth over the period 1984-1994 in per cent | Net migration rate per 1000 population in 1994 |
|---|---|---|
| Rural | 7.9 | -2.65 |
| Urban; <5 000 | 4.8 | 1.44 |
| Urban; 5 - 10 000 | 8.0 | 2.40 |
| Urban; 10 - 25 000 | 24.6 | 1.37 |
| Urban; 25 - 50 000 | 17.2 | 1.29 |
| Urban; 50 - 100 000 | 19.6 | 1.51 |
| Urban; 100 - 250 000 | 11.0 | 1.25 |
| Urban; 250 - 500 000 | 6.7 | 2.28 |
| Urban; over 500 000 | 0.1 | 1.98 |
| Poland | 100.0 | 0.00 |

Source: Computed from the data provided by the Central Statistical Office.

The net migration and migration effectiveness for the flows between rural areas and various urban size bands are shown in Table 5. The table shows that generally the population moves up the hierarchy. Such consistent pattern exists for migration between bands limited by 10 000 and 250 000 thresholds. Cities in the 5 to 10 000 band turned out to be very attractive, gaining population from all larger bands except 250 - 500 000 band. The largest cities, over 500 000 are loosing population to all urban bands. This is mainly due to the loses of male population which in some bands (less than 5000, 10 - 50 000) is compensated by gains of female population. These loses are offset by gains from rural areas. Not surprisingly, the rural areas band lost population to all urban areas bands, loses of female population exceeding those of male population starting from band size between 10 and 25 thousand population. The effectiveness of migration between the rural and all urban bands is high, in most cases over 15%, higher for females than for males. There are some differences in the behaviour of male and female populations, the latter demonstrating in general more propensity to migrate to the largest cities. Smallest towns (less than 5000) are also loosing population to larger towns, but the loses are minimal.

**Table 5: Net migration and migration effectiveness ratios in 1994 for males and females by type (rural vs. urban) and urban size classes, Poland.**

| Origin by type and size of unit | Destination by type and size of unit | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Rural | Urban; <5 | Urban; 5 - 10 | Urban; 10 - 25 | Urban; 25 - 50 | Urban; 50 - 100 | Urban; 100 - 250 | Urban; 250 - 500 | Urban; over 500 |
| | | | | | males | | | | |
| Rural | | *15* | *19* | *14* | *15* | *17* | *16* | *22* | *13* |
| Urban; <5 | -709 | | *4* | *0* | *1* | *2* | *2* | *7* | *2* |
| Urban; 5 - 10 | -1358 | -19 | | *4* | *4* | *2* | *3* | *3* | *6* |
| Urban; 10 - 25 | -2572 | 2 | 74 | | *1* | *3* | *2* | *7* | *2* |
| Urban; 25 - 50 | -2067 | -5 | 47 | -24 | | *2* | *1* | *7* | *3* |
| Urban; 50 - 100 | -2182 | -19 | 23 | -77 | -41 | | *1* | *5* | *4* |
| Urban; 100 - 250 | -2473 | -15 | 38 | -63 | -27 | 20 | | *6* | *4* |
| Urban; 250 - 500 | -2020 | -42 | -26 | -159 | -109 | -75 | -104 | | *9* |
| Urban; over 500 | -4337 | 44 | 201 | 143 | 156 | 251 | 244 | 381 | |
| Total | -17716 | 655 | 1735 | 2315 | 2027 | 2492 | 2660 | 2916 | 2916 |
| | | | | | females | | | | |
| Rural | | *15* | *18* | *16* | *16* | *18* | *17* | *23* | *16* |
| Urban; <5 | -741 | | *3* | *1* | *1* | *3* | *3* | *9* | *2* |
| Urban; 5 - 10 | -1330 | -14 | | *2* | *2* | *0* | *0* | *6* | *1* |
| Urban; 10 - 25 | -3028 | -17 | 28 | | *0* | *2* | *1* | *8* | *0* |
| Urban; 25 - 50 | -2270 | -10 | 26 | 12 | | *2* | *2* | *8* | *1* |
| Urban; 50 - 100 | -2421 | -28 | -4 | -61 | -55 | | *1* | *6* | *2* |
| Urban; 100 - 250 | -2794 | -28 | 4 | -49 | -48 | 17 | | *6* | *1* |
| Urban; 250 - 500 | -2376 | -57 | -56 | -178 | -143 | -95 | -126 | | *7* |
| Urban; over 500 | -6326 | -43 | 44 | -33 | -49 | 101 | 72 | 346 | |
| Total | -21288 | 544 | 1386 | 2709 | 1947 | 2594 | 2842 | 3377 | 5889 |

Source: computed from the data provided by the Central Statistical Office.
Notes: Urban bands size are in thousands. Net migrant numbers are displayed below the diagonal in each table. Effectiveness = absolute value of net migration divided by gross migration and expressed as a percentage.

If we consider net migration within the urban subsystem only, the pattern of gains of medium to large size towns (50 to 500 thousand) and 5 to 10 000 on the expense of small to medium size towns (less than 5000 and 10 to 50 000 bands) as well as largest towns (over 500 000) is visible. The effectiveness of migration within urban subsystem is generally low, in most cases below 4%. Only the exchange with the two bands encompassing the cities in the 250 -500 000 band have effectiveness over 5%.

This general pattern may be interpreted as a result of high attractiveness of medium and large cities, which offer a wide range of facilities, higher level services and acceptable environmental conditions. Small cities cannot provide the range of services attractive for migrants whereas the largest cities suffer from high prices, traffic congestion, overcrowding and poor environment all of which deter migrants. Towns within the 5 to 10 000 band are quite interesting as they break a general pattern of the flows up the hierarchy. At this stage we are unable to offer any explanation of this phenomenon. Difficult economic conditions of the recent years have blocked much more the growth of the largest towns, than those of the medium to large sized and selected small sized ones. They have substantially reduced, but not totally blocked rural exodus. Some attention should be devoted to the differences in male and female migration patterns. The female pattern is more aggressive, showing that ladies are more determined to move upwards the settlement hierarchy, towards better amenities.

### 5.2 Deconcentration within urban regions

There are some indications of the deconcentration of population in the largest urban agglomerations. This process will be discussed using the example of the capital city of Warsaw. Both in the period 1980-1990 and 1984-1994, communes and cities surrounding Warsaw were gaining population. This deconcentration has accelerated in the early nineties. The acceleration has been manifested by the fact that all communes surrounding Warsaw either remained in the period 1984-1994 in the same category of population growth as they were in the period 1980-1990 or moved to a higher category. Simultaneously Warsaw which in the earlier period had been gaining population, in the later period has been losing it.

A snapshot perspective could be offered based on 1994 data. Out of 19 communes and municipalities bordering Warsaw only two have a negative migration balance. At the same time Warszawa-Centrum, the core of the capital has been loosing population. At the intra-city level the process of deconcentration can be corroborated as none of the boroughs constituting the outer ring (not belonging to the core) of the city noted any migration losses.

This statistical pattern suggests that in Warsaw a suburbanization has started similar to the one which in Western Europe occurred earlier in the century. Certainly this process has been accelerated by the economic and social changes: the introduction of the free market economy and relative economic prosperity of Poland in 1993-1994 has contributed to the creation of an embryonic middle class with incomes comparable to the incomes of middle class in Western Europe and similar aspirations and consumption patterns. This in turn increased demand for high quality housing in decent environmental conditions. This demand in turn was met by numerous developers who constructed housing estates either on the outer ring of Warsaw or in the neighbouring communes and municipalities. The future of this process, in particular its geographic extent will depend, apart from economic situation, on the development of a decent transportation system in the Warsaw region.

## 6. RELATION TO THE DISTANCE FROM URBAN CENTRES

One of the important aspects of the analysis of migration flows is the distance between origin and destination. It is a proxy variable for accessibility, an important consideration of the migration decisions. We will examine the impact of distance on migration in two steps. First we will look at the migration behaviour of rural population as a function of the distance from the nearest town with population 10 000 or more (Table 6). This relation will show how the geographical accessibility to the basic amenities influences migration. In the second step we will examine migration behaviour of rural population and the population of towns below 25 000 as a function of the distance to the nearest city with the population of 100 000 or more (Table 7). This will reveal the relation between migration and the geographical accessibility to the higher level services.

**Table 6: Net migration and migration effectiveness ratios in 1994 for males and females from rural locations by distance from nearest town or city over 10 000 inhabitants**

| Origin band of distance | Urban | Destination band of distance: Up to 5 km | 5-10 km | 10-15 km | 15-20 km | 20-25 km | 25-30 km | 30-36 km |
|---|---|---|---|---|---|---|---|---|
| | | | | males | | | | |
| Urban | | *12* | *9* | *14* | *21* | *24* | *28* | *27* |
| Up to 5 km | 1819 | | *4* | *2* | *9* | *12* | *16* | *15* |
| 5-10 km | 2483 | -95 | | *6* | *13* | *16* | *20* | *19* |
| 10-15 km | 4962 | 53 | 332 | | *7* | *10* | *14* | *13* |
| 15-20 km | 4664 | 164 | 468 | 311 | | *3* | *7* | *6* |
| 20-25 km | 2485 | 103 | 270 | 208 | 39 | | *4* | *3* |
| 25-30 km | 1044 | 49 | 122 | 104 | 32 | 8 | | *1* |
| 30-36 km | 259 | 12 | 30 | 25 | 7 | 2 | 0 | |
| Total | 17716 | -1534 | -1166 | -4699 | -5529 | -3095 | -1359 | -334 |
| | | | | females | | | | |
| Urban | | 15 | 10 | 16 | 23 | 26 | 28 | 24 |
| Up to 5 km | 2301 | | *5* | *1* | *8* | *12* | *13* | *10* |
| 5-10 km | 3017 | -125 | | *6* | *13* | *17* | *18* | *15* |
| 10-15 km | 5949 | 32 | 365 | | *7* | *11* | *12* | *9* |
| 15-20 km | 5588 | 162 | 517 | 342 | | *3* | *5* | *1* |
| 20-25 km | 2994 | 106 | 302 | 233 | 47 | | *2* | *2* |
| 25-30km | 1175 | 45 | 123 | 100 | 26 | 4 | | *4* |
| 30-36 km | 264 | 8 | 25 | 18 | 2 | -1 | -1 | |
| Total | 21288 | -2072 | -1560 | -5651 | -6534 | -3680 | -1475 | -316 |

Source: computed from the data provided by the Central Statistical Office.
Notes: Net migrant numbers are displayed below the diagonal in each table. Effectiveness = absolute value of net migration divided by gross migration and expressed as a percentage.

**Table 7: Net migration and migration effectiveness ratios in 1994 for males and females from rural locations and towns below 25 000 by distance from nearest city over 100 000 inhabitants**

| Origin band of distance | Towns | Destination band of distance <10 km | 10-25 km | 25-40 km | 45-60 km | 60-75 km | 70-85 km | 85-100 km | 100+ km |
|---|---|---|---|---|---|---|---|---|---|
| | | | | males | | | | | |
| Towns | | *4* | *1* | *13* | *14* | *16* | *19* | *18* | *22* |
| <10 km | -180 | | *6* | *18* | *18* | *20* | *24* | *22* | *27* |
| 10-25 | 356 | 69 | | *12* | *13* | *14* | *18* | *16* | *21* |
| 25-40 | 4116 | 233 | 1122 | | *1* | *2* | *6* | *4* | *9* |
| 45-60 | 3986 | 222 | 1092 | 72 | | *2* | *5* | *4* | *9* |
| 60-75 | 2375 | 129 | 657 | 113 | 68 | | *4* | *2* | *7* |
| 70-85 | 1266 | 66 | 356 | 129 | 102 | 40 | | *2* | *3* |
| 85-100 | 621 | 33 | 173 | 49 | 37 | 11 | -4 | | *5* |
| 100+ | 493 | 25 | 140 | 65 | 54 | 24 | 4 | 4 | |
| Total | 13033 | 957 | 3116 | -5043 | -5112 | -3268 | -1959 | -916 | -808 |
| | | | | females | | | | | |
| Towns | | *3* | *4* | *15* | *16* | *18* | *20* | *19* | *24* |
| <10 | -119 | | *6* | *18* | *19* | *20* | *23* | *22* | *26* |
| 10-25 | 1099 | 78 | | *12* | *12* | *14* | *17* | *16* | *20* |
| 25-40 | 4991 | 236 | 1102 | | *1* | *3* | *5* | *4* | *9* |
| 45-60 | 4833 | 227 | 1085 | 84 | | *2* | *4* | *3* | *8* |
| 60-75 | 2961 | 137 | 685 | 139 | 85 | | *2* | *2* | *6* |
| 70-85 | 1520 | 69 | 362 | 119 | 89 | 28 | | *1* | *4* |
| 85-100 | 777 | 36 | 183 | 52 | 38 | 9 | -3 | | *5* |
| 100+ | 616 | 27 | 152 | 71 | 58 | 25 | 7 | 5 | |
| Total | 16677 | 929 | 2391 | -5864 | -5958 | -3945 | -2182 | -1088 | -960 |

Source: computed from the data provided by the Central Statistical Office.
Notes: Net migrant numbers are displayed below the diagonal in each table. Effectiveness = absolute value of net migration divided by gross migration and expressed as a percentage.

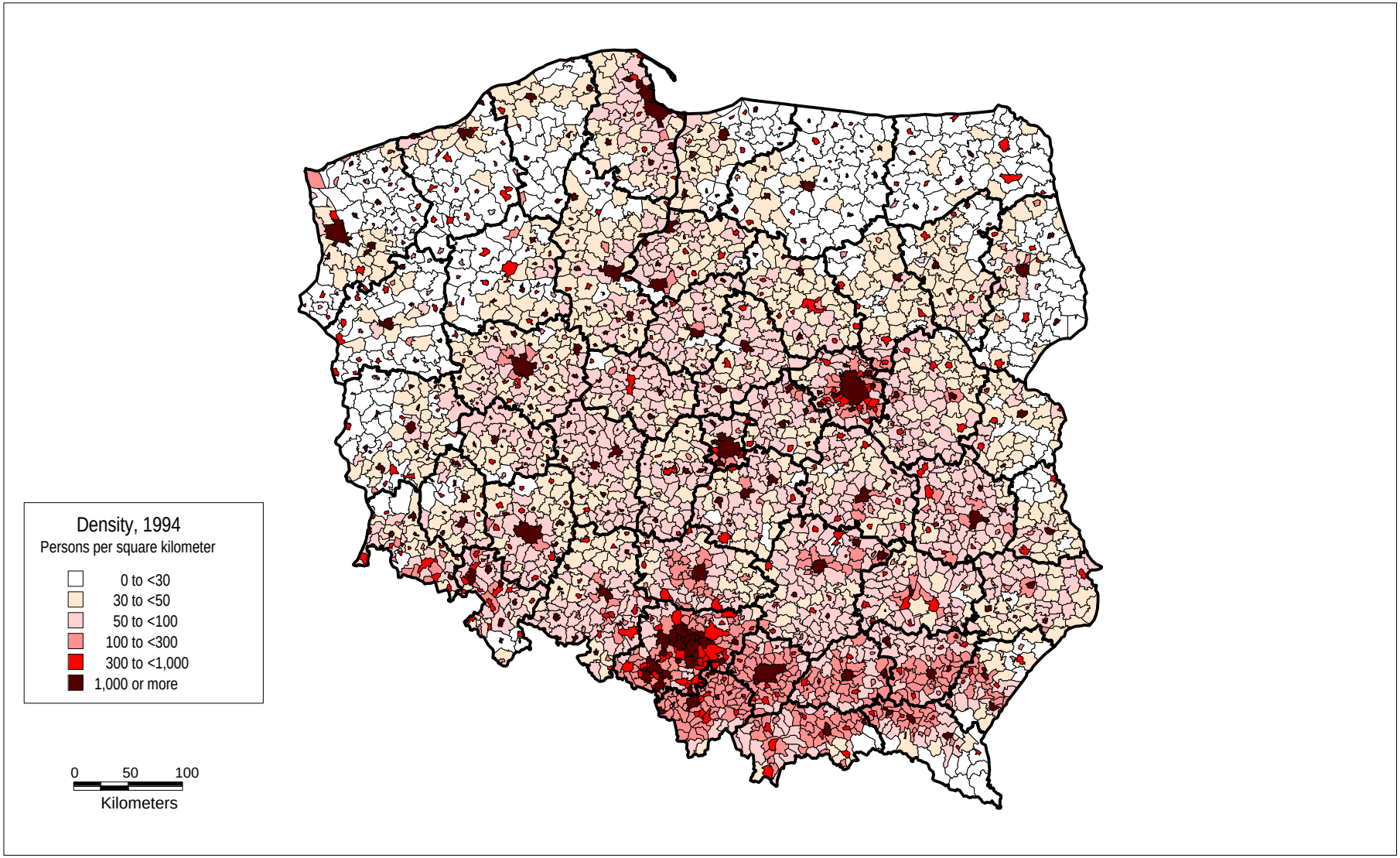
Both tables show a consistent and very similar pattern in which units closer to a town or a city gain population from units more distant from a town or a city. The notable and important deviation is that the units closest to to towns and cities (up to 10 kilometers band in Table 7) gain population from these towns and cities. This means that the best possible accessibility (living in towns and cities themselves) cannot offset the cost of housing as well as displeasures and troubles of urban life. Migration between three most distant classes is low and ineffective. More important, migration between the two most distant classes and any other classes is low but very effective. Efficiency of migration shows uniform linear growth with the distance from either towns and cities or classes closer to them. They are lower and gradients are less steep as the distance of origins and destinations from towns and cities increases. We may say there is a sense of hopelessness hidden behind these tables. Those in places far away from urban lights and thrills find it very difficult to relocate to places which are closer, but if they manage to do so, they do not return unless under considerable pressure.

# 7. RELATION TO POPULATION DENSITY

## 7.1 Geographical patterns of population density

Average population density in Poland in 1994 stood at 123 persons per square kilometre. Regional variation was quite substantial ranging from 2 to 4174 persons per square kilometre (Figure 14). The lowest density areas are rural areas, mainly in Northern Poland with the exception of Gdansk region and in Western Poland, Bieszczady and Beskid Niski. The highest density areas are mainly urban centres and urban agglomerations. In particular the Warsaw, Upper Silesian and Poznan agglomerations create hubs with high densities of population. In the 100 to 300 persons per square kilometer band there are quite a lot of rural communes in Southern Poland, on the foothills and in the Carpathian Mountains.

## Figure 14: Population density in Poland by communes and municipalitites, 1994



The density of population is not necessary directly linked with the economic prosperity or quality of life. A good example of the contradictions may be found amongst urban agglomerations, mainly in the highest density band, which are poles of economic growth with low unemployment and high wages, but simultaneously suffering from overcrowding, heavy traffic, very high pollution and all sort of social problems. On the other end of the spectrum are rural areas of North Eastern Poland, struggling economically but offering a relatively unspoiled environment.

### 7.2 Relation between population density, population growth and migration

Population density is weakly correlated with population growth over the period 1984-1994 (0.25) and slightly more strongly with net migration in 1994 (0.35), in both cases with very high significance level.

**Table 8: Distribution of population growth 1984-1994, population change 1984-1994 and net migration in 1994 by density class, Poland**

| Density class (in persons per square kilometer) | Distribution of population growth over the period 1984-1994 % | Population change in density band over the period 1984-1994 % | Net migration rate per 1000 population in 1994 |
|---|---|---|---|
| less than 30 | -1.0 | -0.3 | -5.6 |
| 30-50 | -2.6 | -2.6 | -4.7 |
| 50-100 | 1.6 | 0.1 | -2.4 |
| 100-300 | 12.4 | 5.7 | 1.2 |
| 300-1000 | 29.2 | 11.5 | 1.7 |
| over1000 | 60.5 | 6.4 | 1.6 |
| Poland | 100.0 | | 0.0 |

Source: Computed from the data provided by the Central Statistical Office.

The distribution of population growth 1984-1994, population change 1984-1994 and net migration in 1994 by population density class is shown Table 8. The population growth is augmenting roughly speaking exponentially with the increase of density and is highly concentrated in the band of the highest density. This band accounts for over 60% of the entire growth of population and about a half of Polish population but only 9% of all administrative units. This is not very surprising as all except 15 towns over 50000 inhabitants fell into this category.Population change 1984-1994 was positive in all bands except for the two with the lowest population density. The growth is substantially stronger in the higher density classes, reaching a maximum at 11.5% for the band 300-1000 thousand inhabitants per square kilometer. The relation between population density and net migration is positive. Two bands at the bottom of density scale suffered from relatively high negative net migration. Net migration in all other bands have moderate values.

Table 9 shows net migration and migration effectiveness ratios in 1994 for males and females by population density classes. In all cases more densely populated areas gained population from less densely populated areas. The only exception is migration between the highest and the 300-1000 persons per square kilometer bands where the latter gains men (but not women). The total balance of the migration is negative for three lower bands and positive for the rest. Migrations are very effective whenever the interaction between the lowest population density bands and medium or high density bands (over 100 persons per square kilometer) is involved. It is higher for exchanges between non-neighbouring bands than between neighbouring bands. Exchanges between extreme density bands: the two lowest, and the three highest bands are rather ineffective.

The general pattern shown above is fairly clear. There is a consistent movement of population towards more densely populated areas. The lowest density bands have the strongest interactions with high density bands and lose population. The highest density band has smaller ‘attraction’ than bands immediately below. This may be interpreted as strong position of highly populated rural communes and urban centres, except the most densely populated and weak position of sparsely populated rural

regions, where available population does not guarantee a necessary momentum for the economic growth.

**Table 9: Net migration and migration effectiveness ratios in 1994 for males and females by population density class, Poland.**

| Origin band of population density | Destination band of population density | | | | | |
|---|---|---|---|---|---|---|
| | less than 30 | 30-50 | 50-100 | 100-300 | 300-1000 | over1000 |
| | | | males | | | |
| less than 30 | | *1* | *9* | *22* | *25* | *23* |
| 30-50 | -41 | | *7* | *21* | *23* | *21* |
| 50-100 | -359 | -626 | | *14* | *16* | *14* |
| 100-300 | -547 | -1065 | -962 | | *2* | *0* |
| 300-1000 | -806 | -1576 | -1497 | -125 | | *2* |
| over1000 | -2768 | -5387 | -4894 | -50 | 562 | |
| Total | -4521 | -8613 | -6368 | 2399 | 4566 | 12537 |
| | | | females | | | |
| less than 30 | | *1* | *8* | *22* | *24* | *24* |
| 30-50 | -39 | | *7* | *21* | *23* | *23* |
| 50-100 | -351 | -611 | | *15* | *16* | *17* |
| 100-300 | -576 | -1119 | -1043 | | *2* | *2* |
| 300-1000 | -846 | -1649 | -1589 | -95 | | *1* |
| over1000 | -3320 | -6481 | -6301 | -477 | -150 | |
| Total | -5133 | -9821 | -7972 | 2167 | 4030 | 16729 |

Source: Computed from the data provided by the Central Statistical Office.
Note: Net migrant numbers are displayed below the diagonal in each table. Effectiveness = absolute value of net migration divided by gross migration and expressed as a percentage.

# 8. RELATION TO UNEMPLOYMENT

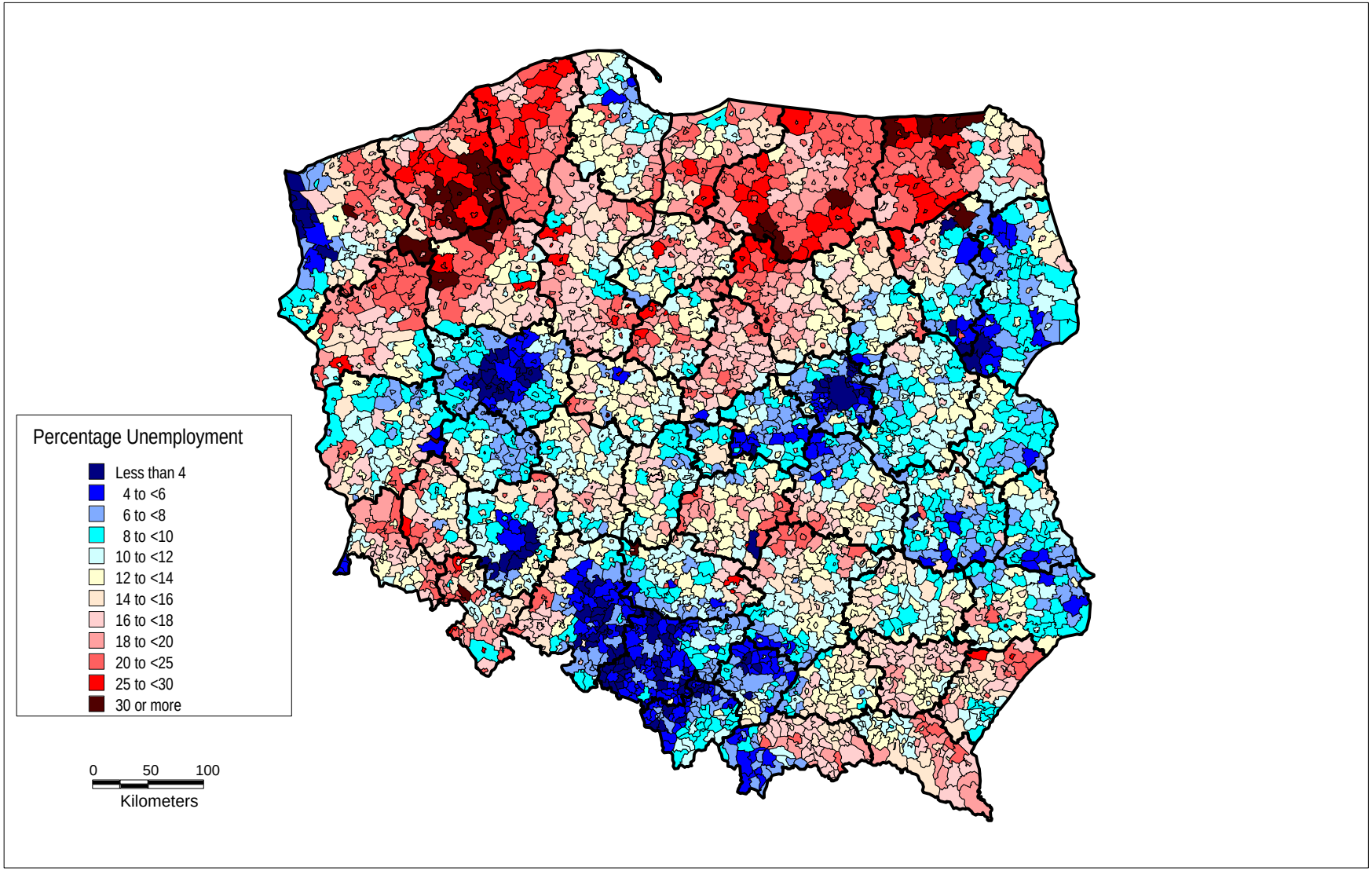
Under the communism 'unemployment' was a dirty word, confined only to the greedy capitalist economies. Nevertheless it existed in a hidden form of overemployment and low efficiency. The economic transformation of Poland has resulted in rationalisation of employment from the economic point of view and unavoidable open unemployment. There is no doubt that it was a major shock for the Polish society, not accustomed to the concept of the market value of labour. A brief review of relations between migration and unemployment is given in Rees, Durham and Kupiszewski (1996). In the Polish case one must keep in mind other restrictions superimposed on mobility: cost of housing paired with a poorly developed housing market and pecuniary cost of move, both very high in comparison to an average salary. We will now examine the geographical patterns of unemployment in 1992 adjusted to 1994 administrative boundaries, the relation between unemployment and population growth over the period 1990-94 and net migration in 1994.

Unemployment in Poland, at 15.1% of labour force in April 1995 (OECD 1995) is one of the highest among economies in transition and higher than in most West European countries. This may be interpreted either as a result of fairly advanced transformation to market economy or as a stigma of particularly unfavourable sectoral structure of the industry. Differences in unemployment across communes and municipalities in Poland are enormous. In 1992 unemployment rate varied from 1.1% to 40.5% with a median at 12.6% and an average at 13.6%.

## 8.1 Geographical patterns of unemployment

Unemployment higher than average (13.6%) (Figure 15) occurs mainly in Northern Poland, with exception of the Gdansk region and communes bordering or close to Germany; in Sudety region, with exception of communes profiting from tourist industry, mainly located in Karkonosze mountains and in Central Poland, with a focus around Konskie and in South Eastern Poland. These data should be treated with some

**Figure 15: Unemplomentin Poland by communes and municipalities, 1992 data recalculated to 1994 boundaries**



caution as there are large gray and black labour markets which artificially inflate unemployment statistics.

Below average unemployment occurs in a triangle with a base on the East Wall and a vertex in Lodz (but excluding it), in Krakow and Upper Silesia regions, around Poznan, extending towards East and West along Berlin-Poznan-Warsaw-Moscow road, and around Wroclaw, Gdansk and Szczecin.

This less than average unemployment occures for different reasons. In the Bialystok region the unemployment is reduced by a hidden rural unemployment (Witkowski 1994). This hypothesis may be supported by frequent occurrence of above average urban unemployment in the region. Large urban agglomerations such as Warsaw, Krakow, Poznan, Lublin, Gdansk, Wroclaw constitute poles of growth and lower unemployment there is mainly due to rapid economic expansion. The effects of economic prosperity on unemployment are also visible along main communication links and along state boundaries, where services and petty trade engages a lot of otherwise redundant labour. In the Silesian agglomeration the story is completely different. Low unemployment there is mainly due to the protectionist state policy aiming at curbing social and political disturbances by large official and hidden subsidies to hopelessly inefficient state owned coal mining and heavy industries.

### 8.2 Relation between unemployment, population growth and migration

Neither unemployment and net migration nor unemployment and population change over the period 1984-1994 are correlated. The correlation coefficient for the former two variables is -0.1159, for the latter two 0.0436. It is the cost and unavailability of housing which make it impossible for unemployed to relocate. In our view there is additionally a mental barrier which make it difficult for people to consider an internal move as a remedy against unemployment. In the past it was jobs which chased the workers. It is enough to recall full page commercial adverts run in national newspapers in the seventies by coal mines, encouraging young people to come and work in Upper Silesian region. It should not be overlooked that population change was measured over 10 years, whereas the phenomena of unemployment has existed since 1991.

Table 10 shows the distribution of population growth 1984-1994, population change 1984-1994 and net migration in 1994 by unemployment class. The distribution

of population growth has an inverted, skewed V shape. First three unemployment classes, which cover around a half of communes and municipalities, attracted over one third of population change. The fourth class (unemployment rate between 12 and 16%) attracted another third. Extensive (over 28%) unemployment means low share of population growth. Only regions with over 36% of unemployment suffered from losses of its population. Also the population change in the years 1984-1994 in unemployment bands shows little relation to unemployment. In fact the highest growth was observed in the band 24-28% of unemployed, that is almost twice the national average. This shows a low sensitivity of population change to unemployment. This is partly due to the fact that visible, unhidden unemployment has existed in Poland only over the last four years analysed.

**Table 10: Distribution of population growth 1984-1994, population change 1984-1994 and net migration in 1994 by unemployment class, Poland**

| Unemployment rate (1992 data recalculated to 1994 administrative boundaries) in % | Distribution of population growth over the period 1984-1994 per cent | Population change in unemployment band over the period 1984-1994 in per cent | Net migration rate per 1000 population in 1994 |
|---|---|---|---|
| <4 | 2.2 | 101.3 | 2.92 |
| 4-<8 | 10.8 | 102.1 | 1.32 |
| 8-<12 | 21.0 | 104.2 | -0.84 |
| 12-<16 | 32.5 | 106.1 | -0.33 |
| 16-<20 | 22.1 | 107.9 | -0.92 |
| 20-<24 | 5.6 | 105.6 | -1.57 |
| 24-<28 | 4.6 | 112.4 | -1.45 |
| 28-<32 | 1.0 | 108.5 | -4.11 |
| 32-<36 | 0.2 | 105.0 | -7.84 |
| >36 | -0.1 | 94.7 | -11.90 |

Source: Computed from the data provided by the Central Statistical Office.

The net migration rate observed in 1994 shows an s-shaped relationship with the unemployment. Only two lowest unemployment bands gain population. All others lose it, with the rapid growth of negative net migration in the two highest unemployment bands. However the rates are low, oscillating around ±1-2 migrant per thousand. Only the first and the last three classes noted respectively net migration gain and losses over 2 per thousand. One can conclude that there is a weak relation between

unemployment and migration and that only extreme levels of unemployment generate significant response in terms of migration.

**Table 11: Net migration and migration effectiveness ratios in 1994 for males and females by unemployment class, Poland.**

| Origin band of unemployment | Destination band of unemployment | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | <4 | 4-<8 | 8-<12 | 12-<16 | 16-<20 | 20-<24 | 24-<28 | 28-<32 | 32-<36 | >36 |
| | | | | | males | | | | | |
| <4 | | *3* | *11* | *9* | *11* | *13* | *12* | *20* | *34* | *38* |
| 4-<8 | 370 | | *8* | *6* | *8* | *10* | *9* | *17* | *31* | *35* |
| 8-<12 | 1112 | -1932 | | *2* | *0* | *3* | *1* | *9* | *24* | *28* |
| 12-<16 | 1096 | -1778 | 377 | | *2* | *4* | *3* | *11* | *25* | *30* |
| 16-<20 | 685 | 1200 | 26 | 258 | | *2* | *1* | *9* | *23* | *28* |
| 20-<24 | 315 | 588 | 123 | 228 | 68 | | *1* | *7* | *21* | *26* |
| 24-<28 | 120 | 219 | 30 | 70 | 15 | -5 | | *8* | *22* | *27* |
| 28-<32 | 65 | 133 | 61 | 82 | 36 | 10 | 5 | | *15* | *20* |
| 32-<36 | 34 | 74 | 48 | 59 | 29 | 10 | 4 | 1 | | *5* |
| >36 | 15 | 33 | 23 | 27 | 14 | 5 | 2 | 0 | 0 | |
| Total | 3812 | 5588 | -3110 | -1772 | -2008 | -1303 | -439 | -391 | -258 | -119 |
| | | | | | females | | | | | |
| <4 | | *4* | *13* | *11* | *14* | *15* | *15* | *23* | *34* | *37* |
| 4-<8 | 575 | | *9* | *6* | *9* | *11* | *11* | *19* | *30* | *33* |
| 8-<12 | 1514 | 2426 | | *3* | *0* | *2* | *2* | *10* | *21* | *25* |
| 12-<16 | 1350 | 1869 | -773 | | *3* | *5* | *5* | *13* | *24* | *27* |
| 16-<20 | 909 | 1462 | 15 | 478 | | *2* | *2* | *10* | *21* | *24* |
| 20-<24 | 400 | 681 | 105 | 298 | 59 | | *0* | *8* | *19* | *23* |
| 24-<28 | 160 | 270 | 37 | 114 | 20 | -1 | | *8* | *20* | *23* |
| 28-<32 | 84 | 161 | 71 | 106 | 42 | 13 | 6 | | *12* | *15* |
| 32-<36 | 36 | 75 | 45 | 58 | 27 | 9 | 4 | 1 | | *4* |
| >36 | 16 | 35 | 22 | 28 | 13 | 5 | 2 | 0 | 0 | |
| Total | 5045 | 6404 | -4418 | -1365 | -2703 | -1518 | -589 | -481 | -255 | -120 |

Source: Computed from the data provided by the Central Statistical Office.
Note: Net migrant numbers are displayed below the diagonal in each table. Effectiveness = absolute value of net migration divided by gross migration and expressed as a percentage.

Nearly one fifth of all migration, both of men and women, occurs within unemployment bands. The rest are inter-band flows. As in the UK case study there is a consistent flow from higher unemployment bands to lower unemployment bands. A notable exception is the exchange of population between 8-12% and 12-16% bands. The patterns for males and females are alike.

The effectiveness of migration is low in the group of central bands and increasing towards extreme values of unemployment band, reaching over 30% for exchanges between the lowest and the highest bands.

This shows that there is a much higher sensitivity of migration on unemployment that one could expect from the investigation of the relations between unemployment and net migration and unemployment and population change over the period 1984-1994 and lack of statistical correlation between these variables. In fact this sensitivity, measured in terms of effectiveness of migration, is much higher than in the United Kingdom, what is an unexpected conclusion, given much better developed housing market and larger differences between unemployment benefits and salaries or wages in the United Kingdom.

## 9. SUMMARY AND CONCLUSIONS

The findings of this paper provide a wealth of information not available so far to the researchers of population mobility in Poland. The main novelty of the study is that it has been conducted using the commune and municipality level, as opposed to most existing studies which focused on regional (*wojewodztwo*) level.

There are important conclusions emerging from this study. The first is that we are watching now a profound change of population redistribution patterns in Poland. This is not surprising given the fundamental social, political and economic revolution reshaping Polish economy and society. We examined various hierarchical structures organised by such variables as population density, unemployment, distance to a town or city. In each case we observed that straight upwards hierarchical mobility has been markedly modified. The first modification is the substantial reduction of migration from rural to urban locations. This reduction has not reversed depopulation of some rural areas, as the number of units where both net migration and population growth are negative has increased

dramatically over the last decade. These regions will not augment their populations unless there is a radical change in migration direction. We noticed communes and small towns which are distant from urban centres from which migration is blocked to some extent and to which returns are unlikely. These are areas with an apparent sense of hopelessness.

There were important changes in the role of cities and towns. Largest cities, massive gainers of the seventies and eighties, have tended to lose population in mid nineties. It is likely that they loose population mainly to the neighbouring communes. We believe that a suburbanization process has been put into motion. In order to confirm this finding investigation on enumeration district level should be conducted. This may be done after the next National Census of Population. Medium to large size towns and cities, in the range between 50 000 and 500 000 attract substantial part of migration pool. This is not a new phenomenon, but the extent of it has increased. Surprisingly we identified increased attraction of small, but not the smallest towns. One possible explanation is that these towns intercept migrants from the lowest levels of hierarchy who cannot afford to migrate directly to larger towns and cities. This may be a deferred demand for migration to larger cities which, if the economic conditions are favourable, may generate substantial flows in future.

The comparison of the observed patterns of population development with the patterns observed in the past in a number of West European countries suggests that Poland is on the trajectory which for example Spain (Gonzalez and Puebla 1996) or Portugal (Peixoto 1996) took in the past.

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