The Demographic evolution of Rural France (1968-1982)

Robert CHAPUIS and Thierry BROSSARD Faculté des Sciences Humaines,
University of Dijon, France and University of Franche-Comté, Besançon, France

Abstract - After more than a century of decline, noticeable increases in the rural population of France became apparent in the 1982 census. The spatial patterns of these changes are interpreted by comparing a set of demographic variables in the 1968-1975 and 1975-1982 intercensal periods. Migration to rural areas near many of the major cities (rurbanization) and to the southern part of France is the main demographic explanation. Using factor analysis and a hierarchical classification system the underlying demographic associations are established and the nation is differentiated into seven types. A method for estimating the probabilities of any one type occurring is also demonstrated. The timing of the demographic changes and the fundamental societal forces which have influenced them suggest that government policy bas played a minor part in the evolution.

Introduction

Whereas the rural population in France bas constantly declined over 125 years (a total decrease of 13 million between 1851 and 1975) and the urban population constantly increased over the same period, a spectacular turnabout took place between the last two censuses of 1975 and 1982: the rural population began to increase rapidly (about 1% per year) while the urban population grew only slowly (0.3% per year). This surprising reversal is not due to a naturel population increase. Quite to the contary, there was a naturel decrease of 0.1% per year whereas there had been a naturel increase before 1975. Indeed, the birth rate declined from 13.4 per 1000 inhabitants between 1968 and 1975 to 11.2 between 1975 and 1982 and the death rate remained at approximately 10.0 per 1000 in-habitants.

The increase in the population is thus solely the result of changing migration between rural areas and cities. Whereas there had been a net out-migration from rural areas between 1968 and 1975 (-0.1% per year), there was a net in-migration (+0.1% per year) between 1975 and 1982. For the same period, cities which previously had a net in-migration (+0.4% per year) experienced a net out-migration (-0.3% per year) between 1975 and 1982. What was the reason for this evolution?

Unemployment in towns and cities impeded inhabitants from leaving the countryside with only 500,000 people leaving the country to become city dwellers but

there was a substantial increase in the number of people moving to the country as 1,500,000 city dwellers became rural residents. This last trend results from many retirees settling in rural areas as well as the contemporary phenomenon of "rurbanization". More and more city dwellers are moving to the villages and rural areas surrounding towns and cities to get away from the noise and pollution of the city and especially, to find in expensive land on which they can build the house of their dreams. These general changes can obviously be interpreted as diverse spatial evolutions from one region to another and also within regions themselves. In order to study these different evolutions, we take the traditional approach of comparing demographic maps based on the 1975 census with those which were made from the 1982 census.

Spatial demographic evolution: comparative analysis of maps

Maps showing ten basic demographic variables were drawn up using computer-assisted cartography for 1975 and 1982. Each variable was divided into classes based on two series of collected data (from 1975 and 1982) so that direct comparisons were possible. Class boundaries were empirically set after studying frequency histograms in order to harmonize the significant statistical thresholds with visual appearance. The spatial resolution of the maps is districts, of which there are between two and seven per department.

The few maps included in this study show botte the value and the limitations of the procedure.

Definite changes are apparent in the spatial pattern of population growth in the two intercensul periods (Fig. 1). There are many more districts with an absolute population decline (<-1.0% per year) between 1968 and 1975 than between 1975 and 1982, whereas the opposite is true for districts having a relative population increase (>+1.0% per year). Moreover, we can see that there is a definite increase around large cities (Paris, Lyon, Toulouse, Bordeaux, Nantes, Rouen) with the exception of Chose in the north and northeast. Growth is also apparent around the cities on the Atlantic coast and in the southeastern quarter of France. The maps of natural population increase, of birth and death rates and of internal migration provide some explanations for these changes.

The patterns and rate of natural population change are quite different in the two intercensul periods (Fig. 2). Between 1968 and 1975, numerous districts had a large or average increase (between +0.3% and +1.0% per year) and these are situated in the "fertile crescent" spreading from Brittany to the northern Alps via the north and east of France. Between 1975 and 1982, there are far fewer districts with a large or average increase and the "fertile crescent" has dissipated. Contrarily, districts having a significant natural decrease (<-0.4% per year) have multiplied during the same period and occupy a large part of France.

The considerable natural population decrease is essentially due to an overall decrease in the birth rate (Fig. 3). The districts which had a high or average birth rate (>12.0 per 1000 inhabitants) and which covered two-thirds of France (and more particularly the "fertile crescent") between 1968 and 1975, only cover a small part of the rural territory between 1975 and 1982. On the contrary, districts having a low birth rate (<10.7 per 1000 inhabitants) have multiplied and occupy a large part of the center and south of France. In contrast, the death rate (Fig. 4) bas remained fairly stable, and we can even notice a decrease in some specific areas. The decrease in the birth rate is not restricted to rural areas. It is found in the entire French population and is a result of the lowering in the fertility rate which has affected botte urban and rural areas since 1964. This decrease, however, is marked by the aging of the population which has followed the rural exodus. However, the "fertile crescent", having a younger population, has kept a higher birth rate and lower death rate than the rest of France. This evolution is obviously not the result of specific governmental actions aiming at rural areas. The "fertile crescent" exists because of past events in its history and the decrease in the fertility rate in rural as well as in urban areas is due to general phenomena in society (i.e., contraception, working women, decrease in the number of marriages, etc.).
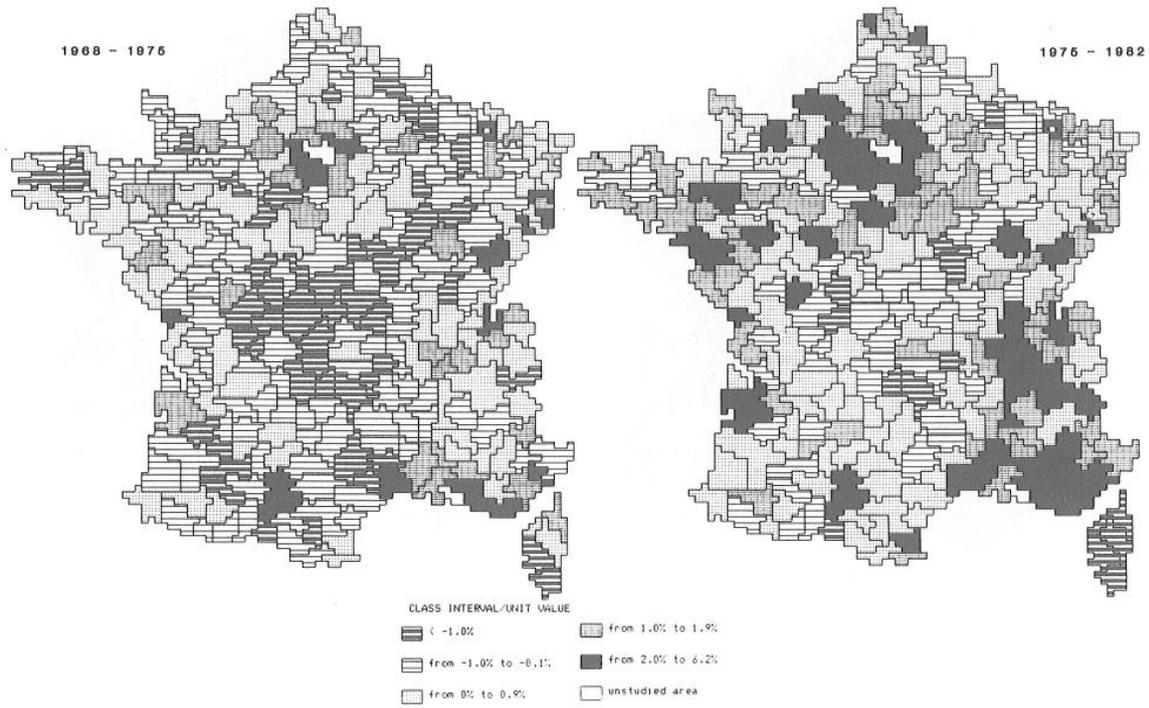
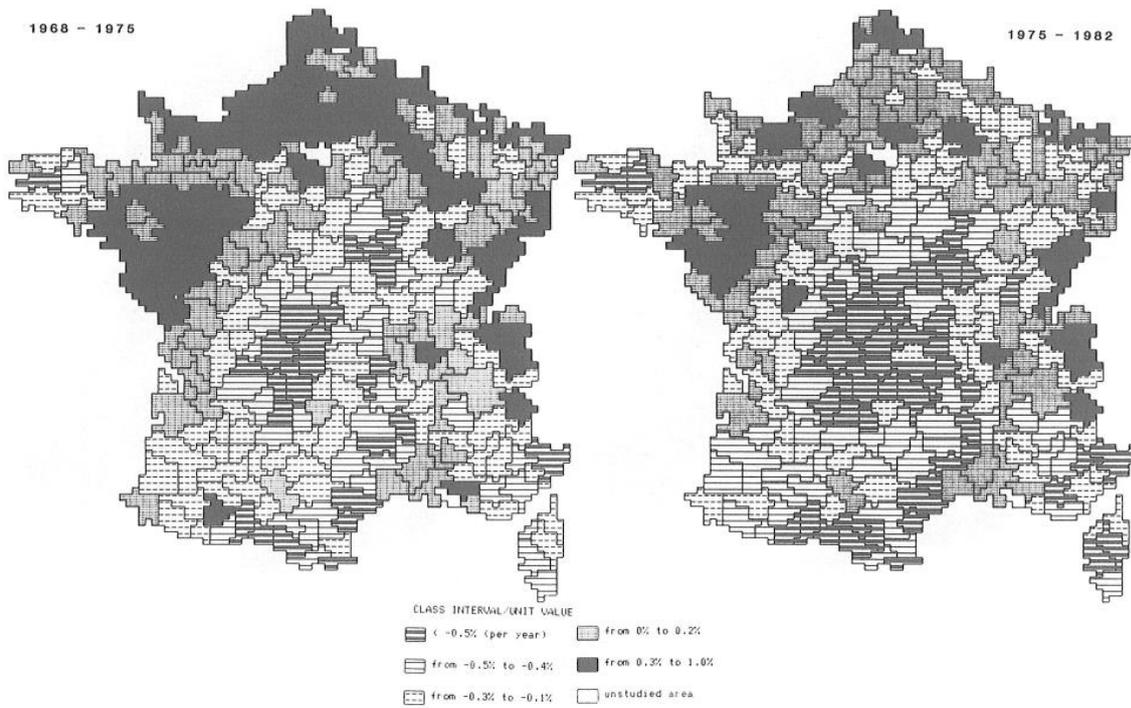**Figure 1.** Population change 1968–1975 and 1975–1982.

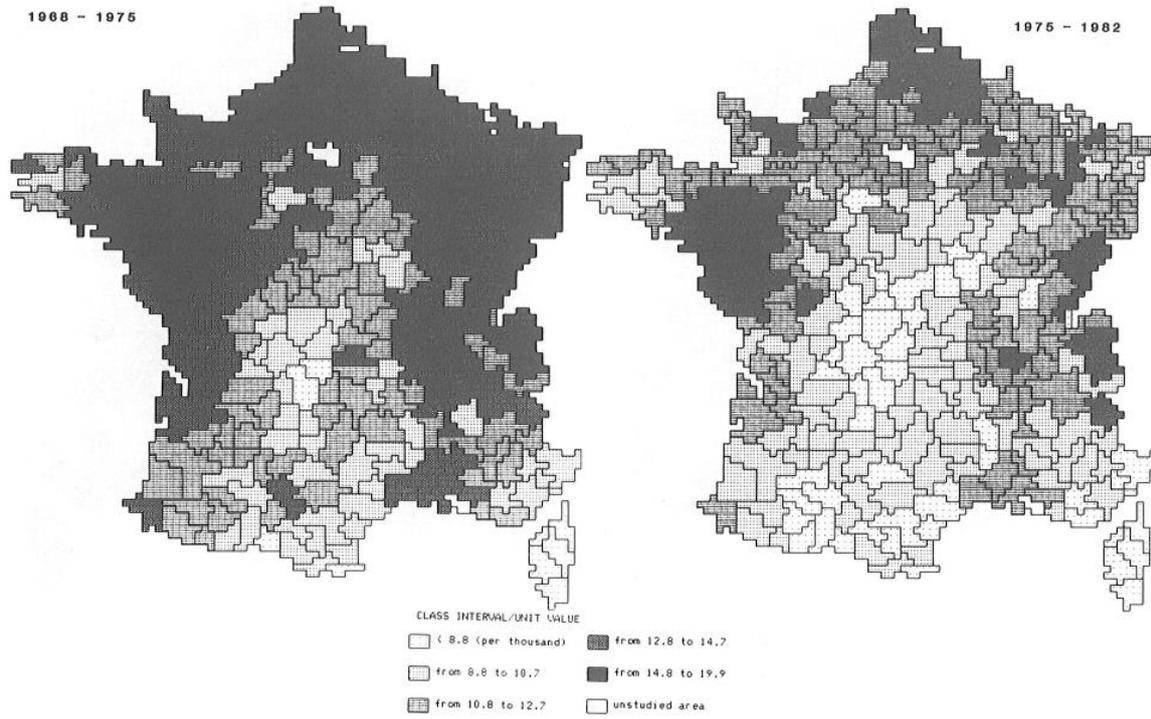**Figure 2.** Natural increase in population 1968–1975 and 1975–1982.

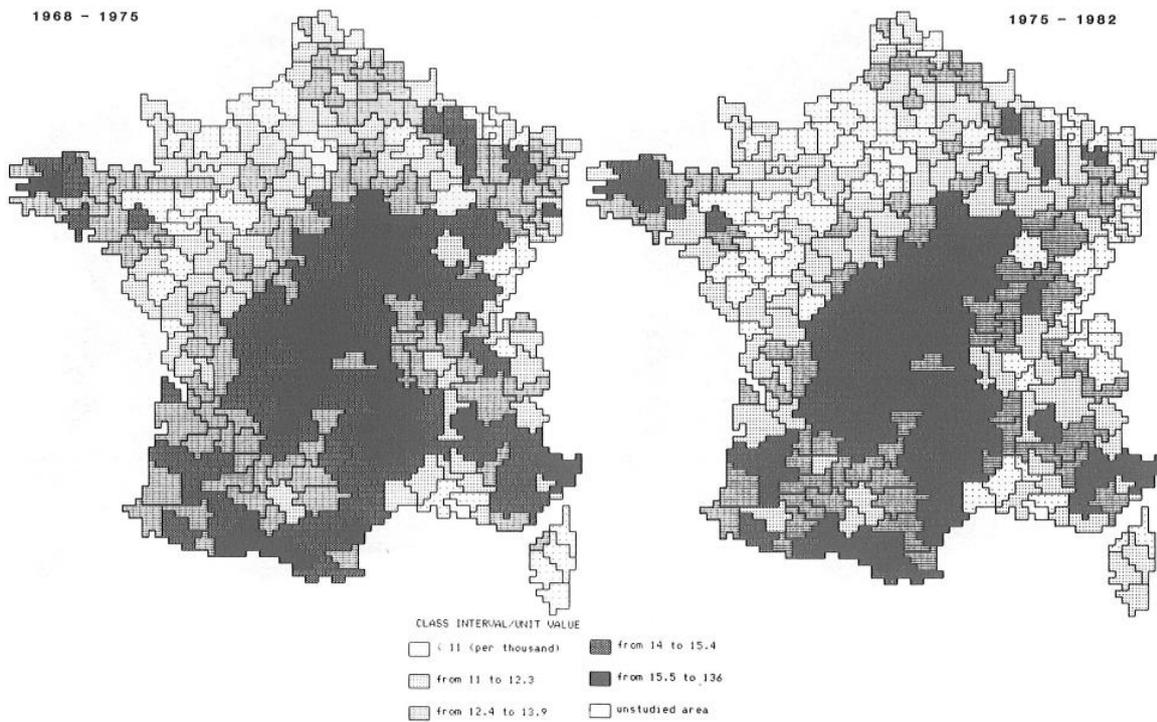**Figure 3**. Crude birth rate 1968–1975 and 1975–1982.

Figure 4. Crude death rate 1968–1975 and 1975–1982.

Between 1968 and 1975, the majority of districts in France had a net out-migration, notably those in the north and in the regions of Champagne-Ardennes, Burgundy, the Central Massif, Lower Normandy and a good part of the Southwest. Districts attracting some migrants (>0.5% per year) are concentrated only around Paris and a few large cities, as well as in the southeast of France. A quite different pattern emerged between 1975 and 1982 when 85% of the districts had a net in-migration. The number of districts having a net in-migration higher than 1.5% per year tripled in number. The rural areas attracting most people (>1.0% per year) are concentrated around the Ile-de-France and on the borders of the southern half of France. More cities than before are attracting migrants to their adjoining rural areas, but towns and cities in the north and east, as well as Chose in the Massif Central are less successful than others. Districts having a net out-migration have become fewer in number (15%) and occupy an area which crosses France diagonally, starting in the region of Ardennes and becoming wider towards Aquitaine. We have called this zone the "empty diagonal"; indeed, it corresponds to an area which is botte sparsely populated and only slightly urbanized. Net out-migration districts can also be found in the Vosges and Jura Mountains.
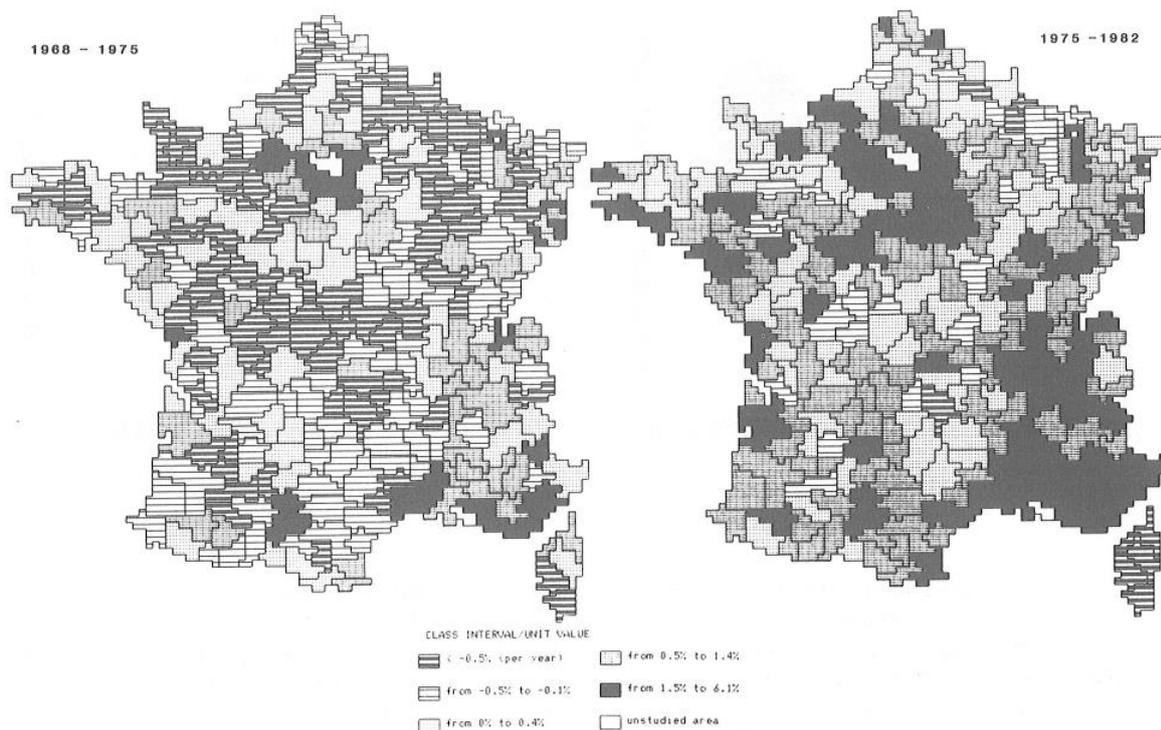
Figure 5. Migration trends 1968–1975 and 1975–1982.

Has the government played a tune in this evolution? We would normally think so since the migration evolution of a region reflects ifs degree of attractiveness or non-attractiveness to the population, phenomena which the government can

influence by its town and country planning and other policies. Yet, we can see that the 1975-1982 map can be explained by three general factors which go beyond the strict rural context. First, the phenomenon of "rurbanization" which increases population densifies in urban peripheries; second, the settling of retirees in the south of Paris and in the south of France near the Mediterranean, and finally, the attractiveness of the three "Ss" (Sun, Sand, Ski) which augments the high net in-migration in the southern half of France. Certain planning projects (i.e., rural development programmes, government subsidized projects for town and country planning and community funding for- suburban zoning), are far too localized to have any appreciable impact. Besides, there were more of them before 1975 than after. Other actions such as the Rural Renovation project have not fundamentally changed the situation of the areas which benefited from them. Indeed, a good part of the areas where the rural exodus is still rampant are those which received subsidies from the Rural Renovation project (i.e., the Central Massif, Brittany, and mountainous regions). Only the Alps (except in specific places) are managing well thanks to their touristic and industrial potential. Similar reasons explain the population growth on the coast of Brittany.

General town and country planning actions such as the decentralizing of industries from Paris, which mat' have played a rote before the 1973 crisis, especially in the area referred to as the "great crown" around Paris or in the west of France, were of little significance after 1973. If, in fact, industries were redistributed from Paris to outlying areas, they moved to the immediate outskirts of Paris. Thus, it seems as though the evolution of rural areas came about "naturally", that is, as a result of economic, social and cultural changes throughout France.

We can see, then, that comparison of maps allows for some interesting analyses. It shows the major trends in spatial evolution and provides us with some explanations of these basic phenomena. Comparative analysis has the disadvantage, however, of being somewhat subjective as far as the interpretation of information is concerned and, moreover, it makes a synthesis extremely difficult, if not impossible. How, then, can the vast amount of information contained in twenty maps be synthesized? We have attempted to solve this problem by using the various applications of multivariate analysis, more precisely, those of factor analysis of correspondences associated with hierarchical classification (Girardot, 1985). Multivariate analysis enables us to update the structuring principles of evolution; with factor analysis, we can collapse the 308 districts into classes in a soundly-based typology according to their characteristics.

Spatial demographic evolution: factor analysis of correspondences

Factor analysis was applied to 10 variables studied at two different dates (1975 and 1982) making a total of 20 variables. The ten variables are population change, naturel increase or decrease, the crude birth rate, the fertility rate, the crude death

rate, internal migration, site of household, number <15 years, number >60 years, the proportion of men to women aged 20-35. These data were then divided so as to be used with factor analysis: a Boolean array was elaborated in which each variable was divided into 4 values (very low, low, high, very high). Factor analysis vas applied to this new data array, resulting in a very well-defined factorial space (Fig. 6). The variables to the left of the figure indicate a negative naturel demographic change: low birth rate; high death rate, few youth, many elderly, few women aged 20-35 years. The variables to the right of the figure represent the opposite phenomena: a positive natural change, high birth rate, low death rate, many youth, few elderly, many young women. Average values are located in the center of the figure. Thus, axis 1 (horizontal) represents the natural demographic change related to the age structure: to the left, the elderly population and a negative natural demographic change (which, in fact, is due to a natural decrease), to the right, the youth population and a positive natural change (due to a high natural increase).
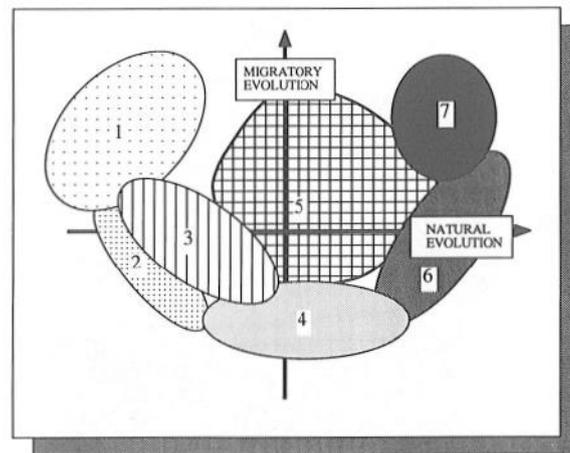

Figure 6. Factor structure and types. See text for further detail.

On axis 2 (vertical) migratory change is a critical factor; net out-migration is located at the bottom of the figure and the net in-migration at the top. The fertility rate is also indicated along axis 2 but in the opposite direction: it is low at the top of the figure, average at the center and moderately high or high at the bottom. This is logical since areas with a high net in-migration are areas which attract numerous city dwellers having a low fertility rate. Axis 2 mainly represents change resulting from migration.

Thus, the overall demographic evolution tends to be expressed by both axes 1 and 2. At the bottom left where there is both a net out-migration and a natural demographic decrease, the demographic change is obviously negative. The population increases if we go higher up and to the right of the figure. At the vert' top right, where there is both a high natural increase and high in-migration, the change is quite positive.

On Fig. 7, vectors represent the evolution of approximately 60 districts. To make the document readable, we have sampled one in five districts. The starting point (a small black square) represents the1975 census and the end point, the 1982 census. We can thus analyse in which direction each of the districts evolved, depending on the two aforementioned factors and thus on the 20 variables initially considered. We can also have an idea of the extent of the evolution: the longer the vector is the greater the extent of the evolution. Lastly, we can also evaluate the general direction of the evolution by studying the overall positioning of the vectors. We can note that the majority of the vectors run both vertically, from bottom to top, indicating an increase in the net in-migration, and horizontally, from right to left, showing a decline in the natural demographic evolution. Most vectors are quite long, as well, implying that a considerable change took place between the 1975 and 1982 censuses. A detailed analysis of the different vectors (not dealt with in this paper) would show the direction of the change and its extent for each district depending on all the considered variables. Such an analysis would greatly help in making decisions concerning town and country planning projects. Thanks to hierarchical classification, further analysis is made possible by regrouping similar districts in the same category, using computer techniques. This type of classification makes apparent areas which have similar demographic tendencies and problems.
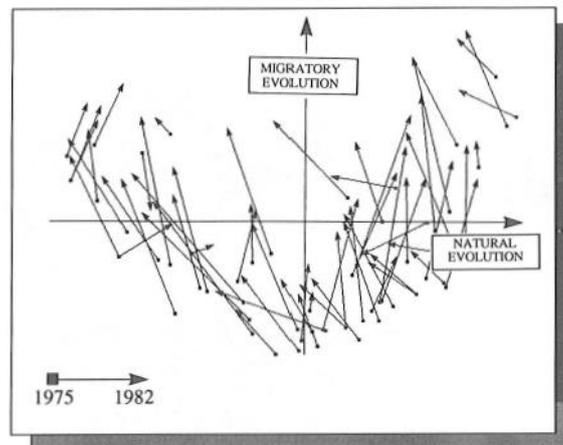

Figure 7. Vectors representing changes in population types by districts 1975–1982.

Spatial evolution: hierarchical classification and typology

Hierarchical classification helped us to identify types among the 308 districts studied (Fig. 6). These groups are organized along a parabola beginning with type 1 at the top left of the chart and finishing with type 7 at the top right. The other types are situated in between. We cannot include a detailed analysis of the results in this paper, but only indicate the most important points.

Type 1 cumulates ail the disadvantageous factors in a population: unfavourable age structure (few youth, many elderly) resulting in a natural decrease (low birth rate worsened by a vert' low fertility rate and high death rate) and average migratory change. The result is a relatively unfavourable demographic evolution. On the maps showing the different types in 1975 and 1982 (Fig. 8), we can see that in 1975, only few examples of type 1 existed. About 30 districts, located mainly in the Central Massif, Pyrénées, Southern Alps and Corsica, belong to this type.

In 1982, this type has spread out to cover about 60 districts located both in the same areas and in areas slightly farther north (Burgundy and central Brittany). It spread at the expense of type 2 and even of type 3, clearly indicating that despite an overall demographic increase, the situation in certain regions has degraded especially in those which were the object of rural planning projects, mostly due to a growing natural decrease. Type 2, similar to type 1, is interesting, yet it differs in that it has a better natural evolution (i.e. a higher natural increase) together with a slightly less favourable migratory evolution (i.e. increased out-migration). In 1975, it extended over approximately 30 districts generally surrounding type 1. In 1982, it has almost disappeared; certain districts have become type 1 districts, as mentioned earlier, while the majority of the others are now included in type 3, as a result of increased in-migration. These districts are generally starting to become "rurbanized". The type 4, situated on the median of the two axes, also merits attention. In 1975, we can find it almost everywhere, particularly in the west, southwest, and east of France. However, in 1982, it has almost disappeared, like type 2. In most cases, type 4 districts have become type 3 or 5 districts, which, like type 4 districts, are located on the median of axis 1 (indicating that natural evolution has not changed much). Yet, these types are situated higher up on axis 2, indicating a significant improvement in their migratory evolution. Once again, rurbanization has played a part in this evolution, but to a much greater extent than for type 2.
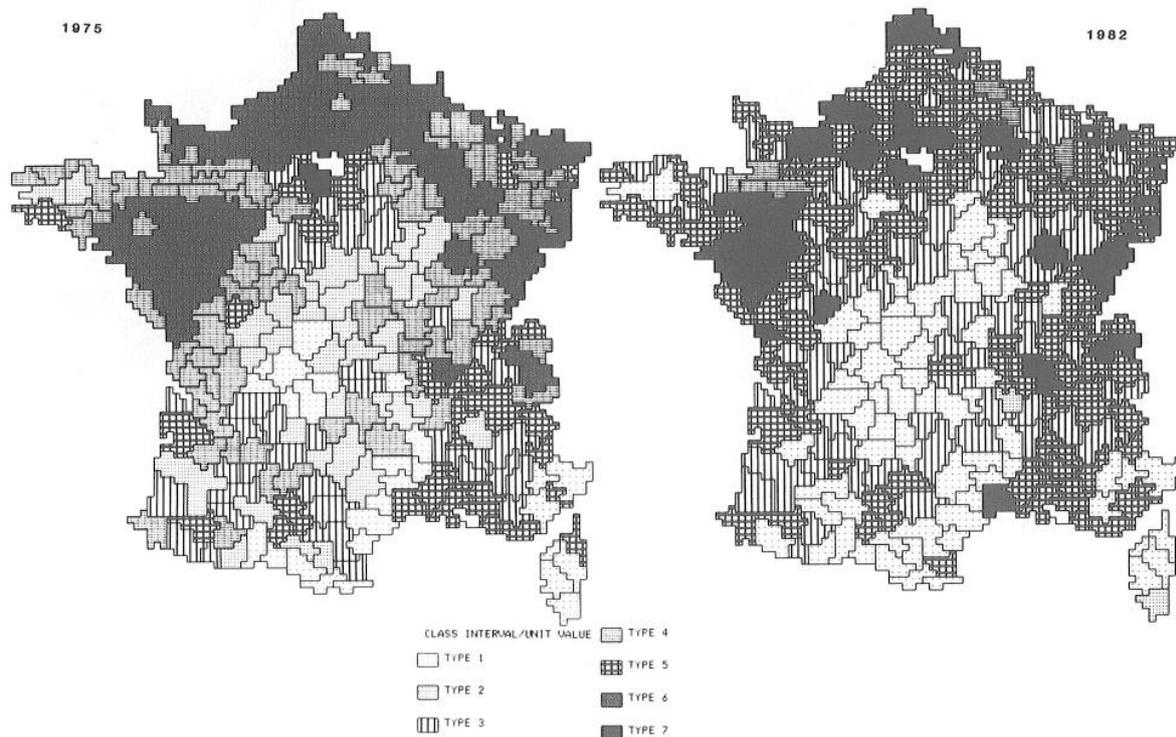
Figure 8. Demographic types 1975 and 1982. See text for further detail.

Types 6 and 7 include districts with the highest growth. With type 6, the growth is more due to natural change, whereas type 7 owes its growth more to its migratory change. The result is that their overall evolution is rather different between the two censuses. In 1975, type 6, along with type 4, cover a large part of the fertile crescent. In 1982, type 6 only remains in a small Island centered around the Pays de Loire, almost disappearing from other parts of France. In the majority of cases, type 6 has become type 5, located more to the left of the graph. In some cases, it has even become type 3, located further to the left, thus indicating a clear decrease in the natural evolution. Type 7, which was found in only 5 districts in 1975, has multiplied in 1982, but it does not cover large areas.

Classification refinement: probability maps

Hierarchical classification is an effective tool; well adapted to the needs of geographers who attempt to divide space into well-defined classes. This system of classification, however, jacks flexibility and it is somewhat restricting. Indeed, it is exclusive, that is, if a certain district belongs to one type, by definition, it cannot belong to another type. Yet, we very well know that if a certain district belongs to type 1, for instance, and is on the borders of this type, it may also very well have some type 2 characteristics. Obviously, this type of classification is not flexible enough to provide this kind of information.

Probability maps provide a way of getting around this problem (Brossard, 1986). To draw these maps, the frequential connections between the Boolean characteristics and the different types are computed. These connections thon give the empirical probability (Spiegel, 1982) for each individual district having such and such characteristics, to belong to the various types. After weighting, in order to eliminate imbalances resulting from a difference of site among the groups, the probabilities for each district to belong to the various types are computed according to its Boolean characteristics. These probabilities obviously very from one date to the next, depending on the different changes which have taken place. A probability map can then be drawn up for each of the types based on the obtained values. For this study, we present the map concerning type 7. It has been "smoothed" in order to be more readable (Fig. 9). We can see that in 1975, the probability for a district to belong to type 7 is extremely low (less than 10%) over most of France, but that some regions may soon belong to type 7, and that five districts already belong to type 7, as mentioned earlier. In 1982, almost 30 districts belong to type 7 and many others are very close to becoming part of it. If the evolution continues in this same direction, we would think that the districts showing strong probabilities to belong to type 7, like those of Rennes and Toulouse, for example, will be classified as type 7 at the next census.
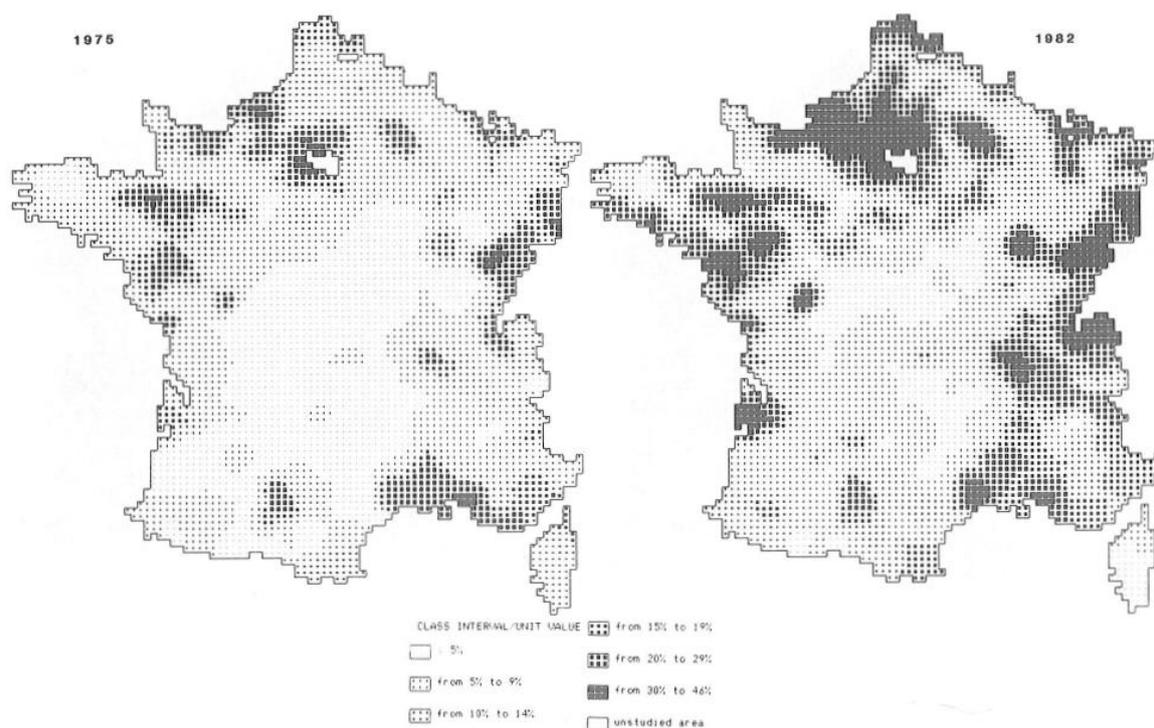

Figure 9. Probabilities of a district being in type 7 (high growth mainly due to migration) 1975 and 1982.

With this technique, we can envisage projections in the future as much as a sufficient number of censuses can be considered and analysed. This technique may thon be a very useful aid in planning if trends continue in the same direction and if

nothing is done to combat decreasing populations. We should also point out that this technique enables the different types identified by hierarchical classification to be better defined. For example, in the case of type 1, 94% of the districts have very low natural increase.90% have a vert' low birth rate, 90% have vert' few youth, 89% have many elderly, 67% have a vert' low fertility rate, etc. Such a refinement in the definition of types mat' improve analyses.

Conclusion

Based on the above findings, we can conclude that the government has played a minimal role in the demographic evolution of rural France. Although policy and planning mat' have had some impact in specific areas, they have not had any significant impact at a regional or national level. However, research on rural areas should not be performed uniquely on a demographic level. For this reason, this particular study is being refined, taking into account social structures, spatial structures, as well as housing and household facilities. The evolution of these parameters will be studied using the same techniques and will form the subject of a later publication.

References

Brossard, Th. (1984) Logiciel DIGICART (Cartographie digitale). Université de Franche-Comté, Besançon.

Brossard, Th. (1986) Probabilités et partition (le l'espace, Cahiers de Géographie de Besançon no. 2, Besançon. Chapuis, R. and Brossard, Th. (1986) Les ruraux francais. Masson, Paris.

Girardot, J.J. (1985) Logiciel ANACONDA (Analyse conversationnelle des données). Université de Franche-Comté, Besançon.

INSEE. General Population Censures, 1975, 1982.

Spiegel, M. R. (1982) Théorie et application (le la statistique. L. Jean, Paris.