

GIS Development and Planning Collaboration: a Few Examples from France

Stéphane Roche & Jean-Baptiste Humeau

Abstract: *This paper deals with the characteristics of French territorial organization and problems arising from the decentralization of power to municipal level. Three case studies illustrate how the implementation of partnership geographic information systems (GIS) projects can contribute to inter-municipal cooperation in regional administration.*

Key-words: *France, decentralization, regional planning, partnership project, local government.*

Introduction

In France, public action to promote local economic development is linked to cooperation between communes (municipalities - the basic administrative unit). Recent laws on territorial decentralization (1982) and planning (1992) clearly establish the decision-making responsibilities of municipal authorities regarding land administration. But

Dr. Stéphane Roche holds an Engineer degree (1993) from the National School of Land Surveying and Mapping (ESGT / Paris - France), a Master of Planning (1994) from the University of Angers (France) and a Ph.D. (1997) both from the University of Angers and Laval University (Quebec - Canada). He is currently Associate Professor in the Geography Department of the University of Angers. Dr. Roche has extensive experience in LIS/GIS design and implementation, social and organizational issues of Information Technologies, and Land tenure and administration. Over the past five years, he has worked as a consultant and researcher in Europe and North America.

Dr. Jean-Baptiste Humeau is currently Professor in the Geography Department and Head of the Social and Human Geography Laboratory (CARTA) of the University of Angers. He holds undergraduate and graduate degrees in Geography from the University of Angers, and a Ph.D. from the University of Caen (France). Dr. Humeau has published widely in the field of social geography and land planning policies. Publications include three books, more than 10 book chapters and 30 refereed journal papers. He has led many research initiatives, funded by several french ministries and European organizations, in France and Eastern Europe related to land reform, urban and rural development policies, and regional planning.

the size of the municipalities (90 % of the 36,000 French municipalities have fewer than 10,000 inhabitants), a legacy of the religious spatial structures of the 18th century (the parishes), is too small to permit efficient regional planning (Table 1). For a long time, public authorities have attempted to change this situation. Recent decades have seen unsuccessful top-down attempts to fuse small municipalities. Voluntary cooperation between municipalities through the creation of inter-municipal syndicates dates back to the end of the 19th century. The "Communautés de communes", an inter-municipal structure encouraged by the State since 1992, reflect early State attempts to modify municipal structures. How can the relative success of this central State initiative be explained ?

People's historical ties to their area remain too great to allow modification of communal borders. However recent demographic data shows that the context of this problem is evolving with increasing popular demand for more and more costly public infrastructure. As the rural population gets smaller in some areas, many rural municipalities are unable to raise enough fiscal resources for basic public investment. Peri-urban development in belts of 10 - 40 kms around most towns emphasizes the importance of mid-scale territorial management. Intermunicipal cooperation beyond the urban centre is vital in establishing networks of collective infrastructure. In France, territorial reorganization is a much-discussed issue. Rapid geographical change in the last three or four decades, and present constraints on public finances, have focused attention on the necessity for territorial administrative structures that allow for optimum efficiency.

The present development and spreading of geographical information technologies (Map 1), especially GIS, and

Table 1: Characteristics of a few European countries

	Number of municipalities	Total surface (km ²)	Average size of municipalities (km ²)	Density (Inhabitants/km ²)
USA	60,000	9,364,000	156	28
ITALY	8,100	301,000	37	189
PORTUGAL	305	92,000	302	109
FRANCE	36,494	594,192	16	100
West GERMANY	8,500	284,577	33	244
BELGIUM	2,500	30,521	12	324
The NETHERLANDS	650	33,938	52	427
LUXEMBOURG	175	2,586	15	142

their local implementation appear to offer small municipalities new opportunities for collaboration. Although isolated use of such tools in small municipalities remains difficult, collective use by groups of municipalities is feasible, provided certain conditions are met. Certain case studies already show that GIS can act as a catalyst in bringing municipalities together around a common project. Firstly, an inter-municipal approach to GIS use allows the poorest municipalities to join the present trend towards geomatics. Secondly, an inter-municipal GIS project provides an indispensable common focus for successful inter-municipal cooperation. Thirdly, a GIS project provides municipalities not only with efficient means to fulfil their mandate in regional planning but also a common conceptual basis for the development of joint planning strategies.

The main aim of this paper is to show, through a few examples of GIS projects, how and to what extent a multi-partner GIS project venture can act as a catalyst in inter-municipal cooperation and help smaller municipalities to deal with their newly decentralized powers. Indirectly, this paper also addresses how the use of a GIS, and the geographical information it provides, can facilitate thinking and dialogue in the field of territorial administration.

This research investigates areas that have already been studied to a greater or lesser extent. In particular, it is strongly related to the question of the human and social implications of GIS (the main theme of Initiative 19 of the National Center for Geographic Information and Analysis - NCGIA) (Harris and Weiner 1996). Other authors have also shown the relevance of such questions (see for just a few examples: Weber 1991; Campbell and Masser 1995; Pickels 1995; Pornon and al. 1995; Masser and al. 1996; Roche 1996; Roche and al. 1996; Roche 1997a). GIS projects are social constructions, both modified by local users and modifying the local context (Chrisman 1997; Roche 1997b). Our study is particularly inspired by Chrisman who underlines the importance of re-situating the study of GIS (as well as their implementation) in their

cultural and historical context in order to improve understanding of their use and potential role.

Our paper starts with a synthesis of French territorial organization. We then focus on the new challenges and difficulties these policies have created, particularly regarding smaller municipalities. We conclude with three case studies that illustrate the benefits of GIS in promoting collaboration in regional planning.

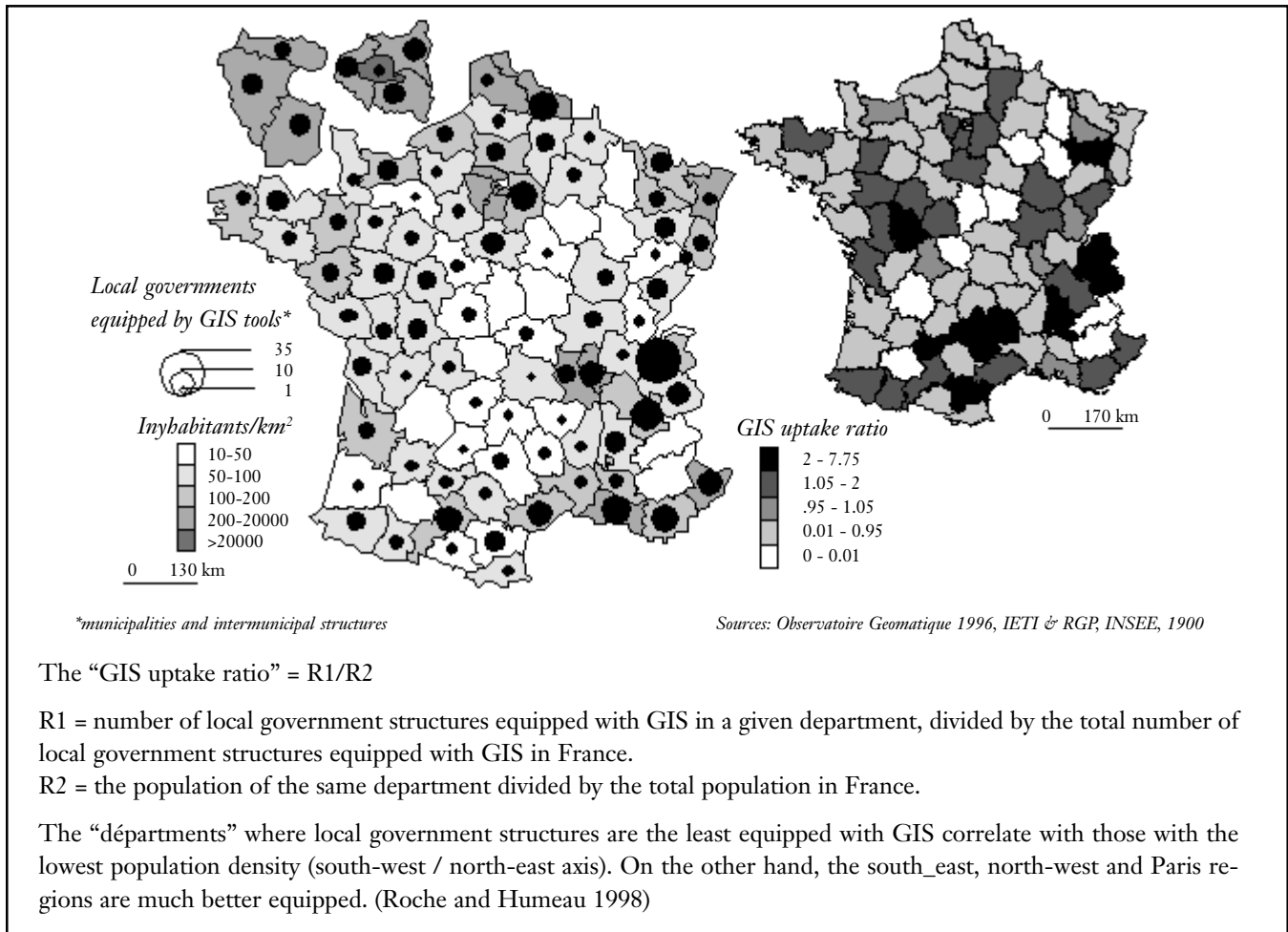
French Territorial Organization

Levels of Territorial Power

Since the Territorial Decentralization Law (1982), decision-making at the local level has undergone profound changes. The responsibilities of the French national State, renowned for its centralization of power (its “Jacobinism” in reference to the political trend of the Revolution and the Empire periods), have been decentralized to four levels of territorial administration (Gruber 1992): commune (municipality); municipal groupings such as the “Communauté de communes” and the “Syndicats” or “districts intercommunaux”; “Département” (the county); and “Région”. They all have statutory responsibilities, tax-raising powers and are accountable to regulatory bodies such as the regional audit office.

The municipality is endowed with major urban planning responsibilities. The “Plan d’occupation des sols” (POS or Land Use Plan) has become an essential planning tool for local authorities. Municipal authorities (with the exception of small rural municipalities which remain under the administrative trusteeship of the State) draw up a POS map defining every plot of land and its permitted use for residential building, new business activities, cultural and social facilities, roads and major collective infrastructure. Public infrastructure must be planned in accordance with this legally binding document. The POS is both a regional planning tool for technicians and a political tool defining the

Map 1: Spatial distribution of GIS tools by “département”



The “GIS uptake ratio” = R1/R2

R1 = number of local government structures equipped with GIS in a given department, divided by the total number of local government structures equipped with GIS in France.

R2 = the population of the same department divided by the total population in France.

The “départements” where local government structures are the least equipped with GIS correlate with those with the lowest population density (south-west / north-east axis). On the other hand, the south-east, north-west and Paris regions are much better equipped. (Roche and Humeau 1998)

major development orientations of a municipality as decided by its elected representatives.

The Territorial Decentralization Law also devolved responsibility for the management of primary school infrastructure and social and cultural facilities to the municipal level, as well as various measures in favour of economic development. This represents a revival of an old tradition in French municipal affairs: the responsibility of the municipality to satisfy local needs. This interpretation of the municipality’s obligations raises problems in a State which recognizes the primacy of private initiative, notably in economic matters. In a difficult economic environment, particularly regarding employment, local authorities are faced with considerable demands on limited resources.

The need for municipalities to be competent in an increasingly wide range of areas has led elected representatives to seek more efficient forms of inter-municipal cooperation. This is not a totally new idea; in the 1950s, inter-municipal syndicates were responsible for the efficient development of electricity distribution networks, and elected representatives have since attempted to multiply inter-municipal structures that allow more efficient management

than that attainable at the individual municipal level. A good example is the “Schéma directeur d’aménagement urbain” (SDAU - Guidelines for Urban Planning). In the case of big agglomerations (the Angers SDAU involves 54 municipalities, that of Nantes 65 communes...), the SDAU brings together the elected representatives of a large area to assess urban growth and agree guidelines for each municipal POS. This kind of inter-municipal cooperation is increasingly necessary; the 36,000 French municipalities have become too small given the big increase in mobility (residential, professional, social, cultural...) of urban and rural populations (Beteille 1995). The 1992 law on Territorial Planning (1992) recommends and financially encourages modern inter-municipal structures such as the “Communautés de communes” and “Pays”.

The “Communautés de communes” are a flexible and evolving form of inter-municipal structure. They have compulsory responsibilities (such as regional planning), with optional responsibilities that can be enlarged over time according to the will of their elected representatives (Baudelle 1995). The “Pays” are bigger structures than the “Communautés de communes”. Their aims are different.

The west of France has a long experience of pays (Map 2) pre-dating the recent law on territorial planning, with groups of municipalities working together to facilitate economic development. Most often, these pays were created around small towns and deliberately ignored the bigger ones which were blamed for accelerating the demographic and economic collapse of rural areas. By providing a legal basis for the constitution of pays, the law has recognized the reality on the ground, although questions remain concerning the nature and relevance of their plans for development. Moreover, it is not easy to share territory and responsibility between the “Pays” and the “Communautés de communes”. Planning technicians can only have a limited point of view on such issues, which must ultimately be decided by the elected representatives of the area.

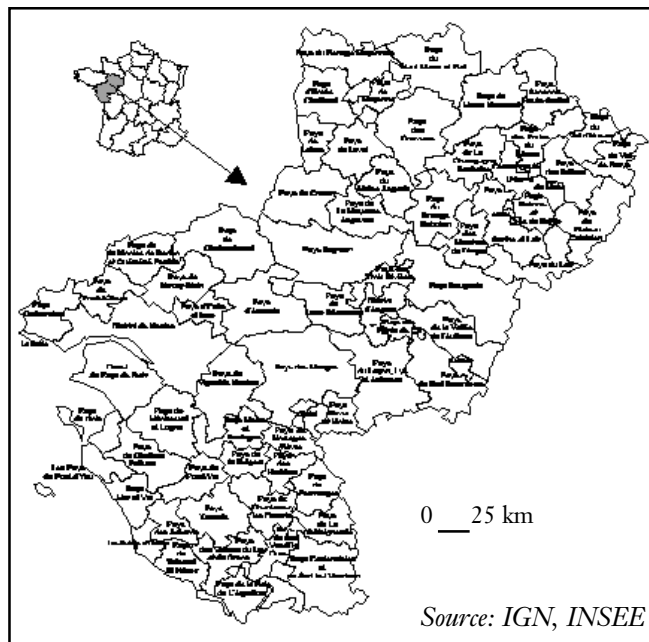
The “Département” (created during the Revolution) and the “Région” (an administrative area created in 1967) also have new regional planning powers. The “Département” is responsible for managing lower-level secondary school (“Collège”) infrastructure, providing certain social services, and maintaining infrastructure for economic development (local roads, bridges and industrial estates). Similarly, the “Région” is responsible for upper-level secondary schools (“Lycées”) and technical and vocational schools. Every five years a regional development plan is negotiated with the State to fix major planning priorities: major infrastructure, promotion of economic development, research, etc. A sizeable budget funded by specific regional taxes gives the “Région” considerable financial power. The “Région” also has privileged links with the European Union, receiving EU financial aid and influencing regional reform.

The Issues

The policy of regional reorganization is progressively modifying all the administrative practices of state and local government. New mechanisms allow new regional planning practices at different levels. New centres of power are emerging which are more closely in touch with local realities. However these new practices also create problems which have yet to be fully analyzed because the process of regional reorganization is incomplete.

The multiplication of levels of intervention is undoubtedly one of the most intractable obstacles. The multiplication of local administrations was identified as a potential problem at the very beginning of regional decentralization, and experience has shown this to be in some respects well founded. The overlapping of regional structures presents clear weaknesses, as in the case of the “Communautés de communes” and the “Cantons” (an administrative grouping of communes that essentially provide a constituency for the election of counsellors to the departmental council). The “Pays” is still faced with the choice of relevant borders that reflect geographical data and older administrative boundaries. Eliminating the old borders and rationalizing

Map 2: “Pays” in the Pays-de-Loire region



the number of elected representatives would have proved politically unacceptable. Nevertheless, the inefficiency of adding and superimposing spatial structures is increasingly evident (Humeau 1995). The definition of responsibilities between regional structures is based on the principle of “subsidiarity” : each regional authority identifies and implements projects at its own level and within its area of competence, using its own tax resources and sometimes also additional finances from other regional authorities. This principle is aimed at increasing the responsibility of each regional authority and shortening the time it takes for local administrations to react to the needs of the elected representatives. Relations between the different levels of regional authority are defined by the regional plan, and various co-financing agreements. The latter have become a basic rule of action for regional authorities.

The financial problem has become the central issue of territorial reorganization. Regional planning cannot overlook the difficult problem of fiscal resources. Small rural municipalities are presently strangled by limited fiscal receipts, though inter-municipal structures have access to greater resources. However, disparities of tax resources between municipalities, between inter-municipal structures, between “Départements” and between “Régions” do not reflect degrees of need: the greatest need in regional investment is located in the poorest areas.

The newly created regional authorities are discovering the importance of improving the spread of taxation wealth among inter-municipal authorities. The creation of «structural financial funds» for use by State representatives in the departments further indicates awareness of the limits of financing regional investment by regionally unequal tax resources. Although setting the main priorities in local and

regional development remains the prerogative of the elected members of the regional authorities, projects and financing must now correspond to national and European requirements.

The importance of a multi-level approach to regional planning is being further increased by the need to integrate these new levels of territorial administration. A map is only one of the elements involved in understanding local areas; projects using various types of observation and evaluation must be able to integrate essential and variable information. A common language (i.e. a negotiated spatial and conceptual framework) between experts and elected representatives is therefore necessary (Roche & Bédard 1997). GIS tools permitting the management of socio-spatial data-bases are becoming more and more complex. The increasing number of cartographic documents makes it even more important to identify the most relevant data. The choice of which data and how to represent it has therefore become a question of power among elected representatives and technicians (Pornon 1997). A gap is appearing between those who can assimilate these GIS techniques and those who cannot (Roche 1997b). Geographic information systems are being established by a number of regional authorities as the need for tools that organize regional information becomes increasingly obvious to both technicians and elected representatives. Development projects need this information and the ability to update data at varying scales (local, regional, national, European).

What Roles for GIS In Inter-municipal Collaboration ?

The use of geomatic technologies by French municipalities has been growing steadily since the eighties (IETTI 1996). However, implementing a GIS project is a delicate operation and can be a major problem for smaller municipalities. Whilst the costs of GIS hardware and software are no longer a major impediment, the cost of data and the institutional obstacles linked with legal authorizations to purchase data - such as cadastral surveys or IGN ("Institut Géographique National": National Geographic Institute) databases - often make it a complex process. These difficulties are particularly felt in small local authorities due to the lack of technical staff to undertake such a task. In short, the three main obstacles to implementing a GIS are the following:

Most municipalities consider the cadastral survey to be the basis for implementing a GIS project. But cadastral service policy is far from helpful to small municipalities. The cadastral service will participate in the cost of digitizing and updating municipal data only if it involves a minimum number of 150 cadastral sections, way in excess of those commonly present in a single municipality (Roche 1993). This subsidy policy¹ also imposes strict standards of digitization

and data structuring and the provision of equipment (hardware and software) to the cadastral service. Such demands increase the necessary financial investment and hinder the spread of GIS among small municipalities.

Secondly, the cost of all geographic data is very high in France, unlike in North America for example. The acquisition of the data needed by a municipality to implement a GIS (digitization of cadastral surveys, aerial photos, IGN numerical databases such as the databases Topo, Carto and Alt, etc.) is extremely costly (e.g. BDTopo : 400 \$US / km² ; 6 \$US / digitized cadastral parcel). It is certainly too expensive for the majority of small and medium size towns.

Finally, municipalities with fewer than 10,000 inhabitants experience specific problems that obstruct and limit the individual implementation of GIS: the lack of technical staff to support the project, operate the system, and update the data (Pornon et al 1995; Roche and Pornon 1996), and the difficulties experienced by elected councillors in understanding the equipment and its potential.

The pooling of financial and human resources appears to be the right strategy for small municipalities who want to invest in geomatics. Implementing a GIS project is easier within the framework of a "multi-partner project" that shares costs and resources. A number of problems obviously remain and new ones arise with the partnership. For a group of municipalities, such projects can present a real opportunity either to enhance and extend cooperation within an existing inter-municipal structure or to create new structures based on the common project. In all cases, it appears that implementing a GIS can provide a catalyst for municipal cooperation in land use management and planning.

This thinking is illustrated by the case studies of the GIS projects of the "District Urbain d'Angers", the "Conseil Général du Département de l'Ain", and the "Pays Yonnais" (Map 4). These three separate projects have been developed in different geographical surroundings, with varying origins, aims and participants. These different contexts and characteristics, as well as the main difficulties and future prospects of each of these projects are presented below. The potential for a new approach to cooperation in regional planning based on these experiences is also examined.

The GIS Project of the "District Urbain d'Angers"

The "District Urbain d'Angers" (DUA - Urban District of Angers) is an inter-municipal structure that provides logistical and technical support for 29 municipalities, including the town of Angers itself with about 80,000 inhabitants. The total population numbers about 200,000 (Table 2). The DUA services carry out regional management and planning operations (such as the "Plan d'Occupation des Sols", and the "Schéma Directeur d'Aménagement Urbain") on behalf of the DUA municipi-

palities. About three years ago, the DUA started work on a GIS project.

The Angers region provides a specific context as regards the development of GIS. In 1986, the “Conseil Général de Maine-et-Loire” presented a proposal for a departmental geomatic centre aimed at providing all local participants (private sector, regional authorities, administration, etc.) with a comprehensive geographical database covering the department (Roche 1993). At the time, this proposal received little support from the municipalities concerned, especially from Angers. Was the project premature? Or was local awareness insufficient? Local politics provide some explanation for these difficulties : the municipality of Angers is left-wing whereas the Maine-et-Loire department is traditionally right-wing. More fundamentally, the proposal was a good example of what Cohen et al. (1972) calls “a solution looking for a problem”. The project initiator was unable to involve the majority of the local stakeholders in the project’s implementation; the process of translation never took place (see Latour 1989).

Whatever the cause, today ten years later, the departmental geomatic centre is reduced to the minimum and is exclusively used by a few departmental services. The advantages for even the smallest municipalities of purchasing a digital cadastral database have also been promoted locally by the “Ordre des Géomètres-Experts” (OGE - professional association of land surveyors). In 1993, a survey was undertaken to assess the particular needs and requirements of 13 municipalities of fewer than 10,000 inhabitants around Angers (Roche 1993). The DUA project is therefore being undertaken in a context in which the municipalities, even the smallest ones, are more or less aware of GIS; this has helped its implementation.

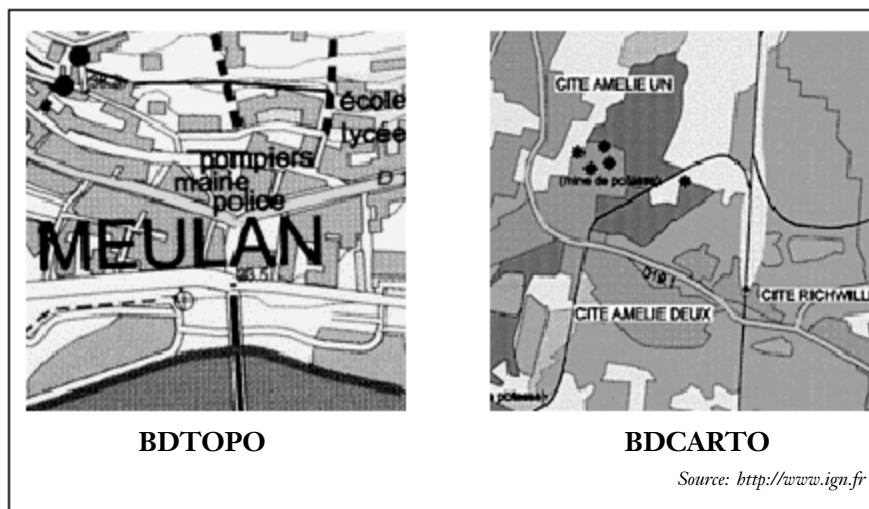
Instigated by the DUA urban planning service, the project’s aims are to facilitate and optimize the creation, management and updating of the POS of the various DUA

municipalities and of the Angers regional SDAU. The project also aims to provide the municipalities with a standard and updated database combining the cadastral survey and the IGN Topo database, with maps of the utility networks and projected development. Digitalization of the cadastral survey has been implemented in conjunction with the services of the DGI (“Direction Générale des Impôts” - General Direction of Taxation), along with the establishment of closer links with the various managers of the local utility networks.

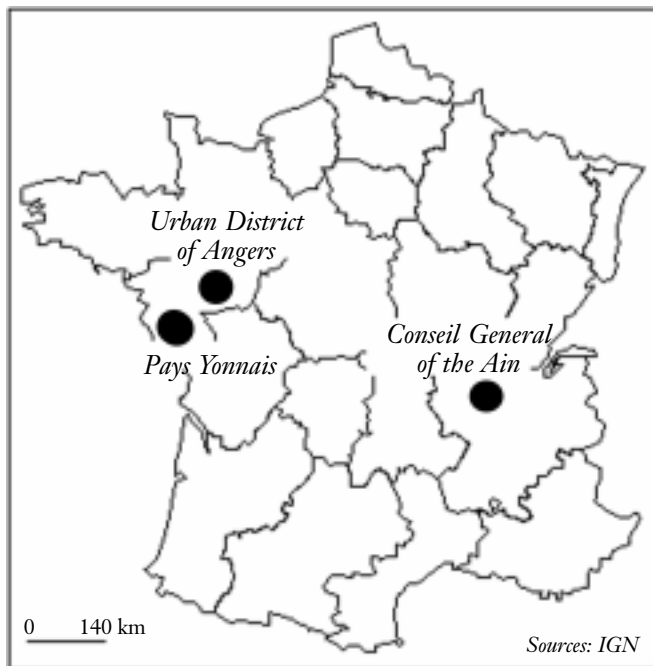
The organization of the database should enable all the municipalities to have access to common data (cadastral survey, networks, POS, Topo database), either directly or on demand, with the updating and the management being carried out by the GIS service of the DUA. Depending on their individual level of interest, and available resources, municipalities are able to establish their own computerized access point, and to input additional information. Municipalities receive updates in disk form, except the town of Angers which is already connected to the DUA through a network. The project is proving to be very versatile for the smaller municipalities, enabling them to have access to data through the DUA in the first instance and then to invest in equipment according to their needs and budget. That project has been well received by the smaller municipalities of the DUA (the district council allocated a budget of seven million francs over two years to digitize the cadastre of it’s 29 municipalities). Awareness of the technology generated by the OGE and the various surveys carried out among the small municipalities of the “Département de Maine-et-Loire” undoubtedly contributed to their positive attitude to the GIS project.

Although the project now appears to be accepted and indeed appreciated by the DUA municipalities, negotiations resulting in the digitizing and partnership agreements have not been without problems. Reaching a consensus on such

Map 3 IGN’s BDTopo and BDCarto



Map 4 Location of the Case Studies



issues as the characteristics of the system and the rights of use and access to information, involved delicate negotiations between parties whose interests were not necessarily convergent (different municipalities, managers of networks, services of the DUA, cadastral services...). The main difficulty undoubtedly dwelt in the choice of an acceptable solution for smaller municipalities who, despite their short-term incapacity to invest in their own consultation equipment (desktop GIS), nevertheless had to participate in financing the database through the DUA.

In this case, GIS implementation has not led to the creation of an inter-municipal structure. However, the availability of GIS resources has allowed the technical services of the municipalities and those of the DUA to envisage new

forms of collaboration. Until now, relations between the municipalities and the services of the DUA have been limited to the assemblies of elected local representatives. The introduction of GIS creates new working relations between technicians. Access to a common data-base gives them a common analytical and administrative basis. According to these participants, the introduction of a GIS is the opportunity they were awaiting to work together on something concrete and to communicate directly without going through the elected assemblies.

The GIS Project of the “Conseil Général de l’Ain”

The GIS project proposed by the “Département de l’Ain”, in the east of France (Table 2), involved the digitizing of the cadastral survey in a joint collaboration between municipalities, inter-municipal structures, decentralized State administrations and various departmental private sector organizations (Dresin 1995). The aim is to centralize information at departmental level, with administration, updating and access provided by the departmental services together with the SIEA (“Syndicat Intercommunal d’Electrification de l’Ain” : Inter-municipal syndicate for the electrification of the Ain). The main aims of the departmental GIS are twofold : to facilitate coordination between various departmental structures and to provide access to various data at various geographical levels.

For the municipalities, particularly the smallest ones, whether they are part of an inter-municipal structure or not, this approach appears interesting. The project aims to give them more autonomy in local development projects, urban planning and network administration (i.e. extra responsibilities, imposed without extra funding through decentralization), by providing them with appropriate equipment and information and technical support. Municipalities will then have access to data (generated from the departmental base to EDIGEO standard - “Echanges de Données Informatisées dans le domaine de l’information GEOgraphique” is a French standard for the exchange) via

Table 2 Characteristics of the three case studies

	District d’Angers	Département de l’Ain	Pays Yonnais
Total population (inhabitants)	238,000	471,000	77,338
Total surface (km ²)	588	5 762	250
Average density (inhabitants/km ²)	405	82	309
Number of municipalities	29	419	15
Average size of municipalities (inhab.)	8,200	1,124	5,156
Biggest municipalitie (inhab.)	146,000	40,970	48,000
Smallest municipalitie (inhab.)	94	14	393
Nb of municipalities > 10 000 inhab.	4	4	1

the telephone network. Each municipality is free to decide whether and when to invest in the appropriate access hardware. The project also aims at providing a local link between all the public sector participants, thus improving public service at the local level.

As a result of in-depth negotiations, all the aims and requirements of each authority, including the small municipalities, have been taken into consideration. But these negotiations have not been easy, particularly in regard to the rights and modes of access to the information (which is centralized in the main system administered by the department). The project had to develop a language, a syntax, a common grammar and a channel of communication so that individual partners could obtain the information according to their specific needs. This search for consensus resulted in the redefinition of certain stakeholders' involvement in the project (Latour 1989). The various participants now have access to the central database from which they can extract updated information and use it locally with the technical support of the departmental GIS service. The project has allowed participants to pool information and minimize costs. It has also allowed certain participants to exchange ideas about their respective activities.

The GIS Project of the "Pays Yonnais"

The GIS project of the "Pays Yonnais", presented by the local press (Ouest-France of 12/23/1995) as a pilot project for rural areas, is based on a contract signed by the Prefect (Government appointee representing the central State at departmental level), the "Communauté de communes" of the "Pays Yonnais" (an inter-municipal structure with fifteen small rural municipalities - (Table 2), the IGN, and many other local partners. The idea is to implement a GIS for the fifteen municipalities over two years combining the data of the various administrative entities involved in regional planning, thereby creating a system integrating a wide range of GIS data and partners. This project is not based on the digitizing of the cadastral survey, the aim being rather to create the possibility of observing the region on a global scale. The IGN and the OGE are both involved in the project, with the IGN donating its Topo and Carto databases.

The "Pays Yonnais" is a rural area located in the west of France in the department of Vendée. It is composed of small municipalities which most probably would be unable to set up a GIS on their own. The "Communautés de communes" of the "Pays Yonnais" is a young inter-municipal structure initiated by the "Vendée" Association of Mayors, which is particularly favorable to inter-municipal collaboration. Although the GIS project is not in this case a catalyst of inter-municipal collaboration, it is nevertheless perceived by the various participants as a means of promoting such links in regional planning. The project is expected to provide a common database allowing the various part-

ners to exchange ideas on topics of local interest using data from identical sources. As such the GIS is expected to act as a "facilitator" in regional planning collaboration.

It is too early to judge the results of this project though it does show that with the support of institutional and existing inter-municipal structures, even the most unpopulated and poorest rural areas can participate in a GIS project. However, as it is not the IGN's policy to provide their databases without charge, as they did in this project, the replication of such projects would involve considerable extra costs.

These three examples are interesting for several reasons. They show that partnerships appear to be the only solution for small municipalities confronted with the lack of versatility of cadastral service policy. They also show the need for protocols that are flexible enough to allow any municipality to adapt, no matter what its size and characteristics. Finally, they show how GIS implementation can be an opportunity for wider collaboration in the field of regional planning. The three case studies also provide a few perspectives for discussion and thought for the future.

GIS Implementation as a Catalyst for Collaboration

A multi-partnership GIS project constitutes a rare opportunity for diverse participants involved in regional administration to discuss their activities, problems, and experiences. Such projects provide small municipalities with the opportunity for finding new forms of cooperation. It becomes necessary for those involved to negotiate, discuss and take into full consideration their partners' activities as well as their own (as clearly shown by F. Harvey 1997).

In some cases, GIS implementation within the framework of a multi-partner project, particularly when these partners are small municipalities, may promote further collaboration by extending areas of common interest in regional planning. It may even create new forms of collaboration as in the case of the department of "Ain". The case may also arise that such a project cannot be implemented when preliminary studies show that differences in the stakeholders' interests are too great.

The multi-partner project represents one of only a very limited number of solutions open to small municipalities wishing to have this type of technology. Some small isolated municipalities have GIS but the context of their acquisition of the technology is not replicable (for example, a mayor working in the field of GIS...). The aim of a GIS project for small municipalities is not to make them even more dependent in the field of information (as is still often the case in some partnerships) but on the contrary to give them the technological tools they need, within the framework of joint projects developed by and for all the partners.

Finally, a multi-partner GIS project provides a pool of common knowledge to all involved, which in turn can repre-

sent a common planning tool. All the partners can then base their decisions and actions on the same information and the same geographical references, undertake analyses using the same system, and communicate and exchange in a language understood by all. The advantage of such standardization is to help towards collaborative decision-making and may in the process improve the appropriateness of regional projects. But it can also cause a levelling-down of the information and thereby a dilution of the quality of the collaborative effort. Such a database doesn't however guarantee a complete collective view even if it is the result of a negotiated consensus and has been socially appropriated by local participants. Even in the worst case, this common framework helps each participant to express a point of view and make it more comprehensible to the others.

Conclusion

The aim of this paper has been to show how implementing a multi-partnership GIS project, particularly with the small municipalities, can promote collaboration in regional development and help municipalities to assume the new responsibilities the French State has vested in them.

The three case studies show that a multi-partnership GIS project can increase and promote collaboration between different municipalities. Moreover, it can provide the participants with a base of common knowledge which is absolutely vital in dealing with numerous and complex responsibilities and fields of intervention (i.e. increasingly complex legal frameworks, new environmental awareness, negotiations at multiple levels of power...). This kind of project is also the only one enabling the smaller municipalities to acquire a geographic information system. Finally, these projects answer two problems experienced by the smallest municipalities : (a) the lack of tools and resources to exercise their new powers of regional administration, and (b) their financial inability to acquire their own geomatic system even though these systems can be the answer to some of their problems.

As mentioned in the introduction, this paper reflects attempts to improve understanding of the human and social implications of new information technologies and their role in land use planning. Our study is only the first step in a larger research project. Further case studies and surveys are needed to understand the social utility of GIS projects and to identify the links between GIS construction and inter-municipal collaboration (social context).

With the pursuit of European integration and the opening of markets to world trends, more and more power lies in the hands of local institutions. Given this context, it is important to examine the methods and resources which will be used in the future. Geomatic technologies and the local societies into which they are integrated are inseparable. The role and usefulness of the former are directly related to the way the latter adopts them. The future of local societies

will certainly be influenced by their ability - or otherwise - to assimilate these new technologies.

NOTES

1. This policy (convention nationale de numérisation) was modified in July 1998. Irrespective of the number of sections involved, the cadastral services now no longer participate financially in the cost of digitizing data (for further information see <http://www.cnig.fr>).

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