

IRPRU

**Industrial Reorganisation and
Modernisation Strategies
in the Aluminium Industry:**

**Sociospatial impacts on
Quebec's local communities**

Working Papers



**Economic and Regional Development
Research Unit**

Centre for Economic and Regional Development Research
1000 University Avenue, Room 3500, Montreal, Quebec H3A 2K4, Canada

ERRRU Working Paper No 11

**Industrial Reorganisation and
Modernisation Strategies
in the Aluminium Industry:**

**Sociospatial impacts on
Quebec's local communities**

Dr Christiane Gagnon
Professeur-chercheure
Groupe de recherche et d'intervention regionales
Department des sciences humaines
Universite du Quebec a Chicoutimi
555, Boulevard de l'Universite
Chicoutimi, Quebec, Canada, G7H 2B1

February, 1992

ISSN 1037-4140
ISBN 0 86758 564 1

Gagnon, Christiane, 1950- .

Industrial reorganisation and modernisation strategies in the aluminium industry : socio-spatial impacts on Quebec's local communities.

Bibliography.

ISBN 0 86758 564 1.

1. Aluminum Company of Canada. 2. Aluminum industry and trade - Environmental aspects - Quebec. 3. Aluminum industry and trade - Social aspects - Quebec. I. University of Sydney. Economic and Regional Restructuring Research Unit. II. Title. (Series : ERRRU working paper ; no. 11).

338.4366972209714

Acknowledgements

This paper was originally presented as a seminar to members of the Economic and Regional Restrcturing Research Unit, University of Sydney, November 29, 1991. I would like to thank the Unit for its warm welcome, especially the support of its Acting Director, Dr Richard Howitt. His useful help, generosity, open and great mind have afforded me great pleasure and satisfaction during my stay at the University of Sydney from October to December, 1991. Without doubt, the insight of his work and the work of other Australian researchers will be an important part of my postdoctoral research on Social Impact Assessment (SIA), the aluminium industry and community development.

This paper is related to my doctoral thesis and postdoctoral research, which were sponsored by the *Conseil Canadien de la recherche en sciences humaines du Canada* (1986-1992) and the *Universite du Quebec a Chicoutimi*.

Christiane Gagnon
Chicoutimi
February 1992

ABSTRACT

Since the end of the seventies, the aluminium industry has been undergoing a process of spatial restructuring. While it closed down in Japan and United States, it has increased its nominal capacity in other places like Quebec, Australia, Brazil and Venezuela. Several factors can explain the relocation the most obvious of which is the cost of energy. For instance, the recent economic strategy of the Quebec government with its low electricity rates have been creating opportunities for the construction of new plants by new producers. Whilst this industry is a substantial area for national growth and economic activity of political concerns, it has impacted on localities and regional communities. Unfortunately, those social and spatial impact have not sufficiently studied by scientists or by environmental assessors.

Trying understand what this will mean, involves an account of regional case study in the eighties. The choice of Saguenay—Lac-Saint-Jean appears very relevant; Alcan Aluminium Limited, which is the most important primary aluminium producer in the Western world, has been concentrating a wide part of its production in the region and has also become involved in a process of modernisation at the end of the seventies. Then, major changes have occurred in the communities. The regional workforce, environment, local tax revenues and regional planning have been deeply affected by the corporate strategies and process of industrial restructuring, accordingly this region is single-industry and remote. The strategies of this multinational corporation has entailed social and spatial impacts which are significant for future localities development in achieving sustainable development. In conclusion we shall explore the meaning of the relationships in a approach of social impact assessment.

**INDUSTRIAL REORGANISATION AND MODERNISATION
STRATEGIES IN THE ALUMINIUM INDUSTRY: SOCIOSPATIAL
IMPACTS ON QUEBEC'S LOCAL COMMUNITIES**

CHRISTIANE GAGNON

Ph.D. IN PLANNING

DEPARTEMENT DES SCIENCES HUMAINES

GROUPE DE RECHERCHE ET D'INTERVENTION REGIONALES

UNIVERSITE DU QUEBEC A CHICOUTIMI

555 BOULEVARD DE L'UNIVERSITE

CHICOUTIMI, QUEBEC,

CANADA G7H 2B1

**ORIGINALLY PRESENTED AS A SEMINAR AT THE ECONOMIC AND REGIONAL RESTRUCTURING
RESEARCH UNIT, UNIVERSITY OF SYDNEY, 29 TH OF NOVEMBER 1991**

CONTEXT

Whilst the primary aluminium industry is considered, in Australia as in Canada, as a substantial area for national growth, economic activity of political concerns or as an example of uneven development for human geography¹, this industrial production and its resource-based projects implied and implies sociospatial impacts at the local and regional scale. The primary aluminium industry has impacted on communities, in different ways such as environment, regional planning, employment and globally on the territorial and social organisation of these affected communities. Unfortunately, those impacts, in the case of shut-down, expansion or new plants, have not been sufficiently studied by scientists or taken into account by social assessors or governmental agencies. Then, communities, for instance through local government authorities, do not have a complete and territorial base survey when they are negotiating with the corporation or state government about zoning, local services, taxation, infrastructure, environmental regulations, etc.

In Quebec, in the case where a aluminium company announces new investments which are supposed to generate local economic activity, the requirements of impact study are limited to environmental repercussions of this specific project and not submitted to the regulation of public hearings as other industries. In the case of partial or total closing plants or substantial expansion it do not require social impact assessment at all, despite their impacts on environment, social organization, present and future planning and development of the communities.

Therefore, a local development approach based on community decision making, in order to promote equitable and sustainable development, is becoming a question on the governmental, social and scientific² agendas. But its complexity, its ambiguousness and its political aspects require an understanding of the new conditions of the international mode of production, corporate and state strategies and

know-how of communities and social actors. We believe, along with other researchers³, that social assessment of industrial projects in rural, urban or cultural communities should be connected with historical, cumulative and community development views. In regards to these, a main question appears: **How can communities survey and respond to industrial restructuring or deindustrialisation and manage to assure the human well-being of its members?** This is a major task for social science which requires an interdisciplinary research program within an international network.

Trying to assess some sociospatial impacts of the restructuring of the aluminium industry, we involved an account of regional case study in the eighties. The choice of Saguenay-Lac-Saint-Jean [SLSJ] is quite appropriate; Alcan Aluminium Limited, which is the largest primary aluminium producer in the Western world, has been concentrating a wide part of its ingots production in this region [figure 1] and also has undertaken a process of modernisation at the end of the seventies. Then, major changes which have occurred in the eighties have affected local and regional communities. The regional workforce, environment, local tax revenues and regional planning have been deeply modified by the corporate strategies and process of industrial restructuring; accordingly this region is single-industry and remote. The strategies of this multinational have entailed social and spatial impacts which are significant for present and future regional development. This restructuring and the corporate's strategies are challenging the communities's abilities to respond to global change and to develop initiatives.

This paper is organized in three parts. Firstly, we present briefly some characteristics of aluminium restructuring in Quebec, particularly in the Saguenay—Lac-Saint-Jean region. Secondly, referring to the case study, we look more closely at the modernisation and territorial strategies of Alcan. Thirdly, we examine four areas

where this restructuring impacted on local communities: employment, local tax revenue, environment and regional planning. Finally, we shall explore the theoretical meaning of relationships between social and spatial and local and global spheres, focussing on industrial restructuring which also means a process of territorial and social change⁴.

Understanding the relationships — between territorial development, global economic restructuring and social change — represents not only a scientific interest for planners and geographers, but has also a social relevance we pointed out some local impacts of the industrial restructuring. Because degradation of the social and physical environment has occurred in many places, and most of the regional or national development policies have failed to diminish inequalities between and within regions, nations and generations, an acute demand exists from local communities to improve their management and planning, in a context of deindustrialisation or redevelopment. Within a process of social negotiation to be mediated by the polarizable debate between the proponents of industrial resources projects and their opponents, especially the conservation movement, the local and social impacts of industrial changes should be stressed. Upon conditions, Social Impact Assessment [SIA] and the ecologically sustainable development (ESD) can give opportunities to communities to define a guideline interface between their own goals and priorities, the support capacity for their territory or environment and the constraints of industrial restructuring.

1. ALUMINIUM RESTRUCTURING IN QUEBEC

In Canada, like in Australia, we are involved in dominant resource-based development. The aluminium industry is, without doubt, one of the most intensive use of capital natural resources with major environmental impacts. This kind of

industry requires large areas of land to produce and store raw materials and waste; intensive mining; water, power and transport infrastructures for transforming, manufacturing and trade. New expansion and plant closures affect regional and local planning and involve communities in a definite way, determining their present and future development.

This situation is related to the huge change which has occurred at the international level. For instance, the nominal capacity of primary aluminium industry, on the one hand, which shutted down in Japan and United States, and on the other hand increased in some other places such as Australia, Quebec, Brazil, Venezuela. In these countries natural resources (bauxite, coal, hydro-power), the access to a low cost energy and the governmental agreements were among the factors which attracted this industry. This restructuring implies new locations or expansion of plants, infrastructural support or services from states and local authorities, financial arrangements for taxation and energy costs, project-oriented planning, environmental and social impacts.

Firstly, a brief account of the recent location of the primary aluminium industry in Quebec. It is located along the Seaway of the St. Lawrence river and the navigable waters of the Saguenay river [figure 1]. In nineteen 1990, there were five transnationals or consortiums:

Alcan Aluminium Limited, the oldest and the biggest producer, located at Beauharnois, Shawinigan, Chicoutimi, Jonquiere, Alma, La Baie;

ABI — consortium of Pechiney, Alumax, Reynolds, Societe generale de financement du Quebec (public corporation) — at Becancour;

Alumax at Deschambault;

Renolyds at Baie-Comeau;

Alouette — consortium of VAW, Hoogovens, Austria Metal, Kobe/ Marubeni, Societe generale de financement du Quebec — at Sept-Iles.

The recent arrival of new producers marks a change in the history of this industry in Quebec: from eighteen ninety-nine (1899) to nineteen fifty (1950) Alcan was the only producer and the subsidiary company of the American company, Alcoa. In the process of production, Alcan exported all its products to Alcoa. In a second period (1950-80), Alcan was legally dissociated from Alcoa and integrated its operations at the international level. The third and present period is characterised by the increasing production of primary aluminium from old and new companies and by a diversification of the industrial operations of Alcan.

In comparison with nineteen eighty there is a phenomenal expansion of this industry in Quebec: five new plants have been constructed at Becancour, Deschambault, La Baie, Chicoutimi, Sept-Iles, two are being expanded (Becancour, Baie-Comeau) and one will be expanded in the nineties (Alma) [figure 1]. This new addition of nominal capacity represents about one million point seven fifty tonnes capacity more per year (1750 kt/a). Production is expected to reach a capacity of two millions point three annual tonnes (2 320 kt/a) by 1995⁵. The total production of ingots by transnationals in Quebec accounted for eight per cent (8%) of Western production⁶ and with this addition of new capacities will reach ten per cent (10%).

However, the present increase follows a period of decrease (the 1960s and 1970s) in which Quebec's share of Western aluminium production capacity declined from twenty per cent (20%) to eight per cent (8%)⁷. The modernisation and restructuring in Quebec was begun with the construction of the smelter at Grande-Baie by Alcan (1981), the first smelter to be built in over twenty-five years.

This spatial reorganisation of the aluminium industry has to be related to the hydro-power energy resource and the political agenda of the Quebec government, which has undertaken the construction of huge dams in the seventies. In turn, the government's decisions have shaped the territorial organization of the northern region and impacted on Aboriginal communities. Those links between the aluminium industry, energy resources and communities impacts can also be interwoven through a regional and urban case study: the Saguenay-Lac-Saint-Jean (SLSJ).

2. THE RESTRUCTURING OF THE ALUMINIUM INDUSTRY IN THE SLSJ

A few words are in order concerning the sociospatial context of the SLSJ. This region lies well beyond the major urban concentrations, within a radius of more than three-hundred kilometers of Montreal, Quebec's largest city, (figure 2). It can be characterized as being truly vast in area covering more than one-hundred thousand, square kilometers (103 900 km²); a small population three-hundred-thousand inhabitants (300 000 h.); a northern latitude, its the northern most urbanised region in Quebec; it's cultural homogeneity, (ninety-eight per cent French-speaking) .

The population is mostly urbanised and distributed among five industrial cities and more than fifty municipalities around the Saint-Jean lake and along the Saguenay River (figure 3). The economy is not well diversified and has traditionally revolved around the exploitation of natural resources, primarily forest products and hydro-electricity. The aluminium and the pulp and paper industries, agriculture and tourism, represent the principal job-creating sectors of the economy. However, this region experienced an unemployment rate higher than that of the remainder of Quebec by from one to five percentage points, between 1977-1988, making this region one of the most sensitive to slowdowns in the Quebec economy⁸. With this as background,

we turn to the specific forms of the restructuring of the aluminium industry at the regional level.

In SLSJ, the four aluminium smelters are all solely owned by Alcan. The smelters are located in a radius of twenty-five kilometers and in the four biggest cities. About forty percent (40%) of Alcan's primary aluminium production is concentrated in this region (1988)⁹, and most of this is exported to foreign markets, particularly to the United States (figure 4).

Historically, it was in 1926, at the Jonquiere complex (Arvida), that Alcan (Alcoa) poured its first aluminium ingot. They later built there the largest aluminium smelter in the Western world to respond to the demands of the Wars. In the nineteen-seventies, the aluminium market experienced several downward fluctuations. Alcan multinational, seeing its profits and its market share decline, modified its strategy. Among other strategies, it decided to modernize smelter plants in Quebec, to relocate part of them and to increase total production capacity of ingots and nominal capacity of hydroelectricity (British-Columbia and Quebec).

As the historical territorial dynamic of this region is widely influenced by Alcan, I paint a broad picture of Alcan's industrial infrastructure development in the SLSJ. This information is presented around the key period of the nineteen-eighties: before the eighties Alcan laid the bases of territorial monopoly and after that it began a modernisation program, a diversification of its production and implemented a territorial strategy with the local communities.

2.1 BEFORE THE EIGHTIES: THE BASES OF TERRITORIAL MONOPOLY

Before 1980, Alcan had established the bases of its territorial monopoly, which can be seen in the following structures. It is the owner of:

- six hydroelectric power plants with a total installed generating capacity of two-thousand-six-hundred and eighty-seven megawatts (2 687MW) (figure 5),
- an electricity distribution grid serving several municipalities and other industries, with its supply production (figure 6),
- water bodies with controlled levels or flow (rivers and lakes),
- a railroad linked with the national rail system,
- a deep sea port for the export of ingots and regional products, as well as the importation of raw materials, such as bauxite and alumina,
- two electrolysis plants: Jonquiere and Isle-Maligne,
- a large, inorganic chemical complex, where bauxite is converted into alumina, where aluminium fluoride is produced, in addition to other products (like gallium of use to the aerospace and military industries),
- an international center for research and development,
- two small fabrication plants: semi-finished products such as aluminium rods and electric cable,
- and a wide network of land holdings along the shores of Lake Saint-Jean, and in the industrial cities.

2.2. THE EIGHTIES: EXPANSION PRODUCTION, DIVERSIFICATION AND TERRITORIAL STRATEGY

With the dawn of the eighties and capital restructuring, the industrial and urban landscapes began to change. The application of Alcan's modernisation strategy brought, among other things, the partial closure of an old plant (Arvida) and its replacement by three smelters : Grande-Baie (1981); Laterriere (to be completed in 1992) and construction at Alma which has yet to be undertaken.

These plants, with a average capacity of two hundred thousand metric tons per year (200 kt/a), are both time replacement and expansion units¹⁰. Replacement in the sense that, following the gradual opening of Grande-Baie, Laterriere and Alma, and also the fluctuations of the market (three pot rooms shut down in October 1991) some of the old pot rooms, using Soderberg technology, at Jonquiere complex and Isle-Maligne have closed and the remain ones will be closed. At the end of the modernisation process, only six pot rooms will be retained at the oldest plant, which will be operating at about one third of its initial capacity. A significant expansion (c. 25%) of the regional production will occur only when Laterriere and Alma will be fully completed, perhaps, for the second part or at the end of this decade.

Whilst Alcan is relocating its smelters intraregionally, it is diversifying its production through the use of small new technology plants:

- the Dubuc plant producing Dural and Duralcan, a new alloy composed of ceramic and aluminium for which applications are found in the automobile industry, sports equipment, the aerospace and military industries;
- Technology C-Axis, a plant producing strengthening materials used in, among other things, Duralcan;

- a plant for the skim treatment from all the aluminium smelters in Quebec.

At this point, it must be remembered that this industrial restructuring, at the intraregional scale, means the decentralisation of smelter operations, new plant locations, the building of small technology plants and the modernisation and expansion of other plants, like the fluoride and casting units.

That is a small part of the global corporate modernisation strategy which is articulated around four topics: growth in productivity, enhancement of the environment, improvement in working conditions, and finally rationalization of energy resources. The strategy of modernisation, as we know it today, is not at all recent: it was thought out around twenty-five years ago, as can be seen in various official Alcan documents and during public hearings in the seventies. At the end of the eighties, the financial situation of Alcan recalls the period following the Second World War and relates the links between profits, hydropower capacity and modernisation.

At this moment of our history, (...) we found ourselves with a strong balance sheet and good cash flow, sufficient flow to undertake a number of long-term projects and in particular both to rebuild in the East of Canada our old smelters and the same time add to our hydro power capacity in the West.¹¹

In actual fact, the modernisation program is a means for the renewal of the industrial capital so as to substantially increase, its profit margin. For example, in Alcan, the reduction in manpower and capital investment permitted, for the sole year of 1987, savings of seventy million dollars.¹²

At another level, the spatial restructuring of the industrial capital has brought not only a modernisation and relocation of the production, but some other strategies. One of these, the territorial strategy is addressed to the regional communities. According to some recent observations, is it clear that this Company, is seeking to keep not only

the good relationships with the communities but to promote the local entrepreneurship, the regional development and plus foster a specific identity¹³.

This corporate strategy combines three types of action. Firstly, the promotion of the regional consensus and the establishment of regional development priorities. This is particularly perceptible during the regional round tables on environment and employment in which Alcan has participated actively. Directly concerned with these hot issues, within the round tables, it has extended its social partnership and social negotiation and the base of its interlocutors. To union and local governments, the traditional interlocutors, were added social groups such as local environmentalists, citizens and regional organizations. The partnership with the local community has sought by Alcan is appearing in its official discourse¹⁴. Now, Alcan has sponsored not only sporting or medical activities but has encouraged conservationist activities (like the Conference lead by Greenpeace against the extinction of white seals in Saguenay and Saint-Laurent rivers) and the self-reliance of the regional community. As a matter of fact, it has invested in the regional Society of job creation [SOCCRENT] for local industries to counterbalance the jobs loss caused by modernisation. It also supports industrial research on aluminium at the University and lead a campaign for promotion of local entrepreneurship and regional identity on the regional TV network. Finally, the head office of this multinational is officially promoting the sustainable development and campaigning for protection of the environment. (Incidentally, I observed at Taronga Zoo, that Alcan is the sponsor of the zoo theater and the campaign for the protection of seals).

In this case study, the emphasis and the targets on Alcan's territorial strategy appears quite relevant. In the context where its modernisation in Quebec is extremely related to the advantageous cost of energy, and its vested interests were regularly questioned and contested by social groups, especially its exclusive management of the artificial

water level of lake Saint-Jean, we have to examine the terms of the renewing conditions for the costs of its hydroelectricity production.

2.2.1 The renewal of the conditions of hydroelectric production

Alcan manages a vast hydrographic network whose surface area (seventy-three thousand square kilometers, slightly larger than Tasmania) which allows it to produce an important power-generating capacity (2 687 MW) (figure 5). At the time of the nationalisation of the hydroelectric system in Quebec in 1963, Alcan owned 27.5% of the power capacity of the entire Quebec system. With some other manufacturing industries, it was spared nationalization. After, it escaped social pressures for nationalization, and was forced to accept an increase in government royalties on its use of the total power-generating capacity. Recently, it negotiated two important contracts with the government of Quebec, that not only reinforced its competitive edge in the world aluminium market but reasserted its spatial preeminence among the communities, by a decennial program of planning shores, against erosion, which is costing forty million CDN dollars.

The first contract, the Peribonca lease, (signed in 1984), established at a very advantageous rate, one part of the rent for use of the hydraulic power of the Peribonca river (figure 5) for the next fifty years. In return, the Company agreed to pursue its modernisation program in the SLSJ and elsewhere in Quebec, according to the following conditions: production of one million metric tons of primary aluminium between now and the year 2015 for a total modernisation investment of three billion dollars. With regard to this contract and its foreseeable capacity of production, it will construct a new smelter in Quebec before the next thirty years or to expand its smelters.

In the second contract (1986), the Quebec government concedes to Alcan the exclusive management of the Lake Saint-Jean, which allows it to maintain an artificial and consistent level water for its own hydroelectric production. In addition, the promulgation of a decree grants it the right to pursue their shore stabilisation program, so as to minimize the impact of erosion, aggravated by the maintenance of this artificially high water level. And this solution was retained, in spite of ferocious opposition of ecologists, lakeshore users, recreation and tourism developers¹⁵, and against the recommendations of the Quebec government body for public hearings on environmental issues (BAPE)¹⁶.

Because it possesses important hydroelectric installations and obtained governmental privileges, Alcan, by its own admissions, has an undeniable advantage over its competitors¹⁷. Whereas for the Western aluminium industry, the cost of energy — which represents thirty-five percent of the cost of production¹⁸ — doubled between 1970-1980, Alcan shelters from this major increase. It has reinforced its competitiveness because it controls the cost of its own hydroelectricity, excepted some government royalties on its use of the hydraulic power [public property].

Not only did its cost of production linked to energy not increase, but its cost of production of a Kilowatt hour is the lowest in the world. Even though the exact cost of a kilowatt hour is an industrial secret, several educated guesstimate have been advanced by researchers, year after year: in the seventies several have calculated a cost of one.point.two.five mills per kilowatt hour or zero.point.one.two.five cent (0.125c)¹⁹, and in the eighties others estimated two.point.five mills or zero.point.two.five cents (0.25c)²⁰ and three mills or zero.point.three cents (0.3c)²¹. [The last estimation represents about nine time less that the cost in New South Wales]²².

This low cost of production allowed Alcan to produce a ton of aluminium in 1980 for fifty dollars "as opposed to three hundred dollars for its American competitors and more than nine-hundred and fifty dollars for Japanese aluminium smelters"²³. Moreover, because Alcan is a private producer and its electricity production is greater than its industrial needs, it has excess electricity to sell. The sale of excess electricity to third parties in Canada by Alcan, represented bi annual (1986-88) profits more than five hundred million dollars ²⁴. This cheap exploitation of Canadian hydraulic forces by Alcan, is a fundamental key to understanding its last redeployment in Quebec and British Columbia.

The advantageous renewal of the conditions of hydroelectric production between Alcan and the Quebec government in the nineties reinforces its global competitiveness and profits. However, we must not forget to make these agreements acceptable or legitimate, the Company is maintaining a strategy which allows it a good political relationship with local communities²⁵. Modernisation and territorial strategies are taking place in the same process of restructuring. Modernisation, increases productivity by the reorganization of work practices and plants, including technological changes. The other, territorial strategy, aims to make the impacts of modernisation and industrial change fairly acceptable to the regional community and, at the same time, reinforces the position of the Company in regional and local issues.

3. THE SOCIO.SPATIAL IMPACT OF THE INDUSTRIAL MODERNISATION STRATEGY

We retained this following areas of social and spatial impact as a consequence of industrial restructuring: employment; local tax revenues; environment and regional planning.

3.1 EMPLOYMENT

The most substantial sociospatial impact of modernisation is, without doubt, on employment. At the regional level, in spite of the construction of two recent aluminium smelters, this strategy incurred a net loss of two thousand-one hundred industrial jobs between 1980-1989; in other words a reduction of about twenty-two percent of the Alcan regional workforce²⁶. This drastic reduction of employment in this manufacturing industry has had dramatic spin-offs in a region whose economy is poorly diversified and where Alcan is the biggest private employer. The payroll in the region is shrinking to insignificance; jobs that have been lost, as a matter of fact, were quite well paid. From this fact one can well imagine the multiplier effects in terms of destabilizing the social and economic web of regional community.

In the context of the regional development problem, the creation of jobs becomes, above all, a social objective. In spite of the appearances of regional economic activity, generated in part by the intraregional relocation of smelters and the modernisation of the infrastructures, an increase in the regional unemployment rate has occurred. In a global fashion, it is well known that the aluminium industry creates few jobs, and those jobs are very expensive to create.

And in the future, is it possible to expect positive effects in regional job creation as a result of the regional increase in primary aluminium production capacity? The future prospects for industrial regional job creation are falling. In any case, it seems it will not be possible to count on multinationals for job creation, that, in fact, multinationals have a marginal role in job creation, — amounting to only three percent (3%) of the economically active world population²⁷. It is true that the case of the aluminium industry in Quebec illustrates this statement well: Its progress in terms of production

capacity (more than seventy percent) is inversely proportional to job creation (minus four percent)²⁸.

3.2 LAND-BASED REVENUES

The modernisation of the aluminium industry causes financial impacts, in particular land-based industrial revenues of the local governments. In fact, the financial situation of the urban municipalities of the SLSJ, who have received the smelters, has changed since the spatial redistribution of primary aluminium production.

First of all, the city of La Baie has seen its revenues increase by some four million dollars with the construction of the Grande-Baie smelter. Next, the City of Chicoutimi will obtain as much with the start-up of the Laterriere facility. However, the situation in the municipality of Jonquiere is considerably less rosy, since the closure of the Soderberg pots rooms at the Jonquiere complex will bring about losses of sixty million dollars in industrial land valuations²⁹. This will entail major decline in the revenues of this municipality. It has also suffered demographic loss, social and health damage in comparison with the other industrial cities.

While the entire industrial smelter operations of Alcan were, before 1980, principally concentrated in Jonquiere, the opening of the new plants will transform the intraregional distribution of industrial property taxes and eventually regional planning, in the sense of the merging of the towns in the Upper-Saguenay [Chicoutimi, Jonquiere, La Baie].

3.3 REGIONAL PLANNING

The modernisation of the electrolysis plants involves the construction of new smelters. As a consequence, vast land-holdings and natural resources are marshalled for the exclusive ends of industrial production, changing local planning, uses of resources, like agriculture or tourism, and occasionally modified radically property limits of the municipalities.

Such is the case of the villages of Laterriere which, following the development of the plant in the very heart of an agricultural and forestry community were merged, and were forced to leave a part of their land area, (nine hundred and seventy hectares). This land area was transformed into an industrial area and conceded to the city of Chicoutimi, who received additional industrial revenues. This merging required a new law which set a precedent in Quebec but allowed more industrial tax revenues from Alcan.

Elsewhere, the intraregional relocation of plants has brought about a new distribution of industrial property taxes among the principal urban centres, which has created conditions favourable to a re-drawing of local boundaries. Now several mayors foresee an eventual amalgamation of the cities of the Upper Saguenay.

In consequence, the spatial restructuring of the aluminium industry in SLSJ has impacted on the territorial organization of communities and their environment.

3.4. ENVIRONMENT

There is a very close link between Alcan's discourse on modernisation and its discourse on the environment. As a matter of fact, one of the motives invoked to

justify the modernisation of the operations is the protection of the environment. For example, at the time of the Laterriere announcement, this multinational refers to this argument:

The recent decision to go ahead with the proposed Laterriere smelter constitutes the next step, of major importance, with the objective of improving the performance of our system of electrolysis plants in Quebec as regards the protection of the environment.³⁰

But if the Company modernizes its old smelters in Quebec, Alcan states that it would not principally be,

(...)for economic reasons. There is no doubt an economic benefit, more efficiency, but the deciding factor will be health and the environment. The old plants had to be modernized because of the environmental problems they were causing³¹.

The governmental norms, the pressure exerted by ecologists, workers and shareholders as well as apprehensions by directors of the corporation that they might have to answer for their actions before the courts have also instigated the Company to integrate environmental concerns into its industrial policies at the beginning of the eighties³².

Even if the new smelters will have less damage on the environment, a smelter like Grande-Baie, considered to meet the minimum norms, emits into the atmosphere a significant quantity of suspended matter, sulfur dioxide, carbon monoxide, fluorides and volatile organic compounds³³. Because of these atmospheric emissions, in particular the concentrations of fluorides³⁴, important buffer zones still extend around the smelters.

In the case of the regional environment, the modernisation of the Jonquiere smelter is vital. Only for the atmospheric emissions of fluoride a total of 173,993 tons of

fluorides have fallen on the urban and regional environment, in the last forty years. This represented seventy-four percent (74%) of all the atmospheric emissions of the aluminium smelters in Quebec³⁵. This fact is unsettling if we take into account the controversy, about held medical and health effects of fluoride³⁶.

In the smelters and inorganic chemical facilities, (for example, Vaudreuil in Jonquiere Complex), the Bayer and Soderberg processes have been the major culprits of pollution. The Bayer process discharges or has discharged several contaminants into the settling ponds, the water courses or into the sewers (involuntary discharges) including the following: caustic soda, cyanide, sulfuric acid and fluoride³⁷. As for the Soderberg process, recognized carcinogenic substances, such as PAH [Polycyclic Aromatic hydrocarbons] have been emitted into the atmosphere above cities³⁸, the Environment ministry has not enacted regulations until now.

As for the water resource, it is interesting to note that the Quebec government office for the study of toxic substances has identified the former chlorine plant of Alcan as responsible for the discharge of two-hundred tons of mercury in the Saguenay River and its tributaries³⁹. In spite of the closure of this plant, "Alcan remains a point source of mercury emissions contributing to the contamination of its environment"⁴⁰, principally with the leachate waters of the waste sites.

We add to this list six toxic dump sites belonging to Alcan, of which five have been classified as "presenting a current potential public health risk and/or a potentially high risk for the environment"⁴¹: these consist of dry materials, a solid waste dump, a heap of ramming mix, a heap of gypsum, lakes of red mud in two cities.

Concerning industrial pollution and decision making about new smelters, an important gap remains despite the intention or discourse of politicians and

industrialists to achieve sustainable development. As of today, in Quebec, no study has evaluated the impacts of the industrial emissions on the health of neighbouring urban populations. Most certainly the modernisation entails some community benefits like a decrease in fluoride emissions or less polluting technology. But the rise or nominal capacity of production ($\pm 25\%$), the synergistic and cumulative effects of the concentration of four aluminium smelters within a radius of twenty-five kilometers, the rise of the production of the chemical complex, the new factories and the maximal management of an hydroelectric system have put additional pressures on the regional environment. Until now, no study has undertaken to have a complete and accurate evaluation of the territorial situation and its environmental support capacity.

Recently a provincial ecologist coalition exerted pressure on the government to apply the law on the quality of the environment and environmental impact assessment hearings for the aluminium industry. [Two previous governmental reports — The Consultative Council on the Environment, 1986 and the Lacoste Report, 1988 — recommended the same thing]. In fact, despite these facts and the intention of the Environment Minister to apply the regulations concerning environmental assessment, all new aluminium projects remain exempt from such regulation.

CONCLUSION

This paper on the primary aluminium industry restructuring and its sociospatial impacts on local communities has concretely ascertained in what sense a modernisation strategy challenges them and affects the orientation of the regional development dynamic. Whether or not the situation of SLSJ is unique in its historical place in the Alcan's process of production and the combination of its social, cultural and environmental components, this case study could point out some relationships between global and local, social, ecological and economic spheres. In conclusion,

firstly, we would rather to return to the meanings of these relationships with a theoretical point of view and, secondly, to the question that we raised in the introduction.

First of all, it seems that any social or economic process is formed by context, so that it cannot be conceived of outside a given place and time. This heuristic preoccupation, in the study of social relationships, suggests that the locality can no longer be simply viewed as a facsimile or replica of an international or universal model. Rather, the locality study must be examined within a view of actors strategies, social position and community development in linkage with the global mode of production and corporate strategies. Locality as a sociospatial dialectic can be seen, in addition, as a factor acting through the production of space and an integral part of the global capital and state restructuring. Wolch and Dear (1989) recognized three aspects to the sociospatial dialectic: in which social relations are **constituted through** space, in which social relations are **constituted by** space, in which social relations are **mediated by** space⁴². This point of view holds that the locality can't be conceptualized as a residual activity or a physical reservoir of resources, or a concrete support of the transnationality of corporations. As I assumed the locality has its own territorial dynamic or spatial life interacting with and within a given time. The recent interest for the locality, which is demonstrated by the state government in terms of social devolution and local self-reliance, as well as by the corporation in terms of partnership, by the communities in terms of identity and powerful, and by academics in terms of locality studies⁴³, shows how the local is an intimate and inherent part of industrial capital restructuring.

Therefore, the industrial reorganisation is not a structural or temporary adjustment of capitalist production. It is also, according to Massey, "a process of social transformation"⁴⁴, "an early element in social change"⁴⁵. As a matter of fact, the

choices concerning spatial industrial restructuring in the eighties cannot be explained solely by factors such as advantageous hydroelectricity costs, or the proximity to markets, or political stability of the country or some new factors, such as the laxness of environmental norms, the involvement of governments or universities as partners, or financial agreements by governments, states or municipalities. The understanding of social change can be apprehended by examining the local and community responses and effects through the global industrial capital restructuring.

In a recent paper⁴⁶, I asked about the role of localities as an actor in global restructuring, in the context of a "partnership society"⁴⁷. On the one hand, with the weakness of the welfare state, localities are called up to stimulate the social and economic development of their communities. On the other hand, companies and industrialists are looking for attractive places, in terms of flexible space and workforce, its ability to allow an industrial or commercial diversification of the production, diversity of local resources, quality of physical and social environment and partnership with other industries, contractors, institutional bodies such as universities. These are some of new requirements of the aluminium industry and of capital accumulation. Through these trends, localities and communities are trying to manage their space, their reproduction and the impacts of the social and economic restructuring. Even if the role of the locality is reinforced by this context, few regional localities and communities are acting with the new space created by the restructuring and enhancing their margin of power.

However, some of them are now reclaiming more direct local economic repercussions from the industrial project, in respect to their quality of life or values. Other are seeking a specific and alternative way to intervene in the economic and social development of their communities and respond to industrial change, often experienced as tourism and leisure projects, planning infrastructure and commercial

services. Other, as the SLSJ region, are implementing a permanent structure promoting a regional sustainable development. But, unfortunately, most of these local initiatives forget that the most important resource for the reproduction of a locality, is the humans and especially the young, who are now being attracted by the core or a place offering more jobs.

I proposed in the introduction a question which expresses the actual issue for the implementation of equitable, sustainable and community development: How can communities survey and respond to industrial changes and manage to assure the human well-being of their members? Even if the answer is unique for each locality, some insights may be considered. For instance, an open, transparent and wide debate (involving each individual or collective member of the community) from the four principles of the sustainable and equitable development as satisfaction of human needs, maintenance of ecological integrity, achievement of equity and social justice, provision for cultural diversity and social self-determination of community and control in decision making⁴⁸ appears to be a way to allow the community to develop sensitive, comprehensive and anticipatory views about the achievement of their goals and priorities for local development.

Another guideline that I stress is the Social impact assessment directed by communities. Social impact assessment of restructuring and changes in industrial or rural localities, in a cumulative, historical and territorial orientations, can provide not only a finely tuned and accurate evaluation of environmental and social impacts, but can also act as a process of learning⁴⁹ and empowerment for communities. A decentralization of assessment at the local scale directed by a community, linked with state regulations and regional priorities, should facilitate an adaptive and creative response to industrial changes or projects, as well as manage with the uses of their resources and improve the community's abilities to decision-making.

Implementing equitable and sustainable development, in this sense, offer a practical tool adapted to community development according to local consensus. Unfortunately, the lack of an accessible methodology and useful framework, linking community development and industrial restructuring, make this a slow process. However, some lessons can be learned by social impact studies of Aboriginal initiative in Australia and with the Indian Kativik Commission in Quebec. The control by the community of the social impact assessment in the case of industrial, planning or policy projects is a powerful way in order to achieve an equitable development for all present and future members of the community.

NOTES AND REFERENCES

- 1 Fagan, B., "Geographically uneven development: restructuring of the Australian aluminium industry", *Australian Geographical Studies*, 19 (2), 1981, p.141-160; Lockton, H.A., *Geographically uneven development: The case of the Hunter Valley Region, New South Wales, 1978-1982*, 1987.
- 2 For instance: Craig, D. and H., Ross, *Sustainable development and indigenous peoples: cross-cultural approaches to Australian Environmental policy*; 1990, non-published, 28p.; Gardner, J., "Decision making for sustainable development: selected approaches to environmental assessment and management", *Environmental Impact Assessment Review* (1989); Jacobs, P. and Munro, A.D., *Conservation with Equity: Strategies for Sustainable Development*. Cambridge, International Union for the Conservation of Nature and Natural Resources, 1987; Redclift, M., *Sustainable development. Exploring contradictions*, Methuen, New York, 1987.
- 3 Howitt, R., "Social Impact Assessment and Resource Development: Issues from the Australian Experience", *Australian Geographer* 20(2), nov. 1989: 153-162; Ross, H., "Community Social Impact Assessment: A framework for indigenous peoples", *Environmental Impact Assessment Review*, (10) 1990: 185-193.
- 4 Castells, M. and J. Henderson, *Global Restructuring and Territorial Development*, London, Newbury Park, Sage Publications, 1987; Massey, D., "Industrial Restructuring as a class restructuring: Production, Decentralization and local uniqueness" in *Regional Studies*, vol 17/2, 1983.
- 5 Including the partial closure at Arvida in the Jonquiere Complex.
- 6 Nappi, C., "Le Quebec et l'industrie de l'aluminium dans les annees 80", *Forces*, 1984, p.7-15.
- 7 Nappi, C., "Canada: an expanding industry" in M.J. Peck (ed), *The world Aluminum industry in a changing Energy Era*, 1988 and *Forces*, 1984.
- 8 QUEBEC, MSSR, *Bulletin regional sur le marche de l'emploi*, vol.9, no.3, 1990:9
- 9 This sum is been calculated with regards of the total of primary production of Alcan vs the production of plants in the region of SLSJ; Alcan, *Rapport annuel*; Secal, *Rapport aux employes*, 1988.
- 10 But, at this moment the modernisation was presented by the Company, at the Labour Court, like an expansion; because this assumption, it won against the union a non-unionized plant [Grande-Baie].
- 11 Alcan, *Presentations made by Culver, D.M.*, Montreal, 1989:13.
- 12 Alcan, *Le lingot*, 21/01/87:6.
- 13 Gagnon, C., *Dynamique sociospatiale, enjeux territoriaux et redeploiement de l'industrie de l'aluminium au Saguenay—Lac-*

- Saint-Jean a l'aube du XXI siecle*, Montreal, Un. de Montreal, Faculte d'amenagement, These de doctorat, 1991:133.
- 14 Alcan, *Rapport annuel*, 1989.
 - 15 Concerning the question of conflictual uses about the Lake Saint-Jean level and shores, see the doctoral thesis (chapter III) of C. Gagnon.
 - 16 QUEBEC, Bureau d'audiences publiques sur l'environnement, *Audience publique sur le programme de stabilisation des berges du lac Saint-Jean*, le 11,12, 15,16, 17, janvier 1985, 233p., transcription des audiences et *Rapport d'enquete et d'audience publique*, programme de stabilisation des berges du lac Saint-Jean, 1985.
 - 17 Alcan, *Memoire soumis par Secal a la Commission elue permanente des Richesses naturelles et des Terres et Forets*, Quebec, 1977: 10.
 - 18 Nappi, C., *Ibid*, 1988: 187.
 - 19 Litvak, J.A. et J.M. Christopher, *Commission Royale d'enquete sur les regroupements des societes*, Alcan Aluminium Limitee, Etude no 13, Ottawa, 1977: 105.
 - 20 OCDE, *Aluminum Industry. Energy Aspects of Structural Change*, OCDE, Paris, 1983, 1983:39.
 - 21 "Alcan a la conquete du monde", *Commerce*, 1983:38.
 - 22 Lockton, H.A., *Ibid*, 1987:169.
 - 23 *Ibid*, *Commerce*, 1983:28.
 - 24 Federation des Syndicats du Secteur de l'Aluminium, Conference Uqac, 19/02/90.
 - 25 *Commerce*, 1983:27.
 - 26 QUEBEC, MSSR, 1989; upon the datas of Alcan.
 - 27 The International Labour Office, 1989 et, GRESA, *Geopolitique de l'aluminium*, Bruxelles, 1983:113.
 - 28 Lapointe, P.-A. et ali, *Analyse sociologique des changements technologiques et de l'organisation du travail dans les usines de production de l'aluminium*, UQAM, rapport de recherche, 1987:13.
 - 29 Radio-Canada, bulletin des affaires publiques, 09/01/1989.
 - 30 Alcan, *Presentations made by Culver, D.M*, Montreal, 28/04/1988.
 - 31 Alcan, Interview with the Director of Environment, 1989.
 - 32 *Idem*.
 - 33 Datas from the Ministry of Environment, 1988.
 - 34 Bureau du Commissaire general du travail, Transcription de l'Enquete, 17/12/1982, vol.III, p.554.
 - 35 QUEBEC, Ministere de l'Environnement du Quebec, Conseil consultatif de l'environnement, *Avis sur les fluorures*, 1984, tableau 17.
 - 36 Departement de sante communautaire de Rimouski et Centre hospitalier de l'Universite Laval, collectif sous la direction de Gosselin, Pierre, *Sante environnementale au Quebec*, Les Publications du Quebec, Quebec, 1986; ONU, Programme des Nations-Unies pour

- l'environnement, *Programme international sur la securite des substances chimiques*, World Health Organisation, Geneve, 1989.
- 37 Alcan, Visite industrielle, Jonquiere, 18/01/1990.
- 38 Lavalin Environnement, *Inventaire des sources d'hydrocarbures aromatiques polycycliques au Quebec*, and *Presence des HAP dans l'environnement quebecois*. Montreal. 1988 and BjOrseth, Alf., *PAH in work atmospheres occurrence and determination*, Floride, 1986; Simanato, L., *Carcinogenic risk in the aluminium production industry: an epidemiological overview*, Lyon, France, 1981.
- 39 This mercury is found in the Saguenay, the fjord and the estuary of the St. Laurence River, thirty-four tons in the atmosphere and thirteen tons in the vast-wump, not considered to be contained. Cf. Guay, G. et M. Couillard (Environnement Illimitee 514 - 521-4927), *Contamination de l'environnement par l'usine de chlore-alcali d'Alcan*, Bureau d'etude sur les substances toxiques, Quebec, 1980, 87 pages.
- 40 QUEBEC, *Inventaire des lieux d'elimination des dechets dangereux*, Quebec, 1984:82.
- 41 Idem, p.4.
- 42 Wolch, J. and Dear, M.(Eds), *The Power of Geography. How territory shapes social life*, London, Unwin and Hyman, 1989:9.
- 43 Duncan, S. and M. Savage, "New perspectives on the locality debate", *Environnment and planning A*, 1991(23).
- 44 Massey, D., Ibid, p.73.
- 45 Idem, p.89.
- 46 Gagnon, C., "Strategie territoriale et grande entreprise: le local partenaire de la restructuration globale", *Le partenariat a la rescousse du developpement local: discours ou realite*, Chicoutimi, GRIR/UQAC, forthcoming, 1992.
- 47 Dommergues, P., (Ed.), *La societe du partenariat*, 1988.
- 48 Gardner, J., Ibid, 1989, p. 340-343.
- 49 Rickson, R.E. and ali., "Social Impact Assessment: knowledge and development", *Environmental Impact Assessment Review* , (10) 1990:1-10.

Figure 1: Location of Smelters and Producers in Québec

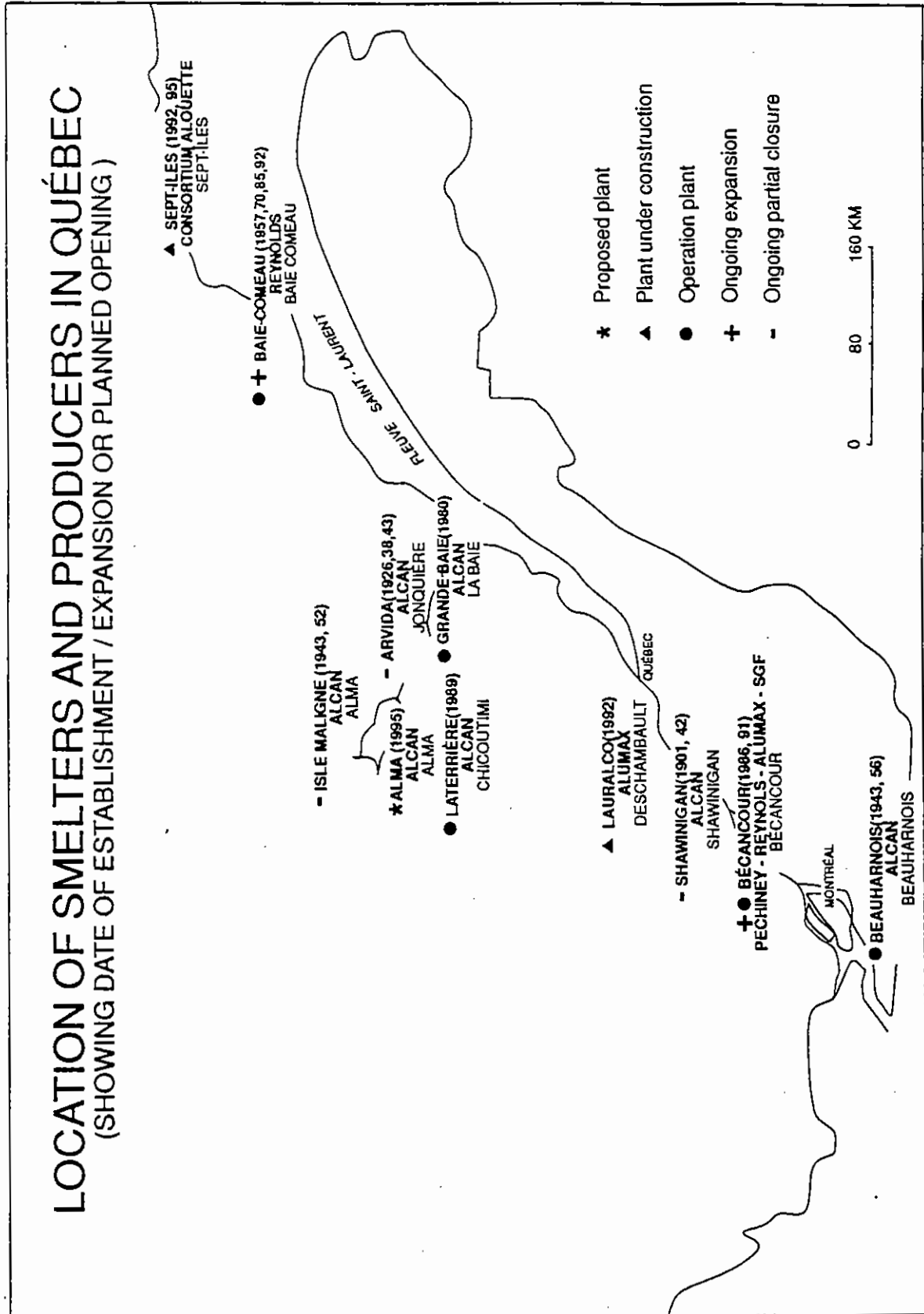
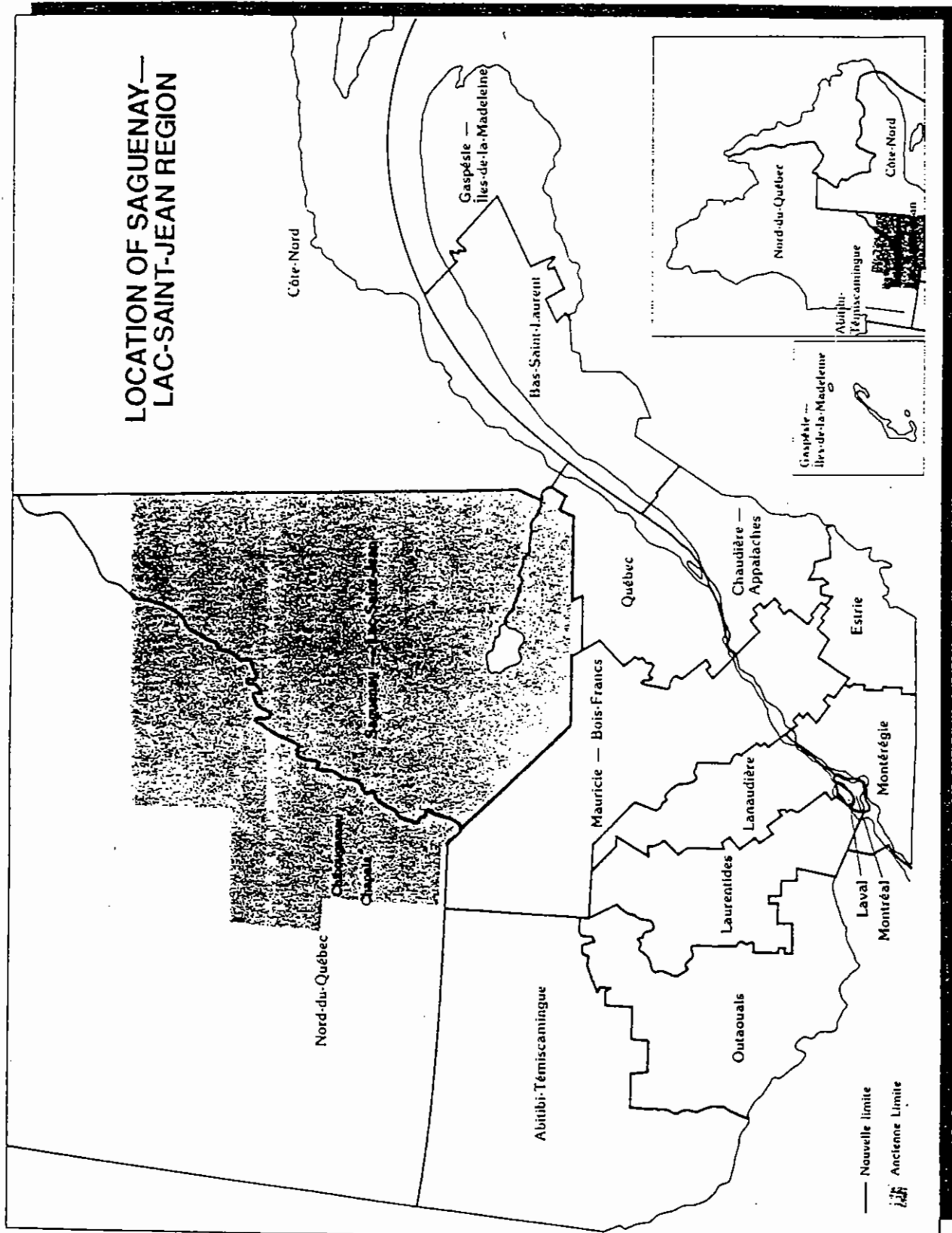
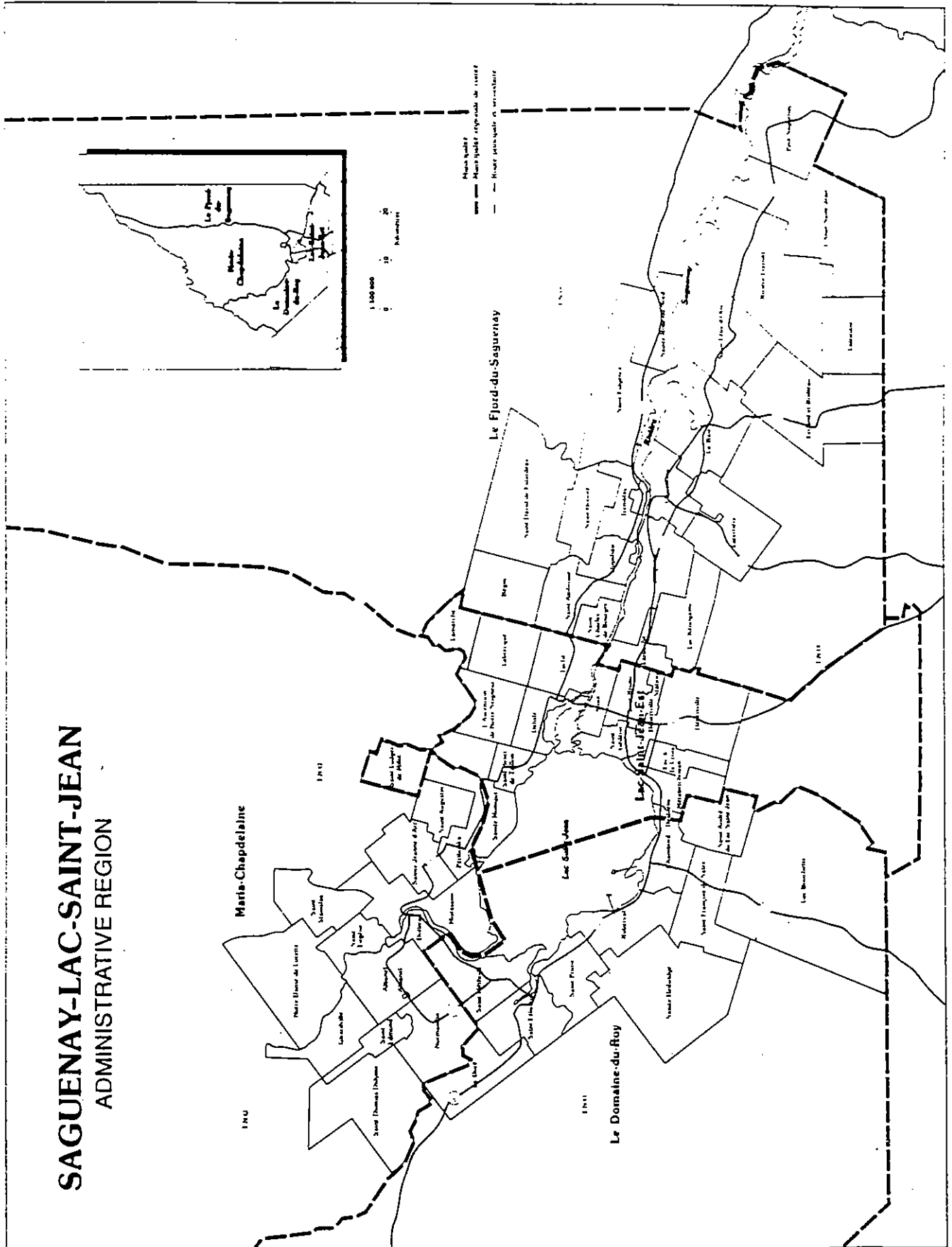


Figure 2: Location of Saguenay-Lac-St-Jean Region



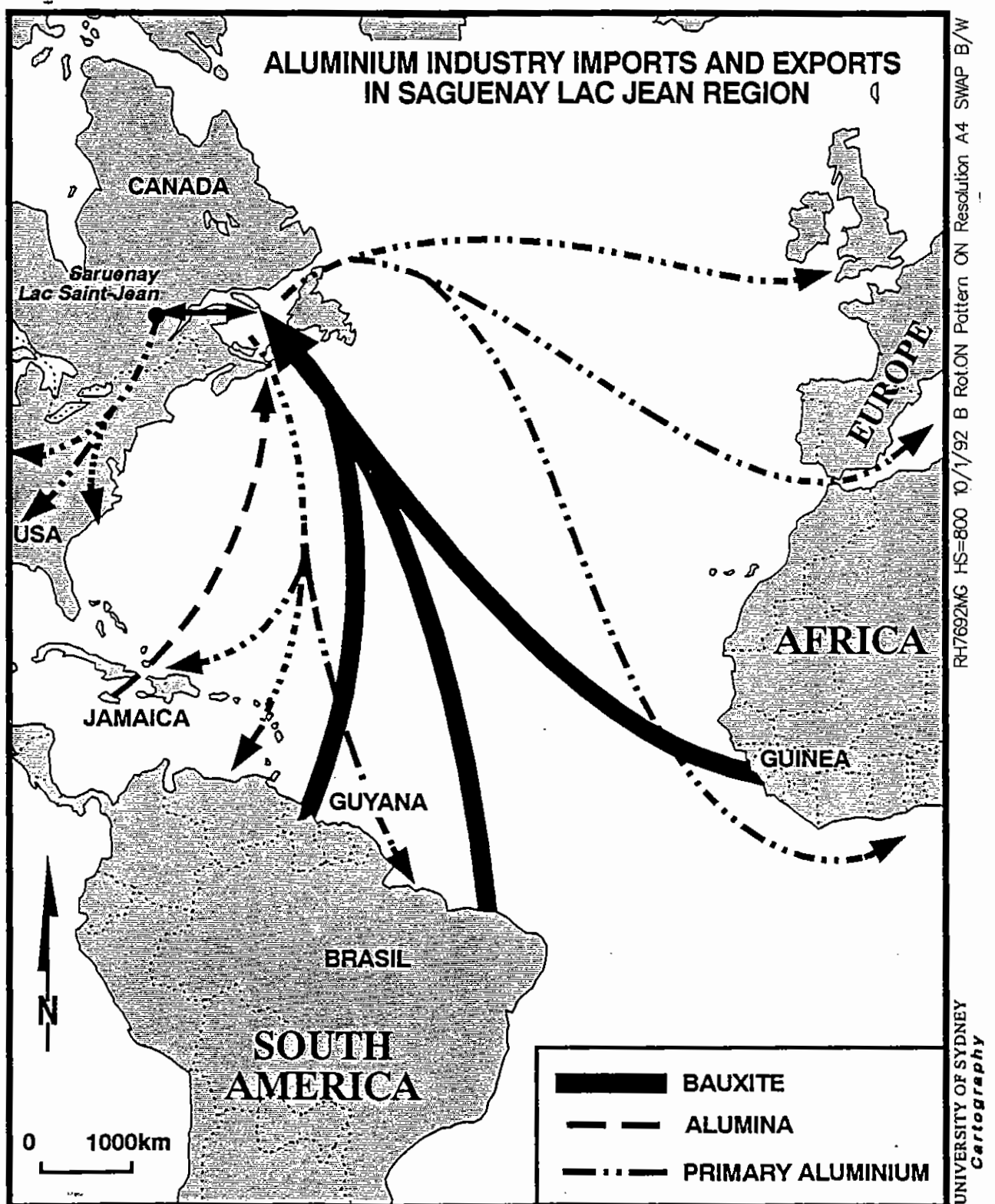
Source : Québec, OPDQ, *Bilan socio-économique, région du SLSJ*, 1989

Figure 3: Saguenay-Lac-St-Jean Administrative Region



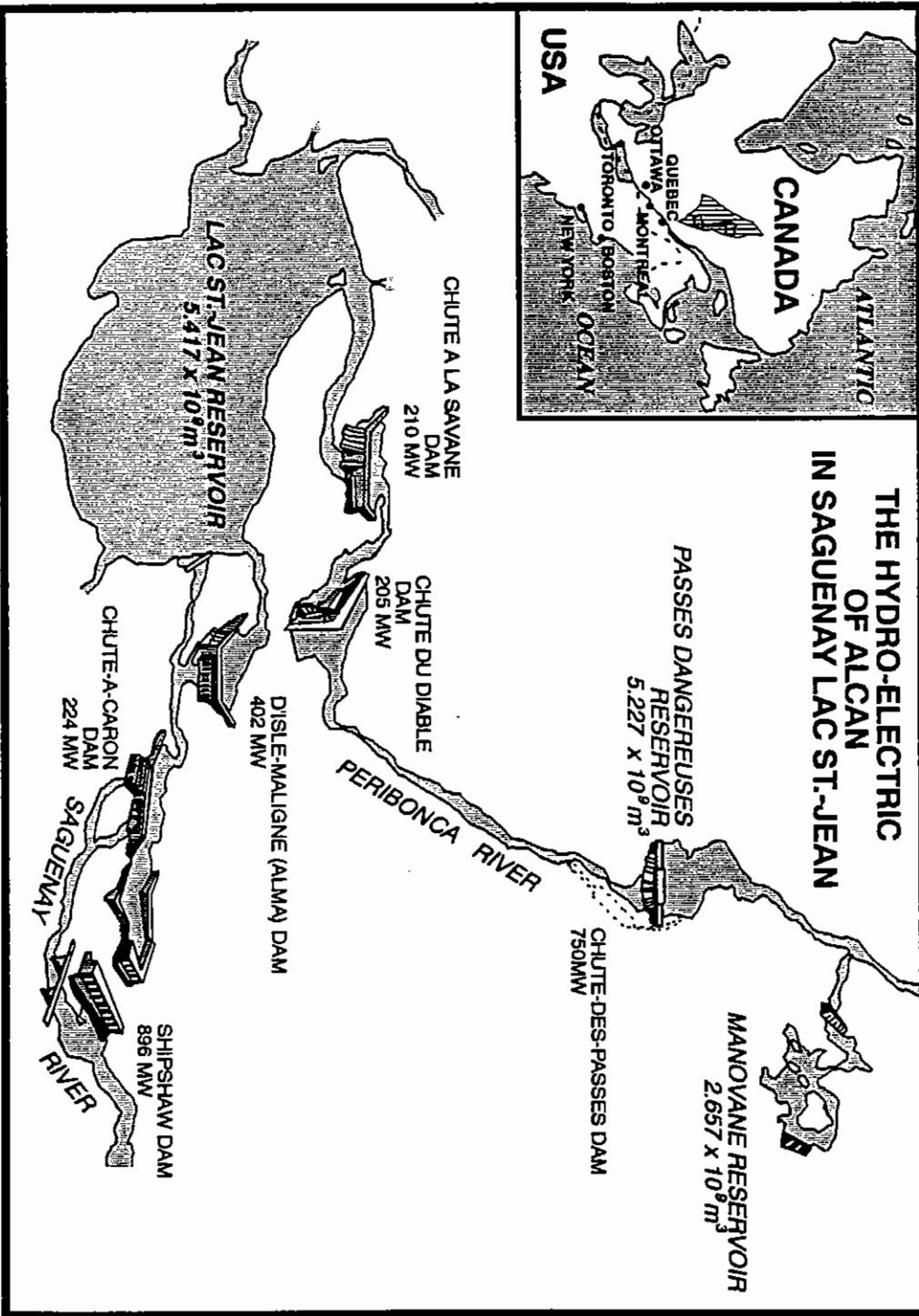
Source : Québec, OPDQ, Bilan socio-économique, région du SLSJ, 1989.

Figure 4: Aluminium industry imports and exports



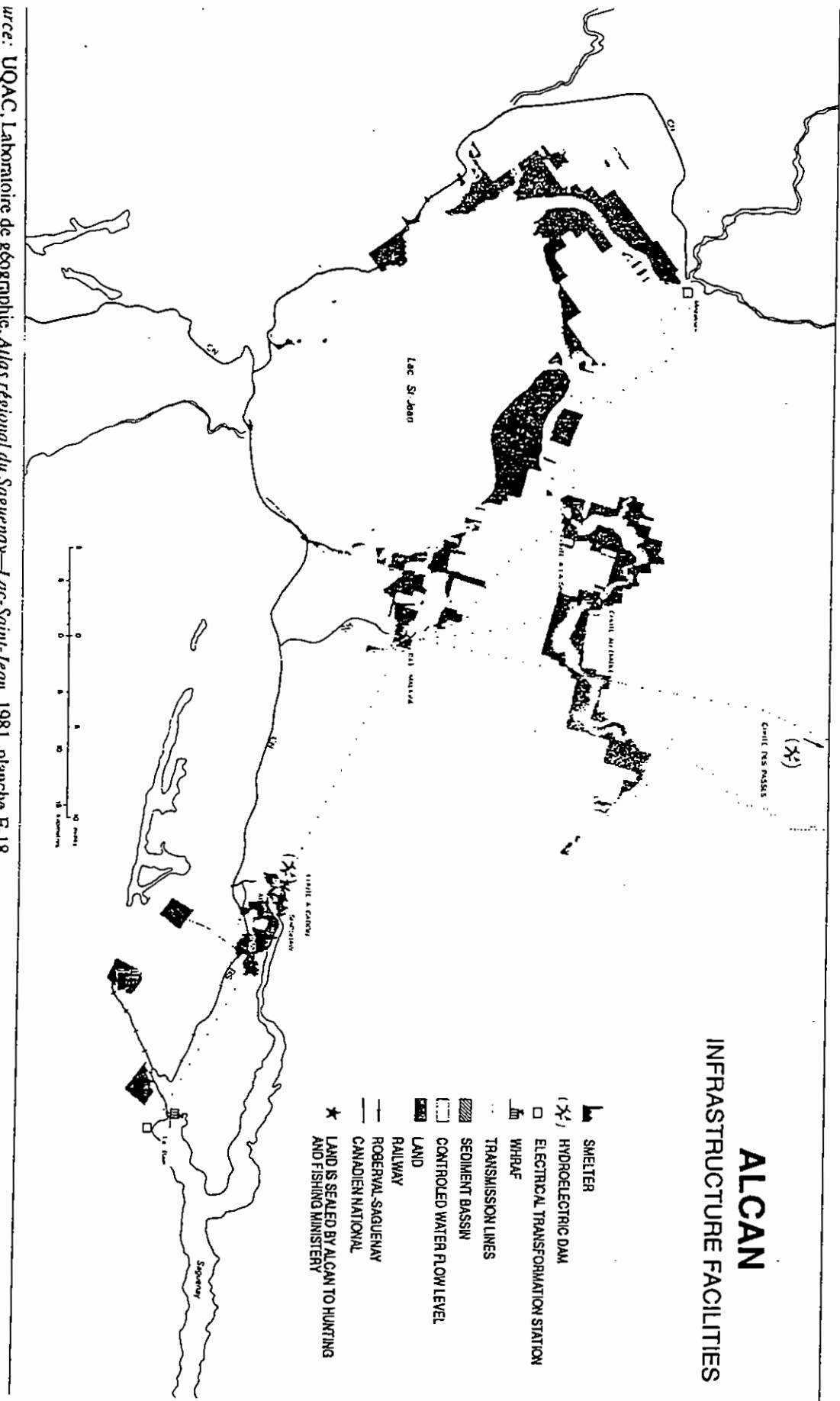
Source: Alcan, Annual Report, 1980

Figure 5: The Hydro-Electric Facilities of Alcan



Source: Alcan, 1980

Figure 6: Alcan infrastructure facilities



Source: UQAC, Laboratoire de géographie, Atlas régional du Saguenay—Lac-Saint-Jean, 1981, planche F-18