FINAL REPORT – PARC QUICK-START PROJECT

PRAIRIE RURAL COMMUNITIES AND ISSUES OF CLIMATE CHANGE

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Prairie rural communities are facing very substantial economic and social issues that tend to overwhelm any significant involvement by those communities in directly addressing issues of climate change. This report summarizes information about some of the social and economic characteristics of prairie rural communities as well as setting some historical context for that information. Results of surveys about attitudes toward climate change as an issue are also presented.

This report represents a work in progress that is funded largely by the Social Sciences and Humanities Research Council (SSHRC) of Canada with additional support through the Prairie Adaptation Research Collaborative (PARC) and CCAF. The larger study involves 10 academic researchers with partners among numerous government and non-government organizations. The researchers are engaged in a three-year study of the social cohesion of six rural communities in the prairies of Saskatchewan. "Social cohesion" refers to the bonding effect within a society that arises from the willingness of individuals to enter into relationships with one another to increase their ability to survive and prosper. It is helpful to think of social cohesion as a collection of norms (folkways, values, beliefs, common expectations about appropriate role behaviour, and the responsibilities that people have to each other) that make people think and act in certain ways. It is this collection that gives meaning to everyday life, allows us to figure out where we fit in and how we order our lives. It reflects our willingness to share and engage in common enterprises. It includes our commitment to each other and how we share and work together. It becomes the local version of a mode of regulation where we accept our collective responsibilities and become attached, emotionally as well as symbolically to place and to that place's collection of people and institutions.

Our SSHRC study explores six objectives:

1. **Providing the essential historical context for community-building** within rural, southern Saskatchewan;
2. **Describing how decisions are made in rural communities adapting to change**;
3. **Developing recommendations on education and training programmes** that support change in rural communities;
4. **Assessing how various levels of government and institutions encourage/promote change** in rural communities;
5. **Characterizing how past changes to the environment affected communities** and developing a model to identify how communities may be affected by further environmental stresses;

6. **Developing recommendations for effective policies to help rural communities to survive.**

This report addresses issues related to objective 5 which involves a consideration of the relative impacts of climate variability and change on the viability of rural communities. The first phase of our work in this regard involved surveying researchers and managers as to their perspective on the importance of climate change as an environmental issue affecting communities. The second phase beginning February 2002 involves a survey of citizens in selected rural communities as to their views on factors affecting the cohesion of their communities including climate change.

OVERVIEW OF DEMOGRAPHIC AND SOCIO-ECONOMIC DEMENSIONS

Population Projections – Western Provinces

Figure 1 shows that between 1971 and 2000 Western Canada's population increased by 58% compared to 33% for the rest of the country. However, there were significant differences within the region. BC and Alberta experienced strong growth while Manitoba and Saskatchewan, modest at best. In the 3 Prairie Provinces, Alberta enjoyed the benefits of population growth – economic stimulation, increased tax base, expanding consumer markets – benefits not enjoyed by Saskatchewan and Manitoba.

Population growth in the West is expected to be modest between 2001 and 2026, average annual rate of less than 1%, most of it occurring in BC and Alberta. Saskatchewan will decrease in population size.

Changes in Human Population – Alberta, Saskatchewan, Manitoba, 1991-1996

Figure 2 shows total human population numbers in more detail - looking at human populations for the 1990's in the Prairie Ecozone relative to ecoregions and provinces. It shows that two ecoregions, both in Saskatchewan, have seen relatively large drops in their populations – the Mixed Grassland and Aspen Parkland. Thus, Alberta has a different set of issues to deal with then Saskatchewan and Manitoba – Alberta's policies seek to manage growth and maximize its benefits whereas Saskatchewan and Manitoba seek to encourage growth and avoid population decline. Such disparities can reduce the sense of regional cohesion and commonality.

Total Population Change - Saskatchewan

Focusing solely on Saskatchewan, Figure 3 shows declines in population throughout the Prairie Ecozone, largely associated with predominantly rural areas. Examining the percent population change between 1991-1996 for Saskatchewan municipalities in the Prairie Ecozone, communities shown in red have lost 40-65% of their population in five years; brown 20-40%; dark yellow close anywhere from 1 to 19%. Data exists to characterize many elements of these communities, e.g. how many schools they have; how many churches; the types and numbers of stores; the number of community organizations; measures of their economic productivity; which ones act as economic or cultural or recreational service centres for other communities; their voting patterns and political affiliations.

Canada Urban/Rural Growth Rates
The trends seen in parts of the western provinces reflect national rural trends. Figure 5 shows that rural populations have been in decline nationally since the 1970's and projections are for severe negative growth rates among rural populations into the near future.

Prairie Ecozone of Canada – Urban Areas
For the Prairie Ecozone of Canada (approximately 460,000 sq. km.), about 75% of the original grassland cover has been converted to other land uses, and the remaining 25% distributed unevenly among the ecoregions of the prairie ecozone and among the three prairie province jurisdictions

With a population of just under 4 million people, 81% of the prairie population lives in urban areas, higher than the national average. The perception of the Prairies as being dominated by rural populations is a myth. While that was the reality in 1930, today, the Prairies are highly urbanized in terms of population concentrations. Any rural to urban shifts that are internal to the Prairie Ecozone will be to these urban areas**.** In Saskatchewan, in particular, urbanization is a result of urban growth combined with rural depopulation.

Destination – New Immigrants – Western Provinces
Immigration's importance to population growth is increasing but its importance varies dramatically among the Western Provinces. 80% of new immigrants within the West head to one of the region's seven largest cities, and the majority go not to the cities in the Prairie Provinces but to Vancouver. The small proportion of immigrants that go to cities such as Regina and smaller centres reflects and reinforces disparities among the economic opportunities presented by the various communities. Thus, prairie rural communities cannot expect that their problems of de-population will be easily resolved by an influx of new immigrants. Nor is inter-provincial migration an equal solution for each of the three prairie provinces.

Interprovincial Migration – Western Provinces
The West has been a major recipient of inteprovincial migrants but with great disparities within the region. Alberta has enjoyed net gains; Saskatchewan and Manitoba have experienced regular losses and significant net losses.

Aging – Western Provinces
All Western provinces are aging. By 2026 21% of western Canadians will be 65 or over. Saskatchewan has the oldest population followed by Manitoba. Alberta has the youngest. Both Saskatchewan and Manitoba have high dependency ratios (the number of people under 15 and over 65 per 100 people) relative to the West and the rest of Canada. A larger ratio indicates a smaller tax base and larger tax burden per individual. Declining proportion of youths with a growing proportion of seniors means a smaller labour market in the decades ahead (this takes into account the so-called "echo" generation). As already indicated, current immigration levels are not sufficient to counter the trend.

Percent Population between 65-75 years of age
Economists tend to remove the 65-and older age group from estimates of the economically productive segment of society. Increasing numbers of communities with increasingly older-aged populations are often interpreted as a sign of decline in economic productivity.

Rural population losses and aging of communities manifest themselves in various ways.

Age-Dependency Ratios
Social programs rely on the presence of a strong tax-paying work force. The dependency ratio gives an indication of the strain on the "working age" population. The larger the ratio, the smaller the tax base and a larger tax burden per individual. Saskatchewan and Manitoba have high dependency ratios. For those two provinces the ADR is expected to exceed 60 by 2026 (for every 100 people 15-64 years of age, there are projected to be 60 individuals under 15 and 65+).

First Nations Populations
One of the many important phenomena of human population growth on the Prairies, particularly in Saskatchewan, is the growth in the numbers of native people. 6% of the West's population identifies itself as aboriginal compared to 1.5% for Canada. Over 1 in 10 residents in Saskatchewan and Manitoba are aboriginal. The aboriginal population is younger than the non-aboriginal population ; relatively few aboriginals are 65+ and relatively many are under 15. Aboriginal market participation rates are more than 10 percentage points lower than those for the total population of Western Canada and unemployment rates are much higher. Almost 1 in 4 members of the Western Canadian aboriginal labour force is unemployed. Aboriginal personal income levels are typically only 60% of provincial averages.

An important reality for Saskatchewan is the significantly increasing numbers of native people whose cultural, spiritual, economic and political values are demanding to be respected; a demand not likely to abate as their numbers increase.

Participation Rates in the West – 1970-2000
Generally, labour participation rates in the West have increased as female participation has risen. However, as Figure 6 shows, that now appears to have hit a plateau. As the population ages and a larger proportion of the adult population leaves the labour force for retirement, participation rates will drop.

Farmers operating more than 1 business
The increased economic pressures that farmers face particularly in the face of rising production costs has been well-documented. One of the many manifestations of that pressure is the increasing numbers of farmers employed in additional labour in addition to their farm work. Figure 7 shows the percent of farmers operating a business in addition to their farming operation; these percentages are increasing as is off-farm employment for women and men. Another manifestation of the economic pressures faced within a number of rural communities is the percentage of low-income families which is increasing in areas throughout the Prairie Ecozone of Saskatchewan.

Concerns in Prairie Rural Communities

The above brief overview indicates a variety of demographic and economic issues that rural people face that affect their social cohesion. People in prairie rural communities struggle with concerns over issues such as rural health care, renewal of rural road infrastructure, off-farm employment opportunities, drought, transportation costs, fuel prices, isolation, depopulation, taxation rates, farm safety, impacts of global subsidies on commodity prices, high volatility in relation to future economic security, education opportunities for their children, care of the aged, all factors affecting the cohesion and viability of their communities.

Not surprisingly, concerns about the impacts of climate change and how to mitigate and/or adapt to those impacts are only one factor among many that are often regarded as having higher priority.

SERM ECOSYSTEM HEALTH STUDY

In 1999 SERM conducted a survey to determine critical issues and concerns regarding ecosystem health in Saskatchewan. Distributed to 1035 individuals, 188 responded (18%). Targeted groups included aboriginals, academics, all levels of government, industry and non-government organizations. The questionnaire identified 49 issues and respondents were asked to rank those issues on a scale of 1 to 5, with 5 being very important and 1 being not important. While climate change was not a primary focus of the SERM study, it was raised by respondents as a component of ecosystem health.

Table 1 shows that water was the main concern of respondents. Drinking water quality ranked as the top overall environmental issue. Groundwater quality and quantity rated third overall, with surface water quality and quantity ranked fifth and export of water sixth. When results were examined relative to the specific target groups, all groups identified drinking water as the most important with the exception of NGO's who ranked drinking water third behind habitat loss/fragmentation and groundwater quality and quantity. Equally revealing is the ranking for the less important issues. Climate change as an environmental issue ranked 19th out of 49.

Extent of Monitoring

Respondents were also asked to indicate the extent of monitoring of the environment with which they were involved. Results are shown in Table 2. Rural Municipalities showed the least involvement of monitoring of the environment within their jurisdictions.

Types of Monitoring

Respondents were also asked to categorize their monitoring activities according to three types of monitoring:

- Baseline monitoring: collecting (e.g. mapping, counting) information that describes ecosystem components such as wildlife, vegetation etc.
- Monitoring quality of the ecosystem: collecting information regarding the quality of the natural environment
- Monitoring use of ecosystem resources: collecting information on the use of ecosystem resources such as fishing, forestry, agriculture etc.

The most common type of monitoring reported was baseline monitoring of which the five key areas were: biological diversity, surface water, ground water, birds and wetlands and riparian areas. Monitoring for climate change ranked 33rd out of 43 areas monitored for ecosystem health in Saskatchewan.

ATTITUDES OF GOVERNMENT AND BUSINESS TO CLIMATE CHANGE

Following upon the SERM study, and as part of the social cohesion study, we investigated the attitudes of managers within government, industry and non-government agencies to climate change and other environmental issues.

Preliminary research began with an investigation of pre-existing surveys that examined the importance of climate change, wildlife and nature to individuals, recreational use of natural areas, and other surveys that explored the relationships between individuals and nature. Various meetings with representatives of several government agencies, such as the Prairie Farm Rehabilitation Agency, were also conducted to gain an appreciation for policy-maker's concerns in this area.

An advisory group consisting of organizations which could benefit from the survey results was established to develop the questionnaire. The following organizations were contacted: Ducks Unlimited, Saskatchewan Agriculture and Food, Saskatchewan Wetland Conservation Corporation, Nature Saskatchewan, Saskatchewan Stock Growers' Association, SaskWater and Saskatchewan Energy and Mines.

Of 163 questionnaires distributed to provincial and federal government agencies, industry and non-government organizations, 45% (n=73) responded (see Appendix 1 for information on response rate). Respondents were asked to rank *potential* climate change impacts on a scale of 1 to 5, with 5 being very important and 1 being not important.

Respondents in all groups ranked the most important potential climate change impacts as those related to water. Reduction in water quality was the number one concern, followed by increases in summer water demand (government respondents) and reduction in wetlands for NGOs and Industry respondents. Other top concerns were shifts in native grassland composition (NGOs) and increased soil erosion (government). Of least concern was a reduction in consumptive recreational opportunities, reduction in non-consumptive recreational opportunities, and a reduction in the number and distribution of game species and their habitat.

Respondents were also asked to rank their degree of certainty as to whether climate change impacts are currently occurring or not. Sixty-four percent of all respondents were of the view that climate change is occurring. A further 31% believe that changes may occur, is likely to occur or is certain to occur. Four percent believed that changes are unlikely to occur, or will not/cannot occur and only 1 respondent (from Industry) believed that climate change will not or cannot occur.

When asked to describe the direction they expected climate change to take in terms of changes in temperature and precipitation, 60% of all respondents believed that the climate will be warmer and drier as a result of climate change. Nineteen percent believed that there will be various scenarios, such as more extreme and unpredictable events,

while 18% of the government respondents and 19% of the NGO respondents believed it will be warmer and wetter.

Respondents were then asked if their organization had any specific policies or programs in place that considered the potential impact that global climate change may have. The majority of respondents among all groups were either unaware of their organization's policies, or believed that their organization did not have any such policies in place. For example, 65% of government respondents stated that their agencies did not have any such policies/programs in place. Thus, while the majority of respondents believe that changes due to climate change are either currently occurring or are likely to occur, and believe many of the potential impacts to be of a serious or very serious nature, there are very few policies and programs in place to contend with this issue.

Government respondents seemed very hesitant to discuss the adequacy of current policies or suggest improvements, yet they had many serious concerns regarding the potential impacts of climate change. This is interesting considering that the survey instruments were distributed to those within the government having a position to influence policy direction.

Respondents were asked to provide suggestions to improve their organization's current policies or programs towards climate change. Of the 73 respondents only 15 (20%) provided any suggestions and these focused on:

- Government Action
- Education/Training
- Research/Monitoring
- Networking
- Increased Funding/Support

It is evident that the majority of the respondents assumed or believed that water will be most heavily impacted, and that concerns regarding the hydrological cycle are paramount. Yet the only concrete climate change response policies given are those related to shelterbelts and carbon sequestering in the form of tree planting. This view has serious ramifications in that one of the most important limiting factors in tree growth on the prairies is moisture. Therefore, it is perhaps a reflection of linear problem-solving, versus the ecosystem and holistic approach that was mentioned by many respondents in each sector (mostly government) as an important element to improve policies and programs. Furthermore, while the majority of the government respondents were most concerned with water issues, there was no mention of any water-related policies or programs, such as "water conservation programs" and "assess impact on wetlands/waterfowl" mentioned by ENGOs. The concerns related to water matters do not appear to trickle down to policy response (or any of the other concerns expressed in the survey).

In follow-up to the surveys described above, and as part of the Social Cohesion Study, phone interviews of 500 respondents in and around six rural Saskatchewan communities (Balcarres, Carlyle, Craik, Eastend, Naicam, and Willow Bunch) will be conducted during February 2002. Among many other questions, respondents will be asked to rank the importance of climate change as an issue in their communities, the adaptations they

are undertaking to adjust to the impacts of climate change, and the importance of government policies in facilitating such changes. The results of that survey should be available by Fall 2002.

CONCLUDING COMMENTS

Most prairie communities are embroiled in a fluid and competitive struggle for economic and political survival and they are grappling with their sense of worth and place. In the Prairies of Canada, many measures suggest that in parts of the prairies, rural communities are on a trajectory of decline in social cohesion. The future of prairie communities is further confounded by global climate change. Some climate forecasts predict as much as 5–7°C rise in annual surface temperature for the prairie provinces of Canada over the next 50 years, further exacerbating the region's ecological and economic woes.

On a regional scale the Great Plains are one of the most "owned" landscapes in North America. Therefore, government programs in the region typically involve a multiplicity of owners, including private owners and lessees, as well as rural and urban municipalities, provincial and federal governments, and a host of interest groups. This must all take place in an atmosphere of socio-economic decline and uncertainty. Due to depressed economic conditions, prairie farmers and ranchers may be receptive to government and non-government efforts to address impacts of climate change if they come with financial incentives. Efforts to engage private landowners in climate change programs need to consider both the opportunities and the potential pitfalls.

Ultimately, adaptations to climate change for people in prairie communities will be filtered through their perception of the risks and opportunities which they attach to climate change in terms of its impact upon their quality of life. Helping rural communities to better assess those risks will require the combined skills of ecologists, agronomists, political scientists, economists, climatologists, biologists, sociologists, health scientists, philosophers and other disciplinary experts. They require dialogue with decision-makers in industry, business, government and First Nations, landowners and land users. Thus, successful adaptations of prairie communities to climate change is dependent upon a comprehensive partnership of interests.

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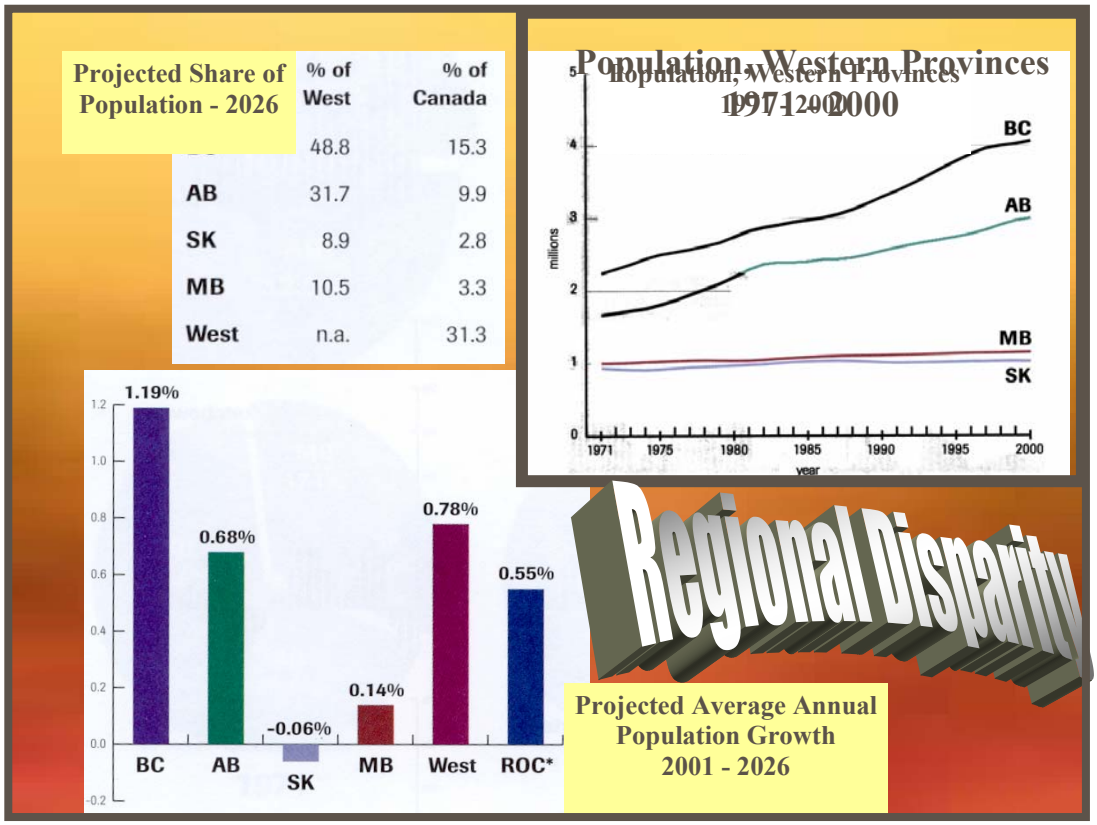
FIGURE 1.



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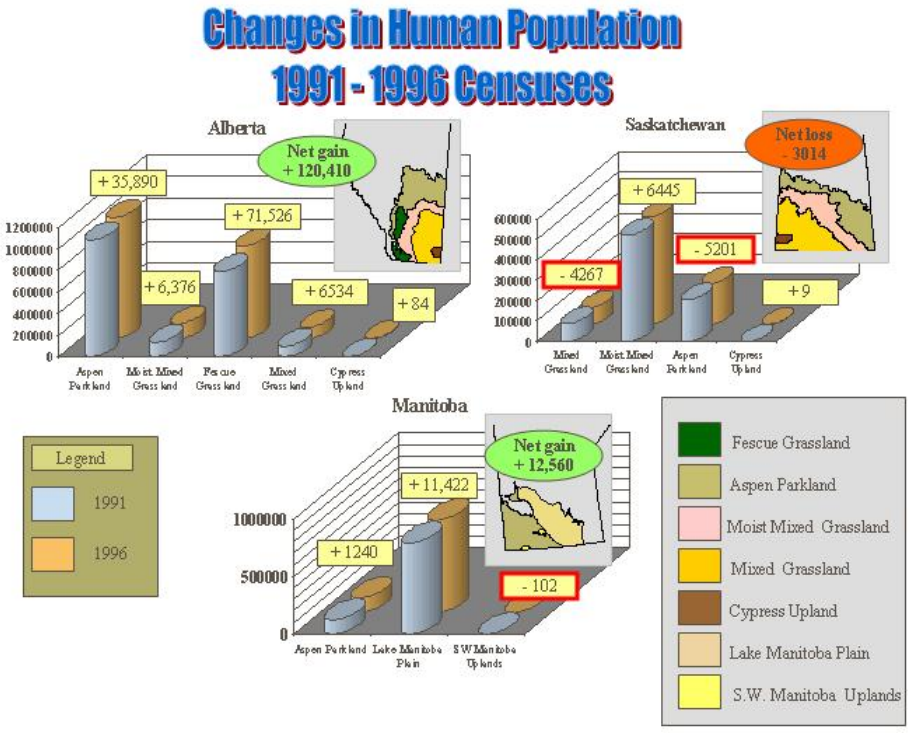

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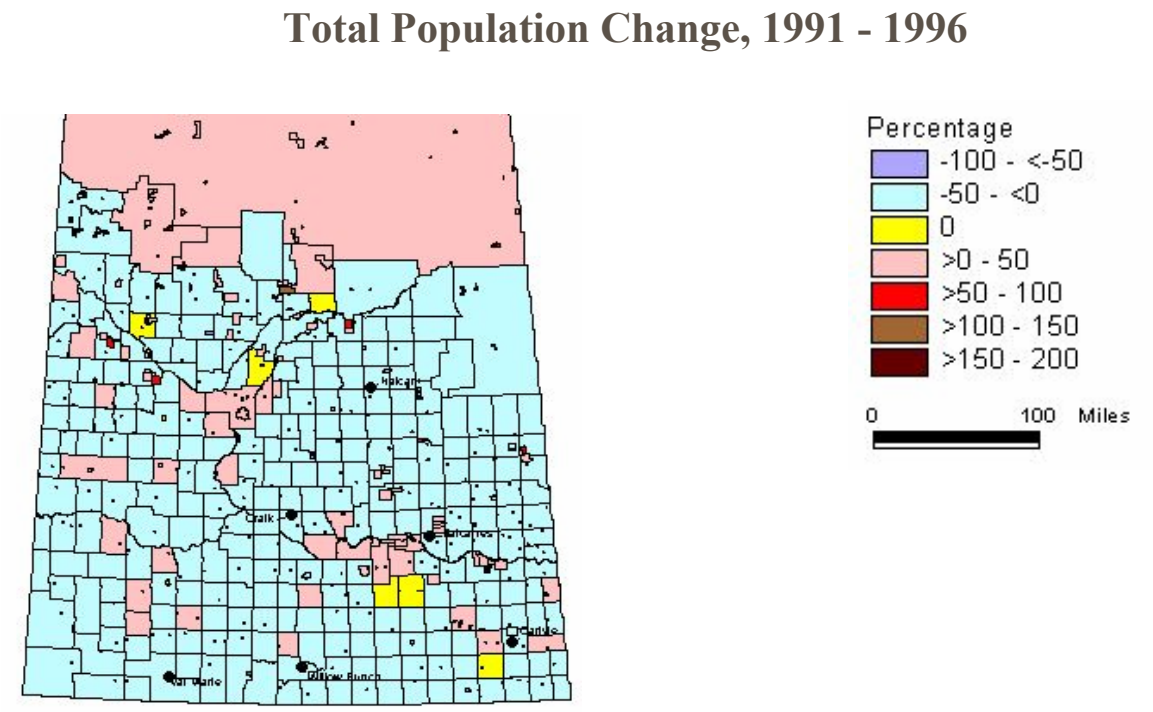

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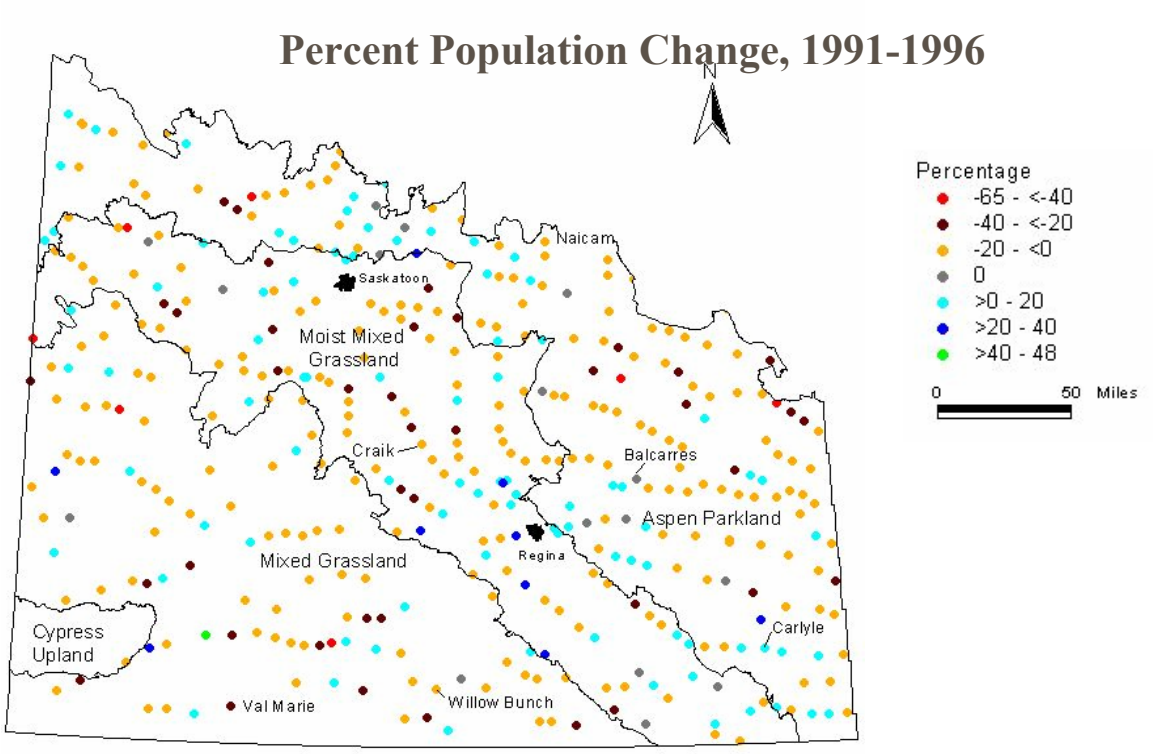

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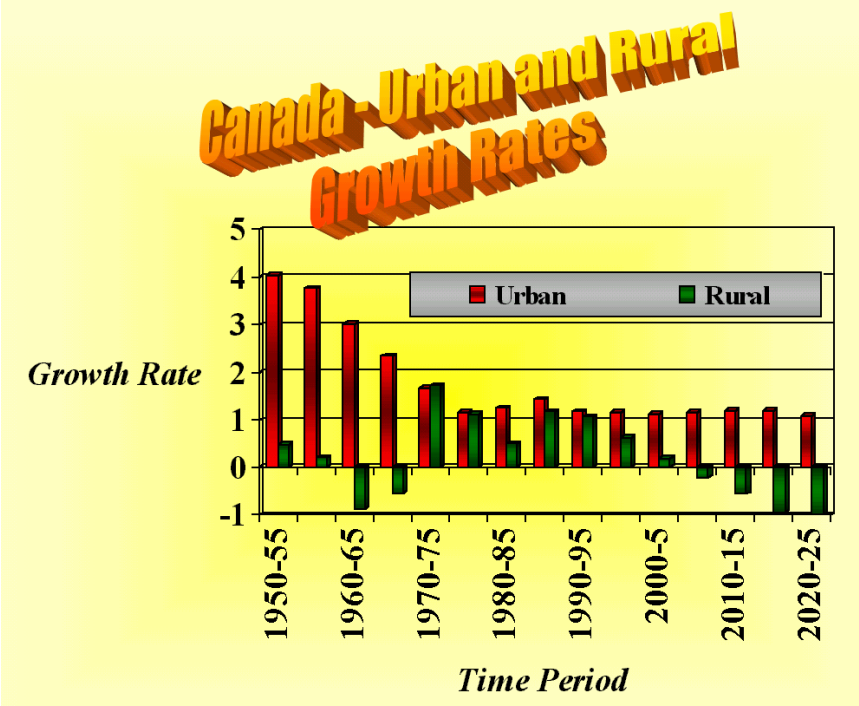

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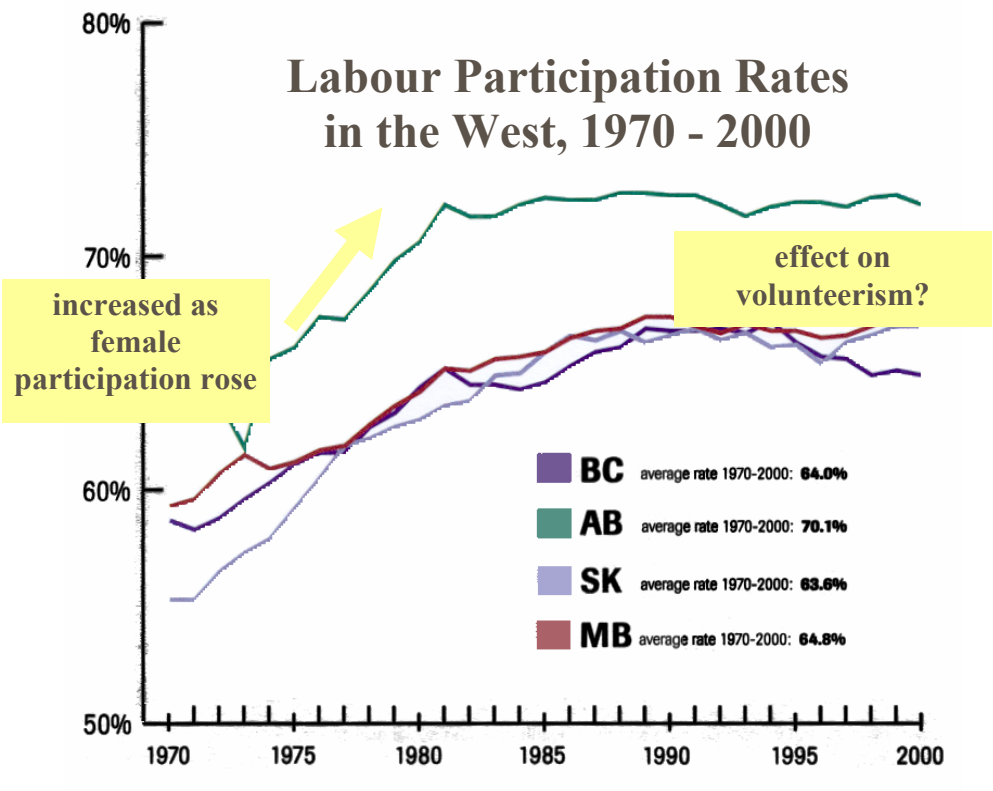

FIGURE 7.

Number of farmers running a business other than farming 1995

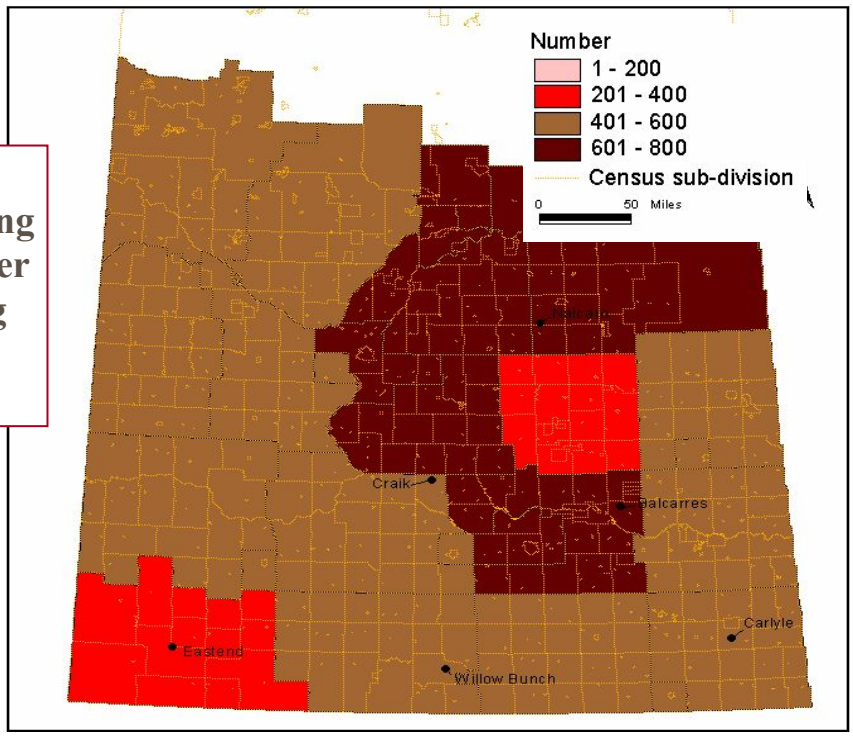

TABLE 1. SERM ECOSYSTEM HEALTH STUDY – RANKING OF ISSUES.

RANK	ISSUE
1	Drinking water quality
2	Agriculture
3	Groundwater quality and quantity
4	Human health
5	Surface water quality and quantity
6	Export of water
7	Pesticide/herbicide use
8	Biological diversity
9	Waste creation/disposal practices
10	Waste management
14	habitat loss/fragmentation
19	climate change / global warming
29	drought
34	ozone stratospheric depletion
48	cultural/heritage
49	ozone ground level

TABLE 2. SERM ECOSYSTEM HEALTH STUDY – PERCENT OF GROUPS MONITORING COMPONENTS OF ECOSYSTEM HEALTH.

Group	Percent of Group Monitoring
Academic	**79%**
Government	**51%**
City	***75%***
RM	***20%***
Provincial	***69%***
Federal	***100%***
Industry	**75%**
NGO	**46%**

APPENDIX 1. BREAKDOWN OF GROUPS TO WHOM QUESTIONNAIRE WAS SENT AND THOSE ORGANIZATIONS THAT RESPONDED.

Surveys were extended to managers, directors, presidents and senior specialists from the following organizations:

Provincial Government:

1. Saskatchewan Environment and Resource Management (x 34)
2. Saskatchewan Energy and Mines (x14)
3. Saskatchewan Agriculture and Food (x5)
4. SaskPower (x6)
5. SARM (x2)
6. SaskWater (x18)
7. Saskatchewan Parks and Recreation

Total = 80

Federal Government:

1. Canadian Wildlife Service (x2)
2. Prairie Farm Rehabilitation Agency (x25)
3. Environment Canada

Total = 28

Industry:

1. Wascana Energy
2. Saskatchewan Minerals (x2)
3. Flatland Exploration Ltd
4. Bill Quill Resources Limited
5. Claude Resources
6. PCS Potash
7. Small Explorers & Producers Association of Canada
8. Norland Exploration Limited
9. Cameco Corporation (x2)
10. Shane Resources
11. Cogema Resources

12. Potash Producers Association Inc
13. ADM

Total = 15

Private/ Non-Profit Organizations:

1. Fishing Organizations (x3)
2. Regina Fish and Game League
3. Ducks Unlimited (x7)
4. Wakamow Valley Authority
5. National Soil and Water Conservation Program
6. Meewasin Valley Authority & Saskatchewan River Basin
7. South Central Community Futures
8. Saskatchewan Archaeology Society
9. Partners for the Sask. River Basin
10. Saskatchewan Natural History Society
11. Canadian Parks and Wilderness Society
12. Last Mountain Lake Bird Observatory
13. Native Plant Society of Saskatchewan
14. Saskatchewan Purple Loosestrife Eradication Committee
15. Nature Conservancy of Canada
16. Ecotourism Society of Saskatchewan
17. Saskatchewan Dutch Elm Disease Association
18. Saskatoon Zoo Society
19. Saskatchewan Eco Network
20. Saskatchewan Burrowing Owl Interpretative Centre
21. GAIA
22. Nature Saskatchewan (x2)
23. Redberry Lake Biosphere
24. Saskatchewan Environmental Society
25. Saskatchewan Wildlife Federation (x3)
26. Saskatchewan Stock Growers Association (x2)
27. Western Economic Diversification

28. PCAP
29. Saskatchewan Wheat Pool
30. Atomic Energy Control Board
31. Professional Geologist Association
32. Saskatchewan Mining Association
33. Saskatchewan Research Council
34. SPIGEC- Sask Petroleum Industry Government Environment Committee

Total = 46

Educational Institution:

1. University of Saskatchewan (x4)
2. University of Regina

Organization	**Number of Instruments Sent**	**Number of Instruments Returned**	**Response Rate**
Provincial Government	80	35	44%
Federal Government	28	12	43%
Industry	15*	8	53%
Private or Non-Profit	46	18	39%
Educational Institution	5	0	0%