

# SIPA

September 2008

## A TIME TO IRRIGATE! Conserving the Waters

*Saskatchewan  
Irrigation Projects  
Association*

The Benefits of Irrigation in Saskatchewan Project has been completed with funding and support from Agriculture & Agri-Food Canada and the Saskatchewan Ministry of Agriculture under the National Water Supply Expansion Program.



### Saskatchewan Irrigation Investments Create Benefits throughout the Province

Irrigation in Saskatchewan is a sleeping mega-project. Opportunities exist to expand irrigated acreage in all regions of the province. The economic evaluation of adding nearly 600,000 new acres to provincial irrigated acres shows there can be large benefits for both farmers and the economy at large. An initial investment in regional water works of some \$3 billion dollars over a twenty year period would lead to increased returns to agriculture and create the foundation for a major expansion in Saskatchewan agricultural value added activities. Together it has been estimated these developments would increase on-farm production by \$12 billion, provincial gross domestic product by \$35 billion, household incomes by \$13 billion and employment by 326,000 person years. Beyond these measurable benefits lay numerous other gains for the rural economy, community development and water supply, tourism and the environment.



#### Special points of interest:

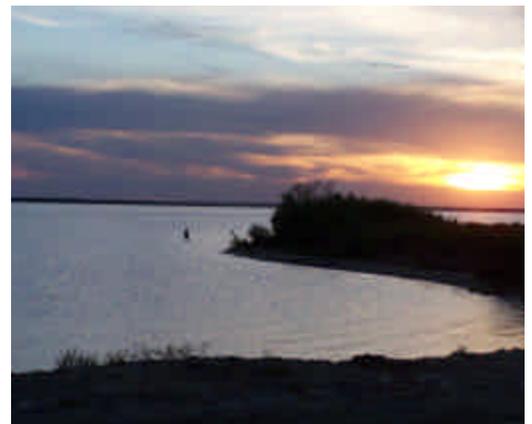
- Today some 40% of the World's Food Production is produced with irrigation on 17% of the agricultural lands.
- Saskatchewan has nearly two million acres of irrigation that could be developed in all regions of the province.
- Irrigation provides an agricultural return of between \$8 and \$10 for every dollar invested in irrigation supply and equipment.

The irrigation developments evaluated were centered around Lake Diefenbaker and also included the restructuring irrigation in the southwest and smaller developments in other regions of the province.

### Lake Diefenbaker Irrigation Benefits Study

The Saskatchewan Irrigation Projects Association completed a major socio economic evaluation of the costs and benefits of irrigating 800,000 acres of agricultural lands, mainly around Lake Diefenbaker and also in other regions of Saskatchewan. The study was undertaken by Clifton Associates Ltd. of Regina, Saskatchewan working with specialists from across Western Canada\*.

The study found large benefits for agriculture, value added processing, municipal water supplies, tourism, drought proofing and the natural environment. Together these were estimated to provide the opportunity to increase employment in many Saskatchewan cities and smaller towns.



\* The Project team for the work consisted of Dr. Graham F. Parsons, Vice President, Clifton Associates Ltd. and Project Manager; Dr. Surendra Kulshreshtha, President of KAEI and Professor of Agricultural Economics at the University of Saskatchewan; Mr. Ray Pentland, President of Water Resource Consultants Inc. and specialist in hydrology and the management of Lake Diefenbaker waters; Mr. David Hill, formerly of the Alberta Irrigation Projects Association, Mr. Darrell Toma, Partner with Toma, Bouma Management Consultants and specialist in Alberta irrigation development and related value chains and rural economic development needs; Mr. Rodger McDonald, President of MR2 Consulting and specialist in municipal and industrial water systems; Mr. Greg Vogelsang, Senior Vice President, Clifton Associates Ltd. and specialist in environmental impact assessments; Mr. David Kent, Chief Engineer, Clifton Associates Ltd. and specialist in rural agri-processing and environmental licensing; Mr. Keith Schneider and Mathew Kreke, specialists in municipal financing, regional development and tourism and, Mr. Toby Thorp, Environmental Scientist, Clifton Associates Ltd.



Drop Tube Centre Pivot

***“With appropriate planning, innovative water management and a strong scientific base informing decision making, Saskatchewan should be able to allocate and distribute its water effectively for economic development.”***

*Professor John Pomeroy,  
Canada Research Chair in  
Water Resources and  
Climate Change,  
University of Saskatchewan*



Global Warming may bring increased precipitation to Saskatchewan

## Saskatchewan's Massive Irrigation Development Potential

Saskatchewan has a large irrigation development potential that recent studies and investigations have suggested now approaches some 2 million acres.

The largest concentration of new irrigation acres is to be found around Lake Diefenbaker created by the construction of the Gardiner Dam on the South Saskatchewan River by the Prairie Farm Rehabilitation Administration as a response

to the decade of drought and rural agricultural and municipal collapse in the 1930s.

Other opportunities exist in other regions of the province. In the southwest converting flood irrigation to pivot irrigation could increase production. Proposals for new water storage with the Meridian and Highgate dams would provide for a further million acres of irrigation. Other smaller irrigation and effluent irriga-



tion exist throughout the province. While not all of these irrigable acres will be developed in the near future it is clear that Saskatchewan can become a major centre of North American irrigation in the 21st Century with new water supply investments.

## Irrigation Potential is Fine, But Will Water Be Available?

Irrigation is the largest consumer of water in Saskatchewan. Irrigation expansion will clearly require more water. Will it be available?

Review of the evidence suggests that with efficient water management, conservation, storage and allocation practices Saskatchewan can obtain the full value of its water resource.

Evaluation of the water requirements of expansion

around Lake Diefenbaker suggests irrigation might use less than one fifth of the available water in a normal year and as little as 3% in a wet year. In a drought year this share would only increase to 22%.

In the southwest conversion of flood irrigation to pivot irrigation can be expected to conserve water resources.

Throughout the province the adoption of water conserving

irrigation practices could increase water use efficiency from the low 30% achieved in flood irrigation to nearly 80% using drop tube centre pivots. The lining of canals, use of water pipelines, monitoring, management and measurement of water use can all expect to improve water conservation for irrigation. In practice irrigators are already some of the best custodians of Saskatchewan's water resources.

## Global Warming will Affect Water Supplies

The international Intergovernmental Panel on Climate Change suggests that climates in the Prairies can expect:

- Warmer and fewer cold days and nights
- Warmer and more frequent hot days and nights
- Warm spells/heat waves increasing over most land areas
- Increased heavy precipitation events and an increased frequency of drought.

The volatility that has historically accompanied Prairie water supply can be expected to continue. Clearly, as John Pomeroy, Canada Research Chair in Water Resources and Climate Change at the University of Saskatchewan notes: *With appropriate planning, innovative water management and a strong scientific base informing decision making; Saskatchewan should be able to allocate and distribute its water effectively for economic development.*

## Availability of Water Supplies Depends on Good Planning

### Saskatchewan's Water Licensing System in Need of Reform

Irrigators are careful custodians of both land and water. Today about 20% of Saskatchewan surface water licenses are over fifty years old. Many are dormant and no longer used. While Irrigation Districts closely

monitor their water use, license requirements do not require the reporting of use. Assumptions built into water use estimates often inflate the amount of water use actually underway. Thus

there are no provisions for waters returned to the system after irrigation. On Alberta's thirteen irrigation districts these returns flows were estimated at over 600,000 cubic decameters.



Extremes of the Irrigation Water Conservation Technologies—From the Flood irrigation practiced by the first provincial irrigators to the drip irrigation used by berry farmers.



### Water Conservation Technologies Can Increase Supplies

Water application technologies for irrigation have dramatically improved in recent decades. Early Saskatchewan irrigation licenses were all issued on the basis of flood irrigation. Hand move, wheel roll, centre pivot and drop tube centre pivots have all increased water use efficiency and significantly reduced the water requirements for irrigation. Drip pivot systems are reducing irrigation water demands even further for certain crops even further.

#### Irrigation Application Efficiencies

Type	Average Efficiency
Flood	30%
Leveled Surface	55%
Hand Move	60%
Wheel Roll	66%
High Nozzle Centre Pivot	72%
Drop Tube Centre Pivot	79%

### Water for Irrigation Represents a High Value Use of Water

Water use for irrigation must compete with other water demands in the economy, society and the natural environment, including the potable drinking water requirements of the population, the demands from industry, power generation and the in-stream needs of the natural environment. Commonly, water is allocated between competing uses on the basis of the perceived value of the water to the economy and society. These can show large variations in value per cubic decameter ranging from thousands of dollars for residential uses to cents for power generation.

In practice irrigation has been shown to have a multi-functional context in which irrigation use can also be complementary to other uses such as environmental development, food processing, municipal water supplies and tourism and recreation. When these additional benefits are taken into account the value of water becomes competitive with nearly any other use in society or the natural environment.



*With efficient water management, Lake Diefenbaker can supply the water supply needs of expanded irrigation and the multipurpose human and industrial uses of the lake*



From rural rail line abandonment to bio-fuel production

### Real Water Value Can Also Be Seen in Sustainable Rural Futures

For many years, Saskatchewan's rural population has declined as farmers left the land. Developing a diversified irrigation economy provides a stable foundation for long term rural futures. The regional water supply investments required for the irrigation expansion are transformative in creating sustainable employment and new competitive, productive and profitable rural economic enterprise. The size of the benefits associated with a diversified agricultural economy can be seen on the ground in the irrigation economy of southern Alberta and are confirmed by cost benefit ratios as high as 16 to 1 at a 5% discount rate and steadily increasing employment and population. Beyond the economics, the related benefits of clean water supplies, drought proofing and tourism opportunities in a beautiful natural environment.



# SIPA

## Create a Legacy! Become Involved!

*Realising the benefits from Irrigation throughout Saskatchewan requires leaders to change the direction of development. For over half a century the potential of Saskatchewan's irrigation development potential has remained unfulfilled, while Prairie waters are developed in the neighbouring provinces of Alberta and Manitoba.*

*The Saskatchewan Irrigation Projects Association is committed to fully developing Saskatchewan's irrigation development potential both around Lake Diefenbaker and in other areas of the province. Contact us soon for either a copy of the study or for more information.*

*Roger Pederson  
Doug Ball*

## Saskatchewan Irrigation Projects Association

### Mailing Address:

Box 391  
Central Butte  
Saskatchewan  
Canada SOH 0T0

Phone: 306-796-4420

Fax: 306-796-2223

Email: [sbathgate.sipa@sasktel.net](mailto:sbathgate.sipa@sasktel.net)

### Website:

[WWW.IRRIGATIONSASKATCHEWAN.COM](http://WWW.IRRIGATIONSASKATCHEWAN.COM)



Lake Diefenbaker's Unrealized Potential

# Time to Irrigate!

The 2nd Recommendation of the 1952 Royal Commission of Inquiry into the South Saskatchewan River Project recommended that *"when the time comes that the Project represents the then best use of water for irrigation, the present finding (to reject the project) should be reviewed in the light of changing conditions.*

***That time has come!*** The world food shortage, the reduction in North American irrigated acreage in California alone, the prospect of global warming in the Prairies, more frequent and longer droughts and positive economic returns to the project suggest it is now ***Time to Irrigate!***



Today water allocated to irrigation shows positive benefits throughout the society, the economy and the environment. Benefits are identified for producers, city dwellers and for the sustainable rural diversification of a large part of the Saskatchewan economy. Irrigation has already transformed the agricultural economies of the irrigation districts of southern Alberta and Manitoba.

The future of rural Saskatchewan has been a dilemma for many. Rural folk have left as economic options were reduced. Irrigation offers a real prospect to transform the long term future of central Saskatchewan and create the diversified legacy for which the Gardiner Dam was originally built.

## Planning a Growing Future Now with Irrigation

Saskatchewan irrigation development requires a long term regional development plan and early funding to commence the transformational change that is possible. There will be barriers to development of the resource including an aging population and the need for targeted immigration and investment capital into the province, power and transportation infrastructure, irrigation research and demonstration for new cultural and water conservation practices will be required and a Region Irrigation Development Agencies will be required to manage the process over many years.

Further study and waiting for better conditions can be costly. Cost benefit ratios for irrigation expansion all increase when the work is not completed quickly. The cost inflation on Lake Diefenbaker expansion alone increased from less than \$100 million in 1952 to \$2.9 billion today is further evidence of the costs of delay. The stop and start policy framework practiced by both federal and provincial governments has itself been a barrier to sustained development of and investment in irrigation.

Long term commitments by federal, provincial and municipal governments and the many agricultural, local and environmental stakeholders will be required to plan for, and invest in a sustainable, long term and transformative future for much of rural Saskatchewan.

