

## A TIME TO IRRIGATE!

# Benefits of Lake Diefenbaker Irrigation Investments for Agricultural Development

*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.



## Lake Diefenbaker Irrigation Investments Create Benefits for all of Saskatchewan

Dryland grain agriculture has been the dominant crop mix for central Saskatchewan since settlement. The 100,000 acres of irrigation around Lake Diefenbaker has been the start of an agricultural irrigation economy from which expanded development is now possible. Five irrigation infill and expansion projects around Lake Diefenbaker could provide for over 500,000 new acres and create an irrigated area of nearly 600,000 acres around the lake. The development of such a large area of irrigation would provide the foundation for diversified agricultural value chains and generate benefits for farmers, municipalities, town and cities throughout Saskatchewan. Some three billion dollars of investment in regional water and on-farm irrigation equipment would generate nearly three times the level of sales within the province. Provincial gross domestic product would expand by some \$33 billion and over 300,000 person years of employment would be created over a forty year period. The benefits that arise from these investments can be transformational for the economy, society and environment of central Saskatchewan and all of the people of the province.



### Special points of interest:

- Today some 40% of the World's Food Production is produced with irrigation on 17% of the agricultural lands.
- Five irrigation projects in the Lake Diefenbaker area of Saskatchewan could irrigate over one half a million acres.
- Irrigation provides an agricultural return of between \$8 and \$10 for every dollar invested in irrigation supply and equipment.



## 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.



Lake Diefenbaker Construction in the 1960s

## Lake Diefenbaker—An Unrealized Investment in the Future

Lake Diefenbaker was 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. Less remembered in the 21st Century was the environmental disaster of tonnes of fertile topsoil being blown away.

The two hundred kilometer lake was intended to provide the foundation for a sustainable irrigated agriculture economy that would be less vulnerable to the recurring droughts of the region.

In the thirty years since the opening of the Gardiner Dam in 1967 there has been some progress in developing the benefits that Lake Diefenbaker provides.



Many of the hydro development, recreational, municipal water supply benefits were developed. However, the potential to irrigate over half a million acres of drought vulnerable farmland around the Lake has never been realized.

***The Five Lake Diefenbaker Irrigation Projects, with the existing irrigation in the area would together form one of the larger irrigated areas in North America.***

## Five Lake Diefenbaker Irrigation Infill and Expansion Projects

Five irrigation expansion and irrigation projects have been identified on both sides of Lake Diefenbaker. The projects are both to infill within existing irrigation developments and to expand beyond them, particularly on the west side of the lake. The regional water supply costs associated with these projects are anticipated to cost some \$2.9 billion over twenty years.

**Infill & Expansion Projects**

- The South Saskatchewan River Irrigation District Expansion and Infill Project
- The Luck Lake Irrigation Infill and Expansion Project
- The Riverhurst Irrigation Infill and Expansion Project

**New Expansion Projects**

- The Westside Irrigation
- The Qu'Appelle Irrigation

Together these projects would add between 435 to 542 thousand acres to the existing 107 thousand district and private irrigated acres in the region to create one of the larger irrigation areas in North America with an irrigation potential of nearly 650 thousand acres.



## A 40 Year Irrigation Development Scenario

The study evaluated the economic impact of irrigating the Lake Diefenbaker area over a twenty year period to complete regional water works and a forty year period to invest in on farm irrigation equipment and off farm value added processing activities. The off-farm building blocks for a transformation agricultural economy in central Saskatchewan included both forward linked on and off farm value added activities. As development and investment in the region grows, crop mixes changes and incomes rise.



Feedlot Investment Supported by Irrigated Feed

Farm Enterprises	Non-farm Enterprises
Cow-calf Production	Cattle Slaughtering & Meat Processing Plant
Small & Large Feedlots (500 to 10,000 head)	
Hog Barns	Hog Slaughtering & Meat Processing
Dairy Enterprises	Cheese Factory
Potato Storage Sheds	Potato Processing Plant
	Biofuels Production

# Some Benefits from an Irrigation Economy

## Irrigation Increases Returns for Agricultural Producers

Gross farm income under dry-land production systems in a normal (non-drought) year is estimated to be \$150 per acre, which is about \$485 per acre less than under irrigation.

Some of the increase is a result of the changing crop mix under irrigation since forages and vegetables can now be grown. When drought occurs, as it does all too frequently, the returns to irrigated agriculture is even higher.

Specifically in drought years farmers net returns to farmers have been negative and as high as \$80/acre compared to net returns from irrigation of some \$270/acre.



Irrigated yields are consistently higher than dryland yields, equivalent to an additional \$270/acre.

## Agricultural Value Added Supply and Processing Opportunities

Value added processing has for too long been a distant dream in rural Saskatchewan. The frequent return of drought however is a continual threat to agri value added investments.

Today the opportunities for these value added food invest-

ments are better than ever before with the relocation of many of these facilities from water short regions of the United States and the growth in demand from an expanding Prairie and growing world population. Demand for meat products is increasingly linked to

the growth and increasing wealth of India and China. Powdered milk consumption in China trebled between 2002 and 2007. 400,000 irrigated acres are expected to be withdrawn from production in southern California by 2020.



## Adapting to Global Warming—Protection from Drought

Science suggests that the 20th Century may have been a relatively wet century that still contained a few droughts in most decades and the social, economic and environmental disaster of the 1930s.



Global Warming is a reality. Scientists tell us Prairie temperatures will rise and that droughts may become longer

and more frequent. The losses from Prairie droughts already run to billions of dollars. Yet irrigation is shown to provide insurance from drought and net returns that amount to \$270/acre over a normal drought year.

## World Agriculture Increasingly Turns to Irrigation to Secure Reliable Food Supplies

Today, 40% of the World's food supply is from irrigated lands where the productivity is commonly 3 times higher than dryland farming. The future growth of the world's population to 9 billion by 2050 and the changing tastes and preferences towards western diets allows agriculture to plan for a more stable future. Consistent agricultural returns from irrigation over dryland agriculture allow farmers to build equity, retire debt and obtain incomes that are more comparable to their urban neighbours.

## A Foundation for 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.

*288,000 person years of employment would be created from the five Lake Diefenbaker Irrigation Projects and a Diversified Agricultural Development Scenario.*

*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.*



40% of the World's Food Supply is from Irrigation

Agricultural Value Chains increase Rural Employment and Diversification



# SIPA

## Create a Legacy! Become Involved!

*Realising the benefits from Lake Diefenbaker Irrigation requires leaders to change the direction of development. For over half a century the potential of the Gardiner Dam and Lake Diefenbaker remains 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.*

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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

Lake Diefenbaker irrigation development requires a long term regional development 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 region, power and transportation infrastructure, irrigation research and demonstration for new cultural and water conservation practices will be required and a Lake Diefenbaker Irrigation Development Agency will be required to manage the process over many years.

Further study and waiting for better conditions can be costly. Cost benefit ratios for the project all increase when the work is completed over a twenty year period rather than a 40 year period. The cost inflation of the project 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 the opportunity.

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 the Lake Diefenbaker region of central Saskatchewan.

