Socio-Economic Impact Analysis Special Areas Water Supply Project

Presenter:

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& Darrell Toma March 5, 2020







Consultants Profile (Edmonton)

- Mark Anielski, B.A., BScF, MSc., 30 years in economics, natural capital assessments, socio-economic analysis
- Darrell Toma, MSc, PAg, CMC- 40 years in economics, project analysis, agfood projects and rural economic developments
- John Thompson, MA, 40 years experience in water projects, benefitcost, and prior author on 2005 review

AGENDA

- Introductions
- Goals of the SAWSP analysis
- Findings









Multi-Use Areas





Berry Creek Precipitation by township, in mm



Sounding Creek Precipitation

by township, in mm



Average mm



Variability High July 2016 vrs 2014



Compiled by Alberta Agriculture and Flural Development, Environmental Steward Groated on August 17, 2016

km Agriculture and Rural Development

Compiled by Alberta Agriculture and Fland Development, Environmental Stavardship Division, Technology and Interaction Branch Groated on August 6, 2014

Methods and Findings

- Reviewed prior studies and did local group meeting; some interviews
- Developed b-c framework and farm finance model for SA
- Used Ag &F data and validated with local input
- Capital cost on 8,000 acres (61 quarter sections) -is high cost project per benefiting farm
- SA info- possible 270 benefiting farmers with 61 irrigation farmers
- Crop mix- hay we used 75%-farmer comments
- Dugouts- have 8,600 now, we assume need 87 (1%) more- or pump
- Possible benefiting- 270 farms; total 1 m acres- range and irrgtn crop

Findings: Net Benefits of Agricultural Production

- Annual net benefits of agricultural production in the region resulting from SAWSP from
 - \$4.240 million (\$69,503 per quarter section) for a low scenario to
 - **\$4.446 million** (\$72,878 per quarter section) under a high scenario.
- These values represent the difference between gross revenues received from increased crop and livestock production with irrigation, back flood forage production and stock watering, minus the increased on-farm annual costs associated with irrigation pumping and more intensive crop and livestock production.

Findings: Net Benefits of Agricultural Production

		Low Scenario	High Scenario
Gross Farm Benefits	Total Annual Crop Benefits	\$2,965,926	\$3,084,000
	Reduced Trucking Costs	\$246,000	\$246,000
	Additional Beef Cattle-calves	\$6,268,991	\$8,545,001
	Stock water benefit;9%;water	\$2,314,066	\$2,314,066
	Risk Management Crops-reduced	\$1,037,964	\$1,421,227
	Subtotal of Benefits	\$12,832,948	\$15,610,295
Deductions and Adjustments for Costs			
	Crop production used for added feed	\$2,160,000	\$3,084,000
	Crop production costs	\$1,364,557	\$1,568,797
	Cattle production costs (excluding feed)	\$3,931,170	\$5,358,863
	Water supply systems costs (annual)	\$849,159	\$849,159
	Stock watering costs (annual)	\$42,358	\$57,889
	Subtotal of Costs	\$8,593,244	\$11,164,709
Net Benefits After Costs		\$4,239,704	\$4,445,586

Findings: Multi-Use Areas

 The proposed 15 multi-use project areas would provide 7,037 acres of backflood irrigation, with annual estimated benefits of forage and livestock water of \$61,691 per year as well as providing an estimated \$98,253 per annum in economic-recreational value due to staging areas for waterfowl and habitat for upland birds, and big game.



Findings: On Farm Benefits

- For farmers who decide to access water for irrigation, the potential financial benefits of investing in irrigation equipment and being able to expand cattle herds clearly exceed the costs.
- Depending on the crop mix being irrigated and fed to cattle, the return on investment would be 61% under the low scenario, (payback period of 6 years), to 68% under the high scenario, (payback period of 5 years)
- This rapid pay-back period is clear evidence of why farmers in the area are supportive of the project

Findings: Provincial Cost-Benefit Economics

- From a provincial cost-benefit analysis perspective, the quantified **discounted costs significantly exceed benefits** over a 50-year period.
- Even the most optimistic scenario whereby hay, spring wheat and additional cattle (AUs) are optimally produced -- the benefit/cost ratio for the project would be no more than 0.128 (12.8 cents in benefits per dollar of cost) with negative net present value per quarter section over the project life of -\$11.6 million, using a 3.0% discount rate.
- Total discounted (3.0% rate) costs (capital and annual operation) over a 50-year period would total \$806.7 million compared to \$102.9 million in total benefits, of which 95% would accrue to agriculture (livestock, crops) and 5% to recreation benefits.

Benefit-Cost Ratios- AB Water Projects

SAWSP benefit-cost analysis reveals that the benefit/cost ratio is significantly lower than previous Alberta irrigation/water infrastructure projects (see Table):

Irrigation/Water Infrastructure Project	Benefit-Cost Ratio	
Pine Coulee Project	1.18	
Oldman River dam	1.17	
Little Bow Project/Highwood Diversion Plan	0.90	
Milk River dam	0.80	
Meridian Dam	0.33-0.35	
Special Areas Water Supply Project	0.122-0.128	

Findings: Socio-Economic Impacts

- A socio-economic assessment shows that construction would have a small short term impact on provincial employment and income.
- Construction would be completed over five years and would directly and indirectly require 2,062 person-years of employment in Alberta (265 person years of employment in the region), and account for \$264 million of Alberta GDP and \$153 million in labour income.
- During its operational stage, water system is estimated to annually account for \$5.6 million in terms of Alberta GDP and 37 person years of employment.
- Regionally, the SAWSP is projected to provide 17 person-years of employment and \$2.6 million in annual income.

Findings: However...quality of life impacts

- From a macro-provincial-economic perspective the SAWSP project would be questionable, there are other local unquantified quality of life benefits to consider.
- These include:
 - local expectations of improved economic development opportunities
 - opportunities for agricultural diversification and intensification
 - opportunities for regional value-added businesses-maybe
 - stabilization of regional populations- maybe
 - reduced demands on governments during drought events, and
 - reduced stress and uncertainty for farm families- yes for some.

Thank you

Questions?



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