Odessa Sub-area Potato Production & Processing Impacts Under An Irrigation-Water Shortage

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The Odessa Groundwater Management Sub-area underlies Adams, Franklin, Grant, and Lincoln counties in East Central Washington. Water availability in the Odessa Sub-area aquifer is in decline putting potato production and processing at risk. Total potato acres fell 25% between 2005 and 2015. As the aquifer declines, deeper and warmer water that is of poor quality is being extracted for irrigation purposes.

Even with increased water scarcity and declining potato acreage, the sub-area produced 943,000 tons of potatoes which were then sold to processors within the four-county region. If irrigation were to stop, it is anticipated most farmers would convert their land into dryland wheat production (given current cropping patterns). Table 1 shows the expected economic losses likely to occur if sub-area growers converted to dryland wheat and processors were unable to source potatoes currently supplied by local potato growers.

Table 1
Economic Losses From Odessa Sub-area Potato Production and Processing Decline

Value Added Processed Potato Exports	-$77,646,267
Indirect Value Added (earned from business-to-business transactions)	-$55,981,184
Induced Value Added (earned from spending for personal activity)	-$5,666,528
Total Value Added Losses	**-$139,293,980**
Direct Employment	-1,229
Indirect Employment (jobs supported by processor business transactions)	-1,448
Induced Employment (jobs supported from processor employee purchases)	-129
Total Employment Losses	**-2,805**

Source: WSU SES IMPACT Center and Emsi 2017.1

Table 2 shows value of potato production, total regional sales, and location quotients for The United States, Washington State, and the Four-County Region. This data shows that the four county region is 132.4 times as concentrated in potato production as the United States, indicating a strong comparative advantage in regional potato production. Potato production in the four-county region represents roughly 3% of regional output. At the national level potato production only represents .02% of output. All of this emphasizes the four-county region's dependence on potatoes and the associated irrigation water necessary for continued production.

Table 2
2015 Potato Production Location Quotients By Region

Region	Potato Production (Sales)	Total Regional (Sales)	Location Quotient
Four-County Region	$201,293	$6,023,766	132.4
Washington State	$771,210	$362,656,959	8.4
United States	$3,750,246	$14,863,510,830	1.0

Source: USDA NASS Quick Stats, Emsi 2017.1, and Author's Calculations

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It is important to understand how potato processing exports reach into every corner of the four-county economy. Exports of processed potatoes bring new money into the region. That new money is then spent by the processors on employee wages, utilities, and raw potatoes. Employees then spend their earnings on household goods (e.g., eating out at local restaurants, getting the oil in their car changed, buying a new home, etc.). As that money ripples through the economy it creates additional rounds of spending and income until it finally leaks out of the region for the purchase of imports.

Table 3 shows that money brought into the economy through processed potato exports ripples through the economy longer and has a higher multiplier effect than the average dollar.

Table 3
Four-County Regional Multipliers

	Regional Average	Potato Processing
Sales Multipliers	$1.14	$1.56
Value Added Multipliers	$1.17	$1.79
Income Multipliers	$1.13	$1.86
Jobs Multipliers	1.16	1.46

Source: WSU SES IMPACT Center and Emsi 2017.1

For every dollar in processed potato exports an additional 56 cents in local economic activity is generated, 42 cents more than the regional average of 14 cents. The output from each full time equivalent job in potato processing supports an additional 0.46 jobs in support industries such as trucking and utilities. This exceeds the average jobs multiplier of 1.16.

Potato production and processing not only has a significant ability to bring new dollars into the region but keeps money in the region longer since it has deeper economic roots in the local economy.

Table 4 shows the current cropping pattern in the Odesa Sub-area along with the total volume of irrigated acres for each crop type. It is clear that the region's agricultural base is highly dependent on water, with nearly every acre being irrigated except for dryland wheat.

Though potatoes are the second largest crop grown in the sub-area, a loss of irrigation water would certainly effect every crop. Excluding wheat, CRP/Conservation, and fallowed land, 98.8% of the acres in the sub-area are dependent on irrigation.

Table 4
2015 Four-County Cropping Patterns

Crop Type	Total Acreage	Total Irrigated Acres	Percent Irrigated
Wheat	136,017	51,940	38%
Conservation	115,000	644*	1%*
Wheat Fallow	89,235	9,382*	11%*
Potato	26,519	26,236	99%
Alfalfa Hay	9,867	9,702	98%
Pea, Green	9,251	9,228	100%
Corn, Field	5,916	5,916	100%
Bluegrass Seed	5,401	5,270	98%
Corn, Sweet	5,270	5,270	100%
Timothy	4,872	4,872	100%
Bean, Dry	4,141	4,049	98%
Onion	2,540	2,540	100%
Canola	2,024	1,874	93%
All Other	7,095	5,193	73%
Total	**423,148**	**142,116**	**34%**

* These figures reflect USDA survey data and these acres are not likely being irrigated though some irrigation canal seepage may be occurring.
Source: Washington State Department of Agriculture