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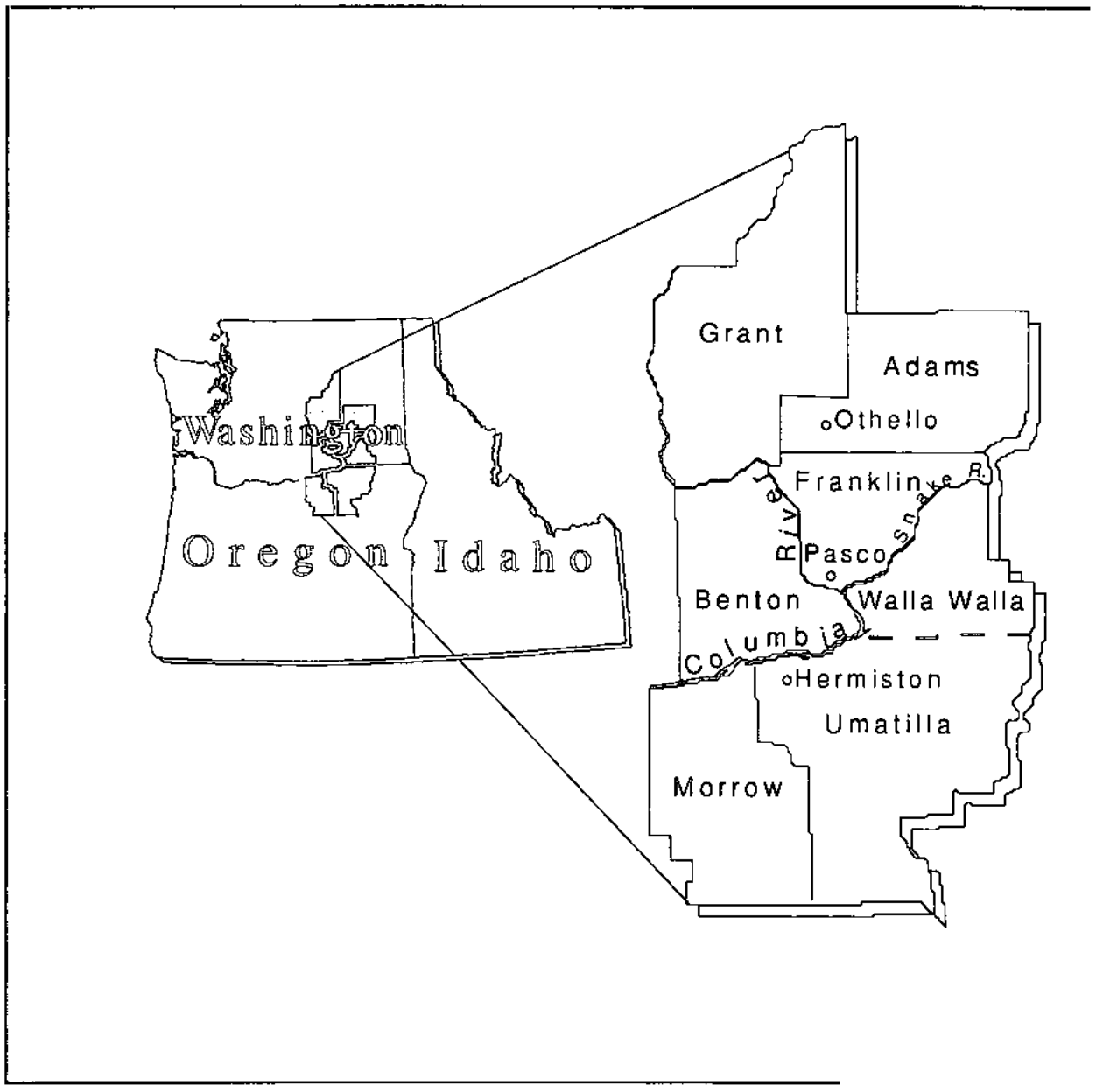
Value Added and Subtracted

The Processed Potato Industry in the Mid-Columbia Basin



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Columbia Basin Institute

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Columbia Basin Institute CBI

Organized in 1987, the Institute has functioned as a regional research and organizational development agency primarily providing assistance to local environmental and community development organizations in Washington and Oregon.

In 1987-1988 the Institute provided assistance to 1000 Friends of Oregon in developing a county-level land use conservation membership structure, organized and conducted Hispanic voter registration drives in four Washington State communities, and assisted Walla Walla and Umatilla County environmental groups in conservation projects, including a minimum streamflow in connection with a small head municipal hydro project in Walla Walla County.

In 1988 2500 new Hispanic voters were registered by the Institute's voter registration drives in Washington State, and in Oregon the Institute's President was awarded the Oregon Trout Riverkeeper Award for successful resolution of the City of Walla Walla hydroelectric project.

In 1988 the Institute initiated a community and housing development project aimed at capitalizing on the electoral gains of the Mexican-American populations in small towns in the Columbia Basin of Washington State. During 1989-91 the Institute served as the organizing, fiscal and development agency for the startup of Hispanic housing, worker training and community service activities in several Basin communities. The Othello-based Council for Development of Hispanics and a pre-workplace organizing project, Hispanos Unidos, are the outcomes of the Institute's Hispanic Organizing Project.

In 1991 the Institute began a transition back to environmental work, convening a coalition of environmental, labor and Hispanic community leaders for a survey of the socio-economic and environmental costs and benefits associated with the Basin's major manufacturing sector, food processing. Also in 1991 the Institute continued to provide Hispanic worker education on industrial insurance and the hazards of pesticides and toxics in the workplace, and initiated a residential energy conservation education program in cooperation with local utilities and community action agencies.

In 1992 the Institute completed a study of the food processing industry and convened leaders of a project on sustainable development in the Mid-Columbia Basin, merging its interests in resource conservation and community development, while expanding its interest in energy conservation education program activities to include the Basin's major water users, irrigated agriculture.

Based in Portland, the Institute's Board is composed of representatives from conservation organizations, labor unions, and regional human and natural resources organizations. A staff of Associates, Consultants, student interns and VISTA volunteers has been employed by the Institute over the years, directed by the Institute's President, William Bean.

The Institute's activities have been supported chiefly by funds provided by foundations, including The Ford Foundation, the Needmor Fund and the Campaign for Human Development. Federal and state agencies have provided support for housing and community services development, with utilities and state agencies providing support for energy conservation education activities.

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Table of Contents

LIST OF FIGURES AND TABLES

FIGURES

TABLES

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EXECUTIVE SUMMARY

Encouraging value-added processing is commonly proposed as a development strategy for economically depressed farming communities. In the Pacific Northwest, state commissions and agencies regularly recommend actions to enhance growth and competitiveness in the food processing industry. Capital assistance, tax abatement, and relaxed environmental standards are often endorsed as policies to assist this industry, which is a major employer in many of the region's rural towns.

This report examines the basic assumptions underlying the value-added strategy as it applies to potato processing in the Mid-Columbia Basin. We focus on answering three central questions:

1. Are financial inducements from state and local government necessary to create investment by potato processors in the Mid-Columbia Basin, or are existing regional advantages sufficient?

2. What impact does the potato processing industry have on water quality and use in the Columbia Basin, and do existing environmental regulations ensure the long-term sustainability of production in the region?

3. Does the potato processing industry have a significant positive impact on rural unemployment and poverty in the Columbia Basin?

Findings of the Study

Competitive Advantages. Analysis presented in this report makes it clear that the potato processing industry in the Mid-Columbia Basin is highly competitive vis-à-vis other regions. Among the competitive advantages of the industry are:

- low-cost water and energy provided by the publicly subsidized irrigation and hydroelectric systems of the Bureau of Reclamation, the Army Corps of Engineers, and the Bonneville Power Administration;

- the suitability of the region's climate and soils for growing Russet Burbank and similar varieties of potatoes, which are preferred for frozen french fries;

- the highest potato yields in the world, resulting from the combined effects of climate, controlled irrigation, long growing season, heavy chemical use, and high rates of fertilization.

The advantages accruing to the industry because of its location in the Mid-Columbia Basin are manifested in several ways:

- lower unit cost of potato production than in competing regions (which strongly influences processing plant location decisions)
- increasing acreage cultivated for potatoes
- continued expansion of total Northwest frozen potato production
- significant regional investments made recently by the industry's major players (such as McCain Foods, ConAgra, Nestle)

The Pacific Northwest's competitive advantages help to explain why potato processors in the Mid-Columbia Basin and nearby Snake River Valley now account for 80 percent of U.S. frozen potato products. Given that multinational potato processing firms continue to make large investments in the region, it is difficult to justify public subsidy and financial concessions to induce further industry growth in the region.

Impacts on Water Quality and Supply. The ten major potato processing plants in the Mid-Columbia Basin have a substantial presence in their small, host communities. Most of the towns share use of local aquifers for water supplies with the processing plants, each of which uses 2 to 3 million gallons of water a day—typically four or five times greater than the community's water requirements.

Water in the plants is usually reused once or twice before being discharged as effluent. Some of the effluent is captured and sold as cattle feed, while the rest is treated and then disposed of by spraying onto fields. This wastewater has an extremely high nitrogen content, which under ideal conditions would be completely absorbed by crops. But because the processors typically spray wastewater onto insufficient acreages and lack adequate winter storage capacity, these disposal practices have had serious consequences for water quality:

- Nitrate levels in alluvial aquifers in areas of potato processing wastewater disposal exceed legal maximums by as much as 12 times.
- Excessive irrigation on small acreages has caused septic flooding in nearby residential areas.
- Pollutants in the alluvial aquifers are now contaminating basaltic aquifers through uncased and abandoned irrigation wells and fractures in the basalt itself.

In addition to affecting the region's water quality, producing and processing potatoes also impacts the water supply. Though the primary cause of groundwater depletion is irrigation,

the problem is exacerbated by the processing industry's use of municipal supplies and wells owned by the plants.

Problems related to water quality and supply impose large costs on communities that depend on groundwater for residential, municipal, and industrial supplies. Unfortunately, state regulations have not mitigated the problems. In fact, some policymakers now propose relaxing environmental standards to encourage more growth in the industry. In addition, proposals are being considered to replace polluted and depleted groundwater supplies with new appropriations from the Columbia River. Analysis presented in this report clearly indicates that such solutions will exact high costs on utility ratepayers as well as on water quality.

Socioeconomic Impacts on Columbia Basin Communities. Critical to the debate about value-added industries is whether they improve the living conditions and livelihoods in the rural communities where they are located. That conditions in the Columbia Basin's small communities are substandard is hard to deny. For example, in Othello, Washington, unemployment reaches 20 percent in the winter months. Per capita income is substantially lower than the state average. Seasonal workers are poorly housed, and even among the resident population, 40 percent live in overcrowded conditions. The infant mortality rate is twice the state average.

Still, can it be said that the potato processing industry exacerbates such problems? This study concludes that the industry's socioeconomic effects are mixed. While it is true that the equivalent of several thousand full-time jobs are provided, the industry also generates seasonal unemployment in the plants and in the fields. The largely Latino workforce is concentrated in lower-wage jobs, and a significant proportion of the industry's workers have incomes below the poverty line. The resulting low household incomes among ethnic minorities in small communities ill-prepared for population growth creates social overhead costs that the industry does not address.

Policy Recommendations

Based on the analysis presented in this report, we have developed policy recommendations in four specific areas.

States' Tax Abatement Policies. The process by which tax abatements are tied to local unemployment levels needs to be more sophisticated and targeted, especially when high unemployment levels are so clearly related to how the industry works. Alternatives to current policies include:

- Obligating a *quid pro quo* from the beneficiary of tax abatements. The beneficiary could be required to spend a percentage of the funds to alleviate community infrastructural problems, such as lack of housing or inadequate public utilities.

- Attaching socioeconomic, conservation, or environmental conditions to the abatements, whereby the recipient would be required to pay an amount equivalent to the abatement for non-performance.

Rural Economic Development Programs. Community Development Block Grant funds should be restricted to socioeconomic and programmatic categories that benefit the exposed population. In addition, a value-added strategy targeted at a greater diversification of production in the region would assist growers' cooperatives or local entrepreneurs seeking new market niches and might increase future employment prospects if seasons were complementary.

Conservation of Water Resources and Hydroelectric Base. The various congressional reviews of regional policy generated by the current conflicts over water allocation in the Columbia Basin provide an opportunity both to restate the system's intended purposes in terms of rural economic opportunity and to provide for a more sustainable exploitation of resources. In this context, the issue of water pricing should be raised again and more realistic costs assigned to this scarce resource.

Groundwater Quality. The EPA could develop a standard, nationwide permitting and monitoring procedure for the industry and make adherence a condition for funding state-administered programs. States should take steps to restore contaminated residential well supplies and protect the deeper basalt aquifers from further contamination. The use of toxic agricultural chemicals known to infiltrate and persist in groundwater, such as atrazine and aldicarb, should be halted on porous soils above perched aquifers. Producers who persist in such applications should be held liable in the future for the costs of replacing drinking water sources that become polluted with such chemicals beyond allowable limits.

Conclusion

Expanding the potato processing industry in the Mid-Columbia Basin, especially by using further subsidies and concessions, raises issues that must be addressed by policymakers at the local, regional, and national level. Essentially, the economic development policy-making has failed to take into account the large environmental and social costs imposed by the industry at the local and regional level. The development of a frozen french fry industry to supply cheap food for McDonald's and other fast-food firms in the United States and the Pacific Rim is perhaps an appropriate use of the federal subsidies contained in the water and power of the Columbia Basin, but the environmental and social externalities of the industry, which currently impact the region, need to be internalized and the industry made sustainable. McDonald's, Burger King, and Wendy's should lead the way in this transformation.

Chapter One
INTRODUCTION: POTATOES AND POLITICS

During the years 1988 to 1991, the Columbia Basin Institute was deeply involved with the Latino population in several small towns in the Mid-Columbia Basin area of South Central Washington State. Throughout that period, in the course of various projects related to social services, housing rehabilitation, injured worker assistance, and voter registration, we endeavored—with limited success—to remedy the various infrastructure deficiencies commonly found in the Mid-Columbia Basin's small, irrigation-dependent communities. Employment in the fields and food processing plants of the Mid-Columbia Basin is often not enough to provide the Latino workers with access to adequate housing and other civic services. Furthermore, the small Columbia Basin communities mostly lacked the community development capability to resolve such problems.

It was in this context that the Institute began a two-year study of the socioeconomic and environmental effects of the frozen potato products industry in the Mid-Columbia Basin. This report presents the results of the Columbia Basin Institute's study of the growing and processing of frozen potato products in the five-county area forming the Mid-Columbia Basin region of Washington and Oregon, where approximately half of the industry's production is located. Together with their counterparts along the Snake River in Southwestern Idaho, the Mid-Columbia Basin's potato processing plants produce over 80 percent of all U.S. production of frozen potato products, and account for more than half the value of the frozen processing sector in the Pacific Northwest (AFFI Ann.; BPA 1989).

Since the Institute began the study two years ago, the focus has widened from an initial concern with the states' economic development and environmental policies related to the industry to include an examination of some aspects of the industry's contribution to regional and federal management issues in the Columbia River's hydroelectric and irrigation system. The federal hydroelectric system is now the scene of resource conflicts precipitated by dwindling salmon stocks and escalating utility rates. Resource management is becoming a zero-sum game in the Columbia Basin.

The research inevitably led into the hydroelectric arena because, as the study progressed, it became clear that not only the causes of the industry's presence in the Columbia Basin, but also the control and mitigation of the consequences of its industrial practices ultimately rested at the regional and federal level. It is now 90 years since passage of the Reclamation Act initiated the system of federal subsidy that forms the basis of today's political economy in the Columbia River Basin. From a position of abundant natural and public resources, the Columbia Basin now suffers severe resource depletion and underinvestment in civic and community life. Ground and surface water supplies have been depleted and contaminated, and in some respects the Columbia Basin's irrigation-dependent communities are poorer today than before the advent of federal water.

The Columbia Basin's major processed food product—roughly 80 percent of all the french fries offered customers in the nation's fast-food chains—is cheap. And the concentration of national production of the french fry in the Columbia Basin is commonly regarded as an example of successful value-added economic development in the region's rural areas. But, as we detail in this report, the process of production of the nation's french fries has been accompanied by serious impacts on the Columbia Basin's natural and public resources. Systems of public subsidy and regulation intended to ensure some standard of rural prosperity and resource protection have been subverted by the competitive pressures of an international industry whose powerful presence in the Columbia Basin's small communities has become problematic.

The challenge for policymakers in the Columbia Basin today is to devise some means of restoring the Columbia Basin's water resources and rehabilitating its communities, conserving what remains of the region's economic advantages provided by the hydroelectric capacity of the Columbia River and protecting the interests of the Columbia Basin's small farmers, agricultural and processing workers. These were, after all, among the intended beneficaries of public investment in exploitation of the natural resources in the Columbia Basin. The price of that exploitation in terms of natural resources has been tragically high; the benefits, in terms of the socioeconomic and environmental qualities of life at the community level, are not apparent.

The McCain Subsidy: A Case Example

In the fall of 1990 the Washington State Department of Community Development (DCD) awarded a subsidized $5 million float loan to McCain Foods Western to induce the Canadian multinational potato processor to expand its french fry plant in the small eastern Washington community of Othello. Othello, like many agricultural towns in the Columbia Basin, has substantial housing and other community development deficiencies. Washington allocated funds from the Department of Housing and Urban Development (HUD) under the Community Development Block Grant (CDBG) Program to provide the processor with a capital subsidy of approximately $400,000, representing the difference between market interest rates and the subsidized rate.[1] Washington publicized the subsidy as the largest of its kind ever granted in the state: "It's a very, very important project to us on the state level," the agency's spokesman told the *Othello Outlook* upon closing the loan.[2] McCain Foods was also awarded $2 million in tax abatements, provided under Washington programs that encourage investment in areas of high unemployment such as Othello, where 200 new processing jobs were projected to result from the state's investment.[3]

McCain Foods received other concessions from the state. Fearing liability for water quality degradation, an adjoining potato processing plant—acquired a few years previously by Nestle's—had recently invested $10 million in a new wastewater treatment system, leaving McCain's in sole possession of the waste disposal site that the two plants had shared prior to Nestle's investment in a new system. For many years the disposal of potato wastes on the site adjoining the community had been the source of citizen complaints concerning air and water quality problems, fish and wildlife kills, and sickened cattle. An ammoniac drizzle caused by the spray irrigation of nitrogen-laden potato wastewater often enveloped the community, the air quality effects being especially severe in a small neighborhood of Latino

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[1] Memo to Kraig Kushar from Dan Riebli, Washington State Department of Community Development, 6 February 1990. See also *The Othello Outlook*, 17 January 1990.

[2] "Plant Loan Formalized," *The Othello Outlook*, 15 August 1990.

[3] Memo to Kraig Kushar from Dan Riebli, Washington State Department of Community Development, 6 February 1990.

workers located next to the wastewater spray fields. Washington's Department of Ecology (DOE) permitted McCain's to continue operations at the unimproved site.

In early 1992 DCD withdrew its loan subsidy when McCain Foods was sued by several local organizations for violating the federal Clean Water Act.[4] The plaintiffs produced engineering reports from DOE's files documenting that the potato processor's waste disposal operations had been illegally discharging contaminants to surface waters in the area for many years, and provided aerial photographs showing that the contamination was continuing. The plaintiffs included a local chapter of the Audubon Society, an organization from the Latino neighborhood, and United Food and Commercial Workers Local 1439, this last arguing that the processors's contamination of water supplies threatened the long-term stability of jobs in the processing industry in the area. Only a small fraction of the anticipated increase in processing jobs had been created at the time of the state's precipitate withdrawal of the loan.[5]

In the summer of 1992, McCain Foods launched a price war in specialty french fries. The firm's president explained to the *Wall Street Journal* that the move was designed to increase U.S. market share, and that, on the basis of expansions in their Othello plant, "We think we're the low-cost producers in the category" (Gibson 1992). Industry consultants interviewed by the *Journal* described the french fry industry in the Columbia Basin as "depressed by overcapacity and thin margins in food service sales" and cited chronic overproduction of potatoes in the Columbia Basin as a reason for the glutted french fry market (ibid.). Competing processors in the Columbia Basin confirmed that the industry suffered from overcapacity and stated that McCain Foods' price cutting would cost them several million dollars (Jones 1992). Union contracts were under negotiation in several plants at the time, and labor leaders expressed fears that the price war in french fries would

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[4] See Case No. CS-92-02235-FVS, Washington Trout, United Food and Commercial Workers #1439 and Central Basin Audubon Society v. McCain Foods Western, Inc., U.S. District Court for the Eastern District of Washington.

[5] Personal communication from Al Spadoni, Washington State Department of Labor and Industries, March 1992. See further discussion below, p. 80.

exert downward pressures in the contract settlements.[6]

In its loan to McCain Foods, the state of Washington appears to have placed itself in the paradoxical position of intervening with a subsidy in a highly competitive industry, while leaving investment in environmental protection to the discretion of the private sector and enforcement of environmental law to the citizenry. While the consequences of the state's decisions amounted to a misadventure in rural economic development, the guiding ideas were entirely consistent with state agency policy orientations and rural development practices in the Pacific Northwest.

Because of the perceived desirability of value-added processing for economic development in agricultural areas, state commissions and agencies regularly recommended policies encouraging capital assistance, tax abatement, and relaxation of environmental standards as a means of enhancing the growth and competitiveness of food processing industries in their respective states. For example, in 1989 both Washington and Oregon commissioned studies that produced recommendations of ways the states could encourage the growth of food processing in their agricultural regions (Meale 1989; Obermiller 1989). These studies produced quite similar sets of policy recommendations. According to Oregon agricultural economist Fred Obermiller,

> "The most desirable changes are:
> 1. reduced workers' compensation insurance;
> 2. reduced local property taxes;
> 3. reduced state taxes;
> 4. easing of international trade restrictions;
> 5. relaxed Department of Environmental Quality regulations;
> 6. more flexible zoning codes and ordinances." (Obermiller 1989:51)

Meale's report to a Washington State gubernatorial task force contained quite similar recommendations. But the evidence offered by the authors in support of these measures was merely the opinion of the industry itself—elicited either in committee deliberations with industry representatives or through industry questionnaires. No analysis or empirical support was provided by the authors concerning the benefits and public costs of implementing the recommendations. Rather, it was deemed sufficient to demonstrate the relative importance

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[6] Personal communication from Larry Hall, UFCW Local 1439, July 1992.

of the food processing industry in the states' rural areas, apparently assuming that growth in such manufacturing jobs provides benefits that would offset the loss in taxes and the impacts of less regulation.

An assumption underlying these recommendations appears to have been that such concessions are necessary to induce processors to invest in the region, despite one author's observation that a recent "flurry of food processing investments" in Washington was motivated by processors' desire to "gain access to raw materials, cheap power, abundant water, and proximity to the Pacific Rim" (Meale 1989)—all conditions which are either natural features of the region or the result of federal, rather than state policy.

A second assumption appears to have been that the region's water resources, upon which the industry depends for both potato production and processing, would be unaffected by relaxing environmental standards. As with many such studies, there was no consideration of the growing environmental crisis in the region and no examination of the premise that the industry can continue to expand indefinitely carrying on business as usual.

Finally, a third assumption that underlies the states' promotion of the industry as a generator of jobs is that the potato processing industry solves problems of rural poverty rather than creating them. No consideration is given to why the towns of the Mid-Columbia Basin are swelling with Latino workers and what the social consequences of that growth might be.

Outline of the Report

This report is organized around an analysis of these assumptions and therefore focuses on answering three central questions:

1. **Are financial inducements from state and local government necessary to create investment by potato processors in the Mid-Columbia Basin, or are existing regional advantages sufficient?**

2. **What impact does the potato processing industry have on water quality and use in the Columbia Basin, and do existing environmental regulations ensure the long-term sustainability of production in the region?**

3. **Does the potato processing industry have a significant positive impact on rural unemployment and poverty in the Columbia Basin?**

Chapter Two traces the development of the processed potato industry in the Mid-Columbia Basin and the federal irrigation and hydroelectric power subsidies that underlie it. Data are analyzed to assess the competitiveness of the regional industry vis-à-vis alternative regions. The chapter concludes with a discussion of the increased investment flowing into the industry and some of the conflicts engendered by it.

Chapter Three analyzes the environmental impacts of the industry on water resources in the Columbia Basin. The discussion focuses on groundwater use and pollution, the processing industry's waste disposal practices, and demands for expanded access to surface waters for more potato production. An attempt is also made to calculate some of the costs to other ratepayers of the impact on the hydroelectric system of the potato industry's proposed expansion.

Chapter Four focuses on the socioeconomic impacts of the industry in the Mid-Columbia area. We compare the results of two surveys in the region to aggregated data about wages and unemployment, and discuss as an example the potato processing community of Othello, Washington. Finally, we assess the logic of the states' rural economic development programs by reviewing the case of a direct subsidy to McCain Foods.

Chapter Five summarizes the report's arguments and presents alternative community development and environmental policy options. As the use of water in the Columbia Basin becomes a conflict among competing interests to divide up a shrinking pie, it is crucial that policymakers recognize the trade-offs inherent in their choices.

Chapter Two

THE COMPETITIVE ADVANTAGE OF COLUMBIA BASIN POTATO PROCESSING

This chapter discusses the development of irrigated agriculture in the Columbia Basin and the subsequent development of a potato processing industry. It examines several factors that together constitute the competitive advantage of the region's potato processing industry vis-à-vis other areas of the United States.

The Development of Irrigated Agriculture in the Columbia Basin

Anglo settlement of eastern Washington occurred in the early 1800s by ranchers who made extensive use of natural grasses as feed for livestock on largely unfenced rangeland. These grazing lands were government-owned and used for free or for a nominal fee. With the construction of the railroads, a large number of homesteaders were attracted by the sale of the railroads' land grants in the 1890–1910 period. These homesteaders developed a dryland agriculture centered around wheat and livestock feed, but the vicissitudes of the market forced many such homesteaders to consolidate farms and others with poorer land to revert to grazing. Population in the Columbia Basin declined 10 percent between 1910 and 1920 and a further 30 percent between 1920 and 1930 (USBR 1978).

While the highly fertile hills of the Palouse seemed well suited to dryland wheat, irrigation was seen as the salvation of many of the other areas that could not support dryland farming. Irrigation began prior to 1840 near Walla Walla, Washington, and Lewiston, Idaho (Crook Company 1993). By 1900, there were 500,000 acres under irrigation in the Northwest, and this expanded rapidly to 2.3 million in 1910 and 3.56 million in 1928 (ibid.).

Construction of the Grand Coulee Dam under the New Deal in the 1930s marked the beginning of major irrigation development in the Mid-Columbia Basin. Nearly two decades of regional conflict preceded Grand Coulee's construction because populist and progressive advocates of publicly supported power and irrigation were opposed by private utilities and their investing banks. With Roosevelt's election, the dam's proponents prevailed, and the advent of cheap public power and irrigation water through the Columbia

Basin Project (CBP) was hailed as the beginning of the prosperous development of the region's arid hinterland by communities of small farmers. Returning World War II veterans took up irrigation sections on the CBP in large numbers starting in 1948 and continuing through the 1950s (USBR 1978).

Approximately 8 million acres are currently under irrigation in the Pacific Northwest (in Washington, 1.6 million; Oregon, 1.9 million; Idaho, 3.6 million; and western Montana, .9 million), and over 5.5 million of these are irrigated from the Columbia Basin's ground- and surface water resources (NEA 1988). By the late 1970s, the Columbia River and its main tributary, the Snake River, were dammed at 27 locations and 4.9 million acres were under irrigation from those sources alone. Nearly 3 million acres are served by Bureau of Reclamation projects in the region (ibid.). Some 35 million acre-feet of surface water were withdrawn annually for agricultural purposes, representing 90 percent of all use of the system's water (Crook Company 1993). Though only 50 percent of agricultural withdrawals are estimated to be returned to the system, 80 to 90 percent of all non-agricultural water withdrawn is returned (ibid.). Therefore, non-agricultural uses account for less than 2 percent of total water consumption.

Low-cost hydroelectricity from the dams provides over two-thirds of the region's power output and constitutes the linchpin of the regional economy. This cheap power also has contributed to the widespread adoption of sprinkler irrigation in the Mid-Columbia Basin, which has been important in the development of the potato industry. By 1987, the value of commodity production in the Mid-Columbia Basin was estimated at $638 million annually, with 13,700 workers engaged in agriculture. Value added by processing in 1987 in the same areas was estimated at $246 million annually, engaging 8,600 workers chiefly in the water- and energy-intensive manufacture of processed, dehydrated and frozen potato products.[1]

The fifty-year period during which the Columbia Basin's irrigated agricultural industry developed was marked by generous public support and the free exploitation of an apparently

[1] Totals are for the Agricultural Production Areas (APA's) 13 & 22, respectively, in and around the CBP in south central Washington and north central Oregon, where most of the Columbia Basin's potatoes are grown and processed. (Wilkins, et al. 1989a:17-23).

limitless resource: the Columbia River, its tributaries, and the region's groundwater. The Bureau of Reclamation's CBP, the largest single irrigation project on the Columbia Basin (550,000 acres), enjoys a public subsidy second only to the Imperial Valley Project in California (USDI 1980). Agriculture pays very little for water and power in the CBP (Runsten and LeVeen 1986), and, as a partial consequence, over 50 percent of all project irrigation water is now used in water-intensive, low-value hay and pasture crops for the region's cattle feeders and dairies, even though wheat, apples, and potatoes are by far the Columbia Basin's most significant crops in value terms. Throughout this period of development, states supplemented federal assistance by granting water rights from surface and groundwater sources. In addition, several streams of capital subsidy paid for irrigation development and operations.

In the 1970s and 1980s, irrigated acreage also was expanded through privately financed groundwater pumping and high-lift pumping directly out of the rivers. A considerable portion of this development has occurred on large farms along the Snake and Columbia rivers in south central Washington and north central Oregon with the specific intention of growing potatoes, grapes, apples, and other high-value crops. Particularly in the production of potatoes, these large operations have been able to achieve high yields and economies of scale by moving onto clean soil,[2] essentially displacing a certain amount of expansion that would have occurred in the areas already under irrigation. Total irrigated acreage in the Northwest continues to grow: a study in the 1980s showed that irrigated acreage had grown 5.7 percent in Washington and 5.1 percent in Oregon between 1982 and 1984/86 (NEA 1988); a recent study found that irrigated acreage in Washington and north central Oregon had grown by 50,000 acres in the 1980s (Crook Company 1993).

The Competitive Advantage of Northwest Frozen Potatoes

Much of the assistance and subsidy offered by state and local governments to the potato processing industry has been justified by a notion that without such subsidy, the firms

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[2] Clean soil (i.e., ground which has not been used previously for potato production) is valuable. The chemical-intensive potato culture practiced in the Columbia Basin leads over the years to a build-up of soil-borne pests and diseases. Clean soil cuts chemical control costs and raises yields in the early years.

would be induced to locate in another region. The following section presents evidence that this is unlikely, that in fact the Northwest has a strong competitive advantage over competing regions in the United States, and hence the industry's investments in processing plants would likely have been made regardless of public intervention.

The first advantage of the Northwest is its extensive publicly supported irrigation system. As noted above, the Bureau of Reclamation projects irrigate approximately 3 million acres in the Northwest. Development of the potato industry in the Mid-Columbia Basin was centered in the CBP, where water and power costs have been heavily subsidized. For example, in 1970, when the industry was growing rapidly, 57 percent of Washington potato acreage was in the CBP (USBR 1986; Lucier, et al. 1991). By 1984, the CBP accounted for only 35 percent of potato acreage in Washington (ibid.), since much subsequent expansion took place outside the CBP, mainly through privately financed irrigation projects along the Columbia River in search of clean soil. The high-lift pumping of the private projects are only economically feasible, however, with the low charges levied for water and power. Industry representatives have supported the expansion of the CBP, both (1) to gain access to clean soil in areas where there is no alternative source of water for the continued expansion of the industry and (2) because of the high rate of subsidy to irrigation in the project.[3]

By contrast, most of the competing fall potato regions in the United States are not heavily irrigated. Figure 2.1 shows that while virtually all potato acreage in the Northwest is irrigated, relatively small proportions are irrigated in Maine or North Dakota. It is certainly possible to irrigate potatoes in particular regions of the Midwest where there is

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[3] The subsidy to the irrigators of the cost of construction of the CBP is about 97 percent (USDI 1980). CBP irrigators also receive the benefits of subsidized project power. For example, the Bureau of Reclamation in 1978 to 1983 used on average 960 million kwh of electricity per year for project pumping in the CBP, for which the irrigators were charged only .5 mills/kwh by contractual stipulation. The opportunity cost of the power was at least the BPA wholesale rate at that time of 22.4 mills/kwh, which implies an annual subsidy in project power costs alone of over $20 million per year (Runsten and LeVeen 1986). The Bureau now proposes to irrigate an additional 87,000 acres in the Columbia Basin Project in central Washington. Of the 87,000 acres proposed for irrigation, 37,000 are currently reverting to dryland farming due to aquifer depletion. See USBR 1989. For an example of local economic development arguments in support of additional mainstem withdrawals in north central Oregon, see Representative Chuck Norris, R-Hermiston, in "Progress Made on Proposal to Pump Columbia's Waters," *The Hermiston Herald*, 21 July 1992.

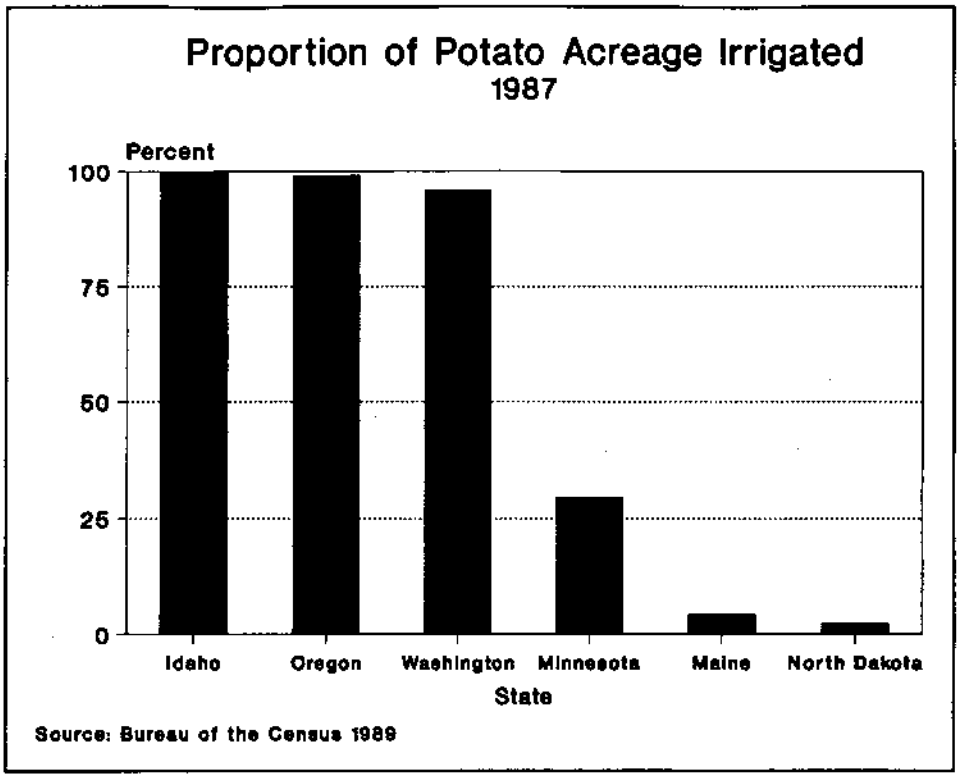
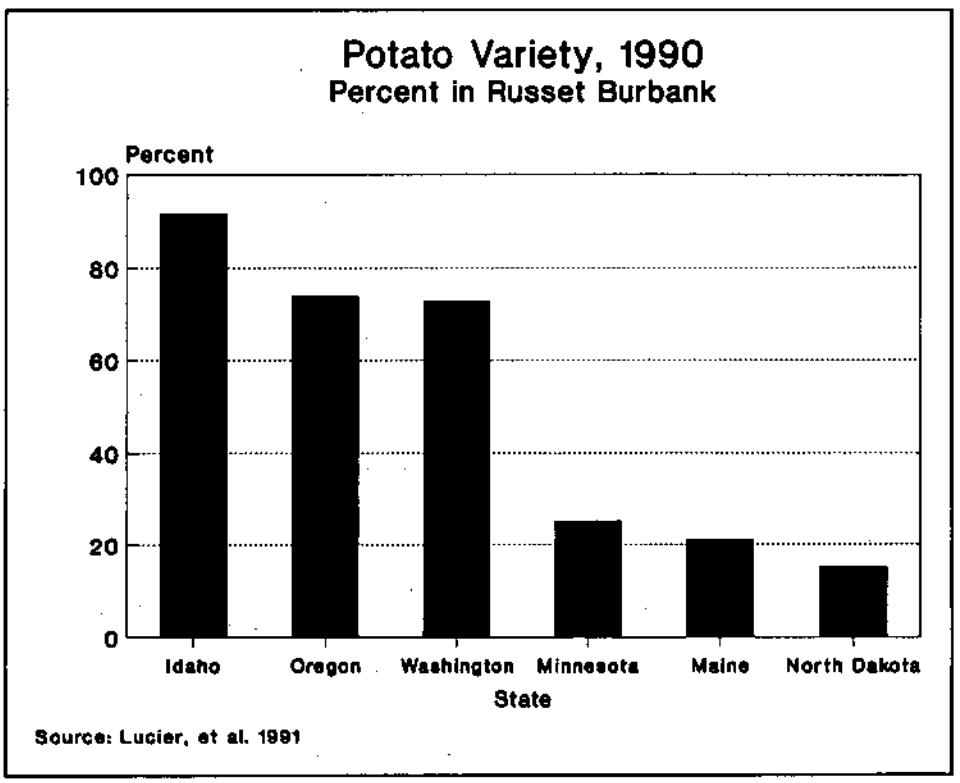


Figure 2.1



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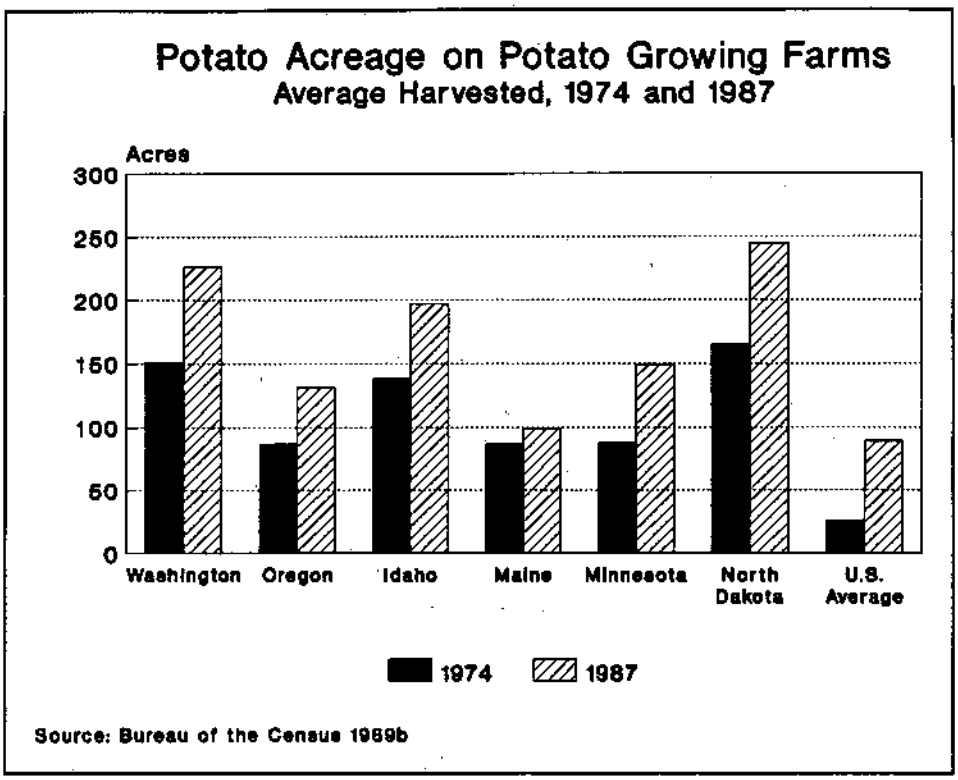

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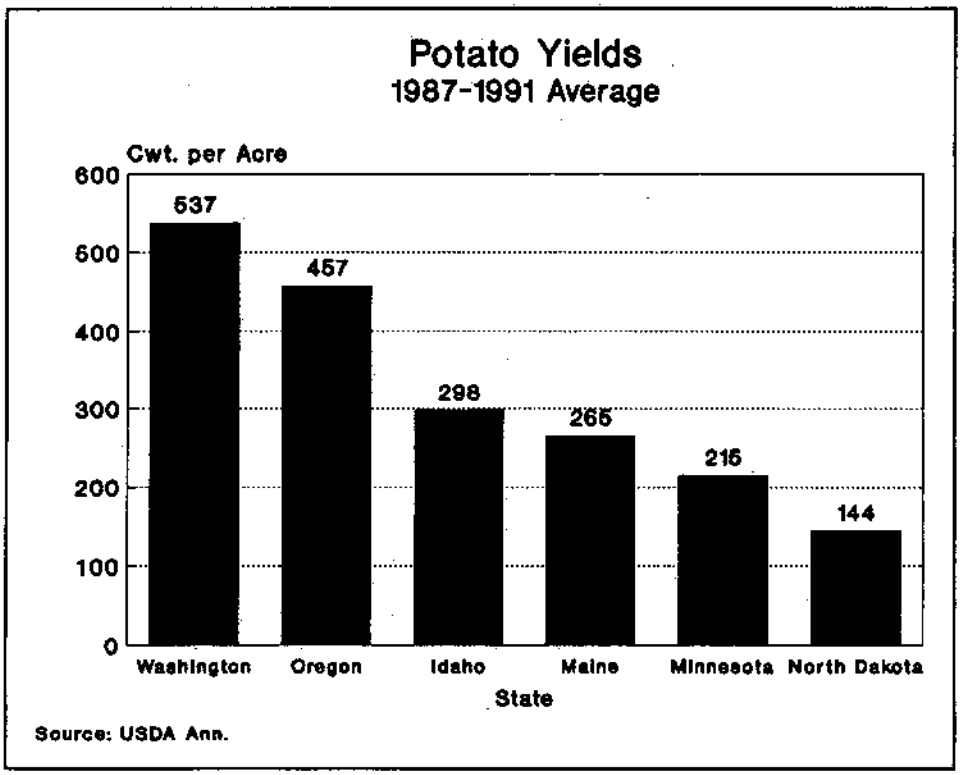

Figure 2.4

groundwater, but it has not been the common practice. The advantage of irrigated potato culture is that quality is more easily controlled and there is less risk that supplies for processing will fall short. The expansion and refinement of sprinkler irrigation in the Northwest, and the necessary access to relatively inexpensive power for it, has provided a particular advantage in this regard. For example, a current research project in Idaho seeks to add polyacrylamide to furrow irrigation water to see "whether the treatment can benefit furrow-irrigated Russet Burbank potatoes. Some growers are switching to sprinkler irrigation because high-quality potatoes result only if they receive timely and even water delivery. Furrow-delivered water infiltrates soil less evenly. . . " (Senft 1993).

The second advantage of the Northwest is that it is a region well adapted to growing the Russet Burbank potato, which has the most desirable properties for the frozen potato industry: it stores well for eight to ten months, it is large (oblong) enough for french fries, and it has the proper solids and low sugar content to fry well (Buteau and O'Rourke 1986:10,16). As shown in Figure 2.2, while over three-quarters of the potatoes grown in the Northwest are Russets, relatively minor amounts of this variety are grown in competing regions. In particular, the Red River Valley of Minnesota and North Dakota has produced principally round white potatoes, which are used fresh or for potato chips. These do not store as well as Russets, which is even more true of so-called early or summer varieties of potatoes grown in other regions of the United States, nor do they make high quality french fries.[4] The processing potato industry could only have developed in a fall potato region that produced storable potatoes (Zepp 1982). The Northwest was an ideal place to construct the industry.

The third advantage of the Northwest is the opportunity for large-scale farming. Just as in other regions of the West, large tracts of land are available in the Mid-Columbia Basin that can be irrigated with pumped water. Figure 2.3 shows the average potato acreage per

[4] Before the advent of frozen french fries, spring-harvested white potatoes were used for food-service french fries in the summer months, as the fall-harvested Russets could not be stored year-round (Love 1986:330). The shift to frozen (Russet) french fries was in fact due to the poorer quality french fries which the whites produced (Ibid.). McDonald's was the decisive force in that shift. In the past decade, new varieties of potatoes have been developed that approximate the quality of the Russets and that are suitable for production in the Midwest, which has allowed some expansion of the industry to occur there.

farm in 1974 and 1987. While farm size grew over these 13 years in every state, in 1987 Washington's average of 227 acres of potatoes per farm growing potatoes was high, surpassed only by North Dakota's 245 acres (Lucier, et al. 1991). (That Washington's acres were irrigated, while North Dakota's were not, meant that Washington's acreage produced far greater yields overall—see Figure 2.4.) Though some argue that large farms are not advantageous, these nevertheless can realize whatever scale economies exist in purchasing or production, and it has been repeatedly demonstrated that they are better able to finance new technology.[5]

The fourth advantage of the Northwest is the combination of sprinkler irrigation (providing the ability to control water application), large farms, a long growing season, and the adaptability to the Russet variety—all of which contribute to high potato yields. Figure 2.4 presents an average of the yields from 1987 to 1991 in various states. Washington has the highest yield, over four times the yield in North Dakota.[6] Oregon and Idaho yields are somewhat lower than Washington's, in part because they produced more for the fresh market.

High yields are doubtless the result of a variety of factors, not least of which are agricultural research efforts. Furthermore, high yields multiply themselves in a cumulative fashion because they allow increased investment in the crop. As with the strawberry industry in California, a high-cost-per-acre/high-yield-per-acre strategy can often produce the lowest unit costs. Because the Northwest offers the possibility of a relatively controlled environment over a long season—irrigation in a semi-arid area (Buteau and O'Rourke 1986:8)—growers are able to take advantage of agricultural research developments as they occur and can better afford to invest in extensive use of fertilizer and chemical control of pests and disease.

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[5] See, for example, Carter and Johnston 1980 for a review of scale issues.

[6] Comparing potato yields with USDA data is a bit like comparing apples and oranges. The data include potatoes of all varieties, grown at all times of the year, for both fresh and processing uses. Because processing varieties yield better, the processing states will tend to have higher yields. Therefore, a more useful comparison would be among potato production for freezing in the different states, but we do not have this data. Nevertheless, it is generally agreed that the Mid-Columbia region has the highest yields, regardless of the variety grown.

In a 1992 potato cost study from Washington State University, fertilizers accounted for 16 percent of variable costs and chemical and application costs represented 38 percent of variable costs, for a total of 54 percent (Hinman, et al. 1992).[7] Zepp found in a comparative study that Washington potato growers applied the most fertilizer of any region studied, because the long season allowed the plants to utilize it and produce high yields (Zepp 1982). In some respects, then, yield advantages are partly the result of the long growing season in a relatively favorable climate (Buteau and O'Rourke 1986). But the high use of fertilizer is probably also owing to the infertility of many of the soils. Data on corn fertilization show that Washington is second only to Arizona in amounts of nitrogen applied (Huang 1992). These chemical additions are therefore the most important costs of growing potatoes in the Columbia Basin. The industry has evolved a chemically managed system that limits labor needs and produces high yields, but that is consequently vulnerable to possible cancellation of agricultural chemicals—such as the loss of EDB or Telone II as a soil fumigant (Nuckton 1991)—or to restrictions on fertilizer use.[8]

The use of this chemical-intensive system also suggests that potato production itself in the Columbia Basin may have serious environmental consequences, since many of the soils that are best for potatoes (porous, sandy soils) have low water-holding capability, making percolation of chemicals and nitrates into groundwater problematic (Krebs 1979; Kellogg, et al. 1992).[9] In fact, in some areas the groundwater is now so contaminated with nitrates that it cannot be used directly on potatoes because it burns the crop or causes poor setting of tubers with consequently lower yields.[10] Some of the desire to obtain access to

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[7] Variable costs exclude land rent, overhead, and returns to management. Chemicals were 27 percent and fertilizers 11 percent of an estimated total cost of $2,425 per acre.

[8] Many of these practices resulted from the demands of McDonald's and other fast food chains for potatoes with consistently high solids (Love 1986). They essentially tried to reshape potato-growing to produce a standard product. This became even more pronounced with the shift to frozen french fries, as the potato became an input into a mass-production manufacturing process.

[9] Many wells have nitrate problems in the region, and this is not just due to the processor waste discussed in Chapter Three.

[10] Personal communication from David Sunding, Department of Agricultural and Resource Economics, University of California, Berkeley, 3 November 1993.

surface water in the region is therefore due to the need to dilute the polluted groundwater down to acceptable nitrate levels.[11]

Other environmental problems that threaten yields in the region are salinity and ponding due to irrigation on land that was not tiled properly for drainage. Some of the land with the worst drainage along the Columbia River has already come out of production, and even the construction of proper drainage systems still leaves open the question of what would be done with the wastewater, since putting it back into the Columbia River would constitute point-source pollution, given the high levels of nitrates and chemicals.[12]

If one looks at potato yields over a long period (see Figure 2.5), it is obvious that Washington and Oregon yields have risen such that the yield advantage over competing states has grown ever larger. However, in the past five years, yields in the Northwest have leveled out. Despite earlier predictions that Washington potato growers could produce much higher yields,[13] it may be that they are reaching the limits of the current technology. In fact, the technology tends to create its own problems, as pests become resistant to chemical controls and as soil fumigation destroys natural balances in the ground (National Research Council 1989).

Furthermore, as chemicals are removed from the market by government regulation, it becomes more difficult to combat these pest and disease problems because fewer new chemicals are developed to take their place, owing to the high costs of testing, and various parties become liable for the environmental costs. For example, both Atrazine (a herbicide used on corn) and Aldicarb (a potato growth regulator that inhibits sprouting) have been found in groundwater in the Mid-Columbia region and are still in use. Both of these chemicals have had their use stopped in certain areas of California susceptible to groundwater contamination. Manufacturers are now trying to protect themselves by putting

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[11] Ibid.

[12] Ibid.

[13] The Washington State Potato Commission maintained in 1984 that yields could be increased to over 1,000 cwt. an acre, or about twice the yields at that time (Buteau and O'Rourke 1986:6).

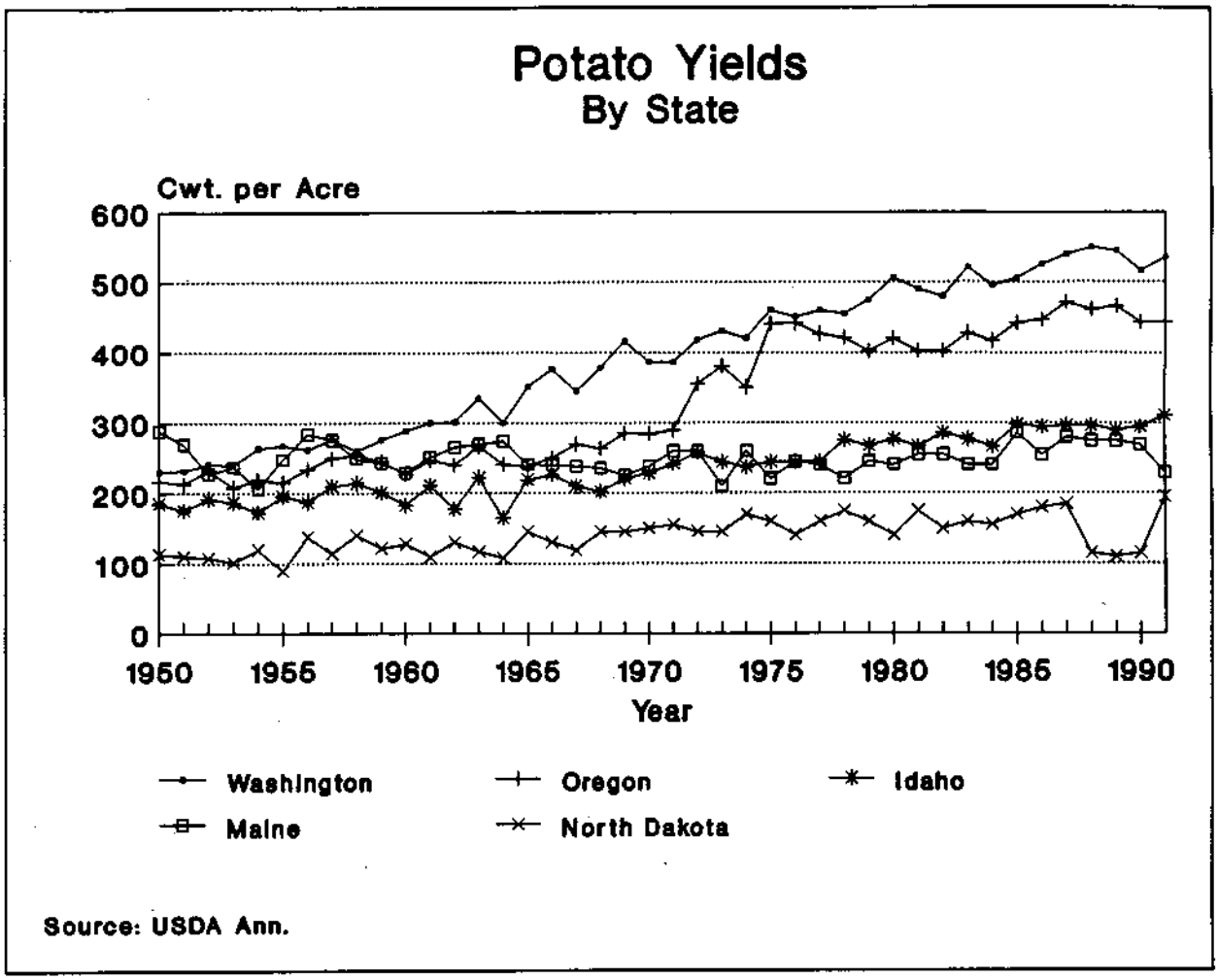

Figure 2.5

warning labels on the chemicals advising against their use in such areas.[14] This may be in anticipation of eventual suits by cities or water districts who will find it very costly to replace drinking water supplies once such contaminants exceed federal limits. Several such suits are now in the courts in California over groundwater contaminated by Dibromochloropropane (DBCP).[15]

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[14] Personal communication from Ralph Lightstone, California Rural Legal Assistance, Sacramento, 3 November 1993.

[15] Ibid. San Joaquin Valley towns such as Fresno, Parlier, and Tulare have brought suit against the manufacturers of DBCP, and at least one case has been settled.

Further restrictions on chemical use, as proposed by the Clinton administration,[16] or on non-point source pollution from nitrogenous fertilizers, as has been discussed by the EPA and USDA for some years, could lower yields in the Columbia Basin and reduce the region's advantage. The porous, sandy soils which are now seen as good for potato production might be just the opposite if environmental externalities must be internalized.

The final advantage of the Northwest is the low electricity rates. This is especially true in agriculture, where the Bonneville Power Administration (BPA) has maintained an "irrigator discount" that has contributed to retail rates in recent years as low as 2.5 cents per kwh and an average effective rate of about 5 cents per kwh throughout the region.[17] Although electricity rates are also low in some of the competing states, such as North Dakota, Minnesota, and Wisconsin, they are much higher in some others, such as Michigan and Maine. These rates can be compared to California, where Pacific Gas and Electric rates for agriculture are now over 10 cents; Florida, where they average 9 cents; or Arizona, where they were 7.5 cents in 1990 (Marsh and Runsten 1992). Low power rates in the Northwest also benefit the processors, which use large amounts of electricity in freezing and storing french fries—electricity was estimated to constitute 8 percent of processing costs (Wilkins, et al. 1989a).

The Northwest also has a *comparative* advantage[18] in processed potato production because of the low opportunity cost of alternative crops and the relative isolation of the region from population centers. Potatoes are usually grown in rotation with low-value crops such as wheat, alfalfa, and other small grains or feed crops in the Columbia Basin, because little of the land is suitable for higher-value fruit and vegetable products. In addition, the

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[16] Melissa Healy, "Overhaul of Laws on Pesticide, Food Safety Proposed," *Los Angeles Times*, 22 September 1993, A1.

[17] The irrigator discount is currently 20 percent off the wholesale prime rate, or a discount of 4.71 mills. Average retail irrigation rates were 25.1 mills in eastern Washington in 1987 (NEA 1989).

[18] By *comparative advantage*, we mean the economic trade concept whereby regions can achieve welfare gains by trading goods such that each region tends to export the services of abundant factors of production and import the services of scarce factors, even though one region may be a high-cost producer for all goods. By *competitive advantage* we refer to actual real-world competition that takes as given the existing system of trade barriers, transport costs, imperfect markets, uneven levels of development, economies of scale, and so forth.

distance from the markets implies that processing potatoes—where weight is reduced by almost half in freezing and even more in dehydrating—is the most economical approach to the transportation costs (Beilock and Dunn 1982). In fact, a model of the U.S. potato industry showed that rising energy costs would tend to concentrate *processing* potato production in the Northwest for just such reasons: the Northwest has a comparative advantage in this production and would tend to specialize in it under most expected factor cost regimes (ibid.).

These advantages are revealed in a variety of ways in the frozen potato industry in the Northwest. First, various cost comparisons have consistently shown that the unit cost of producing potatoes for processing in the Mid-Columbia Basin is lower than in most competing regions. For example, a cost study carried out by Zepp of the USDA in 1981 and 1982 showed Washington costs of producing Russets to be 10 to 15 percent lower than Idaho costs and over 20 percent lower than the costs of producing round white potatoes in the Red River Valley (Zepp 1982).[19] An earlier study by Greig in the 1970s found Columbia Basin potato production costs to be among the lowest, with considerably more potential for expansion of acreage than other low-cost regions (Greig 1976).[20] In a justification to the state of Washington for a loan, one processor in 1990 estimated that it cost $.15 per hundredweight (or about 4 percent) more to produce processing potatoes under irrigation in Nebraska than in the Columbia Basin.[21] Because the raw product is on average nearly half the cost of frozen potatoes (Wilkins, et al. 1989a), an advantage in raw-product cost is important in the location of the processing industry.

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[19] Clearly, as noted above, the comparison between Russet Burbank production and round white potato production is a comparison of two different products. However, some of the same differences in conditions and practices would doubtless affect a comparison of Russets in the Northwest and Midwest.

[20] Although Greig found that two other regions had lower costs of producing potatoes for processing than the Columbia Basin, he then proceeded to explain this away with all the considerations that had been omitted from the cost calculations: returns to quality, per unit fixed costs due to length of season, adequacy of soils for expanded production, water limitations, economies of scale, and so forth. And, in fact, some of the areas the cost comparisons predicted would expand production—such as Nevada—subsequently declined.

[21] Memo to Kraig Kushar from Dan Riebli, Washington State Department of Community Development, 6 February 1990.

Second, the competitive advantage of the Northwest industry is demonstrated by the weak growth of the industry in competing regions. In order to justify moving processing facilities from one region to another, variable costs of production must be low enough at the new site to compensate for the new capital costs. Older plants and production regions thus have an advantage in terms of sunk plant and infrastructure costs. Furthermore, there are often agglomeration economies in developed regions in terms of public physical and research infrastructure, agricultural services, labor force, and grower know-how. For all these reasons, costs of production usually have to be *significantly* lower in a competing region to justify closing a plant and moving the equipment to that region. The closure of some California vegetable freezing plants in the 1980s with subsequent relocation to central Mexico, where the cost of purchasing broccoli for processing was less than half the cost in California after 1982, is an example of how large raw-product cost differentials can in fact cause such shifts (Bivings and Runsten 1992).

From the cost comparisons discussed above, it is likely that the variable unit costs of production are lower in the Mid-Columbia Basin than in competing regions, and where they might be higher the difference is relatively small. There is no apparent incentive to close a plant in the Mid-Columbia Basin and move somewhere else. However, an expanding industry, such as frozen potato processing, is constantly adding new capacity, which creates a different decision-making process: whether to expand an existing plant or to add a new plant in a different region. For many years, processors with operations in the Northwest have run trials in various Midwest states (Minnesota, Wisconsin, North Dakota, Nebraska, Michigan, Colorado).[22] Some have even expanded operations there. Nevertheless, not all of these efforts have succeeded. One firm built a plant in Michigan after such a process, but then subsequently closed it. Another firm abandoned a lease on a Minnesota plant in 1992, saying it was unprofitable.[23]

A third form of evidence of the competitive advantage of the Northwest industry is the significant investment and expansion in the region by large food industry firms. This is

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[22] Interview with Gary Leever, Nebraska Potato Development Board, 5 May 1993.

[23] *Wall Street Journal*, 20 July 1992; Jones 1992.

compelling evidence that Northwest production is highly competitive, and it is to this recent history that we now turn.

The Growth of the Potato Processing Industry in the Mid-Columbia Basin

The potato processing industry in the Northwest was developed in large part as a local industry whose plants were constructed by local agribusiness interests. The industry grew rapidly along with the fast-food industry after about 1965, expanding with the growth of per capita demand for frozen french fries, which increased steadily from the early 1960s through 1976, growing more slowly through the 1980s (Figure 2.6). Despite the decrease in growth of per capita consumption, the overall pack (the total production) of frozen french fries for the foodservice industry has continued to grow at the same rate in the 1980s (Figure 2.7), due in part to the high levels of population growth in the United States in the 1980s and in part to rapid increases in exports (Figure 2.8), mainly to Asia (Buteau and O'Rourke 1986), but also increasingly to other areas such as Mexico (Figure 2.9).

Capital continued to enter and, as in many such generic food processing industries, capacity was added above the actual growth rate of the industry as production processes became more efficient. This overcapacity tended to sharpen competition, which was compounded by the saturation of the U.S. fast-food market. Competition among fast-food firms became increasingly based on price, especially as the recession set in, and this was transferred back to suppliers. Though french fries have provided some of the largest profit margins in fast food (Love 1986), they did not escape such competitive pressures. By the late 1980s, the plain stick french fries, the staple product in fast-food restaurants, had become a generic commodity where competition was largely based on price (Gibson 1992).

The industry found a new basis for growth with the introduction of specialty french fry products in the mid-1980s: curly fries, seasoned potatoes, and so forth (Jones 1991; Gibson 1992). However, production of these products required large infusions of new capital to construct new production lines. In addition, the expansion of fast-food firms into new regions, such as Asia, which could be supplied from the northern United States—at least for the present—made potato processing an attractive takeover target for the rapidly

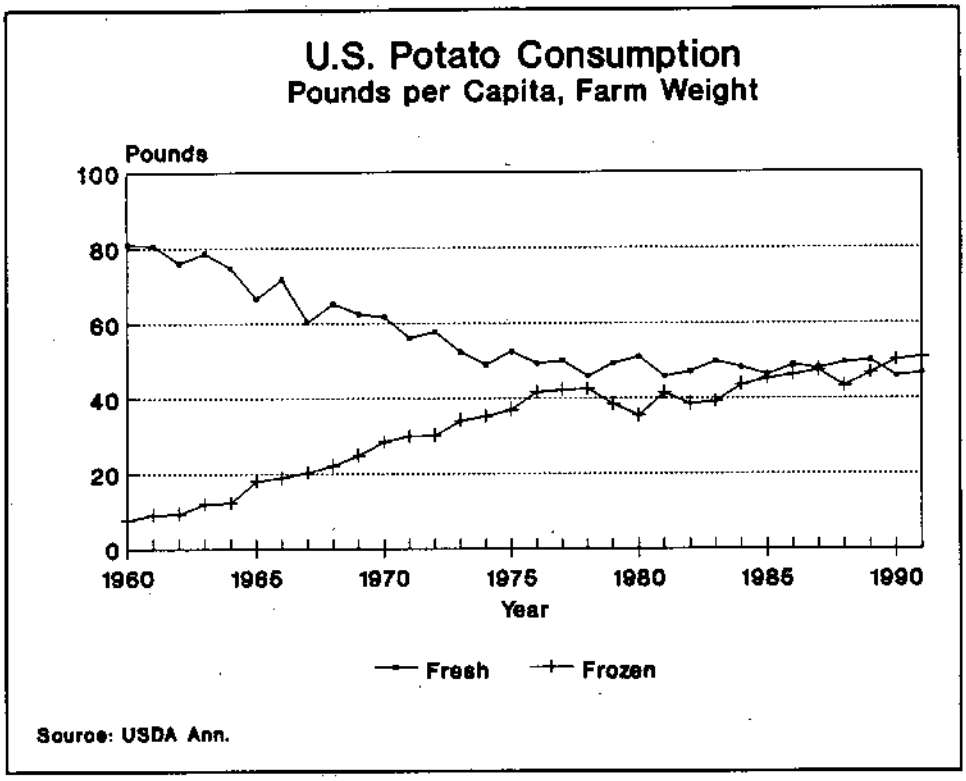
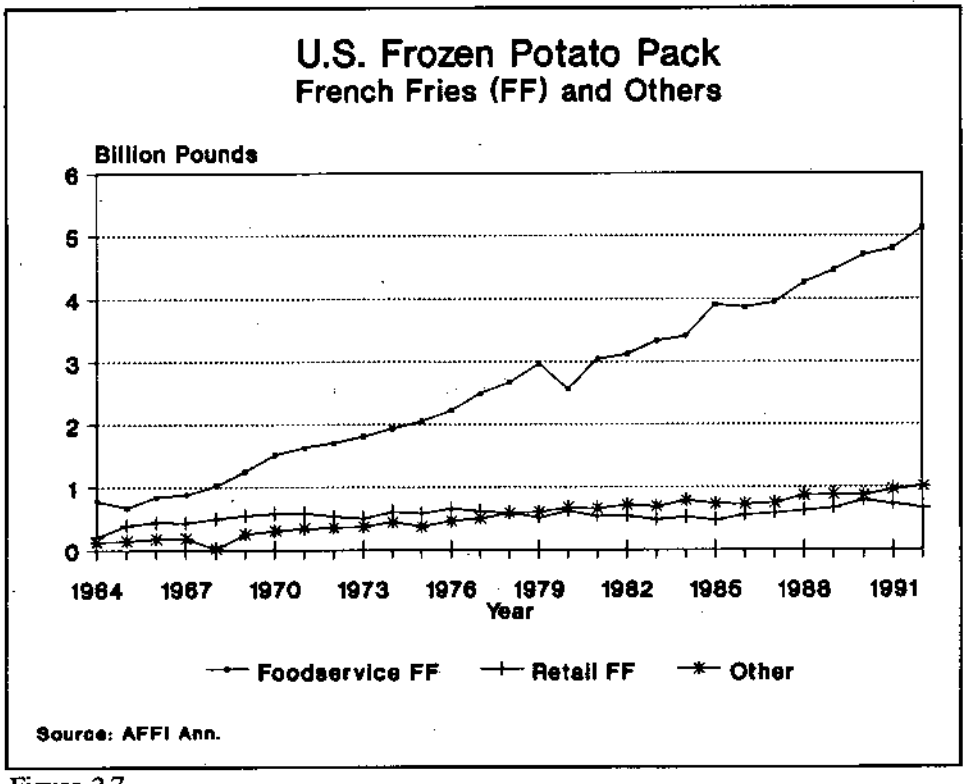


Figure 2.6



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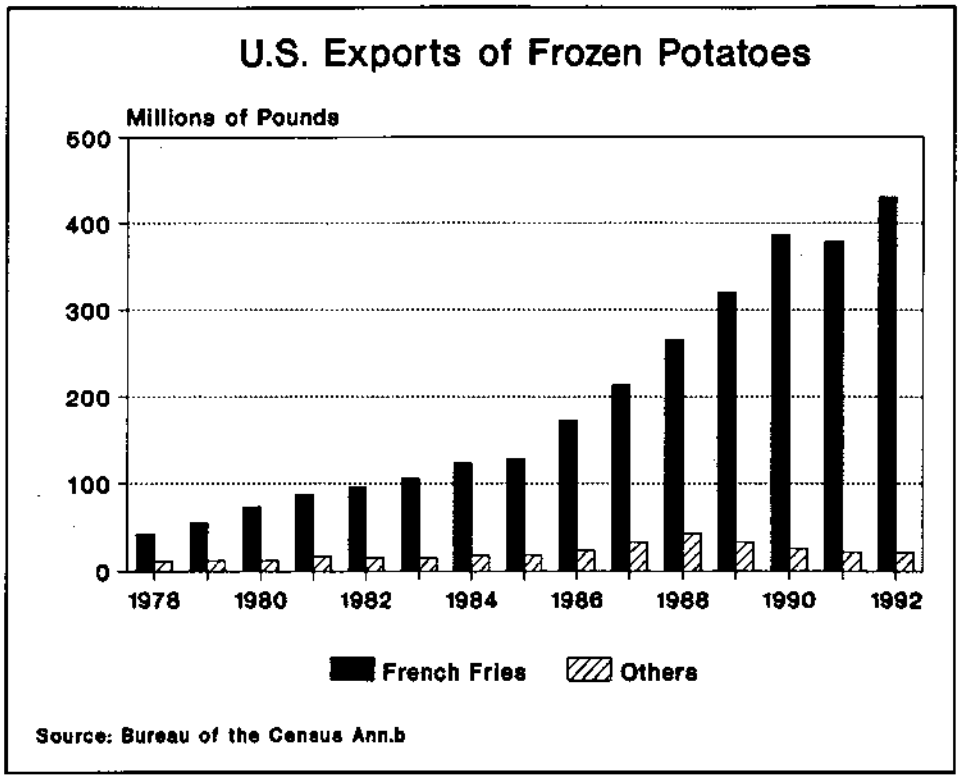

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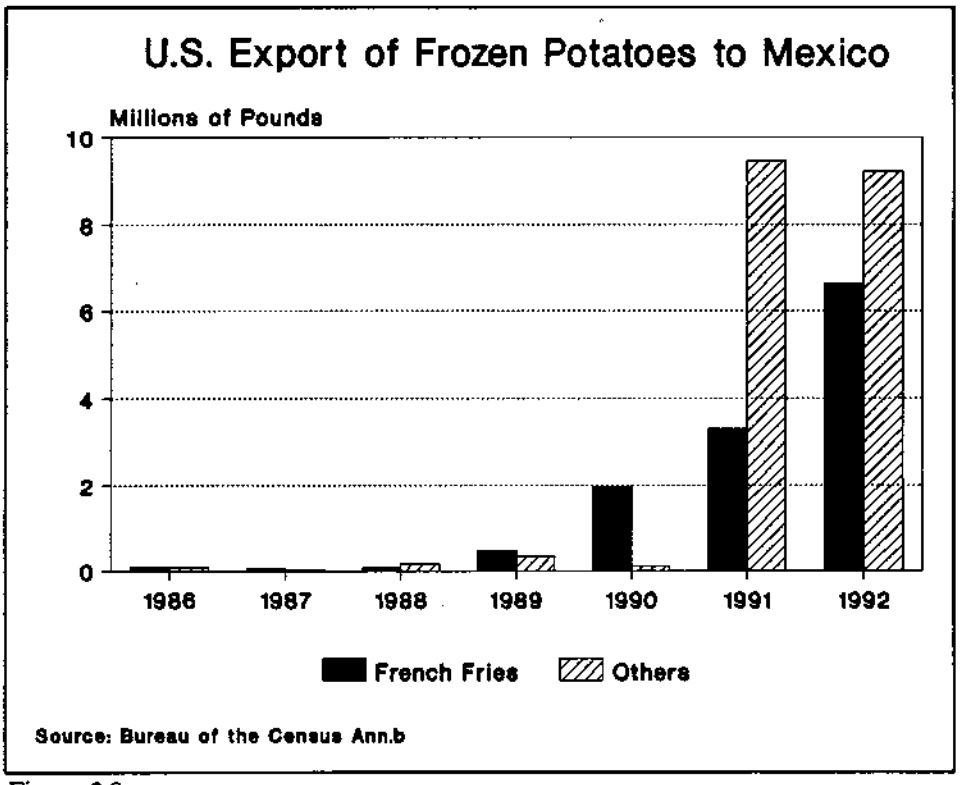

Figure 2.9

Table 2.1
Principal Frozen Potato Plants in the Mid-Columbia Basin

Firm	Town	State	Estimated Average Employment	Union	Date Purchased
Lamb-Weston (ConAgra)	Quincy	WA	450	No	1988
	Richland	WA	450	No	1988
	Connell	WA	450	Yes	1988
	Boardman	OR	550	No	1988
	Hermiston	OR	450	No	1988
Carnation (Nestle)	Moses Lake	WA	450	Yes	1985
	Othello	WA	450	Yes	1985
McCain Foods	Othello	WA	450	No	1989
Universal	Pasco	WA	750	No	1986
Simplot	Hermiston	OR	750	No	--

Source: Interviews with industry participants.

consolidating world food industry. As a result, most of the processing potato plants in the Mid-Columbia Basin were sold to larger food corporations in the late 1980s, as shown in Table 2.1, thereby bringing all of the major players in the industry to the Mid-Columbia Basin. Their location is shown in Figure 2.10, with the grey-shaded areas depicting irrigated lands.

Subsequent to these purchases, the firms began investing large sums in plant expansions to add specialty lines and other capacity. For example, McCain's reported spending $35 million in 1990 for expansion and $8 million in 1992 for a specialty line at their Othello plant (Jones 1991b, 1992); Universal Frozen Foods spent $40 million expanding its Pasco and Twin Falls plants in the late 1980s (Jones 1992). All of this activity and investment strongly suggests that the Northwest has a competitive advantage in frozen potato processing.

Location of Major Potato Processing Plants and Irrigated Lands in the Mid-Columbia Basin

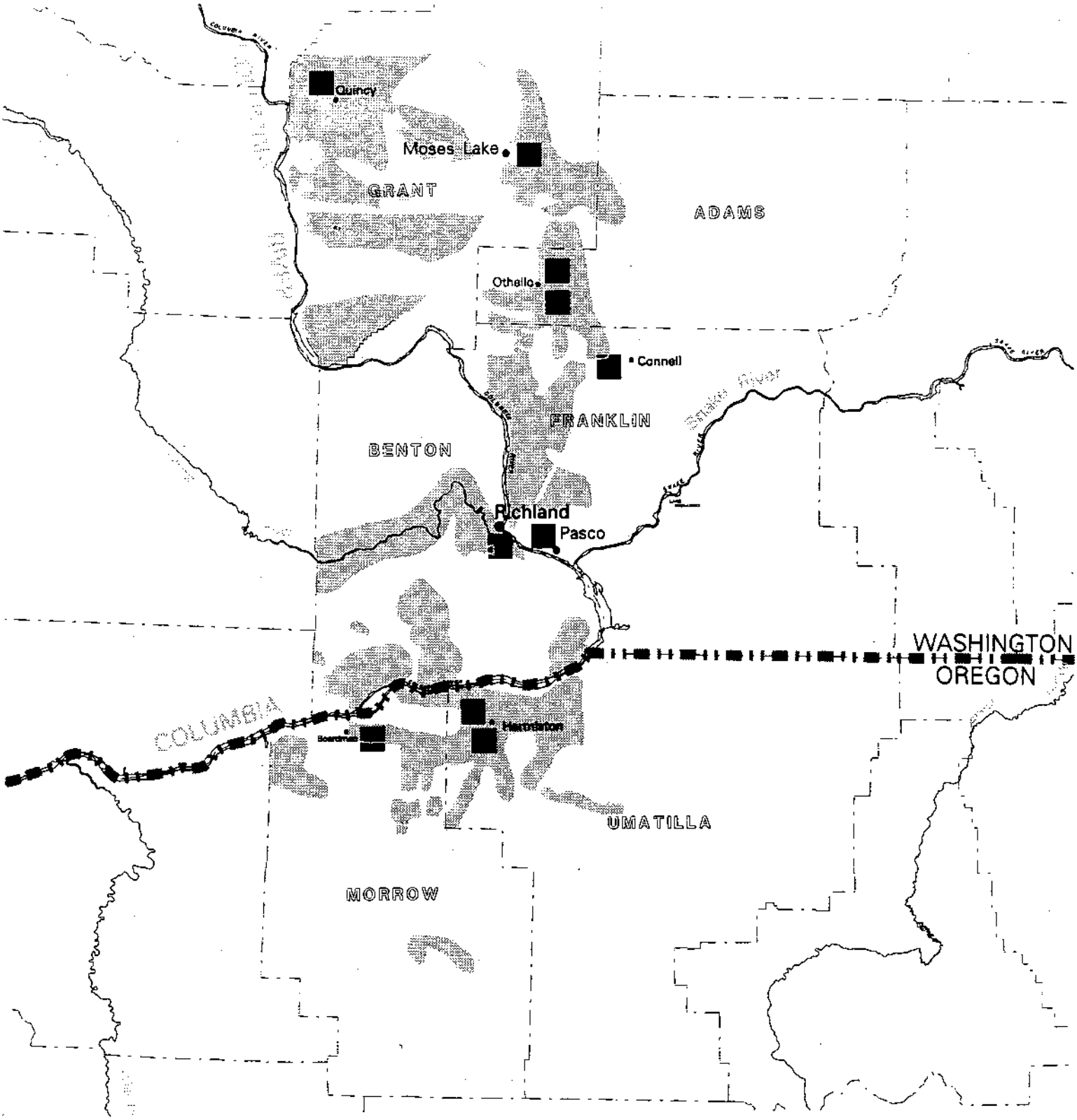

Figure 2.10

■ Potato Processing Plant

Further evidence of this advantage can be seen in the recent increase in potato acreage and production in Washington. Potato acreage increased from 99,000 acres (average 1979–81) to 130,000 acres (average 1989–91) in the 1980s, or over 31 percent, while it had only increased by 25 percent in the 1970s. Washington potato production grew at an average annual rate of 14.1 percent in the 1960s, 3.3 percent in the 1970s, and 4.7 percent in the 1980s; production grew 11 percent in 1991 alone (Lucier, et al. 1991; USDA Ann.). Washington's share of U.S. potato production grew from less than 5 percent in the early 1960s to almost 18 percent by 1991 (Figure 2.11).

The Northwest's share of the total U.S. frozen potato pack has been 70 to 90 percent since the early 1960s (Figure 2.12). As the industry grew, it developed in several regions at the same time, but the bulk of it was always in Washington, Idaho, and Oregon. The Northwest's share rose steadily from 68 percent in 1964 to 88 percent in 1976, and since has shown a slight tendency to decline; in 1992 it was almost 82 percent. Obviously, capacity is being added in other regions; however, there is no evidence of plant closures in the Northwest. On the contrary, Figure 2.13 shows that in fact the Northwest pack in 1992 was 11.5 percent above its previous peak in 1989 and continues to grow.

Conflict in the Columbia Basin

The emergence of frozen potato products as the Columbia Basin's dominant food processing industry has been accompanied by conflict, corporate takeovers and, in recent years, fierce competition. Now most, if not all, of the major plants in the Mid-Columbia Basin are owned by multinational corporations such as ConAgra and Nestle. According to the director of a Columbia Basin potato growers' association, "This is no longer local processing companies doing business with the producers for the benefit of the Northwest. . . the processors have moved in here to make a buck" (Jones 1991a).

Investments in expanded processing capacity for french fries and competition among fast-food chains have led to conflicts with growers as the large corporations which have bought up the frozen potato industry have sought to drive down potato prices in the Columbia Basin. French fry prices are now "a throwback to the early 1970s" according to a Nestle's plant manager (Jones 1992). Contract prices paid to farmers were cut by nearly

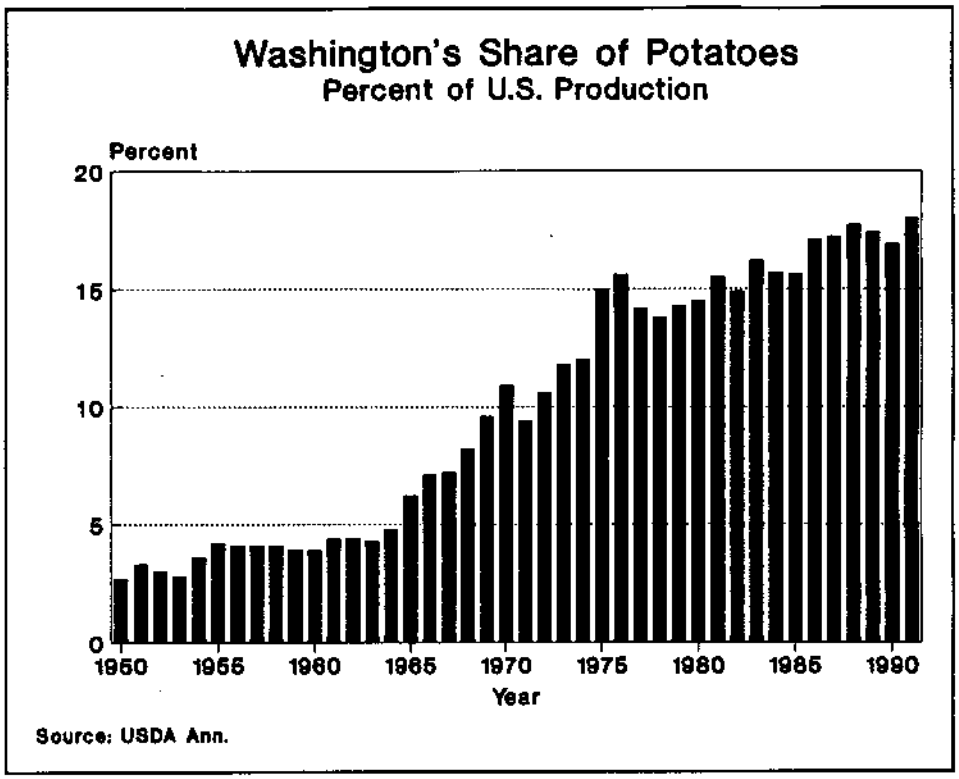

Figure 2.11

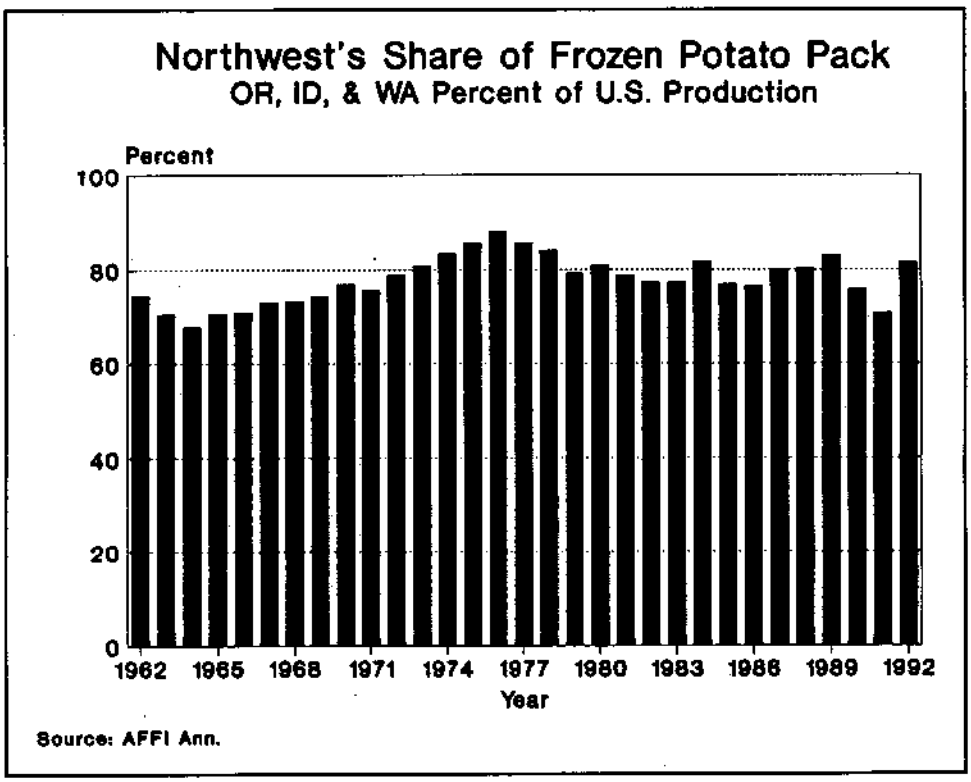

Figure 2.12

15 percent when ConAgra acquired the Columbia Basin's several Lamb-Weston plants in a leveraged buy-out in 1989, prompting allegations of violated contracting agreements and an investigation of the processor's purchasing practices by the Washington State Department of Agriculture (Jones 1991a). At that time the Columbia Basin's potato growers claimed that ConAgra was "abandoning a policy that farmers should be paid enough to stay in business" (ibid.).

Previously, in the late 1970s and early 1980s, the Columbia Basin was the scene of a different conflict over potato prices. Led by the Washington State Grange and the national family farm movement, small potato farmers sought to limit the growth of corporate farming operations, some of which were subsidiaries of potato processors. These firms moved into areas unserved by the Bureau of Reclamation to develop large potato acreages with water pumped from pools behind Corps of Engineers dams on the Snake and Columbia Rivers, or from the deep basaltic aquifers. The Columbia Basin's small farmers waged a losing battle in Congress to prevent farming subsidiaries of corporations such as Mutual Life Insurance and Boeing Aircraft from using federally subsidized water and power to expand potato production in north central Oregon and Washington's Horse Heaven Hills, driving down prices for existing potato farmers.[24] That struggle culminated in a victory for outside investors and corporate farming subsidiaries. Water pumped from pools behind the Corps' dams was exempted from Bureau of Reclamation acreage limitations in the Reclamation Reform Act of 1982, thus paving the way for expanded use of the Columbia Basin's waters by corporate farming operations.[25]

By the mid-1980s, overproduction of potatoes had become problematic in the Columbia Basin, and when the Bureau of Reclamation sought to expand the CBP and irrigate additional acreage, the expansion was opposed by Idaho potato farmers seeking to prevent further glutting of the commodity market (Idaho Citizens Coalition 1981:48). The proposed expansion of the CBP, due once again for public review in the fall of 1993, may

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[24] "Corson said the real threat to (family) farm business came from corporate developers of farms in eastern Oregon and Horse Heaven Hills. He said these corporations undercut his fresh potato prices 90 cents to $1.25 per hundredweight." "Fight Over Water Rights Continues to Divide," *Tri-Cities Herald*, 10 February 1980.

[25] See 43 USCS 390ll.

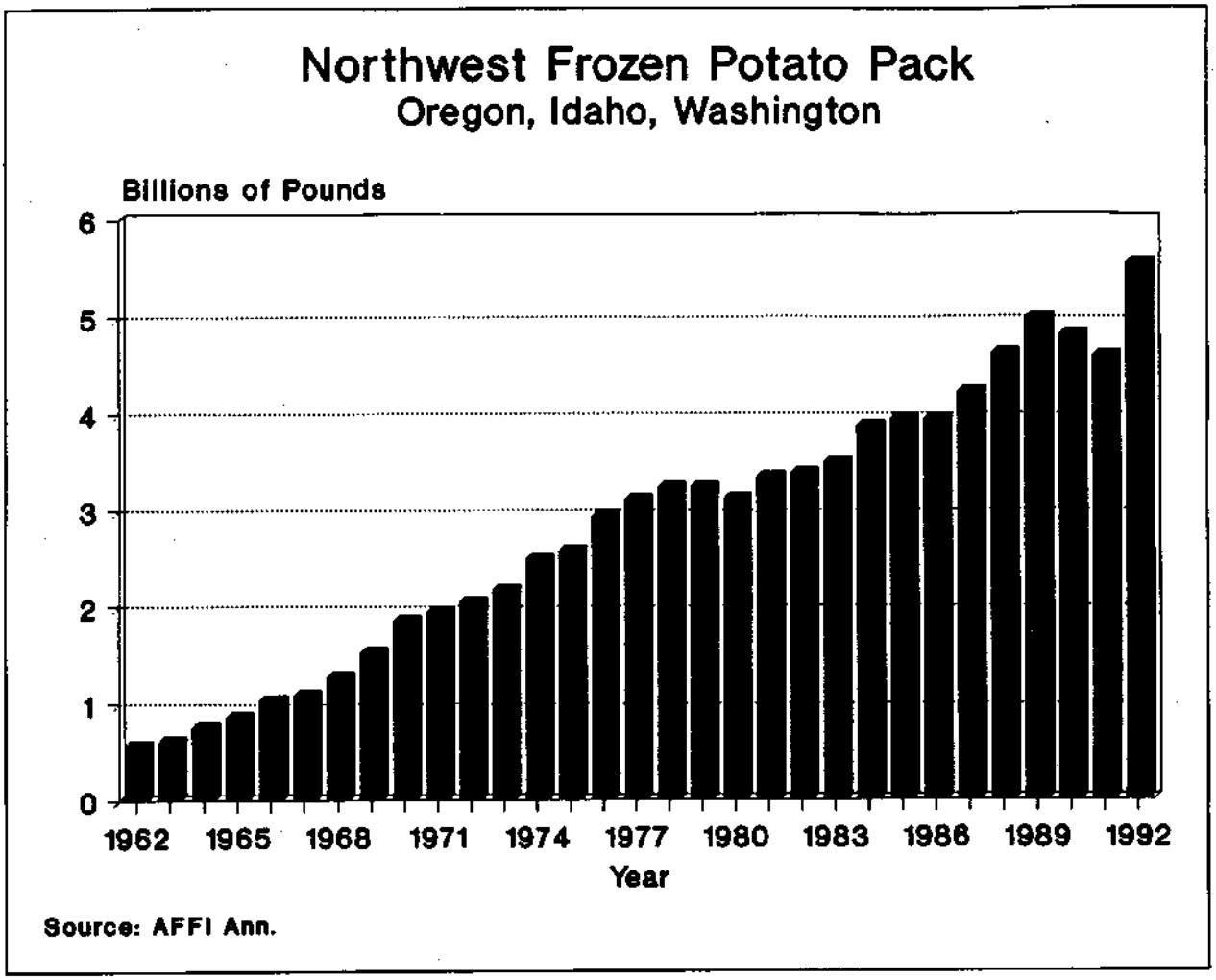

Figure 2.13

elicit similar opposition from existing potato farmers. The CBP's expansion is generally supported, however, by the potato processing industry and local development interests.

Conclusion

Despite periodic dire predictions that the frozen potato industry will flee to the Midwest or Mexico, the evidence suggests that this is unlikely. The Northwest—and the Mid-Columbia Basin in particular—has a number of advantages that have sustained the growth of the industry and kept the Northwest's share of the U.S. frozen potato pack remarkably stable over the past 30 years at 75 to 80 percent. Some of these advantages are

natural attributes, such as climate, while others are the result of government-subsidized infrastructural development in water, power, and agricultural research. The continued growth of the industry in the Northwest at historical rates (see Figure 2.13) and the recent investments by large food corporations are both evidence of the dominance of the Northwest as the low-cost producer of frozen potato products. Given this reality, subsidies by state government to potato processing firms to induce them to expand in the Northwest are unnecessary. Furthermore, subsidy to one firm and uneven application of regulations, as in the McCain's example, is a questionable role for government to play. By the same token, government may be able to ask the industry to internalize some externalities without fearing that it will be driven away.

Chapter Three

POTATOES AND THE ENVIRONMENT: THE INDUSTRY'S IMPACT ON WATER RESOURCES

The agricultural, processing, and wastewater treatment practices of the frozen potato products industry affect the quality and quantity of water resources in the Mid-Columbia Basin. In this chapter, we examine the industry's current water use practices and associated problems of depletion and contamination of groundwater, especially as they relate to emerging water supply problems in municipalities close to processing plants. We also estimate some of the costs of replacing depleted and contaminated groundwater supplies by means of additional appropriations from the Columbia River, an option that is now being proposed as a solution to water resource problems associated with the production and processing of potatoes in the Mid-Columbia Basin.

Mid-Columbia Basin Potato Processing: Large Industries in Small Towns

The Mid-Columbia Basin's ten major potato processing plants are large plants operating three shifts and in most cases employing 400–600 full-time employees. The two largest facilities, operated by Simplot near Hermiston and Universal Fine Foods in Pasco, report employing over 800 workers during peak production periods. These major plants are distributed fairly uniformly throughout the two-state area (see Figure 2.10).

The geographic distribution of the plants reflects one simple fact: bulky raw potatoes must be hauled by truck from the farm gate to the processing plant, where 50 percent of the potatoes' bulk is lost. Roughly 6 billion pounds of raw potatoes are processed annually in the Mid-Columbia Basin (in a typical year, this is about 80 percent of what is produced on the area's 150,000 rotating potato acres). To cut transportation costs, plants are sited as close as possible to where potatoes are grown. Although interstate transport of potatoes is not uncommon, the location and size of the plants is generally consistent with the distribution of the Mid-Columbia Basin's potato acreage.

Other factors influencing plant location include proximity to shipping infrastructure and to housing and other municipal services required by the considerable work force. With

the exception of a Lamb-Weston plant in an industrial park provided by the Port of Morrow at Boardman, Oregon, all of the plants are actually within or near a host community and are largely dependent on that community for sewage disposal, power, and water.

The processing towns shown in Figure 2.10 are relatively small: all are under 20,000 in population. With the exception of Pasco, Richland, and Boardman (by virtue of their location on the Columbia River), they all depend on groundwater for their water supply. These towns often provide water for the plants through the municipal system. While some plants also have their own wells, these wells draw from the same groundwater source as the host community. Only one town, Quincy, provides wastewater treatment to its plant, a Lamb-Weston facility.

Washing, peeling, blanching, cooking, and cooling of potatoes is a highly water-consumptive process. Typically, a plant requires 2 to 3 million gallons of clean water daily. Water consumption typically is four or five times greater than that of the host community. At current efficiency levels, the water is generally reused once or twice before being discharged as effluent. With the exception of the Lamb-Weston plant in Quincy, all processors' wastewater is disposed of by spraying it onto fields, usually after passing it through screens that remove solids and settling it in storage lagoons. Assuming a typical plant's consumption of 600 million pounds of raw product and a recovery rate of 50 percent, roughly 300 million pounds of waste material is generated each year. Currently, about half of this waste is captured and sold as cattle feed. The rest of the waste is distributed in the form of 500 to 800 million gallons of wastewater, which is used to irrigate fields surrounding the host community.

The contents of potato processing waste include nitrates in the form of organic solids and ammonia, biological oxygen demand (BOD) as a function of the putrefaction of organic wastes, and other suspended solids. A typical plant's wastewater will contain 250 to 400 tons per year of total nitrogen and create a biological oxygen demand equivalent to that of 20 to 30 million people—an environmental impact roughly one to two thousand times greater than that of its host community.

Many potato processing plants in the Columbia Basin evolved from small, locally initiated enterprises in the late 1960s and early 1970s. *Ad hoc* arrangements were made for

water services. Processing plants obtained their water supply simply by requesting extension of municipal services out to the plant. Processing wastewater was dumped into a ditch or pumped onto the closest available fields.[1]

Today, much expanded, the same plants are powerful industrial presences in small communities. As demand for frozen potato products has grown and production has concentrated in one region, ownership of the plants has changed and the size and intensity of production has increased greatly. But in terms of siting, water supply, location, and waste disposal methods, many plants reflect the ad hoc arrangements characteristic of the days when they were small, local ventures. As will be demonstrated in this and subsequent chapters, this industrial presence has become problematic for many of the host communities. Twenty years of groundwater contamination resulting from intensive irrigation of potato wastewater onto small acreages close to residential areas—which have themselves expanded—now threaten residential, municipal, and industrial water supplies with nitrate contamination in the deep basaltic aquifer. The threat is compounded by widespread depletion of groundwater supplies associated with irrigation withdrawals for processing and production of the commodity, and related runoff of nutrients and pesticides from irrigated acreage close to the communities. A recent Environmental Protection Agency (EPA) study found agricultural contamination in all tributaries, as well as the Columbia River's mainstem (USEPA 1992).

Potatoes and Groundwater Contamination

Groundwater contamination from the production and processing of potato products is widespread in the Mid-Columbia Basin, mainly in the alluvial or "perched" aquifers close to the surface. In these perched aquifers, processing-related nitrate contamination often occurs in areas where there are elevated background nitrate levels attributable to fertilizer-based nutrients used in the cultivation of potatoes and other crops. In Franklin County, for example, nearly 400 samples from more than 200 wells were tested for nitrates in the period 1986–1989 by the U.S. Geological Survey. Results indicated that nitrate concentrations

[1] Interview with Mel Martin, Carnation Wastewater Manager, 22 April 1993.

consistently exceeded EPA's safe drinking water standards of 10 mg/l in one-third of the residential wells tested, and exceeded this standard on occasion in nearly one-half of the wells.[2] Legal limits were exceeded in some cases in Franklin County by as much as ten times (Drost, et al. 1993). In Figure 3.1, reproduced from the USGS report, the black triangles indicate the distribution of nitrate-contaminated wells that were continually in excess of 10 mg/l in Franklin County. Quite similar levels of nitrate contamination have recently been recorded by Oregon's Department of Environmental Quality (DEQ) in potato and processing areas of Umatilla County (Grondin n.d.). Figure 3.2 shows the results of similar testing in the Umatilla area, demonstrating that a significant proportion of the test wells exhibit nitrate concentrations above 10 mg/l.

Within this context of generally elevated nitrate levels, local areas of extremely high nitrate contamination associated with potato processing waste disposal have been identified over a wide region.[3] In Franklin County, nitrate levels in groundwater in areas close to Universal Fine Foods in Pasco exceed the legal limits of 10 mg/l.[4] In Umatilla County, Oregon, nitrate levels exceeding legal limits have been detected at both the Simplot and Lamb-Weston plants near Hermiston.[5] Recent results from test wells monitored by Washington State's DOE at wastewater disposal sites near the Lamb-Weston plants in Richland and Connell also record substantially elevated nitrate levels, ranging from two to twelve times legal limits.[6]

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[2] Nearly one-third of the residential wells tested were consistently above 10 mg/l, while 46 percent recorded nitrate concentrations in excess of 10 mg/l on at least one occasion during the study period (Drost et al. 1993).

[3] Dorothy Stoffel, a hydrogeologist for Washington DOE, confirmed that "...'a major nitrate problem' exists in groundwater supplies at nearly all Columbia Basin plant sites" (*Tri-Cities Herald*, 11 June 1993).

[4] Communication from John Holmes, Franklin County Conservation District.

[5] Oregon Water Resources Department 1988:26. Nitrate contamination from Simplot's waste disposal operations has also been recorded in gravel and riparian areas of the Umatilla River (Grondin n.d.).

[6] Over the period 1 September 1992 through 19 February 1993, the groundwater monitoring wells at Lamb-Weston's Connell plant showed nitrate contamination ranging from two to nearly ten times legal limits (correspondence from D. Burgard, CES-Spokane to Lamb-Weston Inc. and DOE, 14 April 1993). In early 1993, monitoring wells at Lamb-Weston's Richland plant revealed nitrate contamination ranging from two to twelve times legal limits of 10 mg/l (correspondence from S. Childs, CES, to R. Raforth, DOE, 14 April 1993).

Location of Irrigated Cropland and Wells
Tested for Nitrate-Nitrogen Concentrations in Groundwater
September 1989 - November 1989

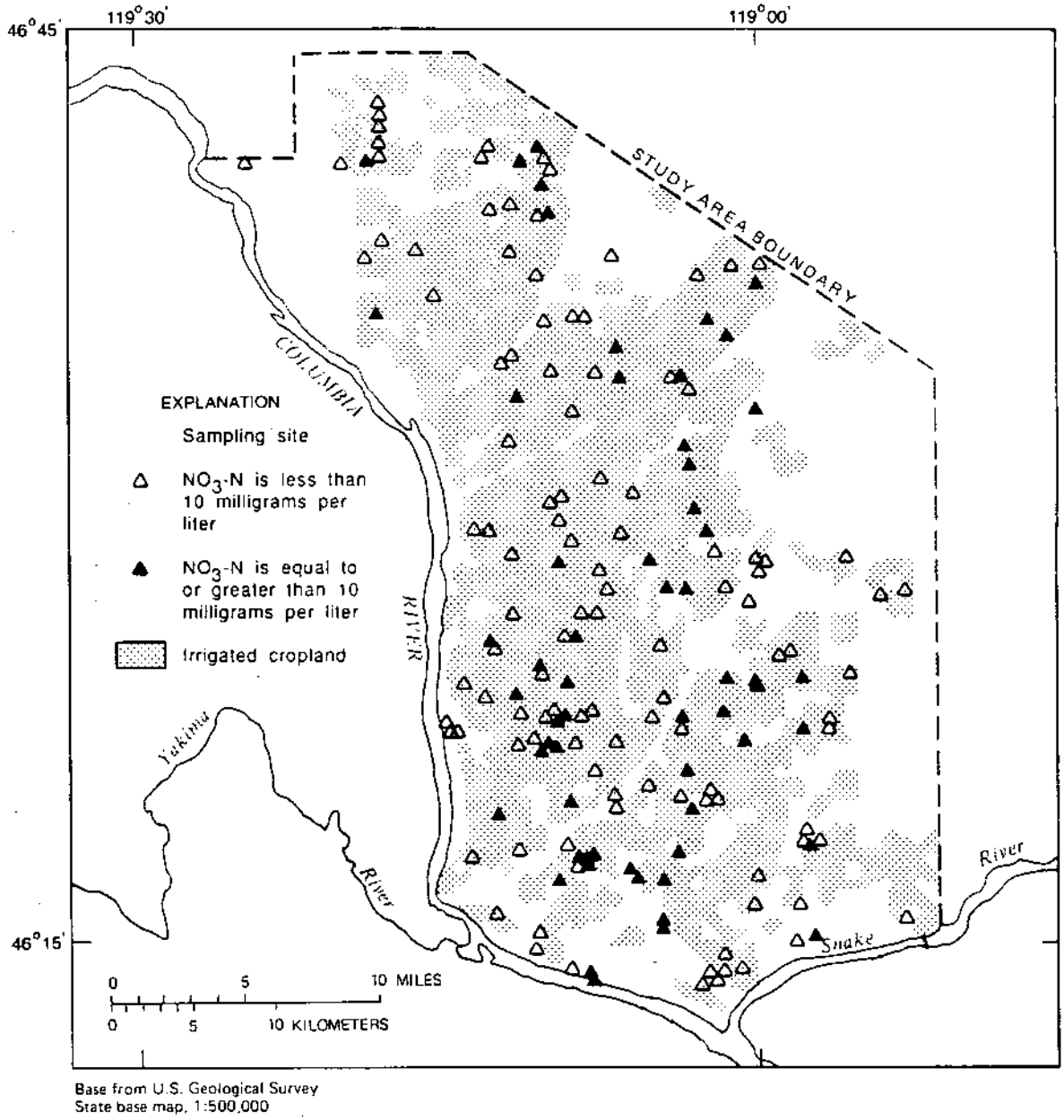

Figure 3.1

Source: Drost, et al. 1993:16

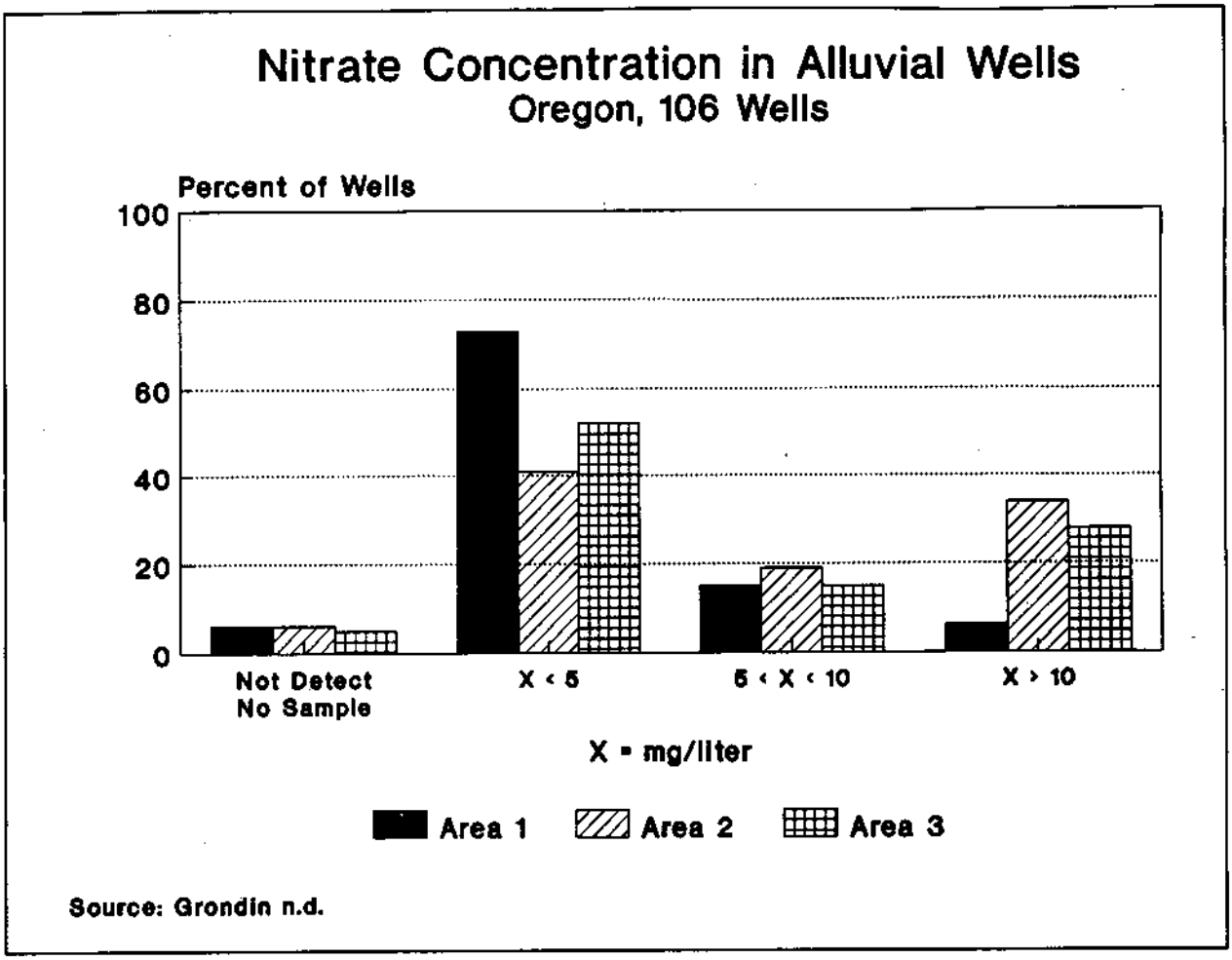

Figure 3.2

Potato processors' permit and monitoring files at Oregon's DEQ and Washington's DOE contain a history of correspondence and intra-agency memoranda expressing concern about nitrate contamination of groundwater (and, in some cases, surface water) due to processors' land applications of potato wastes. A few examples will convey the quality of the concern:

> . . . it can be unequivocally stated that for the past 13 years, the land areas have been severely overloaded with nitrogen. The original 320 acre area has probably received 3,000 tons of total nitrogen with only minimal removal due to cropping.[7]

[7] Memo from Steven F. Gardels to Larry Patterson, Oregon DEQ, 21 May 1986.

> Review of the limited groundwater quality data indicates that groundwater degradation is occurring at the site.[8]
>
> Because the resident fish population. . . has been decimated from previous illegal discharges, no fish kills were reported.[9]

Both Oregon and Washington have legislatively adopted federal groundwater quality criteria and stipulated that nitrate concentration shall not exceed 10 mg/l. However, the enforcement limits designed to accomplish state protective goals have for almost 20 years relied on state agency judgment and protocols to determine, on a case by case basis, what constitutes a reasonable standard of prudence in wastewater treatment. Because potato processing wastewater treatment consists of irrigated disposal on land areas, regulation of the activity falls under the weaker and more weakly defined enforcement powers of the states' respective waste disposal permitting programs, rather than under the more restrictive standards of the National Pollution Discharge Elimination System (NPDES) program, which governs point source discharges to surface water.[10] In light of emerging recordings of excessive nitrates in groundwater near the Columbia Basin's potato processing wastewater treatment sites, it is clear that the industry's practice has fallen short of the states' theoretical goals.

The ability to treat successfully wastewater contaminants such as nitrogen by means of land application depends most critically on the irrigated crops' capacity to consume the nitrogen at a rate that prevents leaching into groundwater. The key variable is the total

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[8] Memo from Dorothy Stoffel to Roger Ray, Washington DOE, undated.

[9] Lawrence Peterson, Washington DOE, press release, 15 June 1989.

[10] The sole exception is the Lamb-Weston facility at Quincy, Washington, where the municipal wastewater system utilized by the processor discharges into a canal in the CBP and is thus regulated under the more specific effluent limitations of the Clean Water Act's NPDES permitting program. Interestingly, the facility is attempting to avoid such limitations by arguing that the canal is not "waters of the United States" and is thus not subject to NPDES limitations.

nitrogen, or Total Kjedahl Nitrogen (TKN).[11] TKN is expressed two ways: (1) as a function of its measurable presence in the wastewater (for example, as mg/l) and (2) as an arithmetic product—in pounds or tons—of (a) the average annual TKN content in a liter of effluent (typically ranging between 60 and 170 mg/l) and (b) the gross amount of effluent discharged by the plant in the same year. For example, a plant producing 800 to 900 million gallons of effluent a year will generate between 500,000 and 800,000 pounds of TKN. To prevent nitrate contamination of underlying groundwater, this amount of TKN must be irrigated onto enough acres growing crops of sufficient nitrogen uptake capacity to consume the available nitrogen and prevent leaching into groundwater.

Whether a wastewater permitting process effectively protects groundwater from nitrate contamination depends principally on the permitting agency's ability to establish and enforce effective relations between TKN, acreage, and cropping patterns in the processors' wastewater irrigation system.[12] Based on information from permitting agencies' files, Table 3.1 (and the corresponding graph in Figure 3.3) provides a rough representation of how well nitrate removal through land application of potato processing wastes was working in 1990.

The limit beyond which nitrate contamination of groundwater may be assumed to have occurred is based on the estimated capacity of alfalfa to utilize nitrogen. As established by Oregon's DEQ in the late 1980s, this capacity—the agronomic rate—is 250

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[11] The total nitrogen, or TKN, applied in a land application site includes ammonia nitrogen, organic nitrogen, and nitrate nitrogen. The organic nitrogen in the effluent is primarily associated with the solids from the potato processing plant. For the organic nitrogen to be available to the crop, it must be broken down by soil microorganisms to the ammonia and nitrate nitrogen forms in a process referred to as nitrogen "mineralization." If the organic material is applied to fields at rates in excess of the soil's capacity to mineralize and absorb the nitrogen, putrefaction and odors result, as well as compacting of the organic material on land surfaces, thereby depressing crop production and further hampering plants' capacities to utilize the nutrients.

[12] Much else is involved beyond the numerical relationships between TKN and the theoretical capacity of various crops to consume nitrogen. Another factor is the active management of the crops and irrigation system with the principal purpose of preventing groundwater contamination rather than, say, maximizing yields. The latter is an agricultural practice that itself contributes to groundwater contamination through excessive applications of nutrients, pesticides, and water. For this reason the emerging practice among processors of disposing of wastewater through leasing and sale arrangements with nearby irrigators is not in itself an acceptable solution. The objectives of maximizing crop yields and preventing groundwater contamination are not identical and are in some cases in conflict.

Table 3.1
Potato Wastewater TKN Loading, 1990

Firm	Town	Annual Effluent (million gallons)	TKN (mg/l)	Treatment Acreage	TKN per acre (lbs.)
Lamb-Weston	Port Morrow	1,600	110	1,000	1,457
Lamb-Weston	Hermiston	800	110	500	1,457
Simplot	Hermiston	650	100	1,000	538
Universal	Pasco	500	125	900	575
Lamb-Weston	Richland	375	125	180	2,156
Lamb-Weston	Connell	750	110	120	5,692
Carnation	Othello	750	110	2,800	244
McCain Foods	Othello	750	110	380	1,798
Carnation	Moses Lake	750	110	1,200	569

Source: State permitting agencies' files.

pounds per acre per year.[13] Alfalfa is the preferred crop for nitrate removal because it utilizes nitrogen at higher agronomic rates than most other crops commonly raised in the Columbia Basin. As the last column of Table 3.1 shows, only the Carnation plant in Othello was in compliance with this standard in 1990, assuming all acreage was in alfalfa.

Two caveats apply to the information displayed in Table 3.1. In a few cases, the acreage shown is less than that listed in the permit files. In these instances, we have made an informed estimate of the actual acreage planted with viable crops. For various agronomic and operational reasons, it is not uncommon for processing wastewater disposal fields to produce no crops whatsoever. For example, McCain Foods nominally lists 680 acres in alfalfa. However, when the firm attempted to abandon the waste disposal site and

[13] Oregon's DEQ adopted a 250-pound agronomic uptake rate for alfalfa based on a majority opinion among agronomists at Oregon State University and, paradoxically, was strongly opposed by the only *public* waste disposal operator in north central Oregon—the Port of Morrow. DEQ prevailed. Correspondence between Joni Hammond, DEQ, and Gary Neal, Port of Morrow, 28 June 1991.

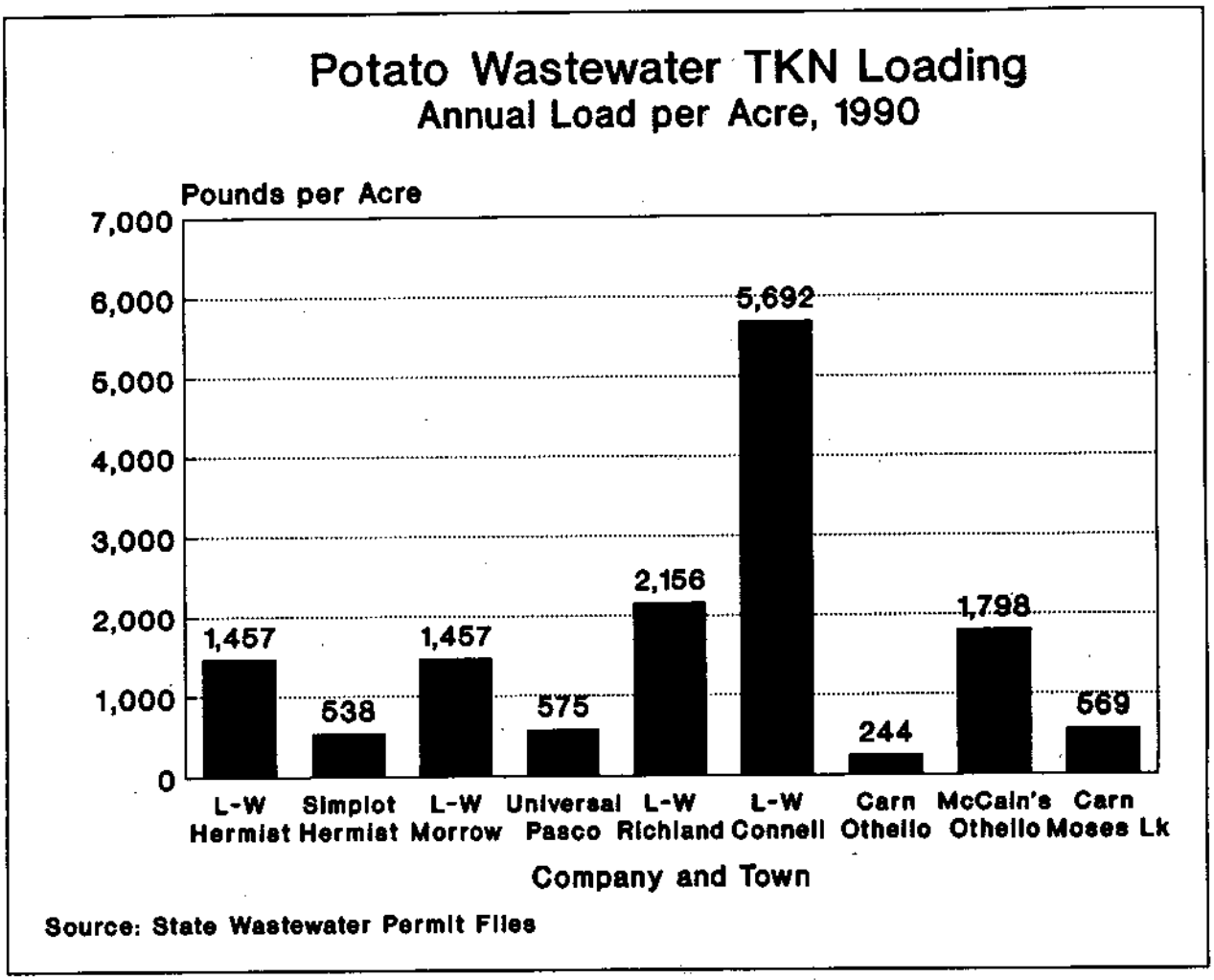

Figure 3.3

escape liability after initiation of legal action by local citizens, engineering reports commissioned by the processor for a new permit admitted that only 380 acres on the site were "suitable" for agriculture. Much of the disposal site is barren scab land on which cattle are regularly grazed.[14]

In the case of another important variable, the average annual amount of TKN per liter of effluent, the numbers in Table 3.1 are in some cases different from those contained in the permit files. Our estimates in such cases are based roughly on the outfall reports filed annually by the processor. We have rounded these numbers for the sake of simplicity.

[14] CH2M Hill, "Engineering Report for McCain Foods Land Application of Process Water," April 1992.

The estimates of nitrate overloading displayed in Table 3.1 and Figure 3.3 are conservative. The Mid-Columbia Basin's processing plants generally operate 250–330 days annually, while alfalfa has a growing season of approximately 194 days, leaving between 50 and 150 days in which no nitrate removal by crops can occur. In addition, several of the Mid-Columbia Basin's processing plants have no winter storage capacity, and irrigation of effluent on frozen and snow-covered land is a common practice. This substantially raises the total annual nitrogen-loading above the levels indicated in Table 3.1 and drives contaminants further down into groundwater due to the lack of holding capacity on the frozen land surface. Where winter storage capacity exists, it is frequently in the form of unlined lagoons that leak and contribute additional nitrates to groundwater. In 1990, only Nestle's Carnation plant in Othello had installed lined lagoons; Simplot and, more recently, the Port of Morrow have since followed suit. Both the Oregon and Washington permitting agencies have engaged in an extremely complex series of *ad hoc* arrangements for irrigation, if not storage, of processing wastewater in winter months.

The capitalization of wastewater treatment varies among the Mid-Columbia Basin's processors. Carnation in Othello made considerable investments in 1989–1990; more recently, Simplot and Universal Fine Foods made investments in in-plant efficiencies; Lamb-Weston and McCain Foods have made relatively little investment in environmental protection.[15] Lamb-Weston, a division of ConAgra that operates five of the Columbia Basin's ten plants, appears to be the firm with the least investment in wastewater treatment: two of the five Lamb-Weston plants use public wastewater treatment facilities in Quincy and the Port of Morrow; the Richland and Connell plants dispose of wastes on quite small acreages (as shown in Table 3.1), have little or no winter storage capacity, and are the Columbia Basin's worst offenders in terms of TKN overloading; finally, the Hermiston plant has recently engaged in complex arrangements with Oregon's DEQ to avoid or defer development of winter storage lagoons and in-plant efficiencies.

[15] Following notification of impending legal action under the Citizens' Suit provisions of the Clean Water Act in 1992, McCain Foods began a move to another waste disposal site.

Prior to 1990 little difference could be discerned between Washington and Oregon in objective results from controlling groundwater contamination by processors. In the late 1980s, however, Oregon's DEQ established numerical criteria for agronomic uptake for various crops. Through a graduated system of penalties and enforcement orders, the agency implemented a compliance schedule for the three plants in the Hermiston/Boardman area. In response, Oregon's processors found more acreage, began to manage the land for wastewater treatment rather than as simple disposal sites, and, in the case of Simplot, invested in equipment to reduce the TKN and BOD contents of the effluent. By the summer of 1993, Oregon's DEQ expected all three plants to be in compliance with agronomic uptake rates.[16]

Washington's DOE, on the other hand, has no objective standards for controlling the key relations between TKN, acreage, and cropping patterns. DOE's re-issue of a permit to a Carnation plant in Moses Lake in 1990 is exemplary in this respect. It displays the impossibility of preventing groundwater contamination without the means or ability to apply objective criteria of compliance to the key TKN-acreage parameters.

The Carnation Moses Lake plant generates between 550,000 and 700,000 pounds of TKN annually, which in 1990 it supposedly irrigated on 1,965 acres. But, as DOE's preparation of the renewal application in 1990 notes, the processor only controls 300 acres suitable for irrigation. On these, it distributes its effluent regardless of the season.[17] The remaining 1,665 acres consist of leased land, an undetermined portion of which is fallow each year, as the agency notes. In the spring and fall, irrigation on the cropped acres is at the farmer's "discretion." No crops are specified. Nevertheless, DOE concludes that a theoretical TKN load of 317 pounds per acre on a theoretical 1,965 acres ". . . would be expected to be utilized through forage crop uptake through a growing season." How this conclusion was reached is not explained.

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[16] Personal communication from Joni Hammond, Oregon DEQ, May 1993.

[17] Washington DOE, "Fact Sheet" for the Carnation Foods/Moses Lake application for permit renewal, undated.

DOE goes on to note that surface water "flows through the permittee's property." Without comment on the quality of that water, the agency then reduces the surface water monitoring requirement from a semiannual to an annual basis. On the basis of unreported results from the only groundwater monitoring well on the disposal site, the agency speculates that "nitrate nitrogen is probably leaching into the aquifer." DOE nevertheless decided to renew the permit for five years, on the condition that the plant study the question of additional winter storage.[18] Washington DOE's decision procedure in this example illustrates the inadequacy of relying on regulatory agency discretion in the absence of enforceable and objective standards of compliance.

Other factors, common to both states, make water resource protection difficult in the frozen potato products industry. Two such factors are the current overcapacity in the processing industry and the importance of processor payrolls in the local economy. An example illustrates how the firms use these conditions to their advantage. In 1989, Lamb-Weston petitioned Oregon DEQ for an abatement in their agronomic rate compliance schedule for the Hermiston plant, citing a shortage of capital due to a leveraged buy-out and arguing, "Unfortunately. . . the company currently has enough excess capacity to manufacture our products at other plants." Lamb-Weston's correspondence also cited "the $30 million in annual payroll, raw product and local purchased services that would be lost if we must curtail production by the 65 percent" required by scheduled compliance with DEQ's agronomic rate standards.[19] DEQ granted the abatement. In 1990, Lamb-Weston doubled its profits to $32 million (Jones 1992) and in the same year ConAgra, the parent company, was again involved in another leveraged buy-out (ibid.).

In 1991, Lamb-Weston avoided constructing wastewater treatment facilities at the Hermiston plant by discharging its effluent, mixed with nearly 6,000 acre-feet of water

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[18] Washington DOE, Waste Discharge Permit #5202, 18 June 1990. Nestle's Carnation has shown reluctance to capitalize lined lagoon construction in Moses Lake, an understandable reaction to their experience in Othello, where DOE permitted McCain Foods to obtain significant avoided cost advantages by continuing to operate the unimproved wastewater disposal site abandoned by Carnation.

[19] Correspondence from Mike Henderson, Lamb-Weston Engineering Manager, to Richard Duvall, Oregon DEQ, 27 June 1989.

withdrawn annually from the Columbia River, onto the fields of an irrigator whose groundwater supplies had been depleted by overdrafting. The Port of Morrow is currently requesting the withdrawal of an additional 90,000 acre-feet from the Columbia River in order to dilute effluent from another Lamb-Weston plant located in the Port's industrial park outside Boardman.[20]

Such improvisations represent cost-effective, end-of-pipe strategies to avoid capitalization of waste reduction measures and in-plant water use efficiencies. Carnation, McCain Foods and Lamb-Weston/Hermiston are now in the process of developing similar arrangements with irrigators in areas where groundwater supplies are declining. Because processors frequently do not control agricultural operations on the leased or contracted acres, the farmers will manage the land to maximize crop yields, not nitrogen uptake. Therefore, these arrangements do not ensure that groundwater contamination will not continue on the new sites. It appears that until effluent restrictions and groundwater protection standards are consistently enforced, processors will avoid complying or favor end-of-pipe solutions over costlier options involving in-plant water and nitrate reduction measures.[21] The critical point is that some sectors of the potato processing industry will continue to avoid the costs of effective wastewater treatment systems until given sufficient incentive to do so. As demonstrated recently in Oregon, consistent enforcement of environmental standards by state permitting agencies is a vital component in the creation of such incentives. In particular, environmental standards could be uniformly enforced in all states, so as not to shift production within the region across state lines, and so as not to favor one firm over another.[22]

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[20] Oregon Water Resources Department Application #71110. Utilization of the Columbia River for such purposes exact hydropower opportunity costs upon regional utility rate payers who are, in effect, financing processors' wastewater treatment systems. We estimate these costs later in the text.

[21] See, for example, the discussion of this point in Swayne 1976. Simplot's investment in an anaerobic digester in the Hermiston plant in response to Oregon DEQ's enforcement of agronomic uptake rates tends to confirm this hypothesis. Biological denitrification, involving the introduction of bacteria into the effluent stream or settling lagoons, is a well-established technology available to potato processors in the Columbia Basin.

[22] This is the spirit under which the environmental side agreement was negotiated for the North American Free Trade Agreement treaty with Canada and Mexico.

The pollution of groundwater caused by agriculture and food processing in the Columbia Basin is no small matter. Once contaminated, groundwater is difficult and sometimes impossible to clean. Because groundwater usually moves slowly, contaminants do not spread or mix quickly. Instead, they remain concentrated in slow-moving plumes and are typically present for many years and sometimes decades. Such groundwater contamination is difficult to detect until it shows up in a well.

Contaminated groundwater in the Columbia Basin poses special threats to the deep basaltic aquifers upon which municipal and industrial supplies depend. Uncased and abandoned irrigation wells, typically penetrating several basaltic layers, provide conduits for contaminants from upper levels. The same is true of fractures in the basalt itself, which are common in several areas of the Columbia Basin. Contamination of the deep basaltic aquifer by this means on the eastern edge of the CBP has already been detected by the U.S. Geological Survey (USGS).[23] In 1988, the Oregon Water Resources Department cautioned:

> The quality of [the Columbia Basin's] basalt aquifers runs the risk of being affected by the natural downward percolation or seepage down well bore holes of contaminants from degraded alluvial aquifers.[24]

As early as 1979, the USGS noted the danger of basaltic aquifer contamination through fractures in the intermediary basalts (Foxworthy 1979:23, et passim).

Nitrate contamination in perched aquifers poses the risk of subsequent contamination of water supplies in the deep basalts. For example, over 20 percent in one section of test wells in the deep basalts were found contaminated in a recent study by Oregon DEQ in Umatilla County (Grondin n.d.)(Figure 3.4). The risk of deep aquifer contamination is exacerbated in areas close to municipal and industrial groundwater withdrawals, where cones of depression are created in the aquifer due to withdrawals concentrated in a relatively small radius. In such localized areas of groundwater depression, contaminants are more

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[23] Personal communication, Sandy Williamson, USGS, Tacoma.

[24] "Ground Water Quality," in Oregon Water Resources Department 1988:21.

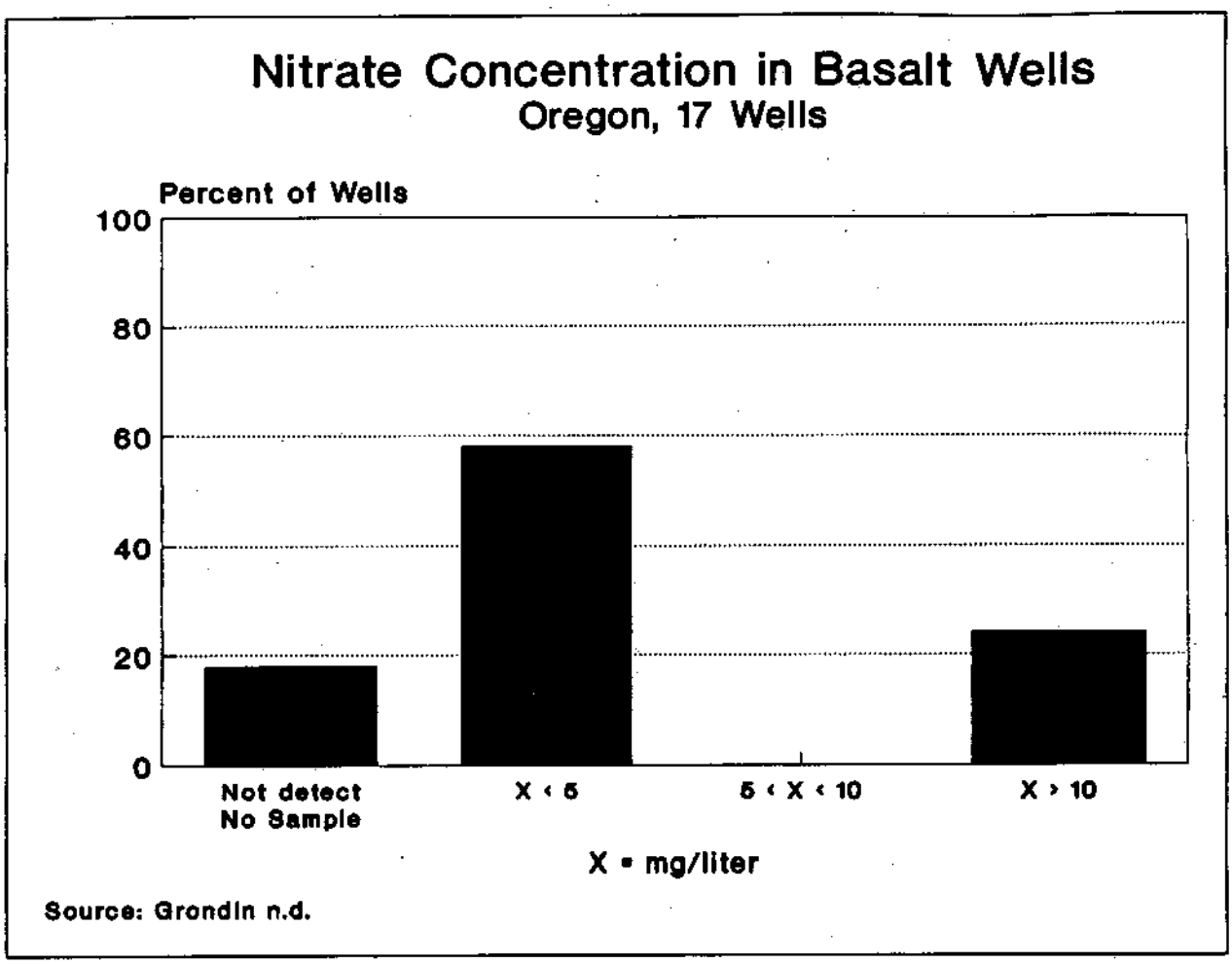

Figure 3.4

likely to be drawn down from upper levels to the deep basaltic aquifer.

At the same time, while local areas of depletion have been created in deep basaltic aquifers, water tables near the surface have been rising due to hydraulic overloading caused, among other factors, by excessive irrigation of processing wastewater on small acreages. When adjacent to residential areas, the overloading causes septic failures and drinking water contamination. Latino neighborhoods in rural Columbia Basin towns appear to be especially exposed to these effects, because such neighborhoods frequently are located on the fringes of processing towns, where dependence on residential wells and septic systems is common.[25]

[25] For example, "Little Mexico" in Othello lost the use of residential wells through infusions from flooded septic systems close to the waste-disposal irrigation operations of the McCain Foods plant and a Bureau of Reclamation unlined irrigation water conduit.

Potatoes and Groundwater Depletion

Potato processing's use of municipal water supplies and withdrawals from aquifers in proximity to municipal wells exacerbates groundwater depletion in the Columbia Basin, the primary cause of which is irrigation. Because processing plants are often located close to land where potatoes and related rotational crops are grown, the general groundwater depletion caused by irrigation affects the plants' processing water supplies.

Although federally subsidized water and power from the Columbia River's mainstem and tributaries have been the primary basis of the extensive irrigation development in the Columbia Basin, significant irrigated acreage also has been developed from groundwater sources by private capital. In the agricultural production areas (APA's) in which the Columbia Basin's potato processing plants are located, 270,000 acres currently depend on groundwater supplies, representing slightly more than 25 percent of the total 1 million acres under irrigation in the Mid-Columbia Basin.[26] Substantial acreage was developed from groundwater on lands not served by the CBP in the Odessa Basin, east of the communities of Othello and Moses Lake. In the potato producing areas of north central Oregon, where nearly 30,000 acres of potatoes are planted annually, 55,000 out of a total 250,000 acres depend on groundwater supplies (NEA 1988). Development of potato acreage irrigated with groundwater in the Hermiston/Boardman area proceeded at a rapid pace during the 1970s on favorable soils, driven especially by the entry of farm management corporations put together by national insurance companies, potato processors (Simplot and Taggares), and a subsidiary of Boeing Aircraft.[27] Even as early as 1965, irrigation's rate of withdrawal from groundwater was in many areas in excess of recharge in the deep basaltic aquifers underlying the geologic Columbia Plateau (Foxworthy 1979). By 1990 declines of as much

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[26] NEA 1988, Table 7. Potato production and processing in the Mid-Columbia Basin are almost entirely contained within APA's #13 and #22, the Big Bend area of Adams, Grant, Franklin (and Benton) counties in Washington, and Morrow and Umatilla counties in Oregon, respectively.

[27] Between 1970 and 1975, Mutual Life, Prudential, Connecticut General and the Boeing Agribusiness Corporation obtained groundwater rights totalling 30,000 acre-feet annually in what are now the Butter Creek and Ordnance Critical Groundwater Management Areas (see "Point of Diversion Summary Report," Oregon Water Resources Department). It was principally these and other corporate farming operations nearby that occasioned water rights conflicts between small farm interests and corporate irrigators (see Chapter Two).

as 500 feet had been recorded in some areas, most notably in the potato producing areas of north central Oregon and the Odessa Basin in eastern Washington (Oregon Water Resources Department 1990).

In eastern Washington, groundwater mining is a consequence of state policy, in which the decision was made to deplete the aquifer in anticipation of groundwater recharge by the build-out of the Bureau of Reclamation's CBP. Limitations on groundwater pumping in that area have been largely determined by the costs of pumping, rather than any conception of sustained yield.[28] In Oregon, despite the existence of a state statute requiring that groundwater withdrawals be constrained by "sustained yield,"[29] irrigation pumping in the potato producing areas of Umatilla and Morrow counties has also been largely determined by economics. By the late 1970s, there was clear evidence that, as in Washington, the deep basaltic aquifer was being mined around Hermiston in Umatilla County (Oregon Water Resources Department 1990). By the late 1980s, both Oregon and Washington had established, or sought to establish, groundwater management areas in order to stem the decline throughout the Mid-Columbia Basin. As shown in the map in Figure 3.5, all of the Columbia Basin's processing plants and communities are now located in designated management areas (the grey shaded regions) or areas nominated for such designation. Nevertheless, groundwater overdrafting has continued throughout the area.

State attempts to manage groundwater have been challenged. When Oregon's Water Resources Department sought to stem the decline in the Hermiston/Boardman area through administrative imposition of groundwater management area restrictions, they faced a legal challenge by irrigators, who argued that water should be looked upon "as a resource similar to gold in a mine and withdrawn totally so long as it is economically feasible to do so."[30]

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[28] See Olsen 1989. The cost effectiveness of groundwater pumping by irrigators has been aided in the Pacific Northwest by an irrigation pumping rate discount provided by BPA for most of the last two decades, thus accelerating groundwater depletions. See also Gardner and Young 1984, in which the authors conclude that setting pumping power rates is tantamount to establishing water pricing in areas of groundwater irrigation.

[29] ORS 537.525

[30] These sentiments were expressed in a May 1992 interview with John Taylor, director of the Adams County, Washington, Economic Development Council.

Location of Major Potato Processing Plants and Groundwater Management Areas

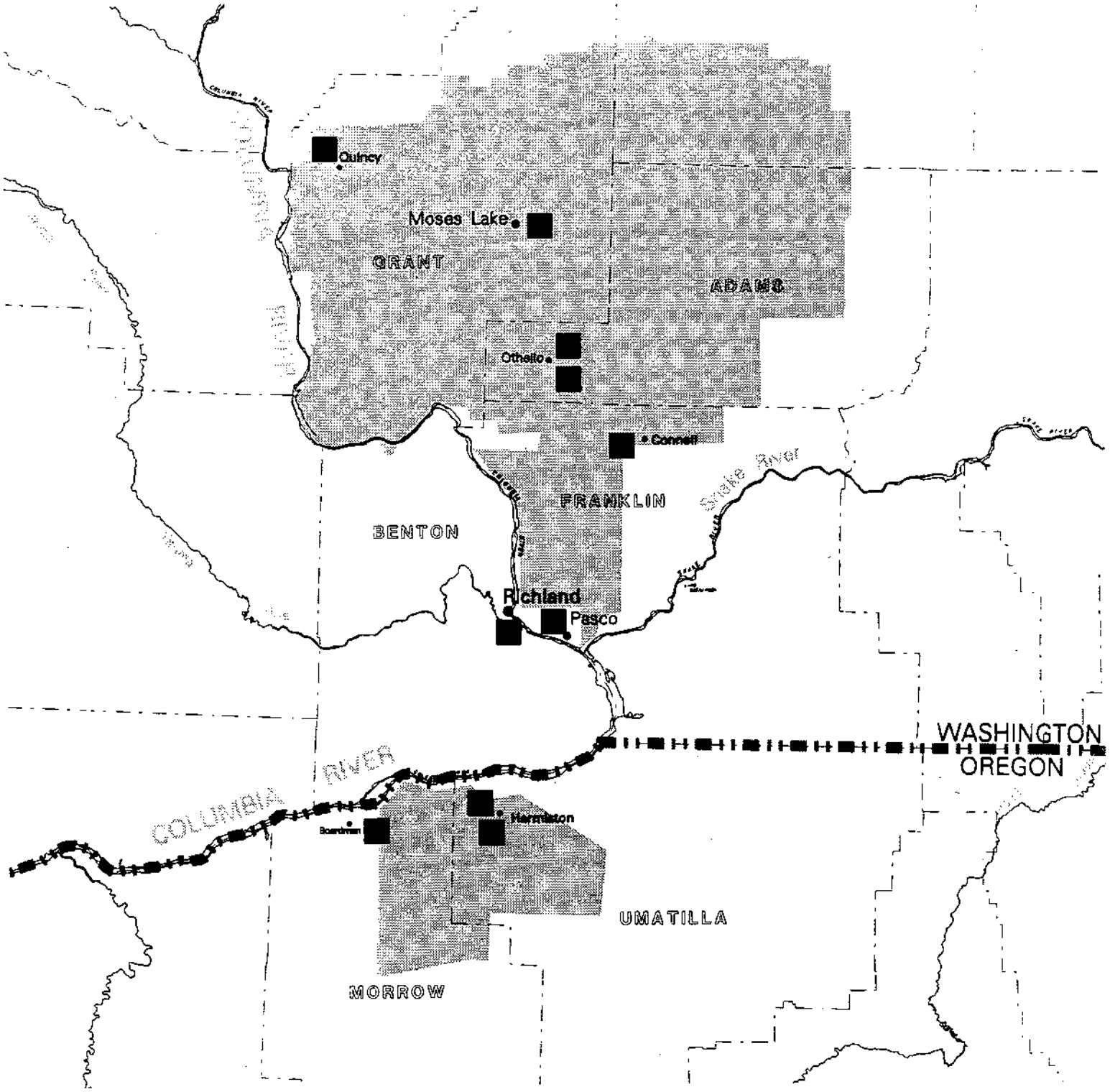

Figure 3.5

Source: Oregon Water Resources Department
Washington Department of Ecology

Responding to the irrigators' challenge by upholding the state's authority to impose a definition of sustainability on the groundwater pumpers in north central Oregon, the Oregon State Supreme Court observed that:

> A logical corollary of this mining-analogy argument is that the public health, welfare and safety are simply not involved where the current generation profitably extracts all of the resource and leaves agricultural ghost towns.[31]

Despite the Oregon Supreme Court's decision in Doherty v. Oregon Water Resources Department, aquifer mining continues in north central Oregon.[32]

One result of groundwater depletions is that the water supply problems facing Othello exist in many communities throughout the Columbia Basin. For example, the Oregon communities of Irrigon, Stanfield, Echo, and Hermiston currently struggle with water supply problems, conditions that have given rise to local requests for new water appropriations from the Columbia River's mainstem. Using water from the Columbia River to replace failing groundwater supplies has become an article of faith for political leaders in the Mid-Columbia Basin and the occasion of considerable rhetoric. For example, the president of the Boardman Chamber of Commerce recently argued for such withdrawals in north central Oregon, stating:

> Without it, all of them [the towns] would wither and die. Without hope many of us would pack up and go away. The sole source of hope is water.[33]

Both the potato processing industry and local government representatives are similarly concerned with the availability of clean water essential to processing operations. Because of processing's dependence on municipal water supplies or on groundwater in areas

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[31] Doherty v. Oregon Water Resources Department, 308 Or 543 P2d 519 (1989).

[32] Current withdrawals from the Stage Gulch Groundwater Management Area serving Hermiston and surrounding communities remain in excess of 20,000 acre-feet annually, 25 percent higher than the level established by the Oregon Water Resources Department as sustainable. A recent decision in the Oregon Court of Appeals upheld the state's discretion in delaying imposition of sustainable yield restrictions on irrigators in view of the "economic" impact on agriculture in the area and the desire to allow irrigators time to "adjust" to reduced withdrawals. Slip opinion, Waterwatch of Oregon v. Oregon Water Resources Department, et al., Oregon Court of Appeals, 19 May 1993.

[33] "HDC, Port Water Permits Kept Alive." *The Hermiston Herald*, 21 July 1992.

within cones of depression shared with municipal withdrawals, the frozen potato products industry also looks to the Columbia River for replacement of industrial supplies with which to sustain current operations.[34] As described earlier, requests for the Columbia River's waters are currently pending for ConAgra's Lamb-Weston plant in the Port of Morrow industrial park, which would withdraw 137 cubic feet per second (cfs) from the river in order to dilute processing wastewater at an annual hydropower opportunity cost to regional utility ratepayers of nearly $1 million.[35]

Thus far, all remedies proposed locally entail additional withdrawals from the Columbia River's mainstem. The purpose of these withdrawals would be to replace depleted groundwater irrigation supplies for municipal, industrial, and irrigation uses. For example, 16,000 acres in the potato producing area around Hermiston/Boardman and 37,000 acres in the Odessa Basin in eastern Washington are included in current proposals for additional appropriations from the Columbia River (Hermiston Development Corporation 1991; USBR 1989). Underlying such proposals is the assumption that the aquifer will replenish itself if irrigation from groundwater is abated.

The Public Cost of Groundwater Replacement in Oregon

Dams on the Columbia River provide both hydroelectric power and water for irrigation. The water in the Columbia River's mainstem is now fully committed to hydropower production. In fact, since the early 1980s, the hydroelectric capacities of the system have been in deficit (Findeis and Whittlesey 1982; Whittlesey, et al. 1981). Because the Northwest's urban areas have expanded, the BPA must now purchase power from more

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[34] Potato processors commonly expressed the expectation that declining groundwater supplies would require eventual replacement from the Columbia River in eastern Washington. (Interviews with Mel Martin, Don Wilson, May 1992.) See also "Rule May End Water Permit Problem," *The Hermiston Herald*, 18 December 1980, in which the Hermiston city manager says, "If you came to me for 2,500 gallons per minute [the usual amount for food processing], I couldn't get it to you." See also Hermiston Development Corporation 1991, in which 60 cfs are requested from the mainstem with which to maintain and expand food processing in north central Oregon.

[35] Assuming 137 cfs are withdrawn on 330 days annually above the turbines at John Day Dam, it would cost BPA over $1 million annually in lost hydropower potential, calculated at an incremental cost rate of 60 mills per kwh, the price BPA now pays for power from high-priced thermal sources in the utility's "resource stack" when it replaces firm losses. See *1993 Final Rate Proposal: Documentation for the Wholesale Power Rate Development Study*, WP-93-FS-BPA-04A:239. See following text for hydropower opportunity cost calculations.

expensive sources, such as thermal plants, in order to meet demand. Moreover, since the initial listing of some salmon species under the Endangered Species Act, the entire Columbia River system has become the focus of new conflicts. Replacing depleted or contaminated groundwater supplies with water from the river's mainstem will not only exact a high cost from the region's utility ratepayers, it also will intensify these conflicts.

For example, consider one set of such proposals currently pending in the Hermiston/Boardman area in north central Oregon. A total of 559 cfs has been requested recently from the Columbia River's mainstem in order to remedy a variety of problems associated with the overappropriation of the area's water resources, as follows:

- 155 cfs by the Port of Umatilla for municipal and industrial uses
- 267 cfs by the Hermiston Development Corporation to replace depleted groundwater for municipal (7 cfs), processing (60 cfs), and irrigation (200 cfs) purposes
- 137 cfs by the Port of Morrow to dilute Lamb-Weston's potato wastewater and maintain crop viability on the processors' wastewater irrigation site

The total cost to all other BPA ratepayers represented by these requests for additional appropriations from the mainstem's waters can be estimated at nearly $4 million annually in 1993 dollars.[36] These are the current annual additional costs required to remedy municipal, processing, and irrigation's depletions of water resources in the Hermiston/Boardman area, and do not include the considerable additional costs of (1) building out the conveyances or (2) the subsidized power required to pump the mainstem's

[36] Calculated on the basis of a 60 mills incremental cost rate for the hydropower opportunity losses in the system. Assuming municipal and industrial withdrawals at 330 days and irrigation withdrawals at 180 days annually, 286,971 acre-feet (AF) will be lost from hydropower production at John Day Dam in the Columbia River's mainstem. (Return flows are a negligible 6 percent from sprinkler irrigation in that area [Crook 1993:209]). The calculation is: 286,971 AF x Total Dynamic Head (TDH) of 242 ft. head at John Day x .87 kwh (value of one foot of head dropped through the turbines) x 60 mills kwh avoided cost rate (thermal) = $3,625,132. The incremental cost rate of 60 mills (actually 60.64) is BPA's current price paid for the more expensive thermal power that must be purchased in order to meet firm energy demand, and is appropriate, because once the water rights are granted, the withdrawals will continue even if critical water conditions occur. Hence, the lost power is, by definition, firm energy. See discussion of this point in Whittlesey, et al. 1981.

water out to the plants, towns, and fields.[37] Nor, for that matter, do they include the pollution abatement costs exacted upon downstream communities, such as Portland, that are deprived of the use of the Columbia River's waters for these purposes.[38]

These proposals amount to a request for a substantial income transfer from all other BPA ratepayers in the Pacific Northwest to sustain irrigation and processing on some 16,000 acres in a corner of north central Oregon. The income transfer is especially clear in the Hermiston Development Corporation's request for 200 cfs with which to irrigate—or re-irrigate—16,000 acres at an annual hydropower opportunity cost to ratepayers of around $900,000. The agriculture on that amount of land, in a typical rotation, will only bring returns to management and risk of roughly $1.5 million annually, with another $3.5 million to landowners. Therefore, the utility ratepayer subsidy to irrigation is a substantial portion of anticipated returns, without considering the pumping subsidies.[39] Assuming that other of the Columbia Basin's 270,000 acres, towns, and processing plants that currently depend on threatened groundwater supplies will require similar income transfers via hydroelectrically valuable surface water appropriations, an assessment of the industry's sustainability in its current technical configuration is needed. The public costs of groundwater contamination and depletion could indeed be high.[40]

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[37] BPA's share of energy costs of pumping in the Umatilla Project just for the replacement of Umatilla River water for salmon migration will be $1 million annually.

[38] See the discussion of these costs in Whittlesey 1976. In 1970, the pollution abatement value of water flowing through the Lower Columbia River was estimated to be between $1.00 and $2.00 per AF.

[39] 200 cfs x 1.9835 = 396.70 AF x 180 days = 71,406 AF x 242 ft. head at John Day = 17,280,252 ft. head loss x .87 kwh = 15,033,819 kwh x 60 mills = $920,029. As an example, anticipated returns to management and risk on 16,000 acres in a typical crop rotation (4,000 acres each of potatoes, wheat, alfalfa, and processing corn) in potato-producing areas in the Columbia Basin may be estimated from Washington State University cost studies (Hinman, et al. 1992) as $1,564,000 in 1991; the corresponding land rents would total $3,540,000. There are, of course, some multiplier effects in inputs, transport, processing and services, but there also would be multipliers from the alternative use of the water.

[40] USBR's current proposal to expand the CBP, re-irrigating 37,000 acres formerly irrigated by now-depleted groundwater supplies and irrigating 50,000 acres currently in dryland farming would, in terms of hydropower losses alone, impose another $12 million in annual costs upon regional ratepayers: 216,000 AF withdrawn at Grand Coulee at 1167 TDH x .87 kwh x 60 mills = $13,158,158 (minus 75,000 AF return flow at McNary x 316 TDH = $1,237,140) = $11,921,018.

Conclusion

Washington and, until recently, Oregon have failed to enforce groundwater quality standards. These policies have provided processors with incentives to avoid capitalization of waste reduction and efficiency measures, creating a long-term threat of deep aquifer contamination, the magnitude and eventual cost of which can only be surmised. The states of Washington and Oregon have also pursued *de facto* policies of aquifer mining. The consequences of these policies are now becoming manifest in distressed municipal and industrial water supplies.

The pursuit of high potato yields and quality standards depends on chemical inputs that raise grower costs and produce environmental externalities in the form of water contamination. The contradictions of this production system motivate a restless search for newly irrigable lands on which the high costs of pest and disease control can be minimized for a short but profitable period.[41]

Thus, several factors combine to produce a relentless pressure from the potato processing industry for additional public resources, especially in the form of water—which in the Columbia Basin implies hydropower opportunity costs to be borne by ratepayers. In its current technical configuration, the growing and processing of frozen potato products is sustainable only through this continuing transfer of public resources. As we have shown in the example of new withdrawals in north central Oregon, these costs can be significant. Having evolved under a set of conditions characterized by an abundance of natural and public resources, the frozen potato products industry has not yet been required to alter its practices to conform to the new realities facing the Pacific Northwest, as the limits of the hydroelectric system are reached and other external costs imposed on the region's water resources are now appearing as bills come due.

[41] Personal communication from Jim Cole, Columbia Basin Project Manager, September 1992.

Chapter Four

SOCIOECONOMIC COSTS OF THE FROZEN POTATO PRODUCTS INDUSTRY AND RURAL DEVELOPMENT IN THE COLUMBIA BASIN

In this chapter we assess the merits of rural community development notions that underlie state subsidies of the frozen potato products industry in the Mid-Columbia Basin. First, we review the subsidy programs in the Northwest. Second, we trace the growing employment of a Latino work force in the industry's fields and factories; examine relationships between wages and seasonal unemployment in the industry; and look at the effects of those relationships on the standard of living in a selected potato processing community—Othello, Washington. Third, we analyze in some detail the assumptions motivating Washington State's capital subsidy to McCain Foods, which is based in Othello. Finally, we assess the efficacy of state policies and practices promoting job creation in the frozen potato products industry as a strategy for raising the standard of living in the Columbia Basin's agricultural communities.

State Subsidies to the Potato Industry

In providing capital subsidies to multinational potato processors in the Mid-Columbia Basin, Washington and Oregon state agencies have been guided by "key-industry" strategies, which assume that interstate competition requires financial concessions to regionally or locally important businesses, such as the frozen potato products industry. Because of the importance of value-added processing of agricultural commodities in local economies in the Mid-Columbia region, encouraging these value-added industries is currently a key component in state and local economic development strategies in the area.[1] The presence of the french fry plants in the Columbia Basin's small communities is often regarded as an example of successful rural development.[2]

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[1] Washington State Department of Agriculture 1988; also, "Jobs Through Agriculture and Value Added Agriculture," Morrow/Umatilla Regional Strategy, announced by then-Governor Neil Goldschmidt, press release, 14 March 1989.

[2] See, for example, Sommers 1992.

States also provide tax abatements to the potato processors in the Mid-Columbia Basin. Motivating these abatements is the general notion that businesses locating in areas like the Columbia Basin require financial incentives because the local counties are economically "distressed." In Washington and Oregon, this term is applied to counties with chronically high unemployment levels. All of the agriculturally dependent counties in the Mid-Columbia Basin qualify as distressed under that definition.[3]

In developing a policy justifying tax abatements in economically distressed areas of the state, Washington planners stated:

> The primary goal of the distressed area policy as stated in our recommendations is to improve employment opportunities and raise the standard of living in these areas to levels currently enjoyed by the more prosperous regions of the state (Washington State Economic Development Board 1988:3).

As a means to this goal, Washington offers two tax incentives to firms locating or expanding in distressed areas: Sales Tax Deferral and a Business and Occupations Tax Credit. The state selected these tax incentives because "economic development professionals affirm that they do have an impact... . We feel that without these incentives distressed areas are at a competitive disadvantage in attracting and retaining business" (ibid.:18).

As described earlier, both Washington and Oregon recently commissioned reports that recommend additional industry-specific rollbacks in other state and local tax structures to encourage the expansion of value-added processing in the region's agricultural areas. The newly recommended concessions have included reducing workers' compensation insurance premiums, unemployment taxes, and local property taxes (Meale 1989; Obermiller 1989). Thus, though the industry is now the beneficiary of capital subsidies motivated by a key-

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[3] Washington's distressed-areas policy is contained in the Community Revitalization Act of 1985, RCW43.165. Tax abatements, as well as capital subsidy preferences, are allocated under the distressed-areas policy to counties (and communities) that have had unemployment rates 120 percent of the state average (currently 7.6 percent) for at least three years. All of our study counties currently qualify as distressed under this criterion. In Oregon, the specific distressed-areas policy ended in June 1993. However, preferential status for various capital assistance programs continues under Chapter 765 of Oregon Laws, subsections 79 and 80, and the Oregon Department of Economic Development is currently proposing criteria for the distressed-areas designation that include higher-than-average unemployment levels as one indicator.

industry strategy in both states and tax concessions based on high unemployment numbers in Columbia Basin counties, further tax concessions are proposed. The underlying notion appears to be that creating employment in the industry justifies such revenue sacrifices.

Wages and Employment in Potato Processing in the Mid-Columbia Basin

Before the expansion of the fast-food industry in the early 1960s, approximately 1,000 Washington farmers harvested potatoes on less than 20,000 acres and delivered most of the crop as fresh produce to local markets (Jones 1991b). The dramatic expansion of potato farming in the Columbia Basin for the processing industry was discussed in Chapter Two. Figure 4.1 shows the rapid growth of fall potato acreage for processing to current levels of roughly 115,000 acres annually in five selected Mid-Columbia Basin counties[4]. Half as many potato farmers exist in the Columbia Basin today as 30 years ago (Jones 1991b), indicating a rapid concentration of production. In 1991, only 175 farmers in Washington were raising potatoes as their principal crop, and only 85 in Adams and Grant counties.[5]

The growth of potato processing, as well as increased production of labor-intensive crops such as grapes, apples, and vegetables, has attracted a growing population of Mexican and Mexican-American workers to the Columbia Basin.[6] According to the Census Bureau, in the five counties studied here, the Hispanic population grew by 90 percent in the 1980s (Figure 4.2). Recent research has shown that the census seriously undercounts Hispanic

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[4] The counties are Adams, Grant, and Franklin in Washington, and Umatilla and Morrow in Oregon.

[5] Personal communication from Ron Wahlers, State of Washington Employment Security Department, 6 August 1993. The 1987 Census of Agriculture found 486 farms producing some potatoes in Washington and 206 farms producing some potatoes in Adams and Grant counties (Bureau of the Census 1989b).

[6] The word Mexican is used here to refer to people born in Mexico. Mexican-American refers to people of Mexican descent born in the United States. Latino is used to encompass all people of Latin American descent, whether born in the United States or abroad, and thus subsumes both Mexican and Mexican-American. Hispanic is a category of the Census Bureau that is even broader, including all people of Hispanic descent, such as the community of Spanish-Americans in New Mexico, put probably excluding people of indigenous origin from Latin America. We use Hispanic here only when referring to census data. Most of the Latinos in the Mid-Columbia Basin are Mexican or Mexican-American.

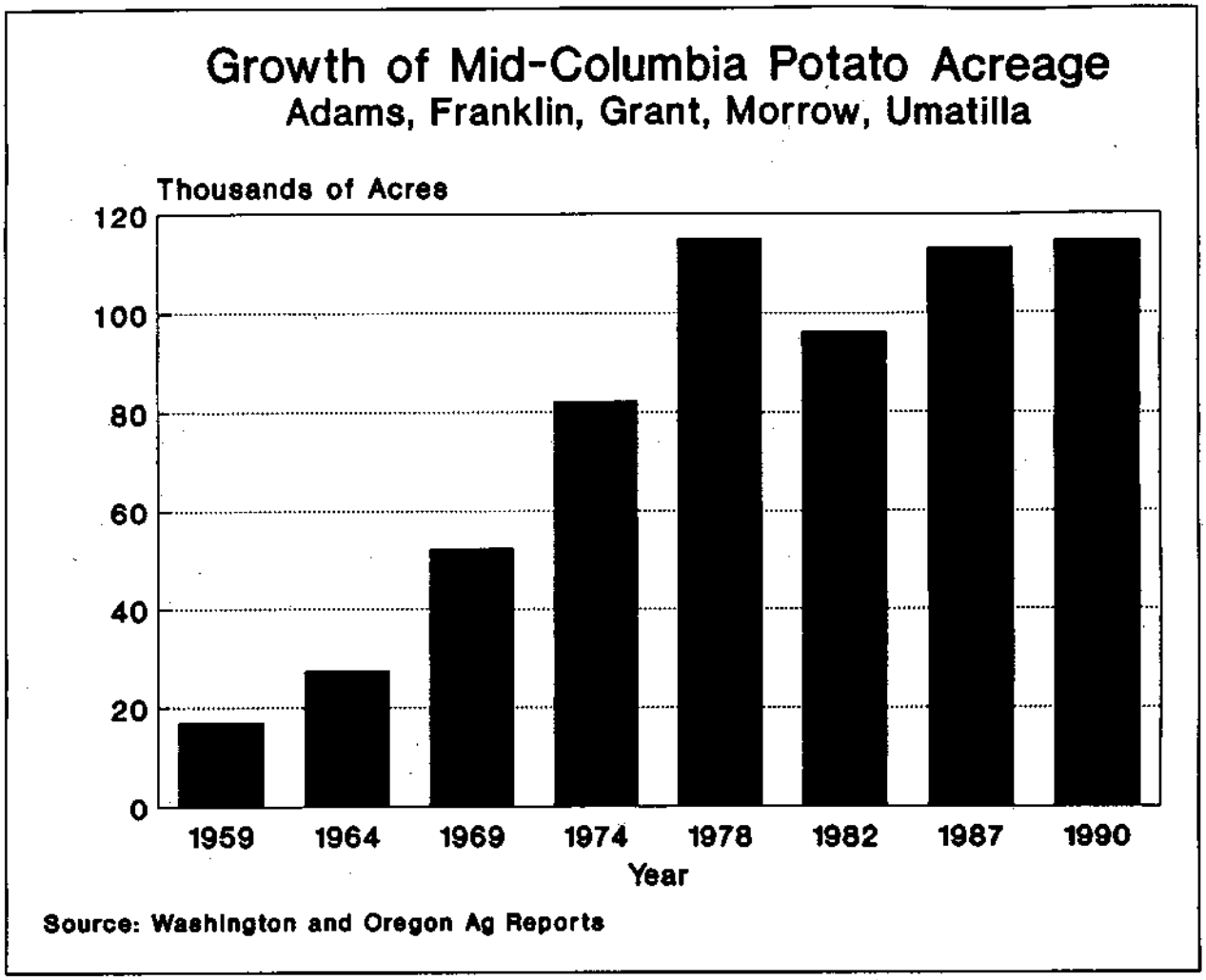

Figure 4.1

farmworkers,[7] implying that the Hispanic population is growing even faster in the Columbia Basin. In fact, Hispanics are now replacing a dwindling population of Anglos, as the absolute number of Anglos in the five-county area fell in the 1980s (Figure 4.3), so that by 1990 Hispanics accounted for 18 percent of the enumerated population.

Annual average food processing (SIC 20) employment in the same five counties is displayed in Figures 4.4 and 4.5. There is a slight upward tendency in the aggregated numbers, but employment is not growing nearly as fast as production. This suggests that

[7] See Gabbard, Kissam, and Martin 1993. They estimate that the 1990 census undercounted farmworkers by 60 percent.

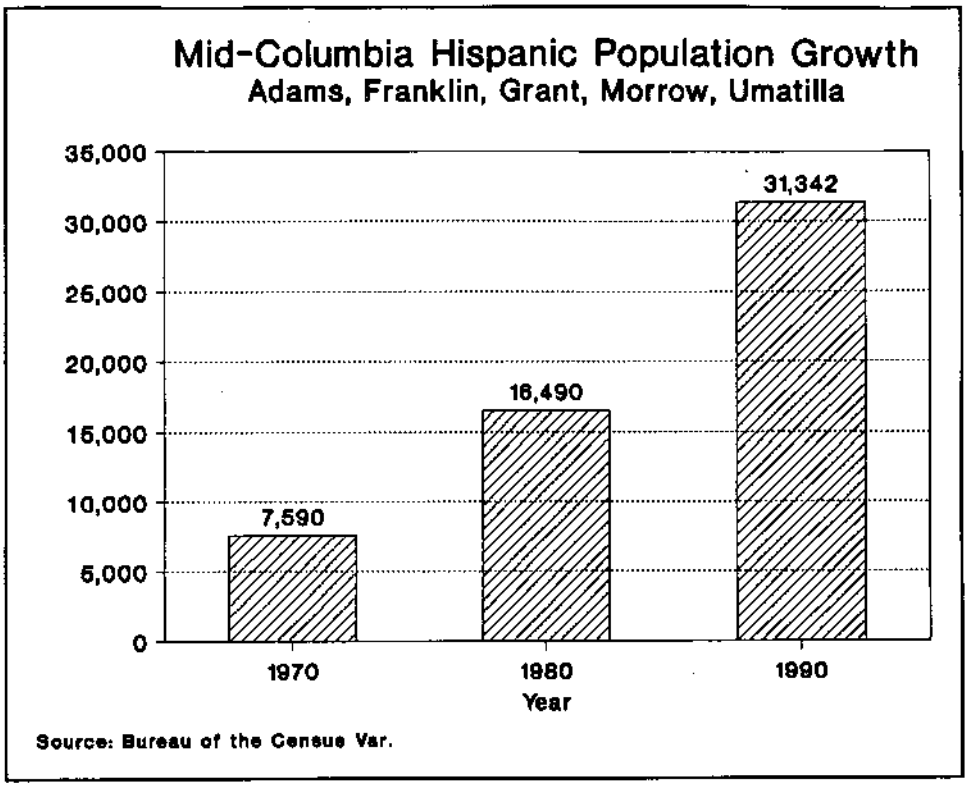

Figure 4.2

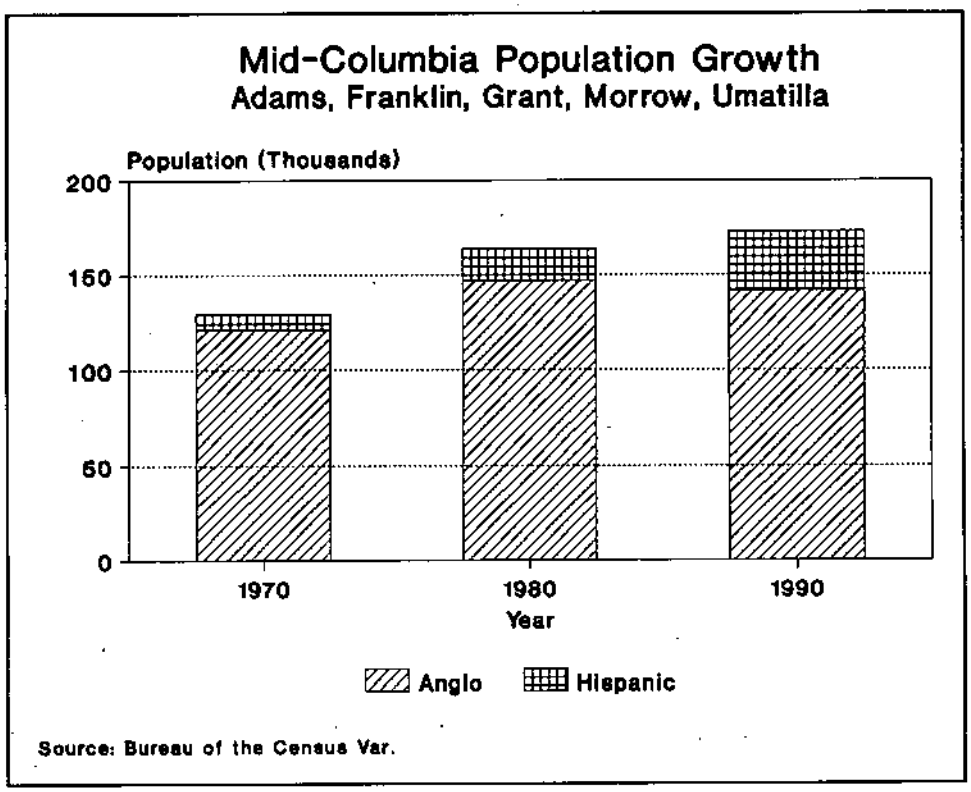

Figure 4.3

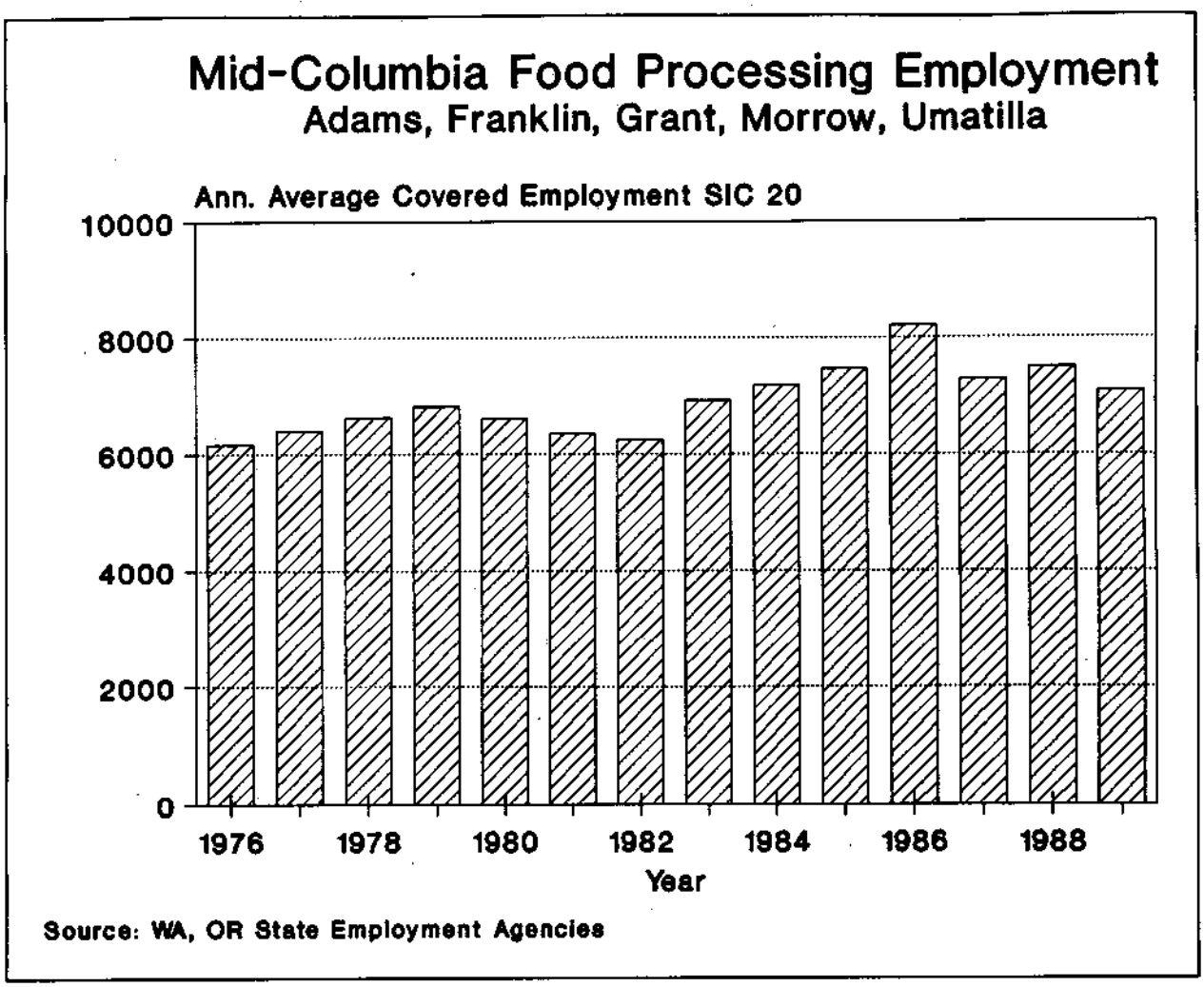

Figure 4.4

productivity is rising through investment in capital equipment. At the individual county level (Figure 4.5), annual fluctuations in employment are more evident, indicating the need for a pool of workers who can be hired and let go. The size of Umatilla County's food processing work force has varied considerably between 1979 and 1989, as has that in Adams, Grant, and Franklin counties in Washington, where year-to-year variations of 10 to 20 percent are not uncommon, even if the demand for labor tends to grow or decline over longer cycles (see Figure 4.5).

Wages in Potato Processing in the Mid-Columbia Basin. In a June 1989 survey conducted at two potato processing plants by the Columbia Basin Institute and Operating Engineers

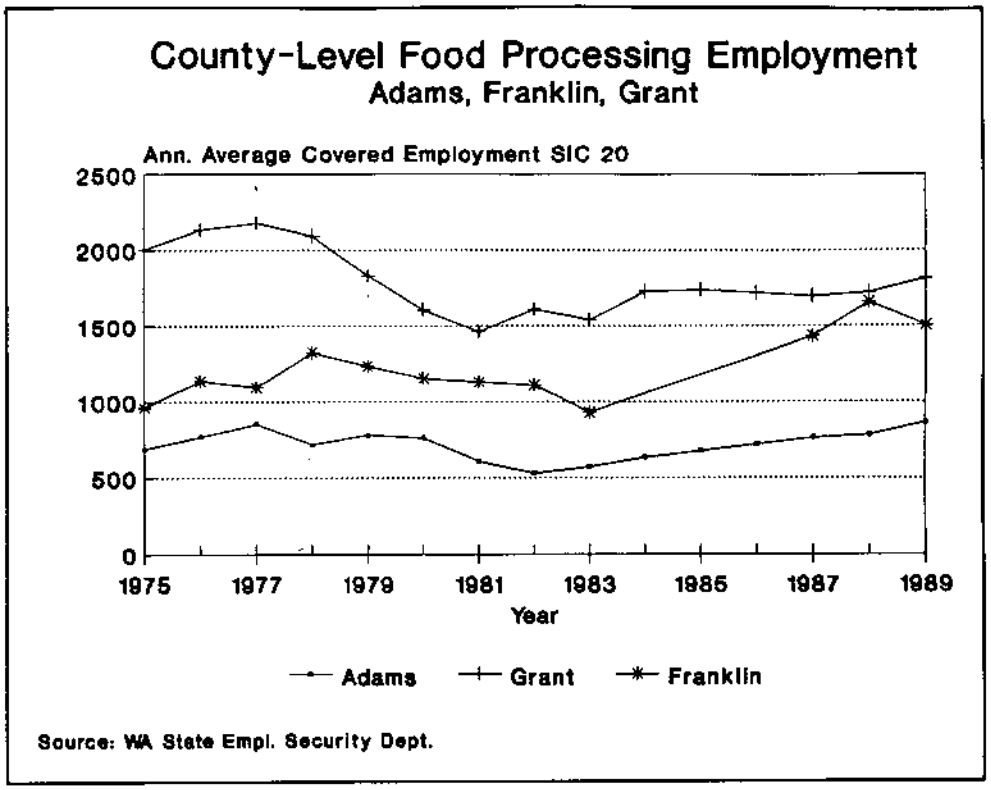

Figure 4.5a

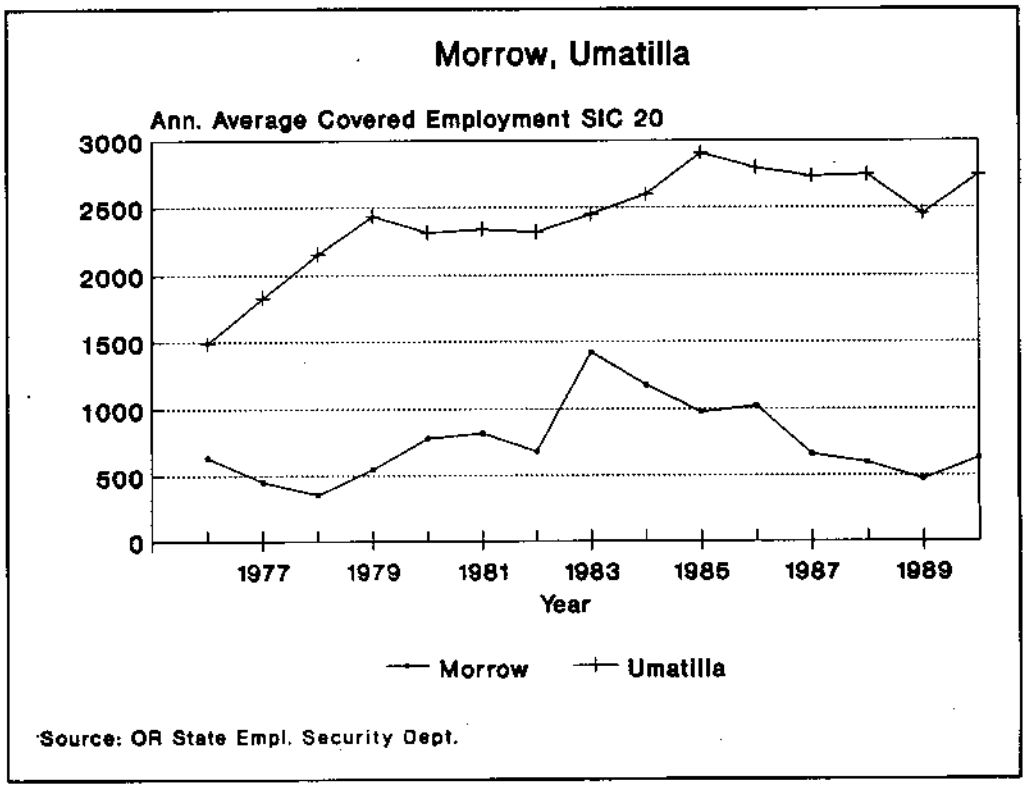

Figure 4.5b

Local #318,[8] Latino workers were found to constitute 69 percent of the work force at Lamb-Weston's plant in Connell and 73 percent at Carnation's Othello plant. Assuming that these plants are representative in the region, then two-thirds to three-quarters of the Columbia Basin's roughly 8,000 processing jobs are held by Latino workers. Given that the 1990 census reports the total Hispanic population in the five-county area as 31,342, a significant portion of the local Latino labor force is employed in the industry.

Data from the survey indicate that the minority work force is concentrated in the lower-wage jobs (see Figures 4.6 and 4.7). In 1989, in the Lamb-Weston plant in Connell, 31 percent of the hourly workers were Anglo, 47 percent Latino, and 22 percent other minority groups, mostly Asian. Some 43 percent of the work force received the lowest wage of $6.75 per hour. Only 23 percent of the Anglos, however, were in this lowest wage group, while 47 percent of Latinos and 64 percent of the other minorities were in this group. At the other end of the spectrum, 37 percent of the Anglos were in the top five pay brackets, while only 13 percent of Latinos and 5 percent of other minorities were as well paid. Exactly 50 percent of the hourly work force made less than $7.00 per hour, with the mean wage $7.02, the median $6.99; the mean wage for Anglos was $7.96, for Latinos $7.24, and for the other minorities $6.99. Only 7 percent of the work force made over $10 an hour.[9]

Wages were lower in the Carnation plant in Othello in 1989, but much the same structure existed. In this plant, only 25 percent of the workers were Anglo, whereas 75 percent were minorities, virtually all Latinos. Overall, 39 percent of the hourly work force received the lowest wage of $6.24, but only 25 percent of Anglos were in this category, while 44 percent of the minorities were. In contrast, 21 percent of Anglos were in the highest pay brackets, while only 4 percent of the minorities were as well paid.

The Carnation plant reports current (1993) entry-level wages as $7.33 an hour (Baldridge 1993). At the time of the 1989 survey, the entry-level wage in the plant was $6.24, so it has increased about 17.5 percent in four years, which is just above the rate of

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[8] See Appendix B for the survey methodology.

[9] Note that these are 1989 base wages and do not include payments for overtime, unemployment insurance, health benefits, etc. That is, this wage is not the total cost to the employer.

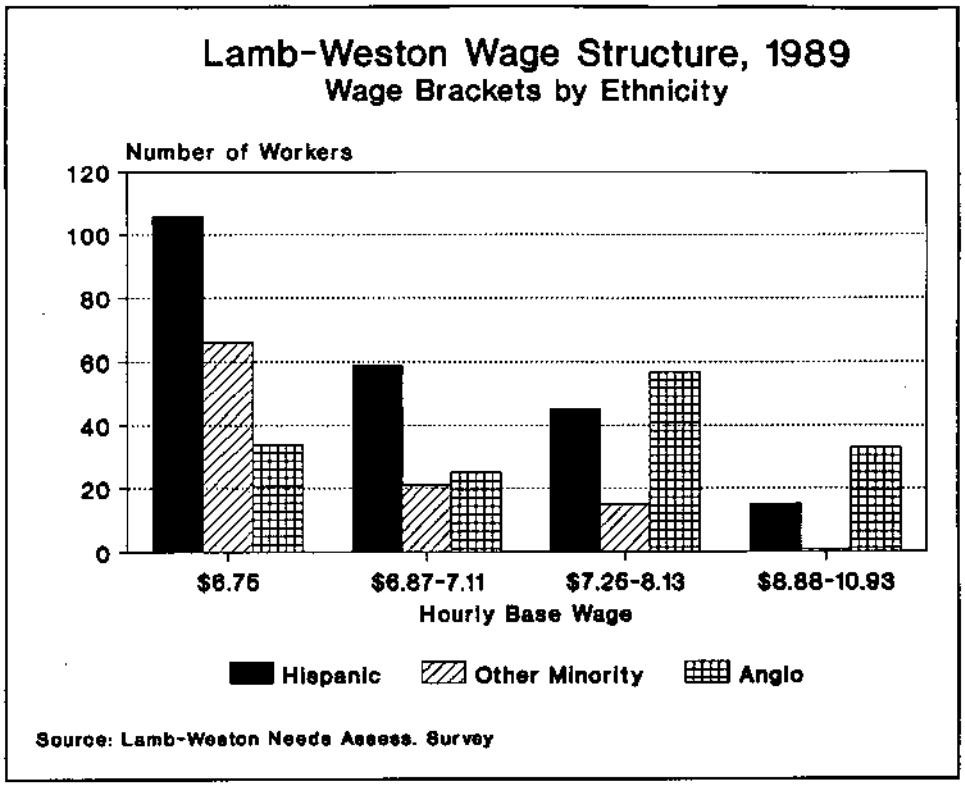

Figure 4.6

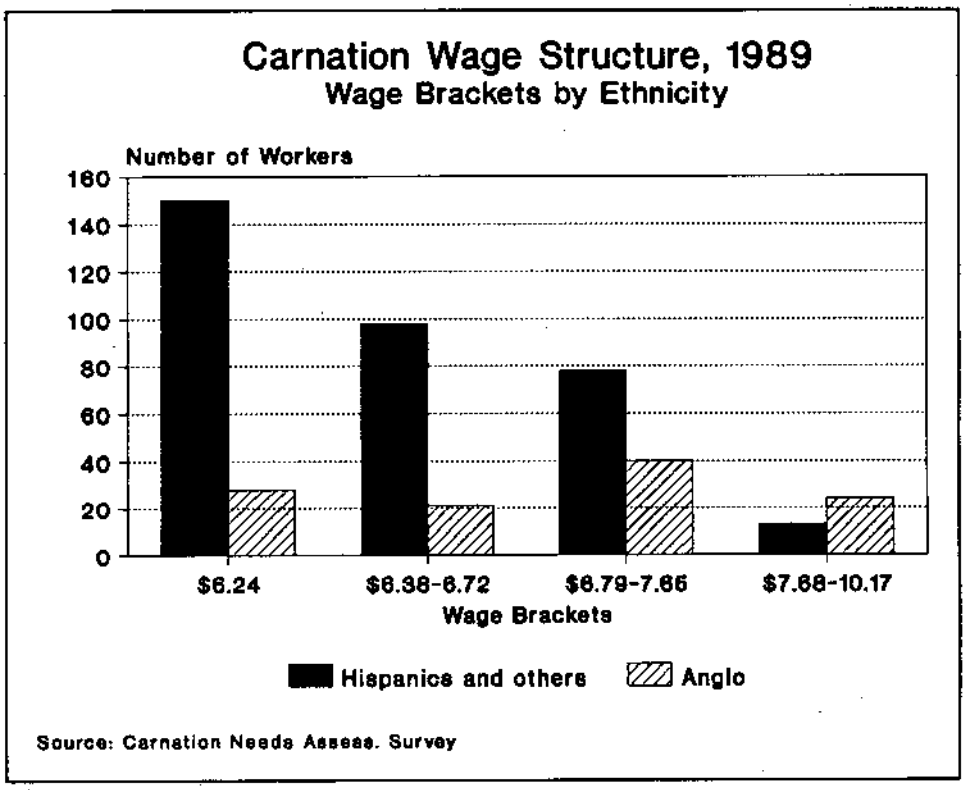

Figure 4.7

inflation of 16.3 percent over that period.[10] This indicates that real wages in potato processing are at least not declining, as they are in many manufacturing industries.

The Census Bureau does a census of manufacturers every five years. The most recent census data available is from 1987. In that year, Washington frozen fruits and vegetables (SIC 2037) reported 6,300 production workers were paid an average "wage" of $8.27.[11] The census is done in the off-season and therefore includes few lower-wage, seasonal workers.

The Census Bureau also does an annual survey of manufacturers, based on a sample, but it does not report estimates for SIC 2037 in Washington, only for SIC 203, which encompasses a variety of industries besides freezing, including fruit and vegetable canning, dehydrating, and juices. The survey "wage" (calculated in the same way as the census wage) for SIC 203 in Washington was $8.25 in 1988, $9.11 in 1989, and $10.14 in 1990 (Bureau of the Census Ann.). For comparison, the national SIC 203 "wage" in 1990 was $9.23, or 9 percent less than Washington's (ibid.).

We can conclude that potato processing is not a low-wage industry in the sense that much seasonal agriculture, the fast-food industry, or garment manufacturing are. But the common assertion that the industry's slightly above-average wages are a consequence of unionization and isolation (Chase 1992, Wallace and O'Rourke 1980) seems dubious. Relatively few plants are unionized and the high levels of unemployment in the region suggest that the labor supply is adequate. Rather, it would seem that the wages are a reflection of the dominant position of the Northwest in potato processing and the increasing productivity of labor. Constant real wages in the industry suggest that most productivity

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[10] The increase in the Consumer Price Index from 1989 to 1993 was 16.3 percent, while the Implicit GDP Deflator for Personal Consumption Expenditures rose 16.4 percent over the same period (1993 numbers are projected). See U.S. Council of Economic Advisors 1993.

[11] The census reports total production-worker hours, including overtime hours, but excludes hours paid for vacations, holidays, or sick leave. It also reports total wages paid to production workers, that is, the pre-tax gross earnings of the workers, including dismissal pay, bonuses, vacation and sick leave pay. If one divides these total wages by total production hours, one arrives at the result reported here. This wage is thus a measure of the total gross cost to the employer per hour actually worked and is inflated by overtime pay and vacation pay. See Bureau of the Census 1989, Appendix A: A1-2.

gains are not being shared with the workers. However, average wages can be misleading if they divert us from looking at the groups at the bottom of the wage structure.

Unemployment in the Potato Industry. Agricultural workers suffer more from unemployment than virtually any group in society. The most recent national data, the 1991 National Agricultural Workers Survey, found that all workers in seasonal crop agriculture worked a mean number of 160 days a year (Mines, Gabbard, and Samardick 1993:40). A study done for the Washington Legislature in 1986 showed that six of the top ten 3-digit SIC sectors in the state with the most seasonality of employment were in agriculture; vegetable crops were the most seasonal of all, with peak-to-trough fluctuations in employment of over 200 percent (WA State Legislature 1987:24). Average annual earnings for potato workers in 1989 in Washington, at $11,208, were only 52 percent of the average for all hired workers in Washington (Washington State Employment Security Department 1991:12).

Food processing was 18th on the list of Washington's most seasonal industries, with the highest seasonality of any manufacturing sector, showing annual peak-to-trough fluctuations of over 55 percent (Ibid.:24). Adams and Grant counties had a higher proportion of the non-agricultural work force in seasonal industries than any other area of Washington (Ibid.:45). Figure 4.8 shows monthly employment reported for food processing in Umatilla and Adams counties in 1990, a typical year. Employment levels in Umatilla County varied between a low of 1,940 workers and a high of 3,660, or 89 percent.[12] In Adams County, where the food processing industry is almost entirely accounted for by the potato processing plants, SIC 20 employment levels ranged between a low of 476 workers in July and a high of 1,289 in November, or 171 percent. Although these numbers are not disaggregated between potato processing and other seasonal food processing activities in the counties, and therefore are not specific to potato processing, they tend to confirm industry estimates of 2,000 seasonally employed potato processing workers in the Columbia Basin,

[12] SIC 20 employment figures in Umatilla County do not reveal the full extent of seasonal unemployment, because of the common use of "temporary" workers—who are not reported under the SIC 20 code. In 1992 the Oregon Department of Employment Security estimated that most of nearly 150 "temporary services" workers in the county were employed by potato processors. Personal communication from Gerald E. Wood, March 1992.

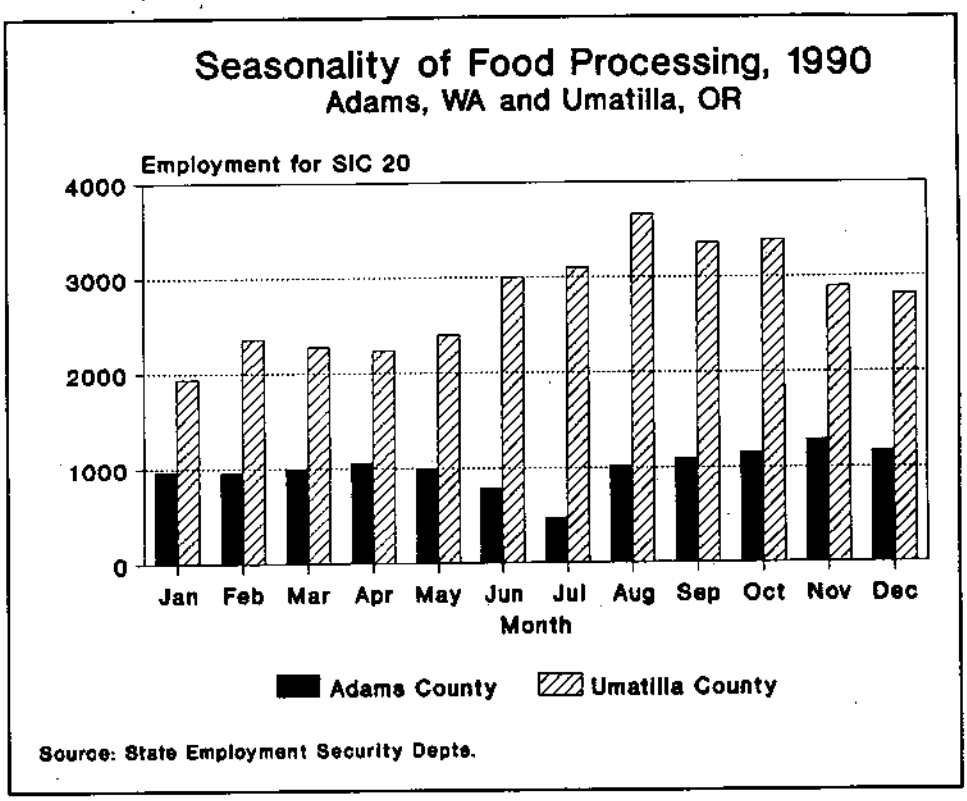

Figure 4.8

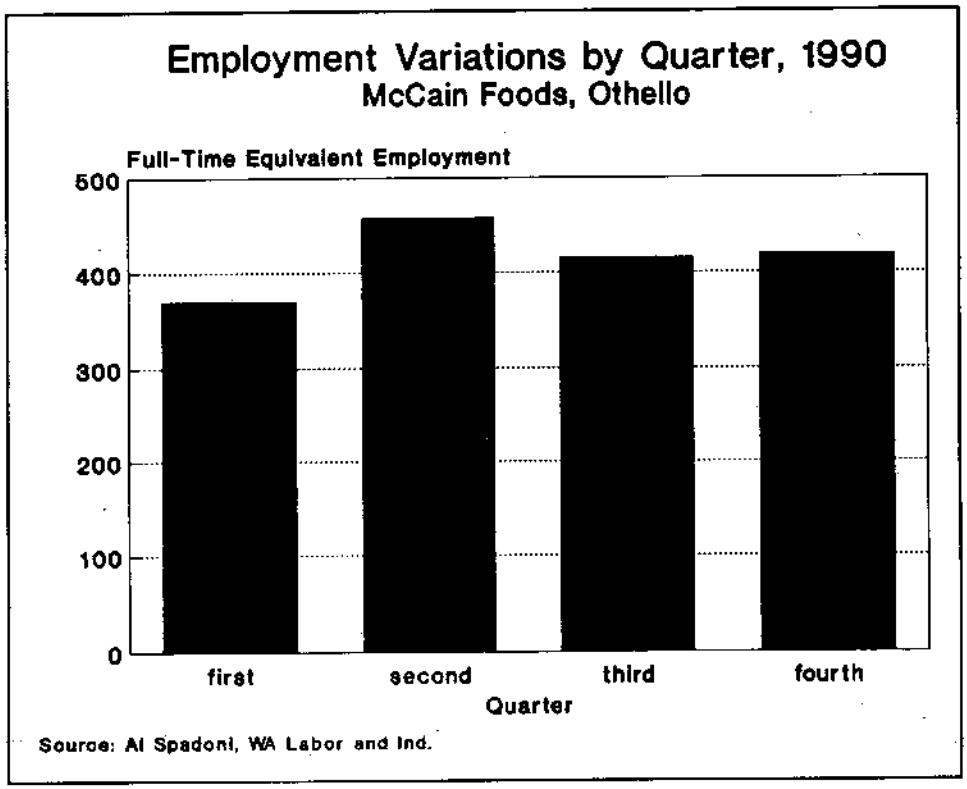

Figure 4.9

or 25 percent, relative to a more or less fully employed (10–11 months) base of 6,000 workers (Jones 1991b). Further confirmation of this proportion can be found in 1990 data from McCain Foods in Othello (Figure 4.9), which shows a variation of 24 percent between the first and second quarters in full-time equivalent employment estimates.[13] Though seasonality has fallen in the industry as new varieties of potatoes have lengthened the harvest and improved storage has lengthened the post-harvest processing period, agricultural production and processing is inherently seasonal and will probably remain so.

As with most seasonal industries, the food processors receive a subsidy through the Unemployment Insurance (UI) system. For example, in 1990, $203.66 were paid out to claims for every $100 paid into UI by firms under SIC 20 in Adams County, where virtually the entire SIC 20 work force is employed in Othello's two potato processing plants.[14] Therefore, the firms can lay off even the bulk of the workers at certain slack times of the year and only pay part of the cost of their maintenance.

Relationship Between Processing and Agricultural Labor. Seasonal unemployment in agriculture generated by the potato processing industry may be roughly estimated by comparing the number of plant workers to the number of seasonal agricultural workers required to produce a specific quantity of potatoes for processing. In 1990, the total yield from Adams and Grant counties' 63,000 potato acres was 33,075,000 cwt.[15] Peak labor demand reached 633 field workers in the production and harvesting of the crop in the two counties, as shown in Figure 4.10.[16] The McCain Foods plant in Othello utilizes about 6 million cwt. of potatoes annually and thus accounts for roughly 20 percent of production in Adams and Grant counties. Therefore, the plant's demand for the commodity accounts for

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[13] Shop class hours in covered employment by quarter at McCain Foods Western in Othello in 1990: (1) 178,000; (2) 219,500; (3) 200,500; (4) 200,800. Personal communication, Al Spadoni, Washington State Department of Labor and Industries, February 1992.

[14] Communication from Betty Norton, Washington State Employment Security Department, February 1992.

[15] Washington Agricultural Statistics, 1990-1991.

[16] Columbia Basin Ag Area 4, p. 28, "Agriculture, Forestry and Fishing Employment in Washington State," Washington State Employment Security Department, July 1991.

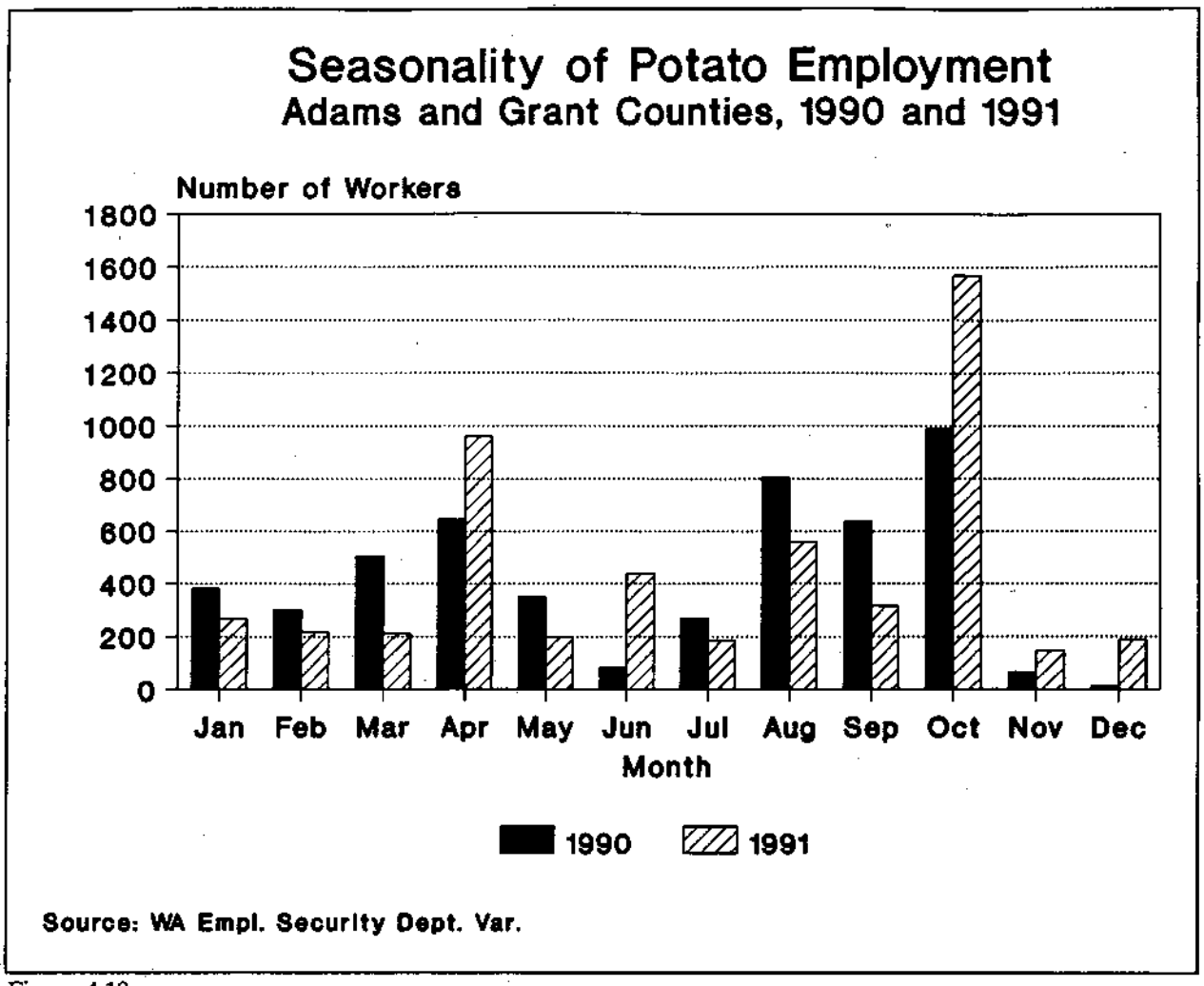

Figure 4.10

approximately one-fifth of the seasonal agricultural labor demand in potatoes, and at the period of peak harvest activity in the fields in 1990 some 127 seasonal agricultural laborers were required to support an average of 418 employees on the McCain Foods processing line. While it is difficult to establish agricultural/processing labor relationships with any precision, this implies that for every 100 potato processing line workers there will be another 30 seasonally employed agricultural laborers,[17] which, combined with the seasonal processing workers, means that 30 to 40 percent of the entire potato work force is seasonal.

[17] Oregon's Division of Employment Security estimates that the relationship between processing and field labor for all field crops is roughly 1:1, but there is considerable variation in labor requirements between labor-intensive crops, such as asparagus, and relatively mechanized crops, such as potatoes. Our rough calculations above place it at about 3:1 for processing potatoes. See Wood 1990:15.

Even this cursory review of the wage performance and employment of the frozen potato industry in the Mid-Columbia Basin suggests that the industry does not hold out significant prospects for, in the words of Washington's Economic Development Board, "raising the standard of living in these areas to levels currently enjoyed by the more prosperous regions of the state" (Washington State Economic Development Board 1988:3). Agricultural wages are low and concentrated in a minority work force; processing wages are higher, but the minority groups are concentrated in the lowest wage brackets; unemployment in processing is significant, if reduced from earlier decades; and the industry requires seasonal agricultural labor, which generates even greater unemployment.

The Industry in Othello

As the hand-painted heart on the town's welcoming sign proclaims, Othello, Washington, lies at the center of the U.S. Bureau of Reclamation's CBP. Between 1950 and 1970 the Bureau brought irrigation to 500,000 acres in the Big Bend area of the Mid-Columbia Basin. The project converted Othello and several other settlements from very small, dryland farming communities into irrigation towns expanded by an influx of farmers and workers in agriculture, food processing and related services.

Most of the costs of the CBP are still being paid by U.S. taxpayers and regional utility ratepayers. These outlays stem from the New Deal's commitment to large-scale irrigation development as a mechanism for creating economic opportunity in small farming communities like those in the arid hinterlands of the Mid-Columbia Basin. Othello is just such a community. As the welcoming sign suggests, it is a community-based example of the successes and failures of federal support for irrigation to achieve rural prosperity.

Othello today has about 5,000 residents inside the city limits and another 2,000 mostly Latino residents in adjoining unincorporated areas. It is now nearly ten times as large as it was before irrigation.[18] Almost half of the present population is from Mexico or from

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[18] Othello's historic population: 1950, 526; 1960, 2,669; 1970, 4,172; 1980, 4,552; 1990, 4,636. Data provided by the U.S Census Bureau and the city of Othello. Note the increase between 1950 and 1960, the decade in which federal water arrived.

Texas border towns along the Rio Grande.[19] They work in nearby fields and orchards and in the local potato processing plants.

In the Othello area, unemployment reaches 20 percent in winter months and per capita income is substantially lower than state averages.[20] In Othello, as in many irrigation-dependent communities in the Columbia Basin, seasonal workers are poorly housed and the town is surrounded by a fringe of ancient mobile homes. The population census of 1990 revealed that over 40 percent of the resident population lived in overcrowded conditions, four times the state average (Phillips and Associates 1991). Rents were relatively high and vacancies nonexistent. One third of the population was determined to be in need of housing assistance (ibid.). The infant mortality rate in 1988 was 29.2 per 1,000 live births, twice the state average.[21] And in 1990, the Othello school district spent almost 30 percent less per student than the state average in school districts of similar size, ranking 276th among the state's 297 school districts in expenditures per pupil.[22] Despite the very considerable potential tax base provided the community by the presence of two large potato processors and a large feedlot, the community's educational system is among the most impoverished in the state of Washington.

Municipal water services are problematic in Othello. City council members were recently "stunned" to learn that the water system could not provide adequate pressure for fire protection during periods of peak demand from the potato processing plants.[23] These plants directly consume two-thirds of Othello's annual withdrawal of 2,200 million gallons of water from a declining aquifer and withdraw additional amounts through their own wells. The Othello city council is currently in a quandary over the substantial expenditures needed

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[19] This was found in the Othello household survey discussed later in this chapter.

[20] For example, per capita income in Othello in 1986 was $14,066 compared to $17,784 for the state.

[21] Personal communication from the Columbia Basin Health Association, April 1992.

[22] In 1989, the Othello School District's net expenditures per student, without transportation, were $3,212 compared to the state average of $4,530 for districts of 2,000–2,999 pupils. (Washington State Superintendent of Public Instruction, Report No. 1041, FY 1989/90, K–12 programs.)

[23] "Othello Faces Water, Housing Investments," *Columbia Basin Herald*, 13 May 1992.

to upgrade the system and develop additional sources of groundwater supplies.[24] Water and air quality are similarly problematic. Washington DOE recently found the city's wastewater treatment system in "serious" violation of its NPDES permit.[25] In addition, for nearly two decades, Othello has been exposed to an ammoniac drizzle from the potato processing plants' wastewater disposal operations, located immediately outside the city limits next to a subdivision known locally as "Little Mexico." A nearby cattle feedlot adds its odors, dust, and flies to Little Mexico's ambient environment. Each year, Othello's potato processing plants—both owned by large multinational corporations—feed 150,000 tons of potato wastes to 30,000 cows in the feedlot, which in turn emit 25 tons of ammonia into the community's atmosphere annually.[26] For many years the residents of Little Mexico have, without effect, filed complaints and petitions with Washington DOE regarding air and water quality degradation by the processors and feedlot operators.[27]

The community is clearly in need of investments in housing and water infrastructure. In the early days of the CBP, the Bureau of Reclamation provided some community assistance in the area, but this was never substantial, consisting chiefly of assisting in the planning for the population increases induced by federal irrigation. In the 1950s and 1960s, state and federal government spent over $13,000 per capita on the area's schools, roads and other municipal services (Gibbs and Whittlesey 1976). Today the social overhead costs of irrigation remain high in the Columbia Basin, largely as a result of low-wage and seasonal jobs occupied by a Latino work force that has migrated to the region. This work force is increasingly settled and, given the relatively large families and special service needs, places heavy demands on the social infrastructure, especially education. A significant portion of this work force is tied to the Mid-Columbia Basin's potato industry.

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[24] Ibid.

[25] Correspondence from Don Nichols, DOE permit manager, to Ted Muscott and City Council, dated 20 February 1992.

[26] Personal communication from Lawrence Peterson, WDOE Air Quality Section, September 1993.

[27] See Case No. CS-92-02235-FVS, Washington Trout, United Food and Commercial Workers #1439 and Central Basin Audubon Society v. McCain Foods Western, Inc., U.S. District Court for the Eastern District of Washington, and accompanying aerial photos and affidavits.

Othello Household Survey

In the summer of 1991, the Columbia Basin Institute selected the community of Othello as a study site to examine at a local level the industry's socioeconomic costs and benefits. The town is relatively isolated in a small county with a population of less than 12,000. For nearly two decades, it has enjoyed significant employment opportunity in potato processing plants. Roughly half the population is now Latino, and—as the survey revealed—nearly one-third of all households in the community are employed for some part of the year in processing plants, while over 20 percent are chiefly employed in that industry. An irrigation district of the CBP maintains offices in Othello, as does the Bureau of Reclamation. A wildlife refuge, managed by the Bureau and created by irrigation overflow, lies nearby. Aside from potato processing and irrigation, there are no other industrial activities in or around the community.[28]

We conducted a household survey in Othello in 1991, to determine the distribution of wage income from food processing in the community and to ascertain the quality of the Latino labor force's participation in the industry. Over 266 household interviews were obtained out of the roughly 1,800 households in the area.[29]

Results of the survey revealed that 21 percent of all households in the community were chiefly engaged in food processing employment,[30] and that Latinos comprised 73 percent of those households, corroborating the results of the 1989 workplace survey in the Carnation plant in the same community. Median income for all Latino food-processing households was $21,000—only 65 percent of Washington's median household income of $32,275 in that year[31] and 70 percent of the median household income of $30,000 for

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[28] Seneca intermittently operates an apple processing operation for a few months in the autumn, which may employ as many as 250 seasonal workers. The plant did not operate in the 1991-92 seasons.

[29] See Appendix A for the survey methodology.

[30] A household was considered to be "chiefly engaged" in food processing if more than half of the total months worked by its members were in the food processing industry. A similar criterion was used to define farm labor households. There was little overlap between food processing and farm labor households, because only 5 percent of those surveyed reported income from both sectors.

[31] Personal communication from Jeffrey J. Jaksich, Labor Market and Economic Analysis Branch, Washington Employment Security Department, June 1993.

Table 4.1
Household (HH) Incomes, 1991

Type of Household	Median HH Income	Mean HH Income	Standard Error	N
OTHELLO				
Food Processing HH–Latino	$21,000	$22,796	1,745	41
Food Processing HH–Anglo	30,000	29,067	2,920	15
Food Processing HH–All	23,500	24,476	1,531	56
Farmworker HH–Latino	12,000	13,759	1,277	27
Farmworker HH–All	13,000	14,117	1,286	30
Other HH	22,000	25,206	1,256	145
All HH	20,000	23,588	917	231[1]
STATE OF WASHINGTON				
All HH	$32,275	--	--	--

Source: Othello Household Survey; Washington State Employment Security Department.
[1]Though questionnaires were completed for 266 households, complete income data were only available for 231 households.

Othello's Anglo processing households, as reflected in the survey (Table 4.1 summarizes these data). At $21,000 median household income, Latino processing worker households were representative of the general community of Othello, which reported a median of slightly over $20,000. Processing households, taken all together, reported a median of $23,500.

In contrast, the Othello households chiefly engaged in farm labor had median annual household incomes of $13,000. While wages are generally lower in agriculture, the higher incomes of processing worker households are also due to the longer season of work. Comparing household incomes to 1991 poverty levels and controlling for family size, we found that 62 percent of the Latino farmworker households and 17 percent of Latino processing households were below the poverty line.

Interestingly, very little difference was discovered between Latino processing and farm labor households in terms of duration of residence in the community: 80 percent of all Latino food processing households were resident in Othello four years or more, compared to 70 percent among farm labor households (Figure 4.11); 55 percent of food processing households were resident in the community eleven or more years, compared to 41 percent of farm labor households that were equally settled.

The chief difference between Latino farm and processing households in Othello lies in the degree of citizenship: 61 percent of Latino food processing households reported U.S. citizenship, while only 39 percent of Latino farm labor households contained U.S. citizens. This difference, combined with the finding that only 5 percent of households reported work in both food processing and farm labor, suggests that, contrary to the prevailing notion that seasonally underemployed farmworkers constitute a local labor pool for processing jobs, farm and processing labor comprise two separate working cultures within the Latino population, with mostly U.S.-born workers in the plants.[32]

While 21 percent of Othello households were mainly involved in processing work, an additional 30 percent of households reported having worked some part of the year in the industry, suggesting again that the industry requires the availability of a very substantial pool of seasonal workers. But of those households chiefly engaged in food processing work, 32 percent reported having collected unemployment in the last year, implying nearly one in three food processing households contained an unemployed worker at least some part of the year (see Figure 4.12). These unemployment rates were exceeded only by those of farm labor households, 47 percent of which reported having claimed unemployment benefits in the previous year, although unemployment is surely even higher among farm workers, since the undocumented immigrants do not qualify for unemployment benefits.

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[32] This interpretation is consistent with the report of a potato processing plant manager in Othello who related difficulties in importing plant workers due to the shortage of housing in the community. That is, the seasonally underemployed local farm labor force was not perceived as a labor pool for processing plant recruitment. It is also consistent with studies in other regions, which have found that packing house and processing plant employment is acceptable to U.S.-born Latinos, but seasonal agricultural work usually is not (See Kissam, García, and Runsten 1991).

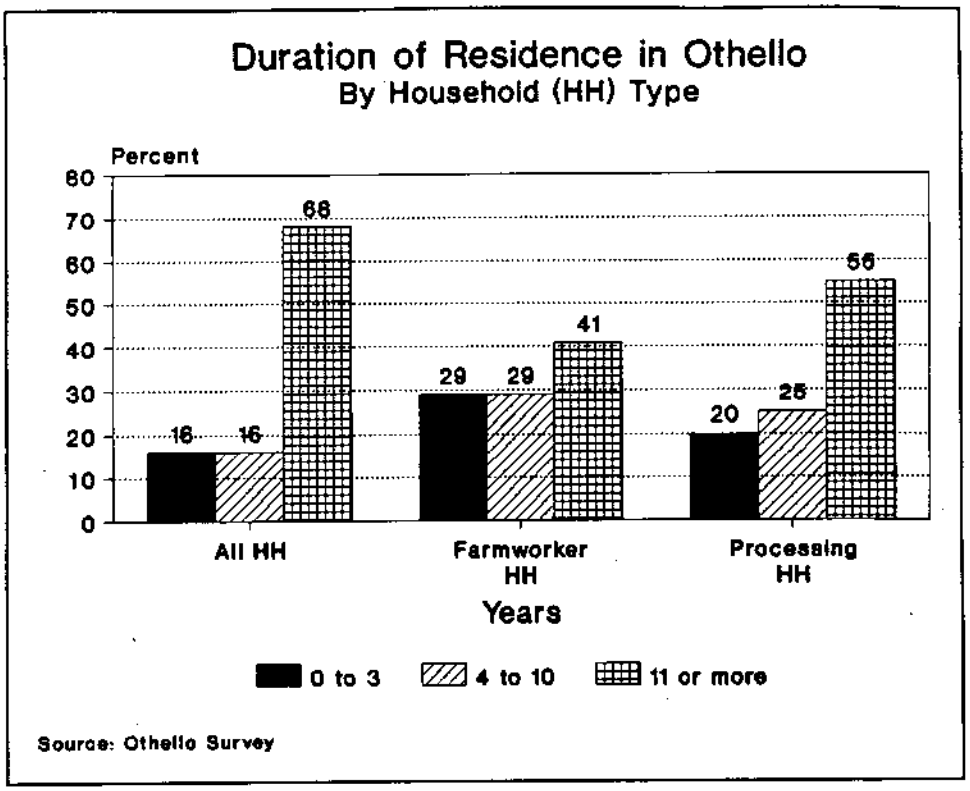

Figure 4.11

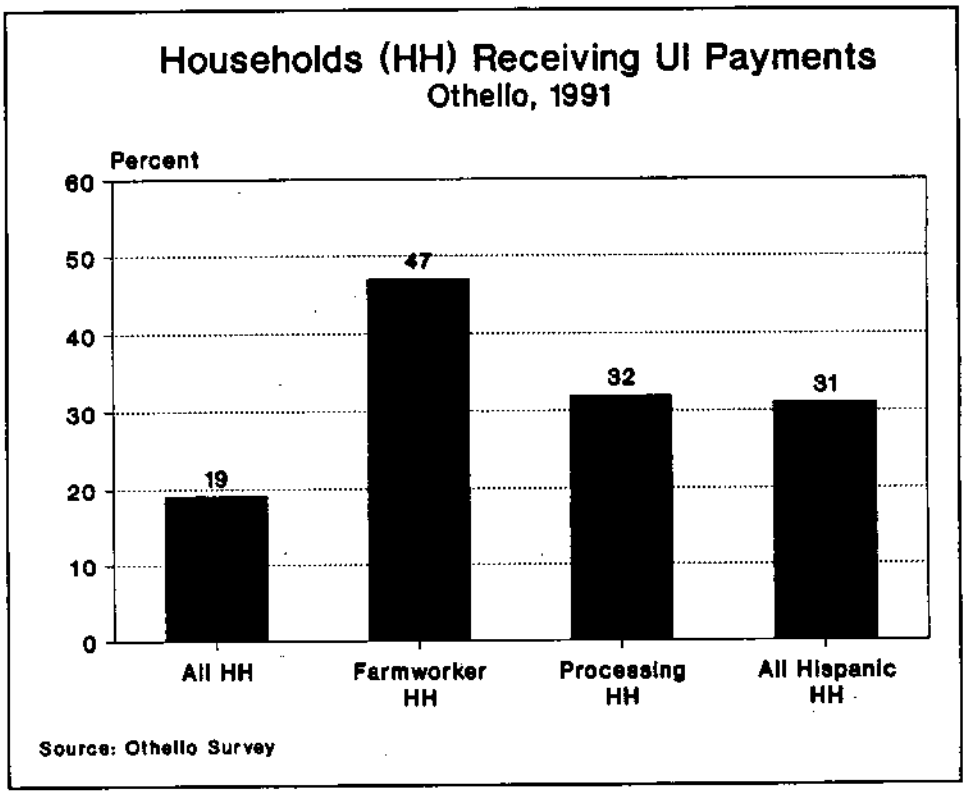

Figure 4.12

To summarize, Othello is chiefly a potato growing and processing community. Here, the Latino food processing households that have year-round jobs occupy a middle-income status, while the (mostly Mexican-born) seasonal farmworker and seasonal food processing households are at the bottom. The roughly $12 million annual payroll from the two potato processing plants, distributed over the one-third (600) of Othello's households engaged in full- and part-time work in the industry, provides the town's working class with only a low to moderate household income by state standards and generates considerable unemployment in the process, which is then subsidized by other sectors of the state's economy. This situation is even more pronounced in related agricultural employment, where incomes are still lower and unemployment more severe.

Because of their low household incomes and relatively large families,[33] well over half of Othello's Latino processing and agricultural workers are candidates for public housing assistance. They may not receive it in Othello, but nevertheless most cannot afford new housing without financing assistance (Phillips and Associates 1991). Only able to live in uninsulated conventional or mobile homes, many pay more than $250 a month in winter to heat a substandard house and nearly half pay over $150 a month (ibid.). As a result, many become eligible for energy assistance, another and more costly form of public assistance.

Despite their tenure in the community, many of Othello's Latino workers live in irregular and under-serviced subdivisions because the community lacks the funds, leadership, and political will to plan, tax and build adequate residences and water services for the potato-related work force.[34] The workers' families are exposed to the environmental effects of irrigation in the form of flooded septic systems and contaminated wells, and must

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[33] Mean household size in the Othello survey was 4.67 persons for farmworker households, 4.08 for food processing households, and 3.36 for other households.

[34] See Holland 1991. The author notes the city's unwillingness to plan and utilize its taxing authority to remedy infrastructure deficiencies: "There is a marked reluctance on the part of elected officials to even consider the use of financing methods which would require additional taxation" (p. 41). Interviewed in May 1992, the city's administrator, when questioned about the housing needs of the community, observed that the most pressing need was for "executive housing" (interview with R. Maestre, 12 May 1992). Other members of local government articulated the notion that Latino workers should be self-sufficient and eschew subsidy, an ironic viewpoint in the heart of the second most heavily subsidized federal irrigation project in the United States.

pay to form water districts and hook up to the municipal system—if access is possible—making further demands on household income.[35] The Latino work force has relatively large families, but there are few prospects for an expansion of employment in the processing industry, as noted above (BPA 1989). Many of the children of the Latino work force will be forced to emigrate to find employment or they will be unemployed, implying increasing social overhead costs in the form of welfare transfer payments, already high in the Columbia Basin's processing communities.[36] The community requires investments in education, housing, and basic water services infrastructure or, as one processing industry executive observed, "This town will be in the toilet in five years."[37]

State Capital Subsidies to Value-Added Processing: The McCain Foods CDBG Loan

The history of potato processing's evolution in the Mid-Columbia Basin does not reflect a shortage of outside capital but, on the contrary, appears to have involved sustained and continuing investment, as discussed in Chapter Two. This contradicts the public position taken by state government officials, who frequently portray the processing industry as beleaguered by extra-regional competition and onerous environmental regulation. According to a Washington Department of Agriculture official,

> "The business climate in Washington State for food processing has been dismal... A myriad of regulatory, economic and environmental issues continue to leave us in a position of also-rans when it comes to recruiting new investment and encouraging expansion of existing processing industries."[38]

Doubtless, it was in this spirit that in 1990, despite a housing vacancy rate of virtually zero in Othello (Phillips and Associates 1991), severe water supply problems attributable to current processing operations, and expansions by other potato processors in the region,

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[35] Where water districts have been formed to replace contaminated residential water supplies, as in parts of Little Mexico, residents report paying up to $80 monthly for water. (Interview with Irene Salas, June 1993.)

[36] Most such indicators are already well above state averages in most public assistance programs in area offices serving the Moses Lake-Othello, Pasco and Hermiston-Boardman areas in the Mid-Columbia Basin.

[37] Interview with Don Wilson, Carnation plant manager, 23 April 1992.

[38] "Governor Appoints McCain Official to Food Council," *Othello Outlook*, 17 November 1990.

Washington DCD awarded McCain Foods a subsidy in the form of a $5 million float loan to expand its Othello french fry production facilities. The money came from the state's share of HUD's CDBG funds. Over a two-year period, the loan was intended to provide the firm with a capital subsidy of approximately $400,000, which amounted to the difference between market interest rates and the discounted rate provided by the state agency.

DCD publicized the loan as being the largest subsidy of its kind ever granted by Washington—ten times larger than any previous loan. It was justified on the basis of a claim that 200 full-time jobs would be created by expanding the french fry production facilities in McCain's Othello plant. As it turned out, when McCain Foods was sued by a coalition of local citizen and labor organizations for violations of the federal Clean Water Act and DCD withdrew its loan, only 14 new positions were on record as having been added at the McCain Foods plant during the period the firm actually enjoyed the subsidy.[39] It had been estimated that expanding the plant would raise McCain's annual payroll from nearly $4.7 million to about $10 million.[40]

McCain Foods' expansion also elicited an additional $2 million in tax deferrals from the state. Moreover, as described in Chapter One, Washington DOE allowed the firm to continue operations in an unimproved waste disposal site previously abandoned by a competing firm.[41] By examining the decisions made by state and local government to justify using the $5 million of CDBG funds, we can identify the reasoning and assumptions behind DCD's assistance to the potato processing industry.

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[39] McCain Foods received the loan in the final quarter of 1990. According to 17 February 1991 correspondence between K. Spain, DCD, and M. Shelley, McCain Foods, 404 workers were employed in December 1990 and, based on industrial insurance reports filed with Washington State Department of Labor and Industries, at the close of 1991 a quarterly average of 415 workers had been employed, with 418 working in December 1991. (Communication from Al Spadoni, Washington State Department of Labor and Industries, March 1992.) However, it appears that 60 employees were added to McCain Foods' payroll in the quarter prior to receipt or confirmation of the state's subsidized loan, suggesting that the expansion of the plant was undertaken prior to and independently of the state subsidy.

[40] "Plant Loan Formalized," *The Othello Outlook*, 15 August 1990.

[41] Following a corporate takeover by Nestle's of Holland, and fearing prosecution under the Clean Water Act, Carnation's management decided to invest $10 million in a new wastewater treatment facility and abandoned the site: "We did not want to be the last ones out." Interview with Don Wilson, 23 April 1992.

Assumptions Made by the Washington DCD. A first assumption by DCD, consistent with the policy statements of the state's Department of Agriculture, was that without an incentive, McCain Foods would undertake expansion or new construction in another region. In 1992, McCain's was the world's second largest producer of frozen french fries, with 22 plants worldwide producing an estimated 2.5 billion pounds (Gibson 1992). In acquiring the Othello facility in 1989, McCain Foods also acquired 2,000 acres of leased irrigated land in Nebraska where the Othello plant's previous owner had attempted to develop french fry production facilities closer to Eastern markets. According to the justification developed by DCD, Nebraska had offered a more advantageous tax abatement package. Hence, Washington was compelled to offer McCain Foods a capital subsidy to offset the "Nebraska advantage" and encourage the firm to expand its recently acquired Othello plant.

The State of Nebraska is notable in this context in two respects. In the first place, Nebraska offers a tax incentive program second to none in its generosity to industry, so much so that Nebraska's tax incentive program has been described in a recent study as ". . . so lavish that it might be regarded as less a gamble than a giveaway.. . . By 2008, the state will have an aggregate twenty-year net loss of $18.4 billion, not including interest" (Strange, et al. 1990:60). In the second place, Nebraska is a graveyard of previous attempts by french fry processors to construct production facilities closer to Eastern markets. Various firms had come to Nebraska over the years in order to conduct trial comparisons of local production capability to those in other regions. The area has groundwater supplied by the Ogallala aquifer at depths of 80 feet, soils are sandy and fine for potatoes, and yields are said to be comparable to the Northwest. Nevertheless, no processing firm has developed processing facilities in Nebraska's potato growing areas.[42]

Washington's state government officials strain credulity in assuming that economic incentives in the amounts provided were critical to McCain Food's locational decisions in this instance. Washington's DCD ignored the far more significant advantages described in Chapter Two. These advantages are a direct result of considerable public investment in the

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[42] Personal communication from Gary Leever, Nebraska Potato Development Board, State Department of Agriculture, 5 May 1993. McCain Foods is reportedly transporting production from the 2,000 acres to a Manitoba plant.

Columbia Basin's cheap irrigation water and power and of federal policies favoring irrigated agriculture in the region since the 1950s.

A second notable assumption in DCD's justification of the McCain Foods capital subsidy is evidenced by the state's argument that "this will have a positive effect on the Hispanic population" because the addition of "full-time jobs will provide seasonal, migrant laborers an opportunity to settle permanently in the area. The wide fluctuation in unemployment figures. . . would then level out."[43]

Latino workers who have settled permanently in the area now make up nearly 50 percent of Othello's population. Over 30 percent of Othello's workers are engaged in food processing, yet the county continues to suffer fluctuating unemployment rates reaching as high as 20 percent. It is not immediately obvious how an increase of around 20 percent in the county's processing work force—represented by the projected 200 workers—would remedy seasonal unemployment. Moreover, our understanding of agricultural labor force and migration trends suggests that if seasonal farm laborers were to go to work in processing plants (which they generally do not) their old jobs will be filled by new migrants. We cannot expect new full-time processing jobs to result in fewer seasonally employed agricultural workers. Seasonality in the region's agricultural work is a structural constant.

All other things being equal, more full-time work in processing implies an increase in the absolute number of seasonal agricultural jobs associated with cultivating, irrigating, harvesting, transporting, sorting, and storing the increased commodity production required to employ an additional 200 processing workers. We have estimated the ratio between processing jobs and processed potato agriculture as approximately 3:1. In other words, for every three jobs in potato processing, one worker is seasonally employed (and unemployed) in producing the commodity. Since expanded potato production displaces field crops (wheat, corn, alfalfa), which utilize little seasonal hired labor, an increase in full-time employment in potato processing in Othello generates an increase in the number of seasonally unemployed farm laborers and processing workers in the area, *not* a decrease as DCD

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[43] Memo to Kraig Kushar from Dan Riebli, Washington DCD, 6 February 1990. See also *The Othello Outlook*, 17 January 1990.

supposed. And it is possible—assuming no increase in primary demand markets captured by the region's processors—that McCain Foods' successful expansion in Othello would cost some other Columbia Basin processing community 200 processing jobs. But the state apparently assumed that value-added processing of agricultural commodities would mitigate agricultural unemployment. This reasoning appears to have precluded consideration of how the new processing jobs might actually cause more rather than less unemployment.

A third assumption in the state's assistance to McCain Foods involves the city of Othello itself, to which the DCD delegated the responsibility for preparing an environmental clearance for the projected expansion of the processing facility, as required by the National Environmental Policy Act (NEPA). Specifically, it was the city's job to prepare for the project a finding of "no significant impact" under NEPA.[44] Errors and misstatements of fact aside, the city's finding was notable for two assumptions made concerning the projected plant expansion's effects on the community's water resources. First, the city assumed that because Washington DOE gave a permit to the plant's wastewater disposal operation, no environmental contamination would occur as a result of the projected and substantial increase in operations. Second, the city assumed that because the processing facility usually pumped most of its water supplies from its own wells, there would be no adverse impacts on the city's own municipal supplies.

In fact, there was evidence in DOE files that the processing plant's wastewater disposal operations had for several years been contributing to ground and surface water contamination in the Othello area.[45] In 1990, McCain Foods' wastewater disposal operations were among the region's major sources of nitrate contamination of groundwater by a potato processing plant and were additionally remarkable for their degradation of surface waters in the vicinity of a national wildlife refuge.[46]

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[44] Robert Maestre, city of Othello administrator, "Finding of No Significant Impact and Determination of Non-Significance," 20 February 1990.

[45] See Case No. CS-92-02235-FVS, Washington Trout, United Food and Commercial Workers #1439 and Central Basin Audubon Society v. McCain Foods Western, Inc., U.S. District Court for the Eastern District of Washington, and accompanying aerial photos and affidavits.

[46] Ibid.

More significantly for the city of Othello's assumptions in this instance, nearly all of Washington's permitted potato processing waste disposal operations are producing substantial nitrate contamination of groundwater.[47] That the McCain Foods plant had a waste disposal permit from the DOE's offices for Eastern Washington in no way ensured that ground- and surface water contamination was not occurring. Had the city of Othello requested information from the DOE's permittee files, evidence of McCain Foods' continuing contamination of the community's ambient waters would have been forthcoming and a finding of "no significant impact" would have been impossible.

Similarly, a cursory examination of the hydrology of the basalts upon which the city's water supplies depend would have made such a finding extremely tenuous. McCain Foods' considerable water consumption, like Carnation's, is being drawn from the cone of depression in the deep basaltic aquifer near Othello, which for several years has been declining due to over-pumping for agricultural, municipal, and industrial use. Just because the processors and local irrigators have permits to withdraw large quantities from the aquifer does not mean that the aquifer can continue to support current rates of withdrawal. The DOE has for two decades been pursuing a policy of aquifer mining in the Othello area, anticipating recharge by new withdrawals from the Columbia River's mainstem by the Bureau of Reclamation.[48]

Had Othello officials understood the environmental impact of expanding the processing plant and how this would affect compliance with NEPA, they might have recognized an opportunity to review their serious water supply and contamination problems with the processor. But city officials assumed that because the processing facility held wastewater disposal and groundwater withdrawal permits from the state, expanding the McCain Foods facility would have no adverse environmental impact.

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[47] We analyzed the extent and magnitude of these environmental externalities in Chapter Three.

[48] Personal communication from Ted Olsen, manager of the Water Resources Division, Department of Ecology Eastern Office, June 1992. See also Olsen 1989. Of the 87,000 acres proposed for new irrigation development by the Bureau of Reclamation, 37,000 are currently reverting to dry land due to aquifer depletion, i.e., over 40 percent of the proposed new withdrawals from the Columbia River's mainstem are destined to replace waters depleted by Washington's policy of aquifer mining. See USBR 1989.

Based on the underlying assumptions just described, using $5 million in CDBG funds to help a multinational corporation expand its potato processing capacity in Othello was misconceived. If either unit of government had concerned itself with the sustainable economic development of the area—or even had a plan to accommodate the expanding Latino worker population—they should have considered how the town would provide additional housing and resolve the water problems that would be generated by the expansion.

It seems extremely unlikely that the Othello area would have been able to provide housing and water supplies for 200 more plant workers and 70 more farm laborers with their families, given the housing shortage in the town. Furthermore, DCD projected a 100 percent increase in McCain's payroll through the addition of another french fry processing line in the plant. Had this actually transpired and generated a corresponding increase in the plant's consumption of groundwater, the combined increase in industrial and municipal withdrawals would probably have precipitated a crisis for the local water system. The theoretical expansion was a practical impossibility for the community.

Conclusion

Capital subsidies and financial concessions to the frozen potato products industry in the Mid-Columbia Basin will neither advance rural incomes toward parity with those in urban areas, nor reduce rural unemployment—the stated goals of states' key-industry strategies. Offering financial concessions to this industry in areas already distressed by high unemployment levels is a singularly ineffective, if not contradictory, means of reducing unemployment. If one combines the seasonal potato production labor force with the seasonal processing labor force, then 30 to 40 percent of the mainly Latino potato workers will be seasonally unemployed. As applied to the frozen potato products industry in the Columbia Basin, the "distressed areas" strategy perpetuates rather than diminishes unemployment. Moreover, it is doubtful whether the local subsidies have any effect on processors' investment decisions. In all probability, McCain Foods would have expanded the Othello plant without the state's financial concessions.

The "Value-Added Regional Strategy" pursued by the state of Oregon in north central Oregon's potato-growing Umatilla and Morrow counties appears to have fared little better. This also was the subject of much fanfare—and backed by $1,080,000 in state lottery revenues, $336,400 from the CDBG Program, $350,000 from the Special Public Works Fund, and $850,100 from other federal sources. In 1989, the state's Employment Security Division (ESD) predicted the creation of "between 732 and 1,077 jobs in the region over a period of 3 to 5 years" as a result of the strategy's implementation.[49] The idea was again to subsidize capital investment in value-added processing industries. The funds that were expended went to the Lamb-Weston plant in the Port of Morrow and a variety of small projects. But four years later, in the first quarter of 1993, Oregon's ESD could find only 75 jobs attributable to these public investments in value-added agriculture and processing in Morrow and Umatilla counties.[50]

Certainly there is much in this account to suggest that direct public subsidy has not, in itself, been effective in inducing growth in the potato processing sector in the Mid-Columbia Basin. Moreover, the growth of the industry has been problematic, at least for communities like Othello. Clearly, the community of Othello is in need of various forms of community development assistance. In contrast, it is by no means clear that McCain Foods of Canada required capital assistance from Washington's DCD.

An obvious incongruence exists between the relatively small amounts of capital with which the states propose to leverage investments of much greater magnitude in the processed foods industry, particularly in the dominant frozen potato products sector. McCain Foods, for example, reported expenditures of over $35 million in 1990 and another $8 million in 1992 merely in the retooling of french fry lines in the Othello plant. Investments of similar magnitude have been made recently in the region by Universal Fine Foods, Simplot, and Nestle's Carnation. It appears unlikely that expansionary investments of such magnitude by multinational corporations would in any way be determined by direct capital subsidies such as those provided by short-term infusions of CDBG funds in amounts

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[49] "Morrow/Umatilla Multi-County Strategy Approved by Governor," press release, 14 March 1989.

[50] Personal communication from Gerald Wood, Oregon Employment Division Economist, 28 May 1993.

of $300,000 to $400,000 or, for that matter, tax deferrals in the $1 million to $2 million range.

But conventional wisdom about regional economic development policy contends that it is a primary role of state and local government to provide various forms of public assistance to a dominant form of agricultural value-added processing. Conventional wisdom also holds that the expansion of manufacturing wages in agricultural communities mitigates economic distress and that the environmental effects of such expansions may be accepted. These assumptions effectively preclude alternative approaches to local and state government's role in community and economic development in the Mid-Columbia Basin.

While key-industry strategies and distressed-areas policies in support of value-added processing in Columbia Basin communities do not produce wage labor benefits sufficient to elevate workers' household incomes above the low to moderate range and do not reduce overall unemployment, they do serve the purpose of increasing residual income to irrigated agriculture, transportation, services and processing itself, all sectors clearly benefitting from the evolution of the frozen potato products industry in the Columbia Basin. In analyzing the distribution of benefits to be expected from irrigation of the remainder of the Bureau of Reclamation's CBP and Horse Heaven Hills, Findeis and Whittlesey disaggregated total projected income into two components: wages and residual income (1982). They demonstrated that all projected increases in income to wage labor—of which farm and processing workers received the smallest portion—would be considerably less than residual income to capital and management, which was found to be heavily skewed toward processors, farmers, and the local trade and services sectors. Very little wider regional distribution of benefits could be discerned.

Similar disproportion in benefits can be shown to be at work in the case of Othello's potato processing wages. Although payrolls of around $12 million are paid annually to 600 Othello households—providing an average distribution of $20,000 per household—residual income returns just to local potato growers can be estimated as close to $4 million, providing approximately 50 farming operations with a return to capital and management of

$77,000 each.[51] The processors profit even more: McCain Foods, in applying for state subsidy, estimated that profits would be increased by $8.5 million in the third year of operations in the expanded Othello facility.[52] Finally, fast-food firms probably profit most of all, as french fries have traditionally been among their most profitable items (Gibson 1992).

Doubtless, it is for such reasons that states' departments of agriculture have historically been staunch supporters of value-added economic development strategies in rural areas. Though public support of the potato processing industry as a mechanism for the economic revitalization of poor Columbia Basin communities and the reduction of unemployment is an absurdity as a strategy of *community* development—since just such development created the poor communities in the first place—it may be seen nevertheless to serve the purposes of well-established economic interests in the Columbia Basin, primarily irrigated agriculture and potato processors.

The basic flaw in states' rural economic development theory and practice in the Columbia Basin is evident in these disparities between the rhetoric of key-industries and distressed-areas strategies and the realities of effects in communities dominated by the frozen potato products industry, such as Othello. It simply comes to this: increasingly scarce public funds—in the form of capital subsidy and tax concessions—are being unnecessarily provided to an industry that generates external social problems, problems that in turn require public remediation with those same scarce public funds. It should be obvious that a community "in the toilet" has little economic development potential. If the public funds are not spent on education and housing and water infrastructure now, more will be required in the future, when the potential tax base provided by the industry may not be so broad and the costs of remediation will surely be higher. The industry, in its political dominance and capacity to influence state and local governments with ideas of job creation and multiplier

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[51] Carnation and McCain Foods will purchase at least 12 million cwt. of potatoes, the product of 22,642 acres, assuming per-acre yields of 530 cwt. Assuming an average potato farming unit of 450 acres, 50 farm operators will each receive average net returns of $76,950, assuming $171 per-acre return to management and risk on a price received of $5.00 per cwt. Estimates are based on Hinman, et al. 1992 and recent acreage and yield data.

[52] Memo to Kraig Kushar from Dan Riebli, Washington DCD, 6 February 1990.

effects, takes for itself the few public resources with which communities such as Othello might mitigate the externalities and plan for an economic life beyond the french fry.

In these respects, the disarray in states' economic development policy in the Mid-Columbia Basin resembles the disagreement in Nebraska state policy circles arising out of similar criticisms of that state's "growth poles" strategy. This strategy has generated most controversy as it has been applied to rural meat-processing towns where Iowa Beef (IBP) has captured substantial public subsidy and tax abatements. Assuming the town would benefit from job creation provided by the arrival of the meat processor, officials in Lexington, Nebraska, found that the "unexpected result is a net gain in poverty and expanded demands for understaffed and underfinanced health and social services, and in the need for expanded new education programs and expanded police protection" induced by the importation of a low-wage, Latino work force (Hackenberg, et. al. 1993). In response to these outcomes, Nebraska has begun experimenting with a new theory of rural economic development that starts by building from the bottom up with investments in "human capital and technical and financial assistance to small business, rather than from the top down with the capture of a key industry" (ibid.). In the Mid-Columbia Basin, the question which must first be answered is who has captured whom?

Chapter Five

CONCLUSIONS AND POLICY RECOMMENDATIONS FOR SUSTAINABLE DEVELOPMENT

Rhetoric Versus Reality

A culture of dependence on continuing public assistance appears to have evolved in the Columbia Basin. The values of the small community and the small farmer are frequently invoked to justify increased public assistance to an industry that has come to be dominated by multinational corporations. These corporations enjoy the benefits of a massive federal investment in what was intended, at least during the CBP's political conception in the 1930s, as a means of creating economic opportunity for a disadvantaged class of people. In this respect it is interesting to recall Roosevelt's words in initiating the CBP:

> There are thousands of families in this country. . . who are not making good because they are trying to farm on poor land, and I look forward to the day when the valley is dammed up to give the first opportunity to these American families who need some good farmland in place of their present farms. They are a splendid class of people and it is up to us as a nation to help them live better than they are living now.[1]

Today, there is a disparity between the reality of the rural industries, such as potato processing and large-scale irrigated agriculture, and the rhetoric of local spokespersons demanding continued subsidy in the form of more of the Columbia River's water and more public funds with which to develop it. In 1993, the language of the Boardman Chamber of Commerce invoking the values of the struggling agricultural community and the small farmer rings hollow when applied to requests for public resources to permit corporations like ConAgra to defer capitalizing environmental protection measures, or to reward aquifer mining by Boeing Agri-Industrial Corporation and subsidiaries of insurance companies with income transfers paid for by the region's utility ratepayers.

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[1] *The Wenatchee Daily World*, 4 August 1934.

Neither is such rhetoric persuasive when held up to the realities of community life in processing towns like Othello. There, the great majority of the agricultural and food processing work force is Mexican-American or Mexican immigrant, often unemployed a significant part of the year, some badly housed, a significant percentage with incomes below the poverty line, and most segmented into the lower levels of the social hierarchy of the industrial agricultural towns. These workers, who might have some justification in seeking public subsidy, are the ones no one is looking to subsidize. Over 45 years ago, Walter Goldschmidt saw clearly that agriculture was changing and that public policy needed to abandon the ideology of family farming to change with it:

> Industrial agriculture brings an urbanized society, and industrialization is taking over the rural scene. But the kind of urban society that exists in the future depends upon the agricultural policy that develops. . . If we continue to promulgate laws based upon an outmoded and unrealistic stereotype, our rural communities will be peopled with unstable and insecure workers, spotted with rural slums, broken by class schisms, and devoid of those democratic qualities that have served rural America in the past (Goldschmidt 1947:272–273).

The concentration of farming, the spread of irrigation, the increase in more labor-intensive cropping patterns, the growth of food processing, and the recourse to an imported Latino labor force are all leading the Columbia Basin toward the polarized industrial agriculture that Goldschmidt found in Arvin, California, and that we find today in a growing number of areas that stretch from Florida to northern Mexico. Public policy needs to be brought in line with this reality and its motivating assumptions appraised.

As applied to the frozen potato products industry in the Mid-Columbia Basin, the assumptions underlying state development policy examined in this report are invalid. There is little reality to the threat that the industry will go elsewhere. In fact, our analysis indicates that the industry can internalize some of the socioeconomic and environmental costs it currently imposes on the region. The region's competitive advantages in the production, storage and processing of potatoes explain why the Mid-Columbia Basin and Snake River processors have evolved an industry that accounts for 80 percent of the U.S. pack of frozen potato products. Given the magnitude and continuing nature of investments

by multinational french fry processing firms in the Columbia Basin, public subsidy and other concessions can hardly be justified as a means of inducing industry growth in the region. Since all of the major players are heavily invested in the region, requiring them to internalize externalities will affect them all alike and it will not be a basis for competition among them. The current lack of evenhandedness in regulations across state lines, and the lack of consistency in their application within states, is exactly the sort of unequal treatment that needs to be avoided.

The socioeconomic effects of the industry's presence in the Mid-Columbia Basin are mixed. While it is true that the equivalent of several thousand full-time jobs are provided for a largely Latino work force in processing plants at wages considerably above those in agriculture, the industry also generates seasonal unemployment in the plants and in the fields where the commodity is produced. The resulting low household incomes among ethnic minorities in small communities ill-prepared for population growth creates social overhead costs, which tend to degrade the quality of life in processing communities. Low levels of investment in community infrastructure in processing towns, coupled with these towns' dependence on an industry exhibiting slow employment growth, places these communities at a substantial disadvantage in providing future employment for their increasingly settled population of Latinos.

An even greater set of external costs generated by the production and processing of frozen potato products exists at the community level in the industry's impacts on water resources in settled areas dependent on groundwater for residential, municipal and industrial supplies. For two decades, states have failed to protect groundwater from depletion and contamination. Now, some of the Columbia Basin's communities and residents will pay more and probably will require public assistance in order to secure safe and reliable water supplies. Households dependent on residential wells—most notably Latino workers—are faced with unsafe drinking water supplies and considerable expense in order to secure other sources. Production and processing of potatoes and other crops are directly responsible for this contamination and growers and processors may ultimately be held liable for the costs.

Policies that use scarce state and federal funds to provide capital subsidy and tax abatements to multinational processing firms ultimately fail to mitigate the socioeconomic

and environmental impacts of the industry on Columbia Basin communities. State community development agencies, with their limited funds and abilities, might better attend to the problems of the communities rather than attempting to intervene in such areas as the potato processing industry's locational decisions. Demands from processing industry associations for further tax abatements and various forms of regulatory relief are chiefly the desiderata of a highly competitive industry exercising its considerable political influence for purposes of cost reduction.

It is important to emphasize that these conclusions do not extend to public supports for other forms of value-added processing in the Mid-Columbia Basin, particularly efforts by local farmers seeking to diversify cropping opportunities through locally initiated processing operations. Cases in point include technical and financial assistance projects like that of Washington State University's Food Science and Nutrition Food Processing Specialist, or the Port of Pasco's investments in treatment facilities designed to develop specialty-market processing operations in cooperation with local growers.

In the broader context of the regional policy issues concerning the future management of the Columbia Basin's water and hydroelectric resources, there is an inescapable irony. A regional system of federal subsidy, expanded during the New Deal to provide a better life for a distressed class of small farmers and rural residents, has evolved into a mechanism for creating a new rural underclass, impoverished communities, and degradation of the very water and public power developments upon which the entire system depends. The current state of water resources in the Columbia Basin, in so far as it affects the viability of municipal and industrial supplies, is politically compelling. It now places the burden of additional hydropower opportunity costs on the fiscally troubled BPA and the region's utility ratepayers. The failure to enforce water quality and sustainable yield standards for groundwater use has provided the industry with unwarranted subsidy in the form of avoided costs and artificially cheap agricultural commodities and has led to significant new losses in the region's hydroelectric base. And while it is true that some of the Columbia Basin's surviving small farmers have benefitted from the commodity market created by the processing plants, it has been at the price of social and natural resource degradation, which may ultimately threaten their own existence in the Columbia Basin.

The policy challenge is to devise some means of restoring the Columbia Basin's water resources and wildlife, rehabilitating its communities, while protecting what remains of the region's economic advantage provided by the Columbia River's hydroelectric capacity, as well as protecting the interests of all of its rural residents. It is in this spirit that we offer a few policy conclusions.

Public Policy Recommendations

Based on the analysis presented in this report, we have developed policy recommendations in four specific areas.

States' Tax Abatement Policies. Tax abatement policies, such as Washington's, that are based on criteria related to unemployment levels require more sophistication and revision. This is especially obvious in the case of an industry, such as frozen potato products, where unemployment levels are partly a function of the industry's presence. In the small communities of the Mid-Columbia Basin, expending scarce state and local revenues on the producers rather than on the communities compounds the effects of the decline of federally funded rural development programs.

Short of their elimination entirely, various proposals for amending tax abatement policies appear to have merit. Some portions of the abatement could be recaptured for specific infrastructural investments by requiring the corporate beneficiary to spend a percentage of the funds on industry-related problems. For example, funds might be invested in improved housing, water supplies, environmental protection, or education. Such conditions have been proposed by the Texas Center for Policy Studies in Austin (Lewis 1992). Another approach, recently proposed in the Washington State Labor Council's Social Compact Bill of 1992, is to place socioeconomic, conservation, and environmental protection conditions upon the recipients of such abatements. Clawback provisions, where the recipient of subsidies is obligated to repay them for non-performance or flight, are also possible

measures to ensure compliance with employment and other goals.[2]

In their present form in Washington and Oregon, such abatements do not give the communities of the Mid-Columbia Basin the financial means to mitigate the social and environmental externalities of the frozen potato products industry. Certainly there is no basis for additional concessions as recommended in the legislative reports discussed in Chapter One. The significant competitive advantages offered the industry by the current agricultural infrastructure in the Columbia Basin do not require enrichment at state and community expense. And communities such as Othello need to reconsider their taxation policies toward the industry to ensure that the industry is contributing to resolving local impacts.

Rural Economic Development Programs. The use of the economic development set-aside in HUD's CDBG Program has been the subject of frequent criticism, based on examples across the country similar to Washington's McCain Foods venture in Othello. Given the need in growing rural communities for water infrastructure improvements and the decline of EPA-funded programs, there are compelling reasons to restrict CDBG funds to socioeconomic and programmatic categories that benefit the most exposed population, those least able to afford the deteriorating community services, as exemplified by conditions in Othello. As the National Association of Governors has stated:

> Public subsidies should be in the form of investments in people, resulting in a better educated and skilled work force, and in communities, by developing the physical and social infrastructures that are prerequisites of healthy economic development. Although such investments may be tied to the location or expansion of an individual company, the improvements in the work force and community should not be wholly dependent on the fortunes of one business and should be viewed as assets for other businesses that locate in the community. (National Association of Governors 1993:7)

As analyzed in this report, the key-industry strategy for rural economic development in the

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[2] "The business community has an obligation to deliver the promised benefits (e.g., investment, jobs, and payroll) in return for state development subsidies. The state owes it to its citizens to ensure that all development agreements include provisions for recouping subsidies when businesses fail to meet this obligation." (National Association of Governors 1993:7)

Mid-Columbia Basin has been ineffective. Until now, the strategy has assisted large corporations whose interests are best served by the limited cropping patterns characteristic of the Mid-Columbia Basin. In its place, we recommend a value-added strategy targeted at a greater diversification of production in the region. Support of agricultural processing of crops with labor demands complementary to the dominant crops of the area would assist growers' cooperatives or local entrepreneurs seeking new market niches and might increase future employment prospects.

While the more targeted development of diversified agricultural production and value-added processing opportunities is a natural and desirable policy direction for this region, it is by no means clear that local and state governments possess the capacity to undertake such a program with reasonable prospects of success. As the examples in this report have shown, these agencies have reacted to pressure from influential groups of established economic interests and failed to analyze properly either the markets in which they chose to intervene or the populations of workers whom they purported to serve.

If such a concerted effort were to be undertaken in the Mid-Columbia Basin, it would require a sophisticated market analysis and inventory of cropping and processing opportunities. Such a study was recently conducted in Texas: opportunity industries were identified, a comprehensive plan developed, and incentive programs designed (Muller 1992). Of particular interest in the Columbia Basin is the existence of unused processing capacity in the existing plants, both in terms of labor and capital. The industry could provide a genuine service to the region by working with local growers to develop arrangements for processing alternative commodities in underused plant inventory.[3]

Conservation of the Columbia Basin's Water Resources and Hydroelectric Base. BPA's revenue base is directly affected by new withdrawals from the Columbia River. This is true even at the relatively low-head locations in the Oregon reaches of the Columbia River, as demonstrated in this report. The Department of Interior's exemption of waters behind the

[3] Personal communication from Richard H. Dougherty, Food Processing Business Development Specialist, Department of Food Sciences and Human Nutrition, Washington State University, Pullman, 20 May 1993.

dams from Bureau of Recreation acreage limitations in 1982—a move the Washington State Grange was unable to prevent—has effectively left the agencies responsible for the system's management unable to capture the hydropower opportunity costs of allowing the larger corporate farming operations to use its water. These users are responsible for much of the aquifer depletion in some areas of the Columbia Basin and the consequent appeals for surface water replacements. There is no incentive—other than energy costs—for large corporate irrigators and processors to conserve water if it is to be available without cost or limit from the Columbia River. At present, the only check is through litigation over wild-fish issues under the Endangered Species Act.

The various congressional reviews of regional policy generated by the current situation in the Columbia Basin provide an opportunity both to restate the system's intended purposes in terms of rural economic opportunity and to provide for a more sustainable exploitation of resources. In this context, the issue of water pricing should be raised again. The alternative appears to be the continued hemorrhaging of the region's hydroelectric base for the benefit of a few.

Groundwater Quality. The states' capacities to protect groundwater quality in the Columbia Basin are notoriously subject to the climate of opinion in state legislatures. The EPA should review its role with respect to the states' administration and enforcement of waste discharge permits in ground applications. Compared to Oregon, the absence of uniform requirements in Washington gives segments of the frozen potato products industry opportunities to avoid costs. This penalizes processors that try to comply with the requirement that groundwater be protected. The EPA could develop a standard, nationwide permitting and monitoring procedure for the industry and make adherence a condition for funding state-administered programs. Non-point source amendments to the Clean Water Act, currently under consideration in Congress, would affect irrigation runoff and might have a salutary effect on processors' compliance with groundwater quality protection standards.

The apparently widespread nitrate contamination of drinking water supplies in the Mid-Columbia Basin requires further study. Steps should be taken to restore contaminated residential well supplies and protect the deeper basalt aquifers from further contamination.

Because nitrates in drinking water are associated with cyanosis, or blue baby syndrome, the extent of the threat posed to the health of the population requires further study. By virtue of its demographic composition and its settlement patterns in the Columbia Basin, the Latino community appears to be most exposed to such health risks.

The use of toxic agricultural chemicals known to infiltrate and persist in groundwater, such as atrazine and aldicarb, should be halted on porous soils above perched aquifers. Producers who persist in such applications should be held liable in the future for the costs of replacing drinking water sources that become polluted beyond allowable limits.

The Bigger Picture

The policy issues raised in this report must be addressed at several levels. At the local level, there are the economic, social, and environmental impacts of the potato processing industry on communities in the Mid-Columbia Basin. Though intensive rural development activities such as potato processing generate a stream of economic benefits, there are also social and environmental costs. Expanded potato growing and processing, as currently practiced, means more agricultural chemicals, more nitrogenous fertilizers, and more nitrogenous wastewater dumped onto the soils of the region, resulting in increased groundwater pollution. It means more labor is needed in the region, some of which is seasonal and most of which is now Latino. This labor force crowds the towns and strains social infrastructure and services. The growth of the industry thus has social and environmental externalities that are not currently included in the price of french fries. This reality is the main focus of this study.

At a regional level, the expansion of the potato industry requires expansion of the public subsidy that undergirds it: more subsidized irrigation, more subsidized electricity. Unfortunately, with the growth of the region's urban areas, the Columbia Basin's federal hydroelectric system is becoming a zero-sum game in which additional surface water appropriations and other forms of hydroelectric subsidy for the irrigation and processing of products such as french fries generate costs for other segments of the economy. Additional water appropriations to expand irrigated agriculture and processing in the Columbia Basin, to replace exhausted groundwater supplies, or even to mix with nitrate-polluted groundwater,

will transfer substantial hydroelectric and related environmental and socioeconomic costs from irrigated agriculture to other segments of the regional economy and the U.S. taxpayer.

The potato industry projects a doubling of acreage by 2015 in the Columbia Basin (USBR 1986). It is remarkable how discussion of this expansion in the region focuses only on the presumed economic benefits of growth without considering the accompanying costs. As exemplified by the McCain example discussed above, the industry is viewed by policymakers as a boon, but somehow fragile and in need of coddling and further subsidy. By contrast, this report documents that the industry is growing rapidly of its own accord, incurring not only social and environmental costs, but requiring large transfers of income from other sectors of the regional economy through its use of water and power resources and a partly seasonal labor force.

Finally, there is the larger national—or even international—level of policy issues. The growth of the frozen potato industry is chiefly the result of the growing production of frozen french fries for McDonald's and competing fast-food restaurant chains. Just as the processing tomato industry in California has expanded along with demand for ketchup and pizza sauce, so the processing potato industry in the Pacific Northwest is really a creation of McDonald's.

McDonald's settled on Russet Burbank potatoes, which were grown in the Northwest, as the best for french fries.[4] They wanted uniformity, however, and so became involved in encouraging certain cultural practices in potato production, such as increased fertilizer use.[5] They also wanted to use Russets year-round, but these were not available in the summer because they could not be stored that long after the fall harvest. After considerable experimentation, a frozen french fry was developed that satisfied McDonald's, and they approached Lamb-Weston about producing it for the summer months. However, that firm did not want to take the risk on this new process, which encouraged Jack Simplot, a large potato grower in Idaho, to propose to McDonald's that they switch from fresh to frozen

[4] This discussion of McDonald's is based on information from the corporation reported in Love 1986.

[5] In 1962, McDonald's "...began influencing Russet growers to follow planting and fertilizing practices that would yield potatoes with high solids..." (Love 1986:123).

french fries on a year-round basis. Simplot began production, and the industry was off and running in the 1960s as other fast-food chains followed suit.

Before McDonald's shifted to frozen french fries, fresh potatoes were peeled, cut up, washed, and blanched in the individual restaurants every day, occupying one person throughout most of the operating hours. The introduction of frozen french fries eliminated this job and shifted it to a processing plant, where it could be carried out on a massive scale with much higher productivity of labor. It also cut transport costs, because processed french fries were much lighter than the equivalent amount of raw potatoes. But it raised electrical requirements to maintain the product frozen. Of most consequence for earlier potato-producing regions, it tended to concentrate U.S. potato production in the Northwest, as more plants were built and consumption of potatoes shifted from fresh to frozen.

Glenn Zepp and his co-authors, in a 1985 paper, singled out tomato processing in California and potato processing in the Northwest as two prime examples of the regional concentration of agricultural production that resulted from the cumulation of government policies and technological change (Zepp, et al. 1985). They attributed the location of potato processing in the Northwest to: (1) technical developments in agriculture, such as chemical and biological pest control and new mechanical technology that created scale economies of production; (2) developments in storage technology, processing technology, and transportation infrastructure; and (3) the opening of newly irrigated land and the development of improved irrigation techniques (Ibid.:213).

Clearly, many of these technological and infrastructural developments were the direct result of government policies in such areas as agricultural research and highway building. In particular, federal reclamation policy provided a large subsidy to the construction of dams for irrigation and electricity in the Pacific Northwest. This subsidy provided the foundation for the growth of the processed potato industry in the region. In this sense, U.S. taxpayers, through the federal government, invested in the water and power that is used (among other things) to produce McDonald's french fries. Reclamation policy was not only a rural settlement policy, but ultimately also a cheap food policy, and nowhere is that clearer than in fast-food restaurants. French fry consumers do not pay the full cost of the product because the cost of the water and power used in its production is often heavily subsidized

and because certain environmental and social costs resulting from its production are not internalized by the industry.

It may be appropriate to use this stream of federal subsidies to produce cheap food for the mass of people in the country. But it seems inappropriate to do it by draining and polluting water resources or ignoring the social costs engendered by such development. Practices used to grow processing potatoes in the Northwest—the heavy chemical and fertilizer load, the large use of electricity for sprinkler irrigation—did not fall from the sky, but are the result of McDonald's push for uniformity and the consequent need for controlled conditions.

Levi Strauss, Esprit, Patagonia, and other companies are now leading the way to more environmentally benign cotton and textile production. McDonald's, Burger King, and Wendy's could do the same with their food products, starting with potatoes. By resolving the environmental and social externalities created by the industry in the Columbia Basin, a more sustainable form of production could be created, federal regulation avoided, and a greater justification created for continued appropriation by the potato industry of the public subsidy embodied in the water and power resources.

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Appendix A

OTHELLO HOUSEHOLD SURVEY METHODOLOGY

The household sample was drawn from the 1990 census map for the Othello division. The sampling frame consisted of the census tracts 9504 and 9505 plus the Edson Tracts area of census tract 9503. Each census block was assigned an identification number and blocks were selected randomly. Blocks without housing were discarded. The number of persons per block was taken from census data and divided by three, since the average number of persons per household was 3.01. This gave us an estimate of the number of households per block. We then took a 10 percent sample, giving us a target number of households per block. For example, a block with 89 residents was targeted with three household surveys (89/3 = 29.66 x 10 percent = 2.96).

Selected blocks were assigned to the enumerators. The enumerators began on each block with the southwesternmost household and proceeded in a counterclockwise direction around the block, interviewing every third household until the targeted number of surveys had been completed. Enumerators returned three times to non-responding households. In the few instances where the desired number of interviews was not obtained with this procedure, the enumerator returned to the block, randomly selected the second or third house from the southwest corner and began the process again. In cases where multi-story apartment buildings were encountered, enumerators followed the same procedure, first on the lower level, then on the upper level. The refusal rate among people actually contacted was only 5 percent.

This survey procedure yielded 272 completed interviews, which was actually 12 percent of the tracts' households. Only 266 of the interviews proved to be usable, and it is this data that is reported here. This sample size enables us to make estimates within plus or minus 5 percent of most population characteristics of interest, and the reported data should be interpreted accordingly.

Appendix B

THE LAMB-WESTON/CARNATION NEEDS-ASSESSMENT SURVEY

Data in the Lamb-Weston/Carnation needs-assessment survey were developed from questionnaires distributed to the employees of Lamb-Weston in Connell and Carnation in Othello on 7 June 1989. The purpose of the questionnaires was to determine job-related educational requirements of the work force, and its conduct was sponsored by management and Operating Engineers Local #318. The Columbia Basin Institute provided the enumerator, who returned to each plant in the following week to collect the surveys. Bilingual interpreters were available in both Spanish and Laotian. Reported wages were subsequently compared with worker wage grade and rosters to ensure accuracy.

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