



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

“Analyzing Resources for the Production of High-Value Agricultural Products in the California High Desert”



By:

Jon C. Phillips, Ph.D., (Assistant Professor of Food Marketing and Agribusiness Management and Director of the Center for Food Marketing and Agribusiness Solutions, California State Polytechnic University, Pomona) and Lauren Hays (Student, College of Agriculture, California State Polytechnic University, Pomona)

Published by the
Center for Food Marketing and Agribusiness Solutions
California State Polytechnic University, Pomona
Pomona, California
June, 2007
CFMAS Research Report #07-01

Copyright © 2007 by Phillips and Hays. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this notice appears on all such copies.

Selected paper for the 2007 meeting of the Western Extension and Research Activity (WERA) #72 for Agribusiness Competitiveness, Las Vegas, NV, June 18 – 19.

Acknowledgements:

The authors express their appreciation to Dr. Cheryl Wachenheim and Dr. Kyle Brown for reviewing this report and providing useful suggestions. All remaining errors are the responsibility of the authors. Funding for this project was provided through the 2006 – 2007 John T. Lyle Center for Regenerative Studies Faculty Fellowship Program.

Table of Contents

Abstract	2
Introduction.....	3
Objective.....	3
Methods.....	7
Results	8
Conclusions.....	27
Implications for Public Policy.....	30
Areas for Future Research.....	31
References.....	31
Appendix A: Tables relating to access to beneficial markets.....	35
Appendix B: Web addresses for U. S. Census Bureau fact sheets.....	37

Abstract

Urbanization of previously undeveloped land is a critical concern in Southern California. Housing development brings with it several potentially detrimental effects, among which are hardening of the landscape (pavement), diminished water absorption into the soil, and increased harmful runoff into the Pacific Ocean. The High Desert Region of San Bernardino County, California is an area currently experiencing significant development pressure. It is our belief that the development of agricultural production could, to some extent, substitute for residential and commercial development, and that agricultural production is a more sustainable use of the land in this area. This report examines and inventories resources of an unincorporated area near the Cajon Pass and Silverwood Lake, and assesses how they might best be utilized to introduce production of high-value agricultural products. A conclusion is that although water may be a limiting factor, the production of deciduous tree fruits (e.g., apples, cherries, pears, peaches, apricots, and nectarines) should be considered in this area. Small scale agricultural enterprises are more likely to achieve success. Implications for public policy and areas for future research are also presented.

Keywords

High-value agricultural products, resources, desert, California, strategic planning, sustainable agriculture, demographics, direct marketing

Analyzing Resources for the Production of High-Value Agricultural Products in the California High Desert

Introduction

Urbanization of previously undeveloped land is a critical concern in Southern California. Housing development brings with it several potentially detrimental effects, among which are hardening of the landscape (pavement), diminished water absorption into the soil, and increased harmful runoff into the Pacific Ocean. In making a case for inclusive development, Sachs (2004) argues that economic efficiency should be balanced with environmental protection. With development also come people – and with people come requirements for further development of infrastructure like fire and police protection, utilities, retail, and schools. Such infrastructure can be quite costly. Mirza (2005) notes that certain life cycle costs (e.g., maintenance) significantly increase the overall cost of such infrastructure beyond its initial, direct cost. Further, widespread real estate development can change the character of a region in a way that is perceived negatively by longtime residents (e.g., through increased traffic). While there are clearly positive benefits from such development, the adverse effects are significant and should be avoided or minimized, if possible.

Objective

An example of the growth referred to above is illustrated in Table 1, which provides population data for certain cities in or near the High Desert of San Bernardino County. (The location of the cities in Table 1 is shown in Exhibit 1 on page 5.) Due to this population growth, the High Desert Region of San Bernardino County, California is an area currently experiencing significant development pressure. It is our belief that the development of agricultural production could, to some extent, substitute for residential and commercial development, and that agricultural production is a more sustainable use of the land in this area. Furthermore, the existence of certain types of agricultural production (e.g.,

orchards), can enhance the quality of life for residents in an area by providing open space and visual amenities.

Table 1: Population data for 1990 and 2005 for certain cities in or near the High Desert of San Bernardino County. (Source: U.S. Census Bureau, 2007.)

City	1990 population	2005 population	Population increase, 1990 - 2005	% population increase, 1990 - 2005
Rancho Cucamonga	101,409	169,353	67,944	67%
Fontana	87,535	163,860	76,325	87%
Victorville	40,674	91,264	50,590	125%
Hesperia	50,418	77,984	27,566	55%
TOTAL, FOUR CITIES	280,036	502,461	222,425	79%
TOTAL FOR SAN BERNARDINO COUNTY	1,418,380	1,963,535	544,973	38%

The specific objective is to provide strategic information to allow entrepreneurs to ascertain whether this area might have the capacity to support production of high-value (i.e., differentiated) agricultural products. We will be considering an unincorporated area near the Cajon Pass and Silverwood Lake, east of Interstate 15 Freeway. In particular, the area to be examined for potential agricultural production will be within a 10 mile radius of Summit Valley,¹ which is southwest of Hesperia, California. This is located in an area commonly known as the High Desert. In a prior investigation, we obtained soil and water tests for a plot of land in this location, received favorable

¹ The approximate latitude and longitude for the center of the study area are 34.338° N. and 117.369° W., respectively.

results, and ultimately wrote a farm plan for a new orchard. Thus, our hypothesis is that production of high-value agricultural products may be viable in this locale.

Exhibit 1: Map of study area, the Cajon Pass area of San Bernardino County, California. (Source: mapquest.com.)



In this study, we will examine and inventory local resources and assess how they might best be utilized to introduce production of high-value agricultural products. The resources to be examined will be in accordance with the framework developed by Phillips and Peterson (2002). In brief, this framework was derived from theoretical business strategy literature, including the resource-based view

of the firm (Barney, 1991) and Porter's (1990) Diamond Model of National Competitiveness (an environmental model), as well as interviews with sixty agricultural producers.²

The resource inventory for product-oriented agriculture has two broad categories of resources: less-controllable resources (LCRs) and more-controllable resources (MCRs). In general, the less-controllable resources were derived from Porter's (1990) Diamond Model, and thus are based on the environment in which the firms under consideration operate. In the context of this study, the relevant environment is the Summit Valley area, which is near the Cajon Pass in an unincorporated area of San Bernardino County, California. There are seven categories of resources within the broad category of LCRs. These are agro-ecological resources, access to a beneficial labor supply, institutional infrastructure, physical infrastructure, access to beneficial markets, access to beneficial related and supporting industries, and support infrastructure. The main thrust was to inventory and document the LCRs that apply to the geographic region of this study.

The other broad category of resources, MCRs, is comprised of resources over which firms have general ability to direct and control. Thus, MCRs can be considered internal resources. These resources were primarily derived from the resource-based view of the firm. There are five categories of resources within the broad category of MCRs, namely, physical capital resources, financial capital resources, human capital resources, marketing and information resources, and organizational capital resources. The available assortment of MCRs differs firm to firm, due to heterogeneous resource endowments. For this reason, each firm considering establishing an agricultural production enterprise in this area must inventory its own MCRs and evaluate their suitability for the production of

² See Phillips and Peterson (2002) for a complete description of the development of the resource inventory framework for product-oriented agriculture.

differentiated agricultural products. It follows that the bulk of the results will be an analysis of LCRs. There will be some consideration given to MCRs in the results section, however, to guide firms in applying the resource inventory framework.

Methods

A substantial amount of data was required to implement the resource inventory. For this type of investigation, Blankenship, Breen, and Dutka (1998) recommends starting with a scan for existing, secondary data. A search for sources of secondary data that could provide input to the resource inventory for the research area, therefore, was the starting point. Once all potential sources of secondary data were fully explored, the next step was to specify information gaps that needed to be filled to complete the required resource inventory. After that, we identified key informants from government and industry who likely had the information still being sought. Interview questions were developed for the key informants, with a goal of obtaining the information that was not available from secondary sources. Then, the key informants were interviewed.

Once the data had been collected, it had to be synthesized and organized so that it could be presented in a meaningful format and to facilitate coming to conclusions. Note that many of the phenomena being studied are not easily quantifiable, and that the underlying causal relationships are changing, rather than stable. In this context, therefore, it would not be effective to address these phenomena from a positivistic (i.e., deductive) perspective. The subject matter is best characterized as phenomenological knowledge in that the process involves developing ideas through induction from data, more specifically, developing local rather than global theory (Peterson, 1997). Data collected from multiple sources was compared to achieve triangulation. The intention was for the ideas

generated in this research setting (i.e., a 10 mile radius of Summit Valley, which is southwest of Hesperia, California) to be applicable to other settings.

Results

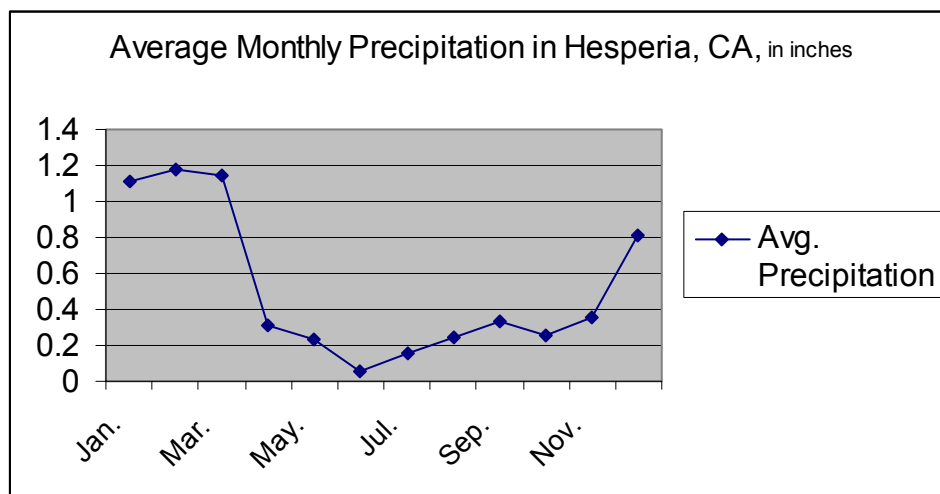
As mentioned above, the first general category of resources to be considered are less-controllable resources, LCRs. Each of the seven categories within the general category of LCRs will be considered in a separate section.

LCR 1: Agro-ecological resources

The average yearly precipitation in nearby Hesperia is 6.2 inches (Weather Channel, 2007).

Exhibit 2 shows how the precipitation is distributed throughout the year, on average.

Exhibit 2. Precipitation data. (Source: Weather Channel, 2007.)



The rainiest time of the year is between January and March. Most of the precipitation is in the form of rain, but these areas see snow about 4 days a year. The average total snow fall in Hesperia is 2.9 inches per year. Note that for eight months of the year, the average rainfall is less than half an inch per month, which is consistent with the name of the area: the High Desert. The area also experiences

periodic droughts.³ Because the area receives such limited precipitation, water will be a limiting factor for agricultural production activities here. Much of California agriculture is irrigated. Thus, having access to irrigation water obtained by pumping groundwater or other means, will be a key resource. This will vary, of course, depending on the product produced.

The USDA Natural Resource Conservation Service (2007) classifies most of the soil in the area as loamy sand, which tends to be very well-drained. Unless it has high organic matter content, this type of soil may dry out quickly. Loamy sand often needs additional watering, which may also cause high acidity. If this type of soil is managed carefully, it can be among the most productive soils. Many of the soil types in the area can be used for irrigated crops (USDA NRCS, 2007).

There are strong winds in this area from the west and south in the spring. They can be 60 mph and higher. This fierce wind can cause plants to dry out. Planting trees as wind breaks can mitigate this to some degree. The expense of purchasing trees for this purpose and planting them must be accounted for, and it takes time⁴ for such trees to mature to the point where they provide effective protection from the wind, however. The California Irrigation Management Information System (2007) documents the average wind speed for the area as 6.1 mph.

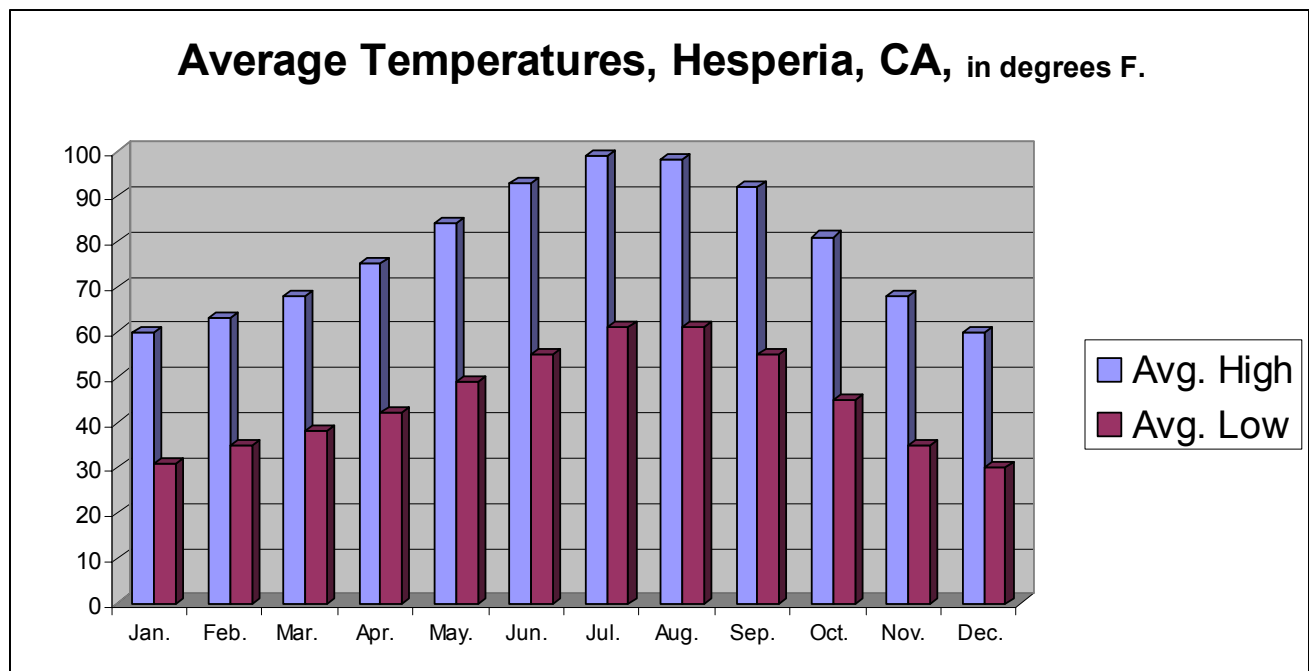
The study area is located at an elevation of between 3,200 and 3,600 ft. (Topo Zone, 2007), which affects temperature. The High Desert has substantial temperature fluctuations between summer and winter, and also from day to night. Average monthly high and low temperatures for nearby

³ For example, in the year from 4/06 to 3/07 nearby Victorville only received 2.51 inches of precipitation (California Irrigation Management Information System, 2007).

⁴ One rule of thumb is that if certain trees are planted five feet apart, they will take five years to create an effective wind break, and if they are planted 10 feet apart, it will take ten years. Thus, wind protection can be achieved sooner at a cost of planting more trees.

Hesperia, California are shown in Exhibit 3. As indicated, the average high temperatures range from the 60s from November to March and the 90s from June through September, and the average low temperatures range from the 30s from November through March and the mid 50s to low 60s from June through September.

Exhibit 3: Temperature data. (Source: Weather Channel.)



LCR 2: Access to beneficial labor supply

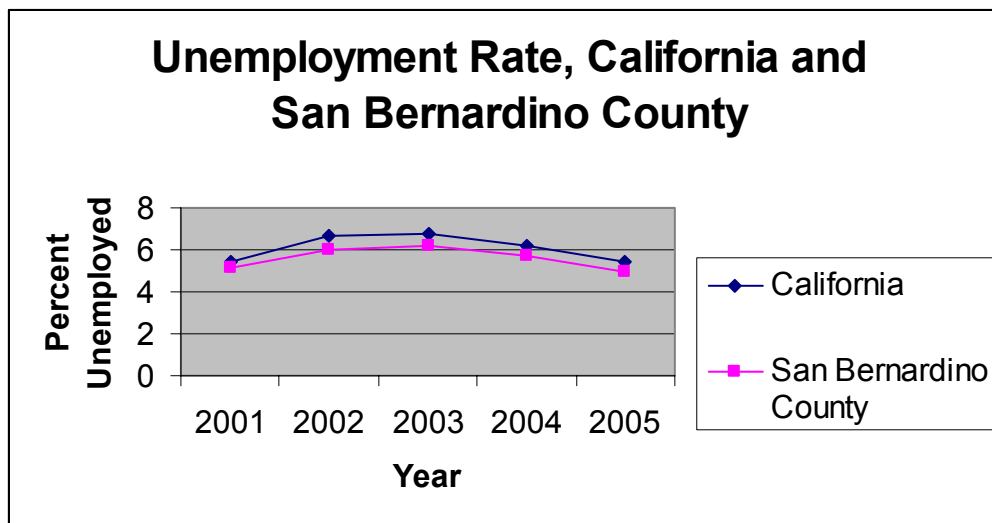
The growth pattern in the High Desert Region is well above the national average. The Wadley-Donovan Group (2000) estimated that the High Desert Region⁵ population would reach 247,129, for a minimum labor force of 89,139 by 2005. The 2000 population within a 15 mile radius of Hesperia (which includes some areas outside of the High Desert Region) was 254,282, with a labor force of

⁵ For this section, High Desert Region refers to the cities of Adelanto, Barstow, Hesperia, and Victorville, and the town of Apple Valley.

132,687, and these numbers were expected to grow. Within a 30 mile radius, the population was 1.3 million, with a labor force of 630,263. The percentage of people from 18-54 is much higher in this area than for the state and the nation, with the median age being 31.6. This indicates that there are a large number of people available to work entry level or labor intensive occupations. The area has a relatively high proportion of households with incomes lower than \$35,000, meaning that a significant amount of people may be interested in a second source of income. Only 52.9% of the High Desert Region's residents who are of working age actually participate in the labor force. Public assistance recipients comprise 17.6% of the population, so 20,606 residents could potentially enter the workforce (Wadley-Donovan Group, 2000).

The unemployment rate for San Bernardino County has been consistently lower than the unemployment rate for California as a whole in recent years. This is shown in Exhibit 4 below.

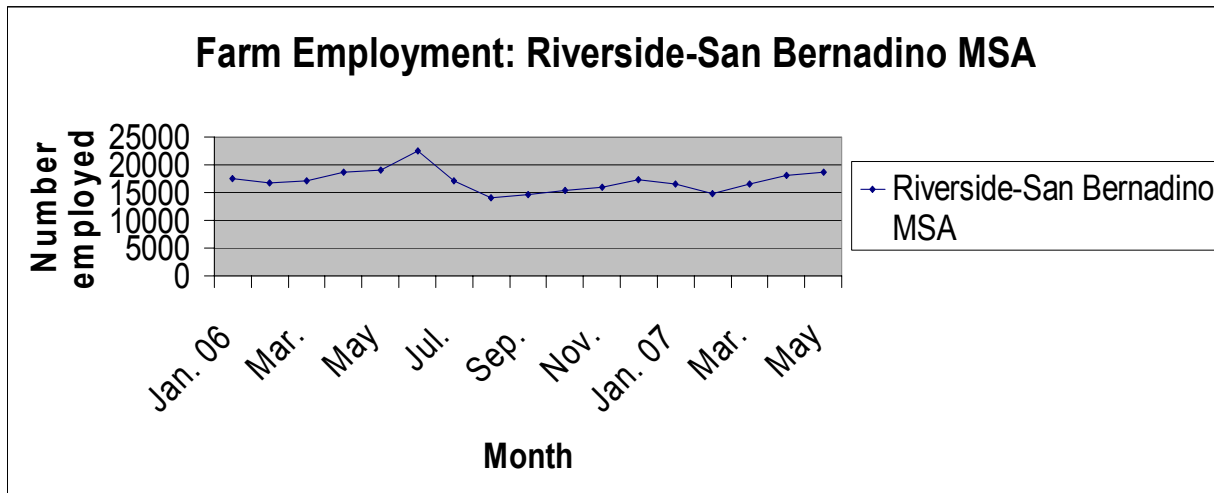
Exhibit 4: Unemployment rates for California and San Bernardino County. (Source: Employment Development Department, 2005).



While Exhibit 4 tends to indicate a tight labor supply in the county, local information referred to above would likely allow for adequate workers for new or expanding agricultural enterprises in the

Summit Valley area. Exhibit 5 below shows total farm employment in the Riverside – San Bernardino Metropolitan Statistical Area (MSA). This illustrates a farm labor market of adequate size, i.e. generally between 15,000 and 20,000 workers for the past year and a half.

Exhibit 5: Farm employment in the Riverside – San Bernardino Metropolitan Statistical Area (MSA) from January, 2006 to May, 2007. (Source: Employment Development Department, 2007).



LCR 3: Institutional Infrastructure

Institutional infrastructure may be characterized as the *rules of the game*. It consists of the laws, regulations, and policies in effect in the area that firms operate. The institutional infrastructure of the research area was analyzed to evaluate if some aspect of it provides an advantage or a disadvantage to firms operating in the area. There are many different realms of institutional infrastructure that affect the performance of agricultural production firms. Three important areas are tax law, labor law, and environmental law. At the same time, relevant institutional infrastructure is not limited to these three areas. Laws, regulations, and policies exist on multiple levels, such as the municipal, county, state, and national levels.

In general, California is a high-tax, highly regulated state. The sales tax in California varies from 7.25% to 8.75%, which is one of the highest sales tax rates in the U.S. With two exceptions,⁶ the sales tax in San Bernardino County is 7.75% (California State Board of Equalization, 2007). There are some exemptions to the sales tax, however, that could benefit agribusiness firms. Under certain conditions, the sales tax does not apply to food animals, feed for food animals, seeds, plants, fertilizer, liquefied petroleum gas (LPG), farm equipment, and diesel fuel (California State Board of Equalization, 2004). California, like most states, has a personal income tax. There are six associated tax brackets, with tax rates progressing from 1% to 9.3%. In addition, there is a 1% incremental levy on incomes over \$1 million. California also has a corporation tax. The minimum tax is \$800, and the average is 8.84% of corporate income (Franchise Tax Board, 2007).

A law that offers property tax relief to agricultural producers is the California Land Conservation Act of 1965, often referred to as the Williamson Act. According to this Act, owners of certified farms and habitat are taxed at lower rates compared to owners of commercial property. The process requires owners of farmland to enter into 10-year agreements to keep their land in agricultural production. After the agreement lapses, owners can either renew or be free to put their land to a new use. Agricultural landowners who enter into Williamson Act contracts typically save between 20% and 75% on their property taxes (California Department of Conservation, 2007). Another potentially beneficial policy is the California Farmland Conservancy Program. Under this program, grant funds may be obtained by a non-profit organization, in order to purchase an agricultural conservation easement. This is a voluntary, legally recorded deed restriction that permanently protects affected land from development pressures (California Department of Conservation, 2007).

⁶ The two exceptions are two incorporated cities. Specifically, Montclair and San Bernardino (city) have a sales tax rate of 8.00%. (California State Board of Equalization, 2007).

The Agricultural Labor Relations Act of 1975 established the right of California farm laborers to collectively bargain with their employers. Under this law, workers may file claims with the Agricultural Labor Relations Board (ALRB), which is authorized to investigate alleged unfair labor practices by employers. Another function of the ALRB is to “determine and implement, through secret ballot elections, the right of agricultural employees to choose whether or not they wish to be represented by a labor organization for the purpose of collective bargaining with their employer” (California Agricultural Labor Relations Board, 2007). Allegations of violations of general labor law are brought to the California Labor Commissioner, who is charged with investigating them.

The minimum wage in California is scheduled to increase to \$8.00 per hour on January 1, 2008 (U.S. Department of Labor, 2007). Once this takes effect, this will likely be the highest minimum wage in the region. The state minimum wages for California and neighboring states are listed in Table 2 below. Minimum wage rates apply to nonsupervisory, nonfarm private sector employment. While they do not directly apply to agricultural producers who employ workers, they provide a benchmark for what workers in a given state could make in other industries, similar to an opportunity cost. It is likely that agricultural producers who employ workers in states with a relatively high minimum wage will have to pay their workers relatively high wages.

Table 2: State minimum wages for California and neighboring states. (Source: U.S. Department of Labor, 2007.)

State	Minimum wage / hour	Comments on premium pay (i.e., time-and-a-half) for overtime	Other comments
Arizona	\$6.75	N/A	
California	\$7.50 (Scheduled to increase to \$8.00 on 1/1/08.)	Premium pay after 8 hours daily. Double time after 12 hours daily. Premium pay after 40 hours weekly. On the 7 th day of the week, the first 8 hours are for time-and-a-half, and subsequent hours are for double time.	
Nevada	\$6.15	Premium pay after 8 hours daily and after 40 hours weekly. Exemptions apply to employees earning more than 1.5 times the minimum wage and to employers with gross annual sales volume less than \$250,000.	Employers are allowed to pay \$5.15 / hr. if they provide employees a recognized health plan.
Oregon	\$7.80	Premium pay after 40 hours weekly. Premium pay required after 10 hours daily in certain manufacturing industries.	Minimum wage rate is adjusted annually for inflation, rounded to the nearest five cents.

Environmental law in California is complicated, and it has a broad scope. An overarching piece of legislation in this area is the California Environmental Quality Act (CEQA) of 1970. This law establishes several regulatory boards, including the Air Resources Board, the Integrated Waste Management Board, the State Water Resources Control Board, and nine regional Water Quality Boards. Each of these boards is under the dominion of the California Environmental Protection Agency (Cal/EPA). Other constituent entities of Cal/EPA are the Department of Pesticide Regulation, the Department of Toxic Substances Control, and the Office of Environmental Health Hazard Assessment (California Environmental Protection Agency, 2007). A final important part of Cal/EPA is its Office of the Secretary. Cal/EPA is a cabinet-level agency intended to give voice to concerns about environmental health in California, and to ensure harmonized use of State resources.

Prior to implementing certain projects in California, an Environmental Impact Report (EIR) must be filed with Cal/EPA. The EIR analyzes the significant environmental effects of the project, and discusses methods of avoiding or mitigating these effects (California Resources Agency, 2005). Depending on how one looks at it, California could be considered as having more stringent environmental regulation than the rest of the country, or as being ahead of the rest of the country regarding environmental regulation.

In the early 90s, the City of Barstow filed a lawsuit against the Mojave Water Agency. The case made its way to the California Supreme Court. In August, 2000, the court decided the case and issued adjudication. The ruling stated that while a court can impose a physical solution to a water dispute, the solution's purpose cannot ignore the priority rights of parties involved (McClurg, 2000). Prior to the adjudication, some Mojave River Basin farmers had agreed to limit their water use, and to pay for water they use that exceeds their agreed-upon allocation. Other farmers refused to sign the agreement, believing it was a violation of their water rights, and sued. This suit was also settled in the adjudication referred to above. The Supreme Court decision was considered to be a victory for the farmers who sued. These farmers will not be required to pay for water, but the farmers who signed the agreement still must pay if they exceed their allocation (Association of Ground Water Agencies, 2000). The adjudication itself is complex, with multiple layers of legal issues. A complete analysis of it is beyond the scope of this investigation. Suffice it to say that agricultural producers without water rights who need to pump large quantities of irrigation water will have to become familiar with this adjudication.

Mandated marketing programs are important in California. In 2003, commodities making up 55% of California's agricultural output were covered by such programs (Carman, Cook, and Sexton,

2003). There were 12 federal marketing orders covering California production and 51 California (state) commodity marketing programs in effect in 2003. The types of products under mandated marketing programs in 2003 included (in declining order based on percentage of total output covered): animal products, fruits and nuts, vegetables, field crops, and nursery products.⁷ The federal marketing orders generally emphasize quality regulations and are authorized by the Agricultural Marketing Agreement Act of 1937. The USDA Agricultural Marketing Service (AMS) provides oversight for the federal marketing orders and its representatives attend meetings of the applicable administrative committees. The state marketing programs generally emphasize research and promotion, and are authorized by the California Marketing Act of 1937.⁸ The California Department of Food and Agriculture (CDFA) oversees the state marketing programs and its representatives attend meetings of the applicable administrative committees and commodity commissions (Carman, Cook, and Sexton, 2003).

California is the nation's top agricultural producer, with more than \$32 billion of farm gate sales in 2005. It is also the top state for exports of agricultural commodities. California produces more than half of the nation's fruits, vegetables, and nuts, by value (CDFA, 2006.) With so much at stake, the state has seen fit to develop and implement regulations to protect the industry. This set of regulations is quite broad. It covers quarantines and pest exclusion, among other issues. For example, moving nursery stock from county to county is regulated. Someone bringing native plant species from another state to California must have a certificate for each plant. Producers interested in finding out

⁷ For a list of the specific commodities covered by federal and state mandated marketing programs, see Carman, Cook, and Sexton, page 111. They also list what each program covers, i.e., grades and size, quantity controls, advertising and promotion, and research.

⁸ According to Carman, Cook, and Sexton (2003), "California also has more than 20 individual laws for the formation of commodity commissions and councils." (pg. 107)

what regulations apply to a product they plan to grow can inquire at their County Agricultural Commissioner's Office.⁹

LCR 4: Physical Infrastructure

The area of interest has a reasonably well-developed physical infrastructure. It is very close to Interstate 15 freeway, which runs north into the Victor Valley area (Adelanto, Hesperia, Victorville, and Apple Valley) and south into San Bernardino and Riverside. At further distance is Las Vegas (about 195 miles northeast) and Los Angeles (about 90 miles southwest). California Highway 138 is also within a short distance. To the east, this highway can provide access to California Highway 173, which eventually leads to Lake Arrowhead.¹⁰ Main Street, which runs east and west through Hesperia, is the northern border of the area. Ranchero Road can be used to reach 7th Street, which also runs through Hesperia. The Union Pacific and Burlington Northern Santa Fe railways run nationally to the north, south, east, and west through the area. Ontario International Airport is only a 45 minute drive and 42 miles from the area. Southern California Logistics Airport (SCLA) is a 25 minute drive and 15 miles away (Victor Valley Economic Development Authority, 2007).

LCR 5: Access to Beneficial Markets

The population of the nearby Victor Valley area, which is to the north and includes Victorville, Adelanto, Apple Valley, and Hesperia, was estimated at 286,545 in 2005. This area's population has been growing at a rate of 2.5% per year, and this rate is projected to continue until 2013 (Victor Valley

⁹ County Agricultural Commissioners will be covered in more detail in the "Support Infrastructure" section.

¹⁰ Lake Arrowhead is a year-round, mountain resort community. Its population is projected to be 20,100 in 2010 (Lake Arrowhead Communities Chamber of Commerce, 2007). Another nearby resort area is Big Bear Lake, California. See Exhibit 1 for the general proximity of these communities.

Economic Development Authority, 2007). Table 3 below illustrates the population and other selected demographic characteristics of Victorville, Hesperia, and Apple Valley, which are the three communities nearest to the study area.

Table 3: Demographic characteristics of Victorville, Hesperia, and Apple Valley. (Source: U.S. Census Bureau, 2007.)

		Communities		
Characteristic		Victorville	Hesperia	Apple Valley
Population		65,229	79,714	93,042
Ethnicity:	<i>White</i>	72.9%	60.7%	50.9%
	<i>African American</i>	9.8%	5.2%	16.0%
	<i>Hispanic/Latino</i>	20.8%	41.7%	34.3%
	<i>Asian</i>	1.9%	0.8%	6.1%
	<i>Native Hawaiian/Pacific Islander</i>	0.3%	0%	0.9%
	<i>American Indian/Native Alaskan</i>	2.1%	1.1%	1.1%
Median Household Income		\$51,119	\$50,298	\$42, 116
Per Capita Income		\$22,196	\$18,222	\$16,727

The small cities and towns in the area may also present marketing opportunities for agricultural producers. Table 4 presents demographic information for some of these areas.

Table 4: Demographic characteristics of Crestline, Muscoy, Lake Arrowhead, and Wrightwood. (Source: U.S. Census Bureau, 2007.)

		Communities			
Characteristic		Crestline	Lake Arrowhead	Muscoy	Wrightwood
Population		10,218	8,934	8,919	3,837
Ethnicity:	<i>White</i>	88.0%	90.5%	42.7%	90.9%
	<i>African American</i>	0.8%	5.5%	7.7%	0.3%
	<i>Hispanic/Latino</i>	10.5%	0.6%	66.3%	8.8%
	<i>Asian</i>	0.6%	13.3%	1.0%	0.8%
	<i>Native Hawaiian/Pacific Islander</i>	0.2%	0.1%	0.6%	0.2%
	<i>American Indian/Native Alaskan</i>	1.1%	0.9%	2.1%	0.7%
Median Household Income		\$44,257	\$60,826	\$25,634	\$50,338
Per Capita Income		\$20,987	\$28,176	\$8,130	\$22,902

Some of the accessible cities south of the area of interest include Fontana, Rancho Cucamonga, Rialto, and San Bernardino. Demographic information regarding these four cities is presented in Table A1 in Appendix A. Riverside County can also be accessed via Interstate 15 freeway. Other nearby counties which are also accessible by freeway are Los Angeles County and Orange County. Demographic information regarding these three counties and San Bernardino County is presented in Table A2 in Appendix A. One point from these tables is that for producers who are willing to transport their products an hour by motor vehicle, more than a half a million consumers are accessible. For those

willing to transport their products somewhat further, several million consumers are accessible. Another point from these tables is that the population in surrounding areas is quite ethnically diverse. This could provide opportunities for agricultural producers to market specialty food products to targeted groups of local consumers with a certain ethnicity (e.g., Asian vegetables).

There are several certified farmers markets in the communities surrounding the research area. A list of such markets, their respective hours, and locations is presented Table A3 in Appendix A. These markets could potentially be used as marketing outlets for agricultural producers who grow products in the area. A list of the certified farmers markets in California can be found at the California Federation of Certified Farmers Markets website.¹¹ About fifty miles southeast of the study area, near Yucaipa, is an apple producing area called Oak Glen. At an elevation of about 5,000 feet, Oak Glen is a community that benefits greatly from agri-tourism. Five apple packing houses are located here. They pack 40,000 bushels of sixty-five varieties of apples each year. More than 1 million visitors come to Oak Glen each year, to partake of U-pick apples and berries, U-press cider, restaurants, a petting zoo, boutique shopping, and related activities (Harris and Lichtig, 2007). It is possible that growers in the study area could benefit from this phenomenon in two ways. First, they could use the Oak Glen apple production region as a model in establishing a similar industry cluster of agri-tourism firms. The San Bernardino National Forest, which borders the study area, is one of the most visited national forests in the country. The area also boasts Silverwood Lake, and the Silverwood Lake State Recreation Area. These are two underutilized resources that could provide synergy with a proposed agri-tourism cluster. Second, the packing houses, restaurants, and shops in Oak Glen could be potential marketing channels for the agricultural products produced in the Summit Valley area.

¹¹ The web address is <http://www.cafarmersmarkets.com/findMarkets>.

LCR 6: Access to Beneficial Related and Supporting Industries

Related industries are those industries that use similar inputs and/or technology in their respective value chains. Supporting industries are supplier industries (Porter, 1990). For this investigation, we examined related and supporting industries that pertain to the agricultural production industry in the Summit Valley area. This section will rely primarily on information from the key informant interviews.

There is currently limited agricultural production in the area. Examples of agricultural production in the vicinity include the remnants of an alfalfa industry, and some pistachio production in the Barstow and Hinkley areas. For this reason, sources of agricultural inputs in the immediate area are quite limited. Trees and landscaping equipment and materials may be purchased from local dealers to meet needs at the homeowner scale. A somewhat larger selection of dealers can be found in San Bernardino (city), which is about a 30 minute drive away. To obtain a large amount of these items (i.e., for commercial scale), one would have to bring them in from Bakersfield, in the southern San Joaquin Valley. A dairy industry of approximately 200,000 cows is located forty miles south in the Chino area. There is also a significant wine grape and wine industry in Temecula, California.¹² There is potential that some of the suppliers to these two industries¹³ could also supply agricultural producers in the Summit Valley area. There is a lack of agricultural consultants located in the research area, however. Regarding financing, several large commercial banks operate in the area, including Bank of America, Bank of the West, and Wells Fargo. In addition, American AgCredit, part of the Farm Credit

¹² Temecula is located about 65 miles south of the research area near Interstate 15, in southern Riverside County.

¹³ The same could be said for the apple producing region in Oak Glen, California. This area was described previously in the “Access to Beneficial Markets” section.

System, has an office in Ontario, which is about 30 miles away. It appears that access to credit should not be a problem for applicants with a credible business plan.

LCR 7: Support Infrastructure

Support infrastructure is the set of public and nonprofit organizations that can assist new or expanding agricultural firms in a given area. At the state government level, the primary organization of the support infrastructure is the California Department of Food and Agriculture (CDFA). The current secretary is A.G. Kawamura, a former produce grower-shipper from Orange County. He was appointed by Gov. Arnold Schwarzenegger in November, 2003. Among the CDFA's 2,300 employees are scientists, veterinarians, economists, marketing specialists, communicators, and administrators. Major functions of the CDFA are inspection, pest eradication, research, and helping growers to create new markets overseas (California Department of Food and Agriculture, 2007a).

Each of California's counties has an appointed Agricultural Commissioner. These Agricultural Commissioners carry out the following functions, among others: pest exclusion; pest detection; pest eradication; pest management; pesticide enforcement; seed certification; nursery inspection; fruits, nuts, and vegetables standardization; egg inspection; apiary inspection; and reporting crop statistics (California Department of Food and Agriculture, 2007b). The Agricultural Commissioner's office is a regulatory agency, whose role is to help people comply with the Food and Agricultural Code and the Business and Professions Code. For a nominal fee, representatives from county agricultural commissioners' offices visit farms to certify producers so they can market their produce at California certified farmers markets. The Agricultural Commissioner's Office assists agricultural producers with exporting to international markets by certifying product for pest cleanliness in accordance with the standards of other countries. Fifty-six personnel are listed on the contact web site for the San

Bernardino County Agricultural Commissioner's Office (California Department of Food and Agriculture, 2007c). Most of these representatives are under the categories of Agricultural Standards Officer and Agricultural Field Aide.

The University of California has an extensive cooperative extension service. Agricultural producers in the state benefit from the farm advisors located in the county offices. Some advisors cover more than one county. San Bernardino County Cooperative Extension is located in the same building as the San Bernardino County Agricultural Commissioner. The county extension director is a farm advisor, specializing in dairy management. There are other advisors with specialties related to this project located in the office of San Bernardino County Cooperative Extension. This would include a desert natural resources advisor and an environmental horticulture advisor. There is an area viticulture/pest management advisor with an office located in Indio (in Riverside County) who is also responsible for San Bernardino County. The acting County Director in Riverside County is an area advisor in farm management/agricultural economics. This individual, who specializes in fruit crops, vegetable crops, and field crops, is responsible for programs in nine counties, including San Bernardino (University of California Cooperative Extension, 2007).

The University of California is a comprehensive, land grant university which is quite active in the area of agricultural research. There is a network of agricultural experiment station researchers and cooperative extension specialists located on the following campuses: UC Berkeley, UC Davis, and UC Riverside (University of California Division of Agriculture and Natural Resources, 2007). The California State University (CSU) offers bachelors and masters degrees in many fields on 23 campuses throughout California. Four campuses have a college of agriculture: CSU Fresno; California

Polytechnic State University, San Luis Obispo; California State Polytechnic University, Pomona; and CSU Chico (California State University, 2007).

There are several producer organizations in California that can assist members in various ways. Examples of these groups are the California Farm Bureau, Western Growers Association, and the Grape and Tree Fruit League.¹⁴ These organizations assist with labor issues, environmental regulation, and provide lobbying of legislators at the state and federal level.

More-Controllable Resources

Other resources, in addition to the less-controllable resources (LCRs) already considered, affect the feasibility of successfully producing and marketing agricultural products. These resources were introduced as more-controllable resources (MCRs) by Phillips and Peterson (2002). MCRs are resources over which a particular firm has a general ability to control and direct. In contrast with LCRs, MCRs can be considered internal to the firm. The broad category of MCRs can be broken down into five subcategories, as follows: physical capital resources, financial capital resources, human capital resources, marketing and information resources, and organizational capital resources.

Physical capital resources include all of the machinery and equipment necessary to produce the products in question. In general, agricultural production requires some complement of machinery and equipment. Of particular interest are proprietary physical capital items that provide the capability to produce agricultural products with special features that are desired by a targeted customer group.

¹⁴ This is not meant to be an exhaustive list. The California Department of Food and Agriculture publishes an agricultural resource directory each year. These directories include an extensive list of commodity groups and other agricultural organizations. The 2006 Agricultural Resource Directory is available at http://www.cdfa.ca.gov/card/card_06.htm.

Financial capital resources include money resources, such as liquid funds, equity, and lines of credit. Financial capital may be strategically important if there are significant capital requirements to enter a differentiated agricultural product industry. Lenders' and venture capitalists' familiarity with product-oriented agriculture versus commodity agriculture may be important to their willingness to provide loans or equity capital to these enterprises. Thus, the quality as well as the quantity of financial capital resources matters.

Human capital resources are the skills, knowledge, and contacts that reside within individuals who work for a particular firm. Once again, the skills, knowledge, and contacts are those that enable firm employees to design, produce, or market differentiated agricultural products. For example, a production manager may have the ability to produce a fruit crop that matures (and can be marketed) two weeks before the rest of the industry's fruit is ready. Because marketing is especially important for product-oriented agricultural firms, marketing and information resources are included as a separate subcategory of MCRs. Marketing and information resources provide strategic intelligence that enable firms to market their differentiated agricultural products. Such resources would include databases that contain information about the product-related needs of customers and potential customers. The final subcategory of MCRs consists of organizational capital resources. In contrast with human capital resources, these resources reside within the firm in general, rather than within individual employees of the firm. Examples of organizational capital resources would be the standard operating procedures (SOPs) of a firm and the web of relationships between a firm and other entities (e.g., firms and government agencies). In order for organizational capital resources to provide a sustained competitive advantage, they have to either have arisen from unique historical circumstances, or be the result of socially complex and causally ambiguous processes.

Let's consider the relation of MCRs and the case of creating and developing enterprises to produce and market differentiated agricultural products in the High Desert Region of San Bernardino County. Because MCRs exist within firms, it is impossible to make generalizations regarding how favorably this area is endowed with MCRs. Each firm must evaluate its own specific endowment of MCRs to determine whether it can derive a sustained competitive advantage from the applicable resources.

This framework can, however, assist by presenting a picture of the LCRs that apply to the High Desert Region of San Bernardino County. Given the description of LCRs provided in the previous section, firm representatives can juxtapose their MCRs to see whether they can provide a sustained competitive advantage in this context. For example, it may be that the human capital resources that exist in a firm enable it to overcome a challenging aspect of the agro-ecological resources in the High Desert Region of San Bernardino County. A specific instance of this would be if an agricultural producer had a unique ability to produce high-quality apples in this area. This producer would have a competitive advantage among customers who live nearby who prefer locally-grown apples.

Conclusions

It should be noted that this investigation was not intended to find the one best crop or animal for entrepreneurs in the area to produce. The nature of agricultural production does not allow for blanket recommendations in an area of varying agro-ecological resources/conditions, which applies to the Summit Valley area. Rather, we intended to lay out the relevant resources, especially the LCRs, which will influence the capability to successfully implement agricultural production in the research area. This work provides strategic information and alternatives for consideration in the strategic planning processes of firms in the area.

It will be challenging to develop agricultural production in the Summit Valley area of San Bernardino County, especially on a commercial scale. The consensus of the key informants was that there are some prominent obstacles to overcome in order to establish large scale, agricultural operations in this area. Small scale, mom-and-pop agricultural operations are more likely to achieve success in this area. In such operations, family members provide the bulk of the production and marketing labor. Like in any other region, the question is whether the resources would earn the highest return if they were deployed in agricultural production. In this area, the key resource is water.

We previously described and evaluated the LCRs that apply to the research area. The recommendations that follow are primarily based on two types of LCRs: agro-ecological resources and access to beneficial markets. The analysis of the other types of LCRs was useful for two reasons. First, it showed that no barriers exist that would preclude the production and marketing of high-value agricultural products in the research area. Second, this information can be used by individuals who would like to establish agricultural production in the area, as they develop their strategies and tactics.

The area is not warm enough to produce citrus products. The production of deciduous tree fruits (e.g., apples, cherries, pears, peaches, apricots, and nectarines) should be considered.¹⁵ If production of these types of fruits is pursued, it would be wise to select later-blooming varieties, to avoid the potential negative effects of the late frosts common in the research area. Producing goats for meat is another alternative. Whatever crops or animal species are selected, producers should emphasize specialty products. There may be opportunities to successfully produce and market products that do not transport well, such as, specialty greens or cut flowers.

¹⁵ Of these fruits, one key informant identified apples and pears as the most promising for this area.

Becoming certified organic or biodynamic are possible methods for producers in the Summit Valley area to differentiate their products. Producers who become certified organic can use the USDA Organic logo to market their products. Producers who become certified biodynamic can use the logo of Demeter, USA, the certifying organization for biodynamic agriculture in this country. Products marketed as certified organic or certified biodynamic achieve price premiums, compared to conventionally-produced products (Phillips and Peterson, 2007; Phillips and Rodriguez, 2006). Of course, these types of production systems tend to entail higher costs, so producers must evaluate whether incremental benefits exceed incremental costs when deciding how to produce. Producers should consider environmental costs and health effects of synthetic chemicals and fertilizers, as well as other, more commonly considered costs.

Firms that implement agricultural production in the area will have to select a marketing channel for their produce. Pros and cons of various marketing channels for organic fruits and vegetables are listed in Phillips and Peterson (2001). One distribution channel that should be considered by new, smaller producers is to become a Community Supported Agriculture (CSA) enterprise. There are many different variations of the CSA concept, but the system usually involves community members paying the agricultural producer in the spring of the year. This benefits the producer by shifting the risk of crop loss to the consumer. Members receive a weekly share of the farm's harvest during the harvest season. This marketing method benefits consumers by facilitating a closer relationship between them and producers (Local Harvest, 2007). Consumers who are interested in local foods and who want to increase their knowledge of where their food comes from are good prospects to become CSA members. Farmers markets are another promising alternative for small producers in the Summit Valley area. Farmers markets in this area are listed in Table A3 in Appendix

A. Finally, an additional marketing channel to consider is to set up a roadside stand, also known as a farm market.

Implications for Public Policy

The recent population growth in the research area was described above. Underlying this study has been the fact that this population is projected to continue to increase. Projections for population growth, however, appear to be based on the status quo. One important element of this status quo assumption is that there will be no problems regarding the availability (and hence, price) of energy. This assumption may not hold, however, as some have predicted an era of much higher-cost energy in the near future.

Communities must address the potential for high-cost energy in their planning. This is especially true for far flung areas, and for energy-intensive areas. The communities of the High Desert Region of San Bernardino County could be characterized both as far flung and as energy-intensive. Communities have to address self-sufficiency in food and water due to the likelihood of future increases in the costs of energy. This is not to say that communities will have to provide all of their own food and water, but they would be wise to move in the direction of providing more of their own food and water.

Under high-cost energy conditions, local production of food becomes relatively more advantageous, compared to under low-cost energy conditions. The implication is that although food production in this area may not appear to be economically feasible at present, it may become more feasible in the future. Changes in the price of energy over time can change the highest and best use of land. While the highest and best use of a parcel of land may not currently be agricultural production, a drastic increase in the price of energy may cause agriculture to be the highest and best use, over, say, a

twenty year period. It may turn out that drastic increases in the price of energy do not occur in the future. If communities plan for such conditions and are wrong, however, community members may still benefit from open spaces and proximity to agricultural production, especially orchards.

Areas for Future Research

Additional research is needed to determine the cost of production and yields of various commodities in the Summit Valley area. Because some types of trees (e.g., apples) do not achieve full production for five years, this type of research would have to be long-term. It would also likely be costly, because of the up front expense of the trees and windbreaks (if necessary), and the labor cost for such functions as pruning. Consumer research to determine preferences for different agricultural products and marketing channels among consumers in the area would also be helpful to potential producers. The resource inventory framework for differentiated agricultural products could also be implemented in a different, perhaps competing, geographic area. This would allow for comparisons between the Summit Valley and the other area, with regard to quality and quantity of resources available.

References

Association of Ground Water Agencies (2000). "Farmers in Mojave River Basin Decision." *Notes from the Underground Newsletter*. Summer. Accessed at: <http://www.agwa.org/summer00.pdf> on 6/17/07.

Barney, Jay (1991). "Firm Resources and Sustained Competitive Advantage," *Journal of Management*, Vol. 17, 99-120.

Blankenship, A.B., G.E. Breen, and A. Dutka, (1998). *State of the Art Marketing Research*, 2nd Ed. NTC Business Books, Lincolnwood, IL, Ch. 2.

California Agricultural Labor Relations Board (2007). "Agricultural Labor Relations Board Web Site." Accessed at: <http://www.alrb.ca.gov/> on 6/12/07.

California Department of Conservation (2007). *Williamson Act Questions and Answers*. Division of Land Resource Protection. Accessed at:

<http://www.consrv.ca.gov/DLRP/lca/pubs/WA%20fact%20sheet%2006.pdf> on 6/12/07.

California Department of Food and Agriculture (2006). *California Agriculture Highlights 2006*.

Accessed at: <http://www.cdfa.ca.gov/card/pdfs/AgHighlightsBrochure06.pdf> on 6/15/07.

California Department of Food and Agriculture (2007a). "88 Years Protecting and Promoting Agriculture in the Golden State." Accessed at: http://www.cdfa.ca.gov/exec/pa/cdfa_history.htm on 6/13/07.

California Department of Food and Agriculture (2007b). "County Agricultural Commissioners."

Accessed at: <http://www.cdfa.ca.gov/exec/cl/cacasa.htm> on 6/15/07 .

California Department of Food and Agriculture (2007c). "San Bernardino." Accessed at

http://www.cdfa.ca.gov/exec/cl/cacasa/sanbernardino_co.htm on 6/15/07.

California Environmental Protection Agency (2007). "Cal/EPA Mission Statement." Accessed at:

<http://www.calepa.ca.gov/About/mission.htm> on 6/13/07.

California Federation of Certified Farmers Markets (2007). "Matching Markets." Accessed at:

<http://www.cafarmersmarkets.com/findMarkets> on 6/11/07.

California Irrigation Management Information System. (2007). "CIMIS – Data." Department of Water Resources, Office of Water Use Efficiency. Accessed at: <http://www.cimis.water.ca.gov/cimis/data.jsp> on 6/8/07.

California Resources Agency (2005). *Title 14. California Code of Regulations*. Chapter 3. Guidelines for Implementation of the California Environmental Quality Act, Article 20: Definitions, Section

15362. Modified October 26. Accessed at http://ceres.ca.gov/topic/env_law/ceqa/guidelines/art20.html on 6/13/07.

California State Board of Equalization (2004). *Tax Tips for the Agricultural Industry*. Publication 66.

July. Revised April 26, 2006. Accessed at: <http://www.boe.ca.gov/pdf/pub66.pdf> on 6/12/07.

California State Board of Equalization (2007). "California City and County Sales Tax and Use Tax

Rates." Accessed at: <http://www.boe.ca.gov/cgi-bin/rates.cgi?LETTER=S&LIST=COUNTY> on

6/12/07.

California State University (2007). "California State University Agricultural Research Initiative."

Accessed at <http://ari.calstate.edu/> on 6/15/07.

Carman, Hoy F., Roberta Cook, and Richard J. Sexton (2003). "Marketing California's Agricultural Production." Chapter 4 in *California Agriculture: Issues and Dimensions*, Jerry Siebert, editor.

Employment Development Department (2005). "San Bernardino County Snapshot." Labor Market Information Division, State of California. Accessed at:

<http://www.calmis.ca.gov/file/COsnaps/sanbrsnap.pdf> on 6/15/07.

Franchise Tax Board (2007). "California Tax Rates and Exemptions." Accessed at: http://www.ftb.ca.gov/forms/catxrate_exmpt.html on 6/12/07.

Harris, Eleanor and Claudia Harris Lichtig (2007). "Oak Glen: Apple Holiday Time." Accessed at: http://www.allgetaways.com/view_destination.asp?destinationid=XGP210-E02 on 6/13/07.

Lake Arrowhead Communities Chamber of Commerce (2007). "Lake Arrowhead Population and Demographics." Accessed at: <http://www.lakearrowhead.net/population.html> on 6/6/07.

Local Harvest (2007). "What is Community Supported Agriculture and How Does it Work?" Accessed at: <http://www.localharvest.org/csa.jsp> on 6/15/07.

McClurg, Sue (2000). "Introduction: The Mojave River Basin Decision." *Western Water*. September/October. Accessed at: <http://www.water-ed.org/septoct00.asp> on 6/17/07.

Mirza, Saeed (2006). "Durability and Sustainability of Infrastructure: A State of the Art Report," *Canadian Journal of Civil Engineering*, Vol. 33 Issue 6: 639-649, June.

Peterson, H. Christopher (1997). "The Epistemology of Agribusiness." Agricultural Economics Staff Paper #97-25, Department of Agricultural Economics, Michigan State University, East Lansing, July.

Phillips, Jon C. and H. Christopher Peterson (2001). "Demand Overview for Organic Produce." Agricultural Economics Staff Paper #01-06, Department of Agricultural Economics, Michigan State University, East Lansing.

Phillips, Jon C. and H. Christopher Peterson, (2002). "Inventorying Resources: An Application to Product-oriented Agriculture." Agricultural Economics Staff Paper #02-17, Department of Agricultural Economics, Michigan State University, East Lansing, July.

Phillips, Jon C. and H. Christopher Peterson (2007). "Strategic Marketing Decisions for Organic Agricultural Producers." *International Food and Agribusiness Management Review*, Vol. 10, Issue 1.

Phillips, Jon C. and L. Pilar Rodriguez (2006). "Beyond Organic: An Overview of Biodynamic Agriculture with Case Examples." Selected paper presentation at the 2006 American Agricultural Economics Association Meeting, Long Beach, CA, July.

Porter, Michael E. (1990). *The Competitive Advantage of Nations*. New York: The Free Press.

Sachs, Ignacy (2004). "Inclusive Development and Decent Work for All," *International Labour Review*, Vol. 143, No. 1 – 2: 161 – 184.

Topo Zone (2007). "USGS Topographic Map." Accessed at: <http://www.topozone.com/states/California.asp?county=San+Bernardino> on 6/6/07.

University of California Cooperative Extension (2007). "San Bernardino County Staff List." Accessed at <http://cesanbernardino.ucdavis.edu/sbdisplay/stafflist.cfm?county=2016> on 6/15/07.

University of California Division of Agriculture and Natural Resources (2007). "Agricultural Experiment Station and Cooperative Extension Working for Californians." Accessed at: <http://ucanr.org/delivers/categories.cfm> on 6/15/07.

U.S. Census Bureau (2007). "American Fact Finder." Accessed at <http://factfinder.census.gov/> on 6/11/07.¹⁶

USDA NRCS (2007). "Hesperia Series." *National Cooperative Soil Survey*. Accessed at: <http://www2.ftw.nrcs.usda.gov/osd/dat/H/HESPERIA.html> on 6/8/07.

U.S. Department of Labor (2007). "Minimum Wage Laws in the States." Accessed at: www.dol.gov/esa/minwage/america.htm on 6/12/07.

Victor Valley Economic Development Authority (2007). "Regional Profile." Accessed at: http://www.victorvalleyca.com/regional_profile.php on 6/8/07.

Wadley-Donovan Group (2000). *Labor Market Appraisal of Hesperia, California*. Report prepared for the City of Hesperia Economic Development Department, October. Accessed at: http://www.cityofhesperia.us//images/Site005/documents/dev_svcs/labor.pdf on 6/8/07.

Weather Channel (2007). "Average Weather for Hesperia, CA." Accessed at: http://www.weather.com/outlook/homeandgarden/pets/wxclimatology/monthly/graph/92345?from=36hr_bottomnav_undeclared on 6/8/07.

¹⁶ Web addresses where information for individual cities and counties were obtained are listed in Appendix B.

Appendix A: Tables relating to access to beneficial markets.

Table A1: Demographic characteristics of the following cities: Fontana, Rancho Cucamonga, Rialto, and San Bernardino. (Source: U.S. Census Bureau, 2007.)

		Cities			
Characteristic		Fontana	Rancho Cucamonga	Rialto	San Bernardino (city)
Population		158,235	144,958	93,284	204,552
Ethnicity:	<i>White</i>	65.5%	69.8%	60.1%	59.7%
	<i>African American</i>	11.8%	5.5%	17.4%	19.5%
	<i>Hispanic/Latino</i>	64.1%	32.5%	64.7%	56.3%
	<i>Asian</i>	5.7%	8.4%	1.4%	3.8%
	<i>Native Hawaiian/Pacific Islander</i>	0.3%	0.2%	0.6%	0.3%
	<i>American Indian/Native Alaskan</i>	0.6%	0.3%	0.8%	0.9%
Median Household Income		\$58,481	\$71,967	\$50,446	\$33,915
Per Capita Income		\$17,627	\$29,749	\$16,514	\$14,296

Table A2: Demographic characteristics of the following counties: Los Angeles, Orange, Riverside, and San Bernardino. (Source: U.S. Census Bureau, 2007.)

		Counties			
Characteristic		Los Angeles County	Orange County	Riverside County	San Bernardino County
Population		9,758,886	2,944,537	1,911,281	1,916,665
Ethnicity:	<i>White</i>	50.9%	62.5%	62.4%	64.0%
	<i>African American</i>	8.9%	1.6%	5.7%	9.1%
	<i>Hispanic/Latino</i>	47.3%	32.7%	41.7%	45.3%
	<i>Asian</i>	13.1%	16.1%	4.8%	5.8%
	<i>Native Hawaiian/Pacific Islander</i>	0.3%	0.3%	0.3%	0.3%
	<i>American Indian/Native Alaskan</i>	0.5%	0.5%	0.8%	1.0%
Median Household Income		\$48,248	\$65,953	\$52,253	\$49,026
Per Capita Income		\$24,705	\$31,126	\$23,478	\$19,991

Table A3: Information about certified farmers markets in the study area. (Source: California Federation of Certified Farmers Markets.)

High Desert CFM	Fontana Kaiser CFM	Riverside CFM
Thurs. 8AM-12PM 18422 Bear Valley Rd. (Victor Valley College Upper Campus), Victorville, CA	Fri, every other, 10A-2P Sierra Ave. and Marygold, Fontana, CA	Fri. 8:30AM-12PM 5261 Arlington Ave. (Sears Parking Lot)
Upland CFM	Lake Arrowhead CFM	Big Bear Lake CFM
Thurs. 5PM-9PM 9 th & 2nd Ave., Upland, CA	Fri. 5PM-8PM California Hwy 189 & California Hwy 173, Lake Arrowhead, CA	Tues. 8:30AM-1PM Big Bear Blvd. & Division Rd., Big Bear, CA

Appendix B: Web addresses for United States Census Bureau fact sheets where information about individual cities and counties was obtained.

Apple Valley

http://factfinder.census.gov/servlet/ACSSAFFacts?_event=Search&geo_id=16000US0633434&_geoContext=01000US%7C04000US06%7C16000US0633434&_street=&_county=apple+valley&_cityTown=apple+valley&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&_qr_name=null®=null%3Anull&_keyword=&_industry=

Crestline

http://factfinder.census.gov/servlet/SAFFacts?_event=Search&geo_id=16000US0650132&_geoContext=01000US%7C04000US06%7C16000US0650132&_street=&_county=crestline&_cityTown=crestline&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=DEC_2000_SAFF&_ci_nbr=null&_qr_name=null®=null%3Anull&_keyword=&_industry=

Fontana

http://factfinder.census.gov/servlet/ACSSAFFacts?_event=Search&geo_id=16000US0602364&_geoContext=01000US%7C04000US06%7C16000US0602364&_street=&_county=fontana&_cityTown=fontana&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&_qr_name=null®=null%3Anull&_keyword=&_industry=

Hesperia

http://factfinder.census.gov/servlet/ACSSAFFacts?_event=Search&geo_id=16000US0682590&_geoContext=01000US%7C04000US06%7C16000US0682590&_street=&_county=hesperia&_cityTown=hesperia&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=

Lake Arrowhead

http://factfinder.census.gov/servlet/SAFFacts?_event=Search&geo_id=16000US0617162&_geoContext=01000US%7C04000US06%7C16000US0617162&_street=&_county=lake+arrowhead&_cityTown=lake+arrowhead&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=DEC_2000_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=

Los Angeles County

http://factfinder.census.gov/servlet/ACSSAFFacts?_event=Search&geo_id=05000US06065&_geoContext=01000US%7C04000US06%7C05000US06065&_street=&_county=los+angeles+county&_cityTown=los+angeles+county&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=050&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=

Muscoy

http://factfinder.census.gov/servlet/SAFFacts?_event=Search&geo_id=05000US06065&_geoContext=01000US%7C04000US06%7C05000US06065&_street=&_county=muscoy&_cityTown=muscoy&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=050&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=&show_2003_tab=&redirect=Y

Orange County

http://factfinder.census.gov/servlet/ACSSAFFacts?_event=Search&geo_id=05000US06037&_geoContext=01000US%7C04000US06%7C05000US06037&_street=&_county=orange+county&_cityTown=orange+county&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=050&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=

Rancho Cucamonga

[http://factfinder.census.gov/servlet/ACSSAFFacts?_event=Search&geo_id=16000US0624680&_geoContext=01000US%7C04000US06%7C16000US0624680&_street=&_county=rancho+cucamonga&](http://factfinder.census.gov/servlet/ACSSAFFacts?_event=Search&geo_id=16000US0624680&_geoContext=01000US%7C04000US06%7C16000US0624680&_street=&_county=rancho+cucamonga&_cityTown=)

http://factfinder.census.gov/servlet/ACSSAFFFacts?_event=Search&geo_id=05000US06065&_geoContext=01000US%7C04000US06%7C05000US06065&_street=&_county=rialto&_cityTown=rialto&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=

Rialto

http://factfinder.census.gov/servlet/ACSSAFFFacts?_event=Search&geo_id=05000US06065&_geoContext=01000US%7C04000US06%7C05000US06065&_street=&_county=rialto&_cityTown=rialto&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=

Riverside County

http://factfinder.census.gov/servlet/ACSSAFFFacts?_event=ChangeGeoContext&geo_id=05000US06065&_geoContext=01000US%7C04000US06%7C16000US0665000&_street=&_county=riverside&_cityTown=riverside&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=010&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=

San Bernardino (City)

http://factfinder.census.gov/servlet/ACSSAFFFacts?_event=Search&geo_id=16000US0660466&_geoContext=01000US%7C04000US06%7C16000US0660466&_street=&_county=san+bernardino+city&_cityTown=san+bernardino+city&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=

San Bernardino County

http://factfinder.census.gov/servlet/ACSSAFFFacts?_event=Search&geo_id=16000US0665000&_geoContext=01000US%7C04000US06%7C16000US0665000&_street=&_county=san+bernardino+county&_cityTown=san+bernardino+county&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=

Victorville

http://factfinder.census.gov/servlet/ACSSAFFFacts?_event=Search&geo_id=16000US0602364&_geoContext=01000US%7C04000US06%7C16000US0602364&_street=&_county=victorville&_cityTown=victorville&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=ACS_2005_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=

Wrightwood

http://factfinder.census.gov/servlet/SAFFacts?_event=Search&geo_id=16000US0639444&_geoContext=01000US%7C04000US06%7C16000US0639444&_street=&_county=wrightwood&_cityTown=wrightwood&_state=04000US06&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=DEC_2000_SAFF&_ci_nbr=null&qr_name=null®=null%3Anull&_keyword=&_industry=