ECONOMIC CONTRIBUTIONS *of* SAN MATEO COUNTY AGRICULTURE

Agricultural Impact Associates
"Quantifying the value of California agriculture"

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Economic Contributions of San Mateo County Agriculture

San Mateo County Agriculture:

…contributes a total of $216 million to the local economy, including:

$160 million in direct economic output;

$56 million in additional "multiplier effects" from expenditures by agriculture companies and their employees.

…provides 4,708 jobs in San Mateo County economy, including:

1,204 direct employees;

3,504 additional "multiplier effect" jobs made possible from expenditures by agriculture companies and their employees.

…is especially important along the coast, which has 12.5% of the county's population but 94.1% of its direct, agricultural economic output.

Introduction

Residents and visitors alike know and value the rural parts of San Mateo County. Farmers markets overflow with fresh produce and community spirit. Flowers, Brussels sprouts, and dozens of other crops grow in fertile soils and a moderate climate, many with stunning ocean views. Clearly, agriculture plays a key role in sustaining a healthy local economy. What is not so clear, however, is the true size of that role. How much money does agriculture contribute to the local economy? How many jobs does agriculture support? In other words, just how valuable is agriculture as a driver of the county's economic health?

This report sheds light on these and related questions. Using multiple data sources and advanced economic modeling techniques, it analyzes agriculture's total contribution to the San Mateo County economy. The report also examines agriculture in the context of the "coastal" economy since most of the agricultural production and employment occurs there. On the whole, the findings offer important information for policy makers, the public, and anyone who values a vibrant and diverse local economy.

Our Approach

When it comes to economic analysis, it is important to examine the fullest possible range of economic contributions. This report does that by focusing not just on *direct* economic effect such as farm production and employment, but also on *multiplier effects*. *Multiplier effects* are ripples through the economy. These ripples include inter-industry "business to business" supplier purchases, as well as "consumption spending" by employees. The **Multiplier Effects** section on page 8 explains this further.

It is appropriate to calculate *multiplier effects* when analyzing what economists call a *basic industry*. A *basic industry* is one that sells most of its products beyond the local area and thus brings outside money into local communities. Agriculture is a basic industry in San Mateo County, so this report includes *multiplier effects* when describing agriculture's total economic contribution. Granted, many small producers sell locally. They market directly to restaurants, farmers' markets, and other local buyers. Most of the county's agricultural products, however, are sold across the greater Bay Area and far beyond.

Our analysis only examines agriculture's economic contributions. To understand agriculture's full economic impact, one would also need to assess agricultural-related costs to society, for example net impacts on water and other natural resources. These impacts are important but lie beyond the scope of this study.

Our calculations draw from local and national data sources. Local sources include industry experts and the annual crop reports produced by the county's Department of Agriculture/Weights & Measures. National data sources include federal government statistics and a widely used economic modeling program called IMPLAN®. Where data judgments were required, we used the most conservative (lowest) numbers and adjusted IMPLAN figures based on consultations with local experts and other sources. Except where otherwise noted, all figures are from the year 2011, the most recent IMPLAN dataset available. Please contact the authors for additional details on the methods used.

"Direct Effects" of San Mateo County Farm Production

This section focuses on the simplest measures of economic output: production and employment. It describes total farm production and how production has changed over recent years, as well as the number of jobs in agriculture.

Figure 1 shows the various categories that make up San Mateo County farm production value. Floral and Nursery products are the single largest production category by dollar value, comprising 81.3% of the county total. Among other things, this includes items grown indoors such as flowering potted plants ($79.5 million) and outdoor grown products such as shrubs, trees, perennials, and other ornamental plants ($15.0 million). Vegetable Crops represent the second largest category (12.2%), including key crops such as Brussels sprouts ($8.9 million) and leeks ($1.5 million). Together, these two categories account for 93.5% of the county's direct farm production values. Total farm production value for 2011 was $137.0 million. This gross value does not reflect net profit or loss experienced by individual growers or by the industry as a whole. Interested readers are encouraged to consult the annual Crop Report for additional details.

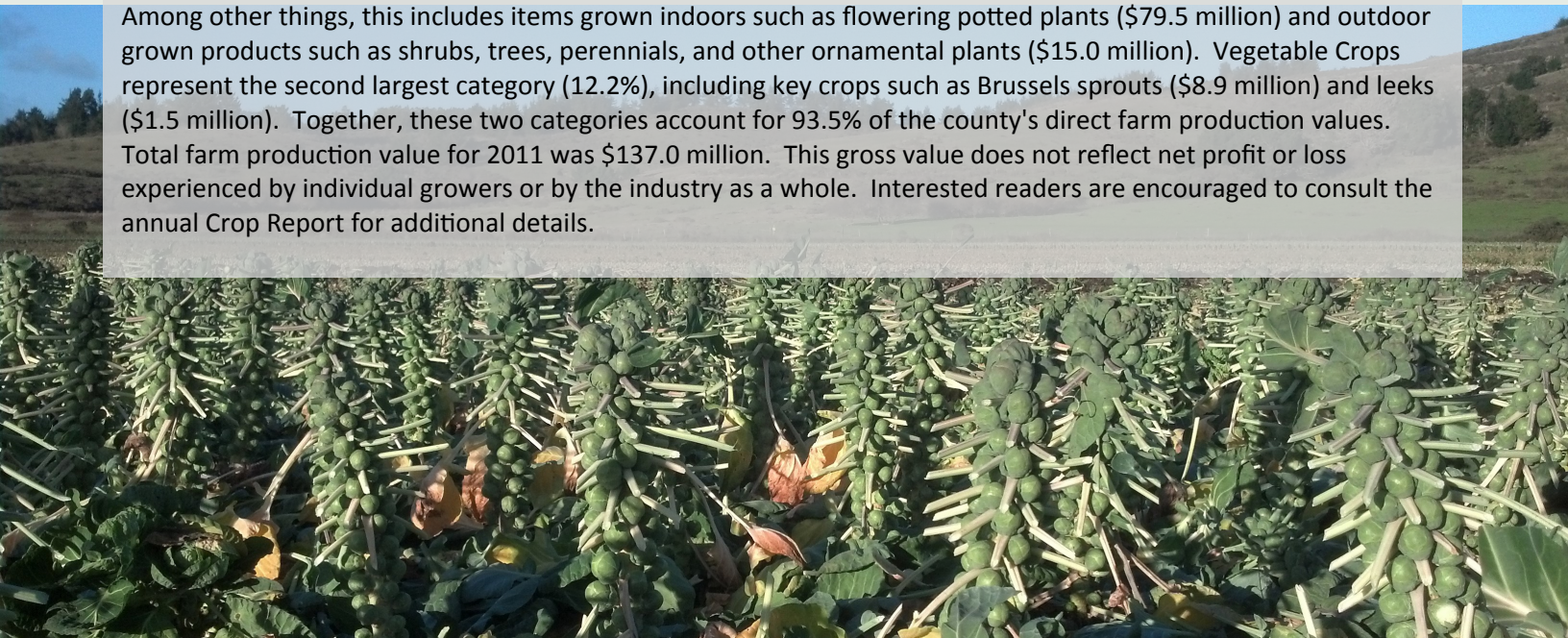
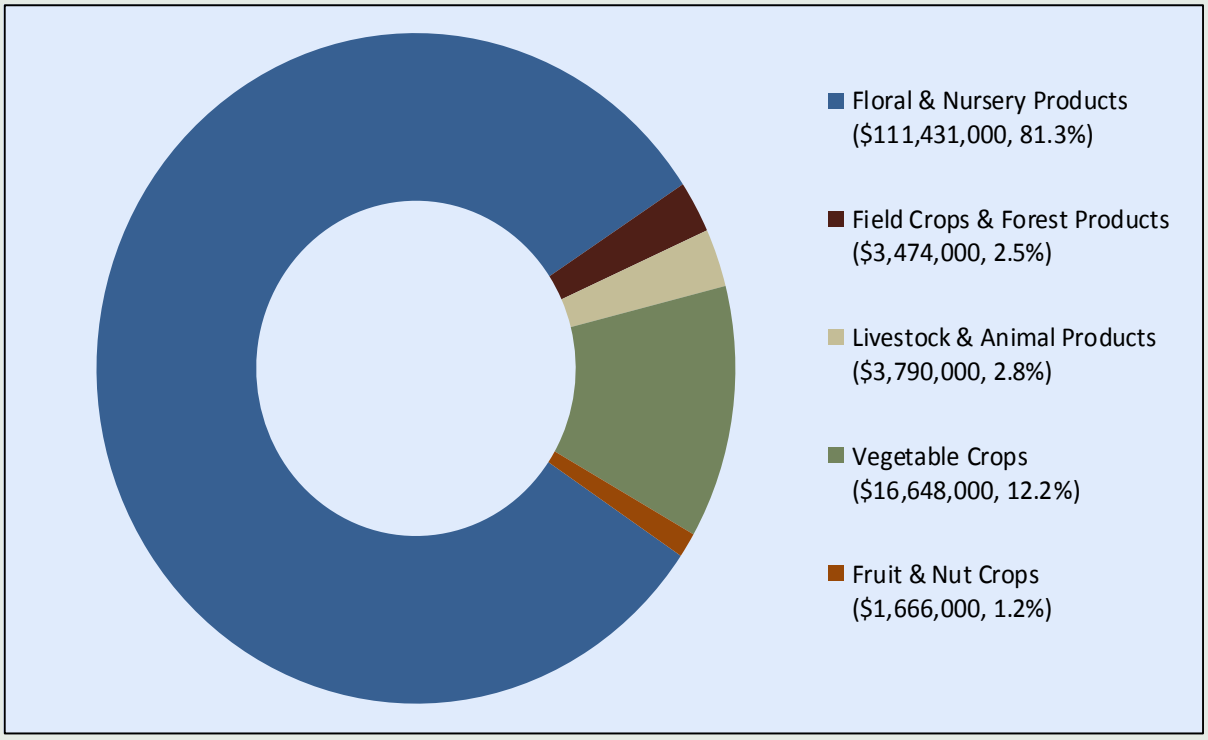


Figure 1: Distribution of San Mateo County Agriculture by Production Value



Source: 2011 San Mateo County Crop Report and IMPLAN

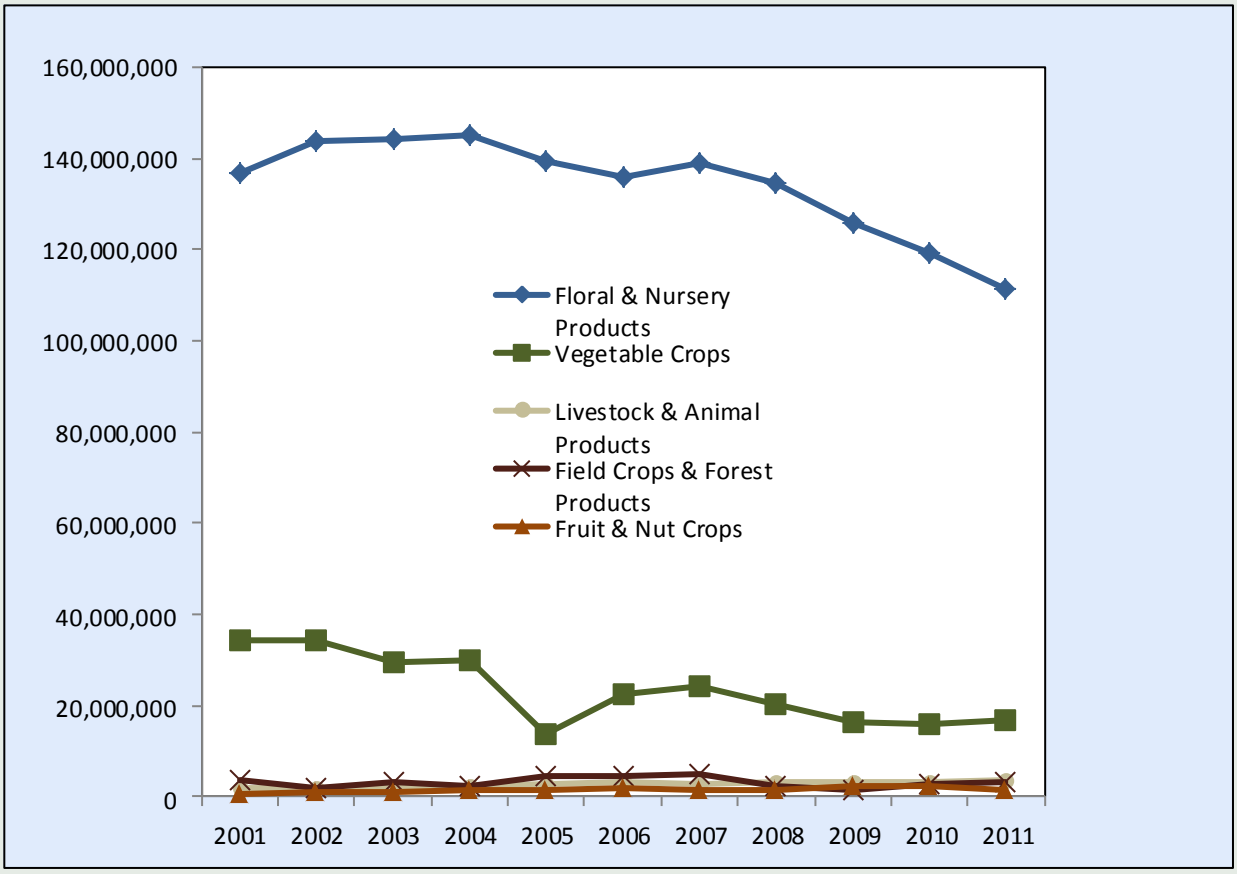
How has farm production changed over time? **Figure 2** shows ten-year production trends. It specifies not just the production trend for a given category, but also growth rates. It also adjusts for inflation using a standard measure called the Consumer Price Index (CPI).

For example, the cumulative change in agricultural production for ten years following 2001 decreased 22.6%, from $177.1 million to $137.0 million. This period included two economic recessions. Based on the Consumer Price Index, inflation totaled 27% over the decade. This means that the "real" (inflation adjusted) production decrease was 49.6%, or about twice the original figure. Growers not only made less revenues than ever in 2011, but they also paid 27% more for seedlings, fertilizer, fuel, and everything else compared to a decade prior.

Figure 2 shows inflation-adjusted effects on specific production categories. Note that the precipitous drop in Vegetable Crops is mostly attributable to the 2005 closing of a large mushroom-growing facility near Pescadero. Started by Campbell's Soup Company in 1957, the mushroom operation was a mainstay of the county's agricultural production. In 2002, for example, mushrooms generated $23.0 million, more than two-thirds of all vegetable production. In the year of the closing, Vegetable Crop production plummeted 54% from $29.8 million to $13.7 million. Since that "reset" year, Vegetable Crops are up 6.5%, even after subtracting 15.0% for inflation. Also on the upside, both Fruit and Nut Crops and Field Crops & Timber Products were positive for the entire decade, up 93.4% and 72.4% respectively.

Figure 2. Ten Year Tends in Gross Production Values

	Production Value		Total Change	Inflation–Adjusted
	2001	2011		
Floral & Nursery Products	$136,614,000	$111,431,000	-18.4%	-45.4%
Vegetable Crops	$34,564,000	$16,648,000	-51.8%	-78.8%
Livestock & Animal Products	$1,742,000	$3,790,000	54.0%	27.0%
Field Crops & Forest Products	$3,498,000	$3,474,000	-0.7%	-27.7%
Fruit & Nut Crops	$692,000	$1,666,000	58.5%	31.5%

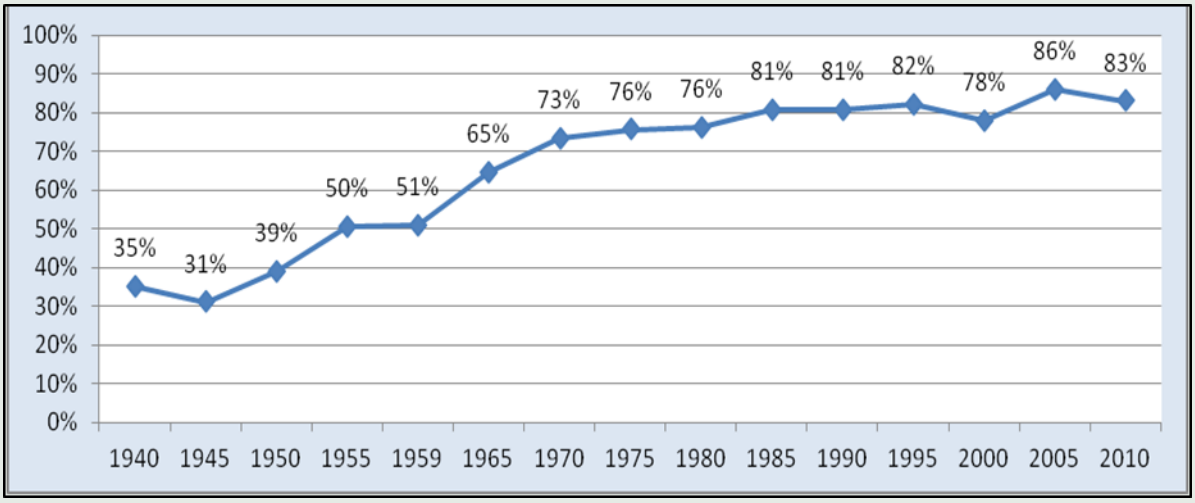


Employment. How many people work in agricultural production? Agricultural production directly employs 1,144 people in San Mateo County. The figure encompasses a wide range of production-related jobs, including not just growing and harvesting, but also sales, marketing and many other roles. It does not include food processing jobs, which we discuss below. Nor does it include the 37 jobs attributable to the county's $3.3 million commercial fishing sector. Unfortunately, employment data for prior years are incomplete and poor quality, making historical comparisons impractical.

Long-term Trends. While **Figure 2** shows recent history, a longer look spanning entire decades provides a more complete picture. Based on historical crop report data, it is possible that agriculture is returning to normal rather than declining.

Several phenomena have driven fluctuations over time. World War II stands as a noteworthy example because demand for food and fiber skyrocketed. The most recent driver was the rapid rise and sudden decline in demand for flowers and potted plants. As **Figure 3** shows, flowers and nursery products grew in importance over the past 70 years. The category represented 35% of revenues in 1940 but more than 80% in 2000 and 2010. Increased dependence on this single category not only brought rising revenues, but also increased vulnerability. Thus, when the potted plant boom faded and foreign competitors entered the flower business, the impacts on the county's agriculture were dramatic. The "Floral and Nursery Products" line in **Figure 2** shows this drop.

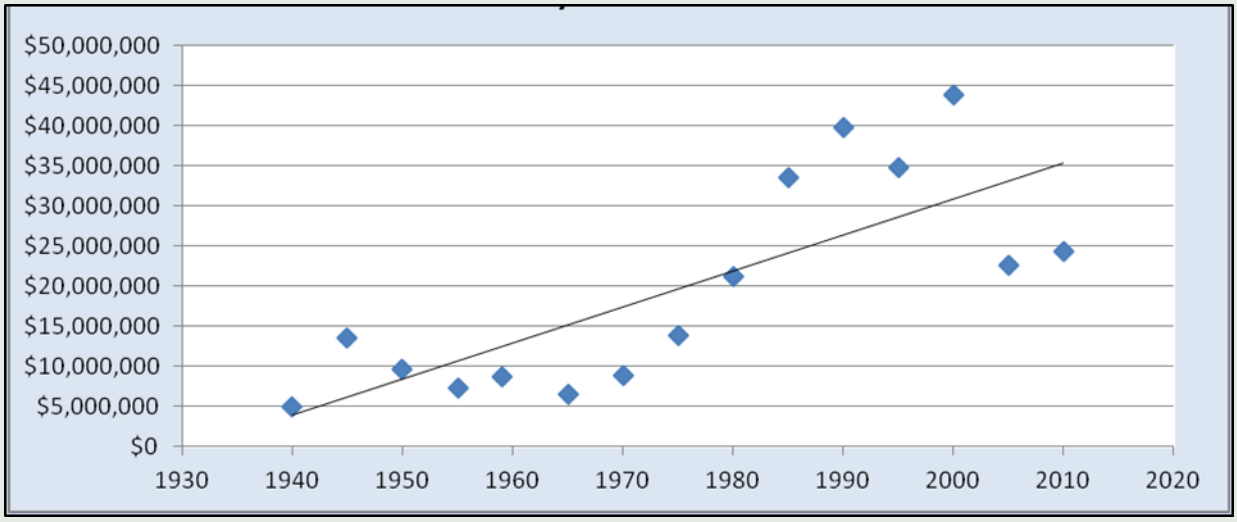
Figure 3. Floral & Nursery Products as a Percentage of All Agricultural Production



What if the nursery product boom never happened? How would the long-term trend look? **Figure 4** shows long-term production values for all of the county's crops *except* floral and nursery products. Note that overall production values have experienced episodic spikes, in particular the 1940s and 1990s. Dips have also occurred, especially the 1970s and roughly 2005 to 2010.

The overall long-term trend, however, has been up. As the regression line shows, production values for crops other than floral and nursery products exhibit a 70-year trajectory of steady growth. The average compounded annual growth was 2.3% and inflation averaged 3.4% during this period. Similar to the past, spikes and dips will likely occur during future decades as well. In fact, crops other than floral and nursery products may have hit their low point in 2005 (at $22.6 million) and already begun a slow, steady climb back to normal, or above normal. Only time will tell.

Figure 4. Regression Line for Non-Floral, Non-Nursery Agricultural Production



"Multiplier Effects" of San Mateo County Farm Production

This section quantifies the economic "ripples" that farm production creates in the local economy. These ripples take two forms: *indirect effects* and *induced effects*. The first consist of "business to business" supplier purchases. For example, when a grower buys farm equipment, fertilizer, seed, insurance, banking services, and other inputs, the grower creates *indirect effects*. The second ripple type, *induced effects*, consist of "consumption spending" by agriculture business owners and employees. They buy housing, healthcare, leisure activities, and other things for their households. All of this spending creates ripples in the economy.

Figure 5 shows agriculture's direct, indirect, and induced economic effects within the county for major production categories. The numbers use IMPLAN multipliers for each sector, which are rooted in U.S. Bureau of Economic Analysis production data and other sources.

Note: Agricultural production created $184.3 million in total economic output within San Mateo County. $47.3 million of this was a result of multiplier effects. Indirect and induced spending supported an additional 3,425 jobs within the county, bringing agriculture-related production's total employment to 4,569.

Figure 5: Economic Effects of Farm Production

Farm Production Sector	Direct Output Effect	"Indirect" Effects Multiplier	"Induced" Effects Multiplier	Combined Multiplier Effect	Total Economic Output
Floral & Nursery Products	$111.4	0.0805	0.2610	$38.1	$149.5
Vegetable Crops	$16.6	0.1919	0.1839	$6.3	$22.9
Field Crops & Forest Products	$3.5	0.3420	0.1090	$1.6	$5.0
Livestock & Animal Products	$3.8	0.1206	0.0839	$0.8	$4.6
Fruit & Nut Crops	$1.7	0.1707	0.2201	$0.7	$2.3
Total Economic Output:	**$137.0**	$14.1	$33.2	**$47.3**	**$184.3**
		Employment Effect (# Jobs)			
Total Employment:	**1,144**	**1,082**	**2,343**	**3,425**	**4,569**

Dollar values are in $ millions. Figures are for 2011 and come from IMPLAN, Crop Reports, and U.S. Bureau of Economic Analysis.

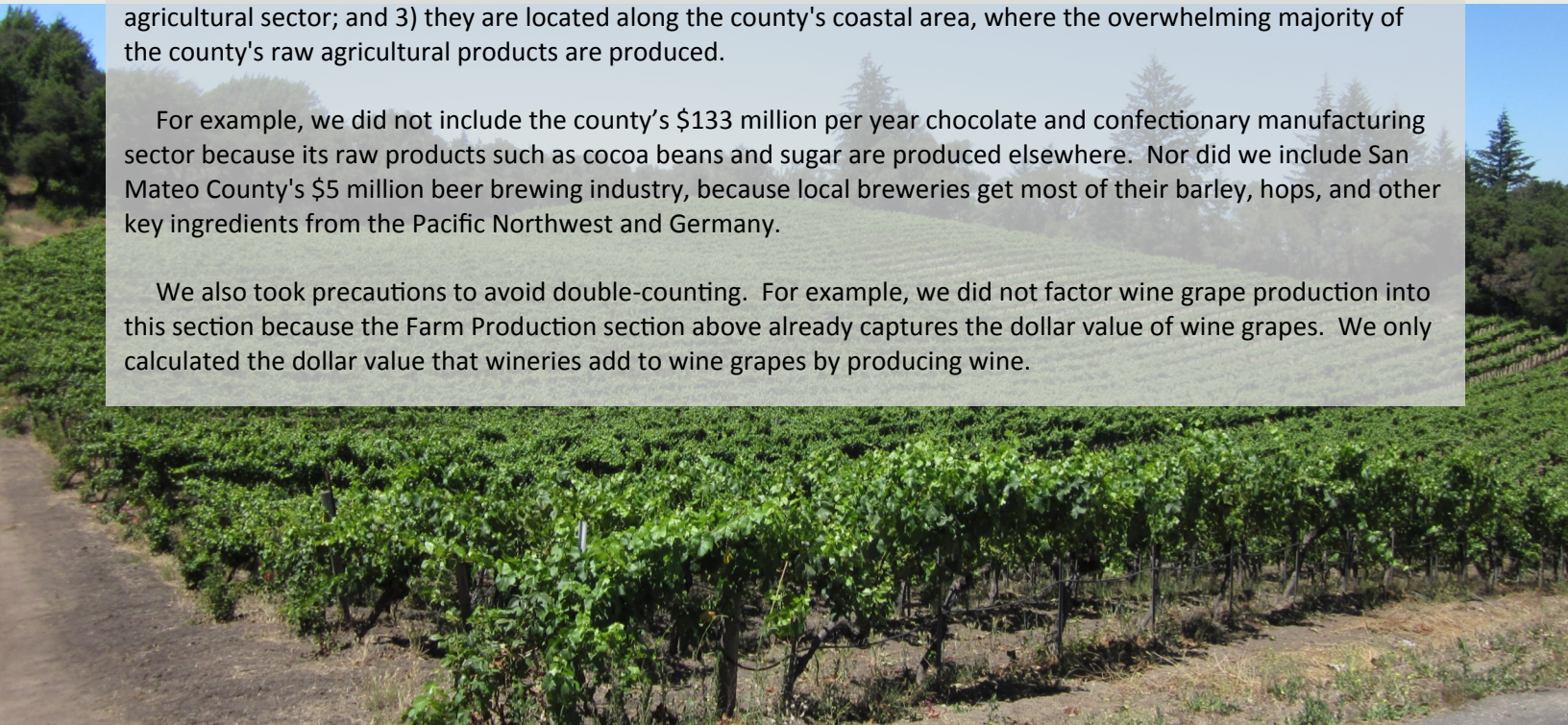
Locally Sourced, Value Added Food Processing

Farm production tells only part of the story. San Mateo County is home to several food processors that play an important role in the local economy. This section examines the economic importance of local food processing. It is neither an exact science nor a full assessment, but rather gives the reader a basic overview of the topic.

To avoid overstating the numbers, we only included food manufacturers and sectors that fit three strict criteria: 1) they use mostly local agricultural inputs; 2) they are unlikely to exist here without the presence of the associated agricultural sector; and 3) they are located along the county's coastal area, where the overwhelming majority of the county's raw agricultural products are produced.

For example, we did not include the county's $133 million per year chocolate and confectionary manufacturing sector because its raw products such as cocoa beans and sugar are produced elsewhere. Nor did we include San Mateo County's $5 million beer brewing industry, because local breweries get most of their barley, hops, and other key ingredients from the Pacific Northwest and Germany.

We also took precautions to avoid double-counting. For example, we did not factor wine grape production into this section because the Farm Production section above already captures the dollar value of wine grapes. We only calculated the dollar value that wineries add to wine grapes by producing wine.



Based primarily on data from IMPLAN, but also from the U.S. Bureau of Economic Analysis and consultations with local experts, we estimate $23.0 million in locally sourced, value added processing for 2011. Multiplier effects – including both indirect and induced – bring this total to $31.6 million. Although detailed sector data are not available, processing operations consist of boutique-scale vegetables and fruit sellers as well as wineries. Estimated employment was 60, with an additional 79 jobs supported through multiplier effects.

Substantial opportunity exists to expand locally sourced, value added food processing, especially given the close proximity to the large Bay Area market. Strong marketing, favorable zoning policies, and reduced cost of permits and infrastructure can all play a role in realizing this potential.

Local food processing produced an estimated $23.0 million in direct output. Multiplier effects brought the total value to $31.6 million. Local processing directly provided 60 jobs, plus another 79 jobs through multiplier effects.

Total Economic Contribution of San Mateo County Agriculture

The previous sections have provided key pieces to an economic puzzle. This section combines those puzzle pieces into a final picture showing the overall economic effect of San Mateo County agriculture.

As **Figure 6** shows, the total economic contribution of San Mateo County agriculture is $216 million. This consists of $160 million in direct output from production and processing, plus $56 million in multiplier effects. Total employment is 4,708. This includes 1,204 jobs directly in agriculture, plus another 3,504 jobs made possible through agriculture's multiplier effects.

Direct and indirect employment figures include only those workers made possible by an agricultural firm, its employees, or its suppliers. This does not include many jobs with non-profit organizations and government agencies that work on agricultural issues. Examples include agricultural educators, researchers, regulators, and others.

Figure 6. Overall Economic Effect of San Mateo County Agriculture

Type of Effect	Direct	Indirect	Induced	Total
Farm Production Sector				
Output Effect ($ Millions)	$137.0	$14.2	$33.2	$184.4
Employment Effect (# Jobs)	1,144	1,082	2,343	4,569
Locally Sourced, Value-Added Food Processing Sector				
Output Effect ($ Millions)	$23.0	$5.1	$3.5	$31.6
Employment Effect (# Jobs)	60	43	36	139
Total Value of Agricultural Sector				
Output Effect ($ Millions)	$160.0	$19.3	$36.6	$216.0
Employment Effect (# Jobs)	1,204	1,125	2,379	4,708

Agriculture and the Coastal Side of San Mateo County

When it comes to agriculture, San Mateo is a tale of two counties. Built up and urban, the eastern "bay side" is home to prominent companies in health care, technology, hospitality, financial management, and other industries. Meanwhile, the western "coast side" is more rural and contains nearly all of the county's farmland. This section explores these differences by analyzing agriculture's role in the coastal economy.

Based on consultations with local experts, we created and analyzed a "coastal" economy consisting of the following eight cities and zip codes: Half Moon Bay (94019), La Honda (94020), Loma Mar (94021), Montara (94037), Moss Beach (94038), Pacifica (94044), Pescadero (94060), and San Gregorio (94074). We also included the Redwood City zip code (94062) because most of it stretches westward over the mountains, including portions of coastal Highway 1. Then we calculated agriculture's economic contributions within this coastal geographical sub-unit.

The results indicate that coastal communities comprise only 12.5% of the county's human population but contribute the overwhelming majority of the county's agricultural output and jobs. Coastal communities produced just under $129.0 million in direct agricultural economic output for 2011, which was 94.1% of the county's total production value of $137.0 million. Applying the same percentage to employment, coastal communities would be responsible for 1,076 of the county's 1,144 jobs in direct agricultural production.

Figure 7 shows sizes and rankings for various industries in the "coastal" economy based on employment and economic output. Note that coastal agriculture ranked 10th in overall size compared to other coastal industries. For the county's entire $94 billion economy (including areas beyond the coast), Agriculture ranked 10th.

Coastal industries no doubt benefit from economic "spillover effects" from the county's large bay side economy. For example, commuters and residents may work on the bay side but spend money on the coast. They buy real estate, stay in hotels, eat at restaurants, and so on. This includes, among other things, agricultural tourism to wineries, pumpkin festivals, and other events. Economists have developed sophisticated techniques for modeling "spillover effects," but such analysis lies beyond the purposes of this study.

Figure 7. Agriculture and the Coastal Economy

Rank	Industry	Employment	$ Output (millions)
1	Business Services & Other Services	14,896	$1.786
2	Manufacturing	1,436	$1,332
3	Finance & Real Estate	4,621	$1,197
4	Construction & Utilities	3,358	$510
5	Health & Social Services	4,045	$480
6	Transportation & Communication	1,399	$434
7	Wholesale & Retail Commerce	4,136	$407
8	Education (including public schools)	3,112	$229
9	Government (including military)	1,118	$157
10	**Agriculture**	**1,076**	**$129**
11	Food Processing & Beverages	225	$54
12	Mining	101	$47
13	Other Natural Resources	31	$3
	Totals	**39,553**	**$6,765**

Toward the Future

This report has documented the role that San Mateo County agriculture plays as a local economic driver. Agriculture contributes $216.0 million to the county economy. This far exceeds direct production values reported in annual crops reports by the county's Department of Agriculture Weights & Measures, for example the $137.0 million figure reported for 2011 and the $140.0 total for 2012. Agriculture also plays a key role in county employment, directly or indirectly supporting 4,708 jobs. Finally, 94.1% of the county's direct agricultural production comes from coastal areas, making these farmlands especially important for the local economy.

Agriculture is an important component of the San Mateo County economy and represents a vital link to the county's cultural past and its competitive future. Although this report has presented many facts and figures, it has barely begun to fill key information gaps about agriculture's role. The process of developing this report has raised several additional questions that lie beyond the scope of this report but may warrant future research **(Box 1)**. In the meantime, the findings herein provide the clearest picture yet of San Mateo County agriculture's economic role.

Box 1: Additional Questions to Answer

How diverse is San Mateo County agriculture in terms of crops, production types (conventional or organic), and size (small, medium, large)? Is agriculture getting more or less diverse over time, and what implications does this have for future economic diversity, stability, and growth? In what ways could diversity be enhanced?

What is the dollar value of wildlife habitat, open space, scenic beauty, pollination, and more than 20 other "ecosystem services" that the county's agricultural lands provide to society?

The Golden Gate Produce Terminal in South San Francisco is northern California's largest wholesale distributor of fruits and vegetables. What specific contribution does this facility make to the county's total economic output? To employment?

What is the "net" economic impact of San Mateo County agriculture after subtracting natural resource impacts and other costs to society? (This study has examined just one side of the coin).

San Mateo County has an exceptionally high ratio of farmers' markets per capita. What economic role do these markets play in the county economy? Do they represent a net inflow or outflow of products and money?

How would "shocks" affect agriculture's economic results, for example significant new regulations, labor policies, or changes in the price of key inputs?

How should resources related to agriculture be allocated to best enhance and grow the sector's size and productivity?

Acknowledgments

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