

REVIVING AGRICULTURE TO DIVERSIFY HAWAII'S ECONOMY

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1. INTRODUCTION

King Sugar is dead. Sugar plantations began to close in the 1970s and the last sugar company in Hawaii (the Hawaii Commercial & Sugar Company on Maui) closed at the end of 2016. Little remains of the pineapple industry, which in the 1930s was larger than the sugar industry. Pineapple plantations have been closing since the 1990s and only two large firms are still operating: the Dole Food Company, which grows pineapple for the fresh fruit market on about 4,100 acres of land in central Oahu, and Hali'imaile Pineapple Company¹ which grows pineapples on 800 acres of land in Haliimaile, Maui for the fresh fruit market and its pineapple-based vodka, gin, rum, and wine-making operations on Maui. It was generally thought that when sugar and pineapple plantations shut down, former plantation crop land would be cultivated with numerous smaller crops.² Instead, much of it lies fallow.³

In 1999, the Hawaii State Legislature declared its intent to revive the flagging fortunes of Hawaii agriculture by passing Act 100 which provides a general directive to the Hawaii Department of Agriculture (HDOA): “To further expand the role of Hawaii’s agricultural industry to benefit the well-being of our island society by diversifying the economy, protecting resources for agricultural production, and gaining greater self-sufficiency in food production.”⁴

Five years earlier, in 1994, the Legislature had created a state corporation, the Agribusiness Development Corporation (ADC), that was charged with finding ways to employ unused agricultural land stemming from the closure of sugar and pineapple plantations to produce diversified agriculture products.⁵ Its mission is “to acquire and manage in partnership with farmers, ranchers, and aquaculture groups, selected high value lands, water systems, and infrastructure for commercial agricultural use and to direct research into areas that will lead to the development of new crops, markets, and lower production costs.”⁶

1 This company also does business as Maui Gold Pineapple Company. See “New Ownership Announced for Hali’imaile Pineapple Company,” *The Maui News*, May 17, 2018. Available at <https://www.mauinews.com/news/local-news/2018/05/new-ownership-announced-for-haliimaile-pineapple-co/> (last access on 11 Jan. 2021).

2 See summary of the Statewide Agricultural Land Use Baseline 2015 study on agricultural land use in Hawaii for a review of changes in the pattern of agricultural land use. Available at <https://hdoa.hawaii.gov/blog/main/nrsalus2015/> (last access on 1 Dec. 2020).

3 For an overview of the aftermath of plantation closures, see Brittany Lyte, “With pineapple and sugar production gone, Hawaii weighs its agricultural future,” *The Washington Post*, December 17, 2017. Available at https://www.washingtonpost.com/national/with-pineapple-and-sugar-production-gone-hawaii-weighs-its-agricultural-future/2017/12/17/c6e69236-e105-11e7-8679-a9728984779c_story.html (last access on 11 Jan. 2021).

4 State of Hawaii, Department of Agriculture (2019). Department of Agriculture Annual Report. Department Overview, Fiscal Year 2020. December 26, 2019. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2019/01/DOA-HDOA-Annual-Report-2019.pdf> (last access on 11 Jan. 2021).

5 ADC is administratively attached to HDOA.

6 See Agribusiness Development Corporation Strategic Plan, October 15, 2008. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2013/01/ADC-Strategic-Plan.pdf> (last access on 11 Jan. 2021).

A second large state government program designed to promote agriculture is the Important Agricultural Lands (IAL) program. At the 1978 Constitutional Convention, a section was added to the Hawaii State Constitution requiring the state “to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands.” It directs the state to identify “important agricultural lands” that should be kept in agriculture. Twenty-seven years later the State Legislature passed legislation that sets criteria for defining important agricultural lands and provides criteria and process for land owners, the counties, and the state to identify and protect such lands. In 2008, the state passed a tax credit that land owners with IAL status can claim against qualified expenses related to IAL lands. Counties took little action to designate IAL lands until 2015 when Kauai started the process of identifying IAL lands. The City and County of Honolulu approved IAL plans and maps in August 2019 and submitted them to the State Land Use Commission (LUC) for review and approval. As of December 2000, the LUC had approved fifteen properties encompassing 136,489 acres statewide for IAL status. Each of the 15 property owners had voluntarily submitted petitions to the LUC asking that the LUC declare their approval of this designation, which qualifies the landowners for an array of state benefits and subsidies only available with IAL designation.

In Hawaii, some people value local agriculture because it preserves open space and reduces urban sprawl. Others value agriculture because it enhances food security in the event of natural disasters and when shipping is disrupted. Others value the fresh food that in some ways only local farmers can deliver to retail markets and stores. Others point to the carbon savings that might be achieved by transporting less food across the Pacific Ocean. State policymakers have identified agriculture as a sector capable of substantial expansion as part of state government’s new efforts to diversify the state’s economy. This policy brief does not analyze whether the state’s goal to diversify the economy by reviving the agriculture sector is a reasonable objective based on one or more of the rationales outlined above. Instead, we examine whether the two state programs, ADC and the IAL program, are likely to be effective and large enough to achieve the goal of diversification via agriculture. Our conclusion is simple: the ADC program is very costly and its impact too small to contribute much to the state’s diversification goal.

To put Hawaii’s situation with respect to agriculture in perspective, we begin by presenting background information on the sharp decline in Hawaii agriculture and make a brief comparison of U.S. and Hawaii farms to highlight some of the different trends affecting agriculture on the mainland and in Hawaii.

2. TRENDS IN AGRICULTURE IN HAWAII AND THE CONTINENTAL UNITED STATES

For the last four decades, agriculture in Hawaii has been in decline. In 1980, the value of all crops, livestock and aquaculture sales in Hawaii was \$634.1 million; in 2017, it was \$563.8 million. Once we adjust both values for inflation, the 1980 crop value is equivalent to \$2.15 billion in 2019 prices and the 2017 value is equivalent to \$583.5 million in 2019 prices. Thus, the real value of agricultural products sold by Hawaii farms over the last 40 years has declined by 72.9 percent. Table 1 shows that the decline is primarily due to massive decreases in the value of sugar, pineapple, and livestock production. “Other crops” reached its peak in 2010 and has since been in decline, with at least part of the subsequent decline to \$415.4 million in 2017 due to the 61.1 percent fall in the real value of seed corn from \$281.7 million in the 2010/2011 growing season to \$109.5 million in the 2019/2020 growing season.⁷ The star performer has been aquaculture, where the real value of output increased by more than 400 percent between 1990 and 2017.⁸

7 U.S. Department of Agriculture, Economic Research Service, National Agricultural Statistics Service, Hawaii Field Office (2020), Tropical and Specialty Crops, May 18, 2020. Available at https://www.nass.usda.gov/Statistics_by_State/Hawaii/Publications/Sugarcane_and_Specialty_Crops/ (last access on 11 Jan. 2021).

8 In an article using farm-level data to evaluate the economic performance of the aquaculture industry in Hawaii in

TABLE 1: VALUE OF HAWAII AGRICULTURE PRODUCTION (\$2019)

Year	Total	All crops	Sugar	Pineapple	Other Crops	Livestock	Aquaculture
1980	2,151,360	1,875,785	1,306,556	259,873	309,356	275,574	na
1985	1,392,587	1,174,412	585,854	238,478	350,080	218,175	na
1990	1,231,279	1,032,233	435,645	216,732	379,856	180,216	18,529
1995	848,302	704,986	213,795	146,258	344,933	121,038	21,922
2000	833,685	689,196	99,351	162,172	427,674	109,076	34,846
2005	829,688	703,275	83,854	112,879	506,543	85,983	39,783
2010	808,704	699,720	83,677	D	616,043	73,055	35,354
2011	831,707	696,926	90,283	D	606,643	88,576	45,467
2012	729,472	595,428	82,755	D	512,661	71,132	61,906
2013	na	578,042	86,221	D	491,821	68,604	na
2014	689,858	518,934	59,413	D	459,522	85,393	84,164
2015	653,732	483,601	52,108	D	431,493	87,627	81,185
2016	614,144	473,102	57,716	D	415,386	60,680	79,077
2017	583,484	na	0	D	na	59,473	77,770

Notes: "D" means that Dept. of Agriculture withheld data so as not to reveal production data for a small number of producers. The value of aquaculture sales in 2019 was \$83.2 million in 2019 dollars. Sources: State of Hawaii, DBEDT (2019), *State Data Book*, Table 19.10. 1989 was the first reporting year for aquaculture data. All values deflated to \$2019 with the Honolulu CPI. Aquaculture data for 2019 are from USDA, National Agricultural Statistics Service, *Hawaii Aquaculture Annual Release*, September 30, 2020. Available at https://www.nass.usda.gov/Statistics_by_State/Hawaii/Publications/Livestock,_Poultry_and_Dairy/201909HawaiiAquaculture.pdf (last access on 11 Jan. 2021).

TABLE 2: AGRICULTURE, FORESTRY, FISHING AND HUNTING INDUSTRIES' SHARE OF HAWAII GDP

Year	By SIC Industries	By NAICS Industries
1980	3.22	
1985	1.75	
1990	1.56	
1995	1.13	
1997	1.17	.89
2000		.85
2005		.72
2010		.70
2015		.59
2019		.43

Notes: SIC=Standard Industrial Classification system; NAICS=North American Industrial Classification system
Sources: SIC data are from U.S. Bureau of Economic Analysis. Calculated from Tables 13.04 and 13.05 at https://dbedt.hawaii.gov/economic/databook/data_book_time_series/. NAICS data are annual data from the State of Hawaii, and are available at <https://data.uhero.hawaii.edu/#/analyzer?analyzerSeries=159126-159107&chartSeries=159126-159107&start=1997-01-01&end=2019-01-01>

Since 1980 the share of Hawaii's GDP attributable to agriculture, forestry, fishing and hunting industries (which is mostly agriculture) has declined from 3.22 percent in 1980 to 0.43 percent in 2019 (Table 2).⁹

2007, Emiko Naomasa, Shawn Arita, Clyde Tamaru and PingSun Leung noted wide variations in the performance of aquaculture farms and "distinct differences" in performance across subsectors. They found over 40 percent of the farms were not profitable and only a few farms attained a "very high level of profitability." See Naomasa, et al. (2013), "Assessing Hawaii's Aquaculture Farm and Industry Performance," *Aquaculture Economics & Management* 17(2):184–207.

9 For agriculture alone, the U.S. Department of Agriculture (USDA) estimates that in 2019 net value added by Hawaii

This occurred because the real value of agricultural output fell by 72.9 percent over the 1980–2019 period, whereas the real value of the rest of the Hawaii economy more than doubled, expanding by 117 percent.

A BRIEF COMPARISON OF U.S. AND HAWAII FARMS

The 2017 Census of Agriculture for Hawaii reports 7,328 farms in Hawaii. Just under 90 percent of them are small farms: 66.4% of them are 1–9 acres in size and another 23.1% were 10–49 acres in size.¹⁰ The size distribution of farms in Hawaii stayed roughly constant between 2007 and 2017, although at the upper end of the distribution, several large pineapple and sugar plantations closed. The relatively constant size distribution of non-plantation Hawaii farms runs counter to the trend observed for continental U.S. farms. Between 1987 and 2007, the average size of a mainland farm more than doubled (Sumner, 2014). The U.S. and Hawaii data are in many ways not directly comparable as U.S. farm output consists primarily of wheat, corn, soybeans and other cereal crops, whereas Hawaii farm output consists primarily of tropical and subtropical products, seed corn, fruits, vegetables, and forestry products. The U.S. data indicate that the minimum efficient size of a mainland farm has been increasing, while there appears to have been little change in the minimum efficient size of a Hawaii farm in the post-plantation era.

A 2014 study by Shawn Arita, Dilini Hemanchandra, and PingSun Leung analyzes micro-level Hawaii farm data from the 1997, 2002, and 2007 U.S. Census of Agriculture and detailed crop-level data on imports from continental United States and foreign countries to understand how Hawaii farms performed vis-à-vis domestic and foreign competition (Arita et al., 2014). They conclude that a 40 percent premium in input costs paid by Hawaii farms relative to other U.S. farms and lack of scale economies (an average Hawaii farm is two-to-three times smaller in acres than a comparable mainland farm) have made Hawaii farms less competitive than other U.S. mainland farms.¹¹ Arita et al. find evidence that “rising levels of import competition”, primarily from U.S. farms, “significantly hinder farm growth in Hawaii” and “increase the likelihood of exit for commercial farms but has little effect on small noncommercial farms” (p. 227). One ray of hope for Hawaii farming is their finding (p. 232) “that small commercial farms perform almost on par with mainland farms.”

Both Hawaii and the United States have large numbers of small, unprofitable farms. Daniel Sumner (2014) finds that in 2012, about half of all farms in the United States gross less than \$5,000 per farm. Sumner (p. 148) finds that “[i]n 2012, a year with record net farm income, farms with sales less than \$100,000 generated negative aggregate net farm income of about -\$2,500 per farm”. Small Hawaii farms also tend to perform poorly. In 2017, 78 percent of Hawaii farms had annual sales of under \$25,000. Fifty-seven percent of Hawaii farms experienced net losses in 2017. Some of the losses may be due to part-time farmers who rely on other sources of income besides their farm. Only 53 percent of Hawaii farm operators reported farming as their principal occupation.¹² Overall, farming in Hawaii has not been a very profitable business recently, and the larger, more commercial farms were more likely to be making a profit. These findings indicate that any program oriented towards reviving agriculture in Hawaii should be cautious about emphasizing starting up

agriculture was \$366 million or only 0.37 percent of the state's GDP. USDA, Economic Research Service (2020), State Fact Sheets: Hawaii, December 2, 2020. Available at https://data.ers.usda.gov/reports.aspx?StateFIPS=15&StateName=Hawaii&ID=17854#.U9_yAmM4LzQ (last access on 11 Jan. 2021).

10 U.S. Department of Agriculture, Economic Research Service (2020), State Fact Sheets: Hawaii.

11 Shawn Arita, Dilini Hemanchandra, and PingSun Leung (2014), “Can Local Farms Survive Globalization?” *Agriculture and Resource Economics Review* 43(2):227–248.

12 USDA, National Agricultural Statistics Service (2017), *Census of Agriculture*, Vol. 1, Ch. 1, Hawaii, Tables 1, 5, and 77. Available at https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Hawaii/ (last access on 11 Jan. 2021).

and assisting very small commercial farms. While subsidizing such ventures could be politically attractive, it is unclear whether very small commercial farms can make a profit in Hawaii's globally open and competitive agricultural markets. Ultimately the answer to this question depends not only on how well Hawaii is able to reorganize its agricultural markets, regulations, and support services but also whether continental U.S. and foreign farmers will be able to supply Hawaii markets with lower-cost products.

AGRIBUSINESS DEVELOPMENT CORPORATION (ADC)

In its 2008 strategic plan, ADC states that it "is responsible for devising means by which arable sugar and pineapple lands and their production infrastructure can be used again by a diversified agricultural industry and for providing marketing assistance that can lead to the development of local, national, and international markets for Hawaii-grown products."¹³

On a smaller scale, the mission assigned to ADC has already been accomplished for very small farmers by the state's Agricultural Park program. Established under the auspices of HDOA's Agricultural Resource Management Division, the program's major objective "is to assist people who are interested in leasing land for farming ventures by providing irrigation water, reasonably priced farmland with infrastructure and facilities to encourage competition within the industry."¹⁴ Currently, the division manages 10 agricultural parks—4 on Hawaii Island, 4 on Oahu, and one each on Kauai and Molokai, comprising some 3,000 acres of land.¹⁵ HDOA leases small lots (typically under 20 acres) to serious (experienced or well-schooled beginner) farmers on long-term leases (a maximum of 45 years) at rents "determined by appraisal conducted for the department or by an independent appraiser".¹⁶ Most of the parks are located on state-owned land, but the program also leases land from private land owners and subleases lots to individual farmers. A lack of vacant lots is testament to the popularity of the program.

ADC was designed to be a much larger scale program than the Agricultural Park program and its enabling legislation gives it more flexibility than the Park program. It exempts the corporation from state land use regulations, Public Utilities Commission regulations, civil service laws, and allows a less cumbersome "licensing agreement" process than the Agricultural Park program's "leasing" process.¹⁷ It provides ADC with broad powers to achieve its goals via land acquisition, training, organizing cooperatives, acquiring or constructing processing or treatment facilities, "conducting research and demonstration projects to facilitate the transfer of knowledge or adoption of technology", and "conducting economic and feasibility studies relating to agriculture."

Since its 1994 creation, most of ADC's activities have focused on acquiring large tracts of agricultural land and irrigation facilities on Oahu and Kauai and then leasing ("licensing") the land in smaller parcels and

13 See Agribusiness Development Corporation Strategic Plan, October 15, 2008. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2013/01/ADC-Strategic-Plan.pdf> (last access on 11 Jan. 2021).

14 See the website of the Agricultural Resource Management Division. Available at <https://hdoa.hawaii.gov/arm/> (last access 31 Dec. 2020). Also see The Kohala Center, Hawaii Agricultural Land Lessors. Available at https://gofarmhawaii.org/wp-content/uploads/2019/10/Land-Lease-Options-for-Farmers-in-Hawaii_Final.pdf (last access on 31 December 2020).

15 Maui county runs an agricultural park in Kula, Maui with similar objectives and rules.

16 See the website of the Agricultural Resource Management Division. Available at <https://hdoa.hawaii.gov/arm/agricultural-parks/> (last access on 31 December 2020).

17 See Agribusiness Development Corporation, undated powerpoint. Available at <https://www.capitol.hawaii.gov/memberfiles/senate/delacruz/Documents/Whitmore%20Village%20Agricultural%20Development%20Plan%20Presentation.pdf> (last access on 31 December 2020).

providing water to farmers to grow diversified crops.¹⁸ Hawaii State Senator Donavan Dela Cruz argues that the state must own the land in order to provide farmers with long-term leases which are necessary for them to invest in their farms.¹⁹

Water is the “lifeblood” of agriculture. The Agricultural Water Use and Development Plan Update for 2019 finds that “agricultural water systems (irrigation systems) are the most important infrastructural requirement to expand Hawaii’s diversified agriculture industry.”²⁰ In 1998 ADC made its first major acquisition when it purchased the Waiahole Ditch, an irrigation facility that brings water from Oahu’s windward coast to 5,866 acres of agricultural land in central and leeward Oahu. It continues to operate and manage the 26-mile long ditch.²¹ ADC’s next major land acquisitions were on Kauai. The Amfac/JMB Realty sugar operations closed in 2002 and the state awarded ADC control over 28,000 acres of state land in the Mana plains area of Kekaha. Included in the transfer was the Kokee Ditch System, the Kekaha Ditch System, two pump stations, two hydro-electric power plants, and an irrigation/drainage ditch system. ADC subsequently licensed most of these lands to large agribusinesses that primarily produce seed corn. In 2005, the state awarded ADC control of 7,000 acres of state land (“Kalepa”) on Kauai previously leased to Lihue Plantation. ADC agreed to assume control over and maintain the East Kauai Irrigation System as part of its mission to maintain plantation irrigation infrastructure. Farmers and ranchers have revocable permits to most of the land.

ADC’s annual report for FY2019 identifies 2012 as the year that “ADC began an aggressive campaign to kick-start Hawaii’s diversified agricultural production.” In December 2012, coordinated action by the Hawaii state government, the U.S. military, the City and County of Honolulu, D.R. Horton, the Office of Hawaiian Affairs, and the Trust for Public Land led to the purchase of 1,732 acres held by the Galbraith Estate on the edge of Wahiawa in central Oahu. The State of Hawaii immediately transferred five hundred acres containing Kukaniloko, the sacred birthing site of Hawaiian royalty, to the Office of Hawaiian Affairs and 1,200 acres to ADC. Governor Neil Abercrombie and ADC then announced plans to improve water access on the Galbraith lands and to lease them to Hawaii farmers. By 2018, only 500 of the 1,732 acres were under cultivation, with much of the remainder lacking access to water. Since its acquisition, the Galbraith Estate land has not been fenced. Some of the security improvements made by ADC, such as gates and barriers, have been destroyed, vandalized, or removed.²² An illegal auto and waste dumping site had emerged on a road going from the

18 See State of Hawaii, HDOA (2019), HDOA Annual Report for FY2019, Division Action Plan for ADC. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2019/01/DOA-HDOA-Annual-Report-2019.pdf> (last access on 14 Jan. 2021).

19 Jason Y. Kimura, “Is Food Sustainability Possible in Hawaii?” Hawaii Retail Grocer, Spring 2017, p. 13 of pp. 11-16. Available at <http://www.hawaiifood.com/portals/0/documents/hawaii-retail-grocer-spring-2017.pdf> (last access on 31 Dec. 2020).

20 State of Hawaii, HDOA, Agricultural Water Use and Development Plan Update, December 2019. Available at https://files.hawaii.gov/dlnr/cwrm/planning/awudp2019update/AWUDP_2019.pdf (last access on 11 Jan. 2021).

21 For more background history, see Agribusiness Development Corporation Strategic Plan, October 15, 2008. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2013/01/ADC-Strategic-Plan.pdf> (last access on 11 Jan. 2021). The Agricultural Water Use and Development Plan Update (2019) rightly notes that owning the Waiahole Ditch does not guarantee that the water in the Waiahole Ditch will be allocated to farms on ADC lands. See the summary of In re Water Use Permit Applications, 94 Hawaii 97; 9 P.3d 409 (2000) in Agricultural Water Use and Development Plan Update, pp. 208-210. In that case, the Hawaii Supreme Court articulated its “public trust doctrine” governing allocation and use of water. The Court’s decision did not specify agriculture as a public trust use of water, arguing instead that farming in Central and Leeward Oahu was “for private commercial gains.”

22 Rick Daysog, “Oahu farmland purchased by state in 2013 site of massive dump site.” Hawaii News Now, April 10, 2018. Available at <https://www.hawaiinewsnow.com/story/37927823/exclusive-state-farm-land-plagued-by-illegal-dumping/> (last access on 31 Dec. 2020).

main highway through the fields. In its December 2020 Annual Report, ADC reported that it had successfully cleared homeless encampments and abandoned autos from its Central Oahu lands.²³

Since 2012, ADC has purchased an additional 2,121 acres of land in central Oahu, with all but four acres bought from Castle & Cooke, Inc., and Dole Food Company, Inc. During FY2019 much of the land in the Galbraith Estate (65 percent), the Waialua 73 tract (52 percent), the Whitmore 24 tract (83 percent), and the Whitmore 257 tract (81 percent) was unoccupied and not leased to farmers.²⁴

The Whitmore Village project is an ambitious plan to revitalize agriculture in Central Oahu around the town of Wahiawa and the lands acquired in the area since 2012. The project is centered around ADC plans to establish an Agri-Business Technology Park where food can be processed and packaged that meets food safety standards, and farmers can share facilities to reduce operational costs.²⁵ A master plan for the project is mentioned in some ADC materials, but is not publicly available. ADC had plans, at least prior to the COVID-19 pandemic, to acquire more land to add to its growing inventory in central Oahu. In 2020 ADC directly manages 22,161 acres of land, with 18,346 acres served by irrigation systems. Through FY2018 the Legislature had appropriated about \$288 million to ADC for capital improvement projects (CIP) of which \$255 million were for land acquisition.²⁶

It is extremely challenging to evaluate ADC's performance as little information is publicly available and easily accessible. The corporation has been described as "a black box when it comes to public information."²⁷ One might expect that a good source of information about ADC would be its annual reports. Since its establishment in 1994, ADC has issued only three annual reports (FY2018, FY2019 and FY2020).²⁸ The information contained in the annual reports is spartan and incomplete.²⁹ For example, financial statements for FY2018 were presented for only two revolving funds, the Agriculture Development Resolving Fund³⁰ and the Waiahole Water System Revolving Fund, rather than the entire ADC.

23 State of Hawaii, HDOA (2020), Annual Report, December 29, 2020. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2020/12/ADC-Annual-Report-2020-final.pdf> (last access on 31 December 2020).

24 The 12,222 acres held by ADC on Kauai had a much higher occupancy rate of 87.6 percent in 2019.

25 See Jason Y. Kimura (2017), "Is Food Sustainability Possible in Hawaii?" Hawaii Retail Grocer, Spring:14 of 11-16. Available at <http://www.hawaiifood.com/portals/0/documents/hawaii-retail-grocer-spring-2017.pdf> (last access on 31 Dec. 2020). Kimura details many other aspects of the Whitmore Project.

26 \$175 million was financed by revenue bonds and nearly \$113 million by general obligation bonds. See State of Hawaii, Department of Budget and Finance, Department of Agriculture, at page 305. Available at <https://budget.hawaii.gov/wp-content/uploads/2016/12/09.-Department-of-Agriculture-FB17-19-PFP.pdf> (last access on 11 Jan. 2021). We could not document more than \$76.3 million in ADC land purchases, and question why there is such an exceptionally large discrepancy between documented land purchases and \$255 million in general obligation and revenue bonds issued for land purchases.

27 Stewart Yerton, "State Agribusiness Agency Says It's Too Busy To Be Audited," Civil Beat, April 12, 2018. Available at <https://www.civilbeat.org/2018/04/state-agribusiness-agency-says-its-too-busy-to-be-audited/> (last access on 31 Dec. 2020).

28 We note that Hawaii state law requires that ADC "shall" submit to the governor and the legislature annual reports no later than twenty days prior to the convening of each regular session. HRS Section 163D-19 (2013). Available at <https://law.justia.com/codes/hawaii/2013/title-11/chapter-163d/> (last access on 11 Jan. 2021). The financial accounts in the ADC FY2019 Annual Report are for FY2018, which, had already been presented in the ADC FY2018 Annual Report.

29 State of Hawaii, HDOA (2020), Agribusiness Development Corporation Annual Report, December 18, 2020. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2019/01/DOA-ADC-Annual-Report-2018.pdf> (last access on 11 Jan. 2021).

30 HRS Section 163D-17 specifies that the Hawaii agricultural development revolving fund holds "any state appropriations to the fund or other moneys made available to the fund, to be expended as directed by the corporation." Available at https://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0163D/HRS_0163D-0017.htm (last access on 11 Jan. 2021).

To find additional information on ADC's operating and capital expenditures, we consulted with the Dept. of Agriculture's annual budget report (Program ID AGR161, Report P61-A).³¹ There we find that for FY2018, total ADC operating cost was \$4.7 million; \$4.2 million came from revolving funds, \$500,000 from special funds, and \$50,601 from the General Fund.³² In FY2018 capital expenditures (mostly for construction) totaled \$11.2 million financed by the issuance of General Obligation bonds.

ADC's goals, objectives and action plans are ambitious and sweeping.³³ Performance measures—which are not included in the annual report—are submitted to the Legislature in the HDOA Variance Report.³⁴ The Variance Report focuses narrowly on the difference between planned program expenditures and actual expenditures. For example, in FY2019 Agribusiness Development and Research (Report V51, AGR161), ADC was budgeted at \$5.5 million but actually spent only \$2.5 million, a difference of 54 percent.³⁵ In the Variance Reports, HDOA sets forth seven quantitative measures of ADC effectiveness:

1. Agricultural lands directly managed by ADC;
2. agricultural lands served by ADC irrigation systems and infrastructure;
3. irrigation systems and infrastructure projects managed by ADC;
4. agriculture-related facilities managed by ADC;
5. ADC projects that benefit diversified agriculture;
6. land in agricultural conservation easements to which ADC holds title; and
7. agricultural-related projects needing ADC evaluation and involvement.³⁶

We note that all of these performance measures relate to production inputs. There is no performance measure regarding the additional output or sales of agricultural products produced by ADC's lessees. That is

31 State of Hawaii, Dept. of Budget and Finance. *Department of Agriculture*. Available at <https://budget.hawaii.gov/wp-content/uploads/2016/12/09.-Department-of-Agriculture-FB17-19-PFP.pdf> (last access on 11 Jan. 2011).

32 In 2010, the Legislature enacted Act 73, 2010 SLH which levies a \$1.05 tax (the "barrel tax") on each barrel or a fraction of a barrel of imported petroleum products sold in Hawaii. Fifteen cents of the tax is deposited into the Agriculture Development and Food Security special fund. HDOA administers the fund, and distributes some monies to ADC. See State of Hawaii, Dept. of Agriculture (2017), *Annual Report on the Agricultural Development and Food Security Special Fund*, December 2017. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2018/01/DOA-Ag-Development-and-Food-Security-Special-Fund-report-2017.pdf> (last access on 11 Jan. 2021).

33 State of Hawaii, HDOA (2019), *Department of Agriculture Annual Report*. December 26, 2019. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2019/01/DOA-HDOA-Annual-Report-2019.pdf> (last access on 14 Jan. 2021).

34 State of Hawaii, Department of Budget and Finance (2020), Variance Report, Fiscal Year 2019 and 2020. Available at <https://budget.hawaii.gov/budget/variance-report-fiscal-year-2019-and-2020/> (last access on 11 Jan. 2021).

35 By comparison, expenditures for the entire Department of Agriculture were budgeted at \$54.3 million for FY2019 while actual expenditures were \$35.2 million, or a difference of 35 percent. For fiscal years 2017 and 2018 (Report V61), the report shows "no significant variances" from initial ADC expenditure plans; reported variances "were due to lower than anticipated revolving fund expenditures." No explanation was given as to why revolving fund expenditures were lower than planned. See State of Hawaii, Department of Budget and Finance (2019), *Summary of Expenditure Variances, FY18-19*. Available at <https://budget.hawaii.gov/wp-content/uploads/2019/12/04-Summary-of-Expenditure-Variances-FY19-FY20.w9C.pdf> (last access on 11 Jan. 2021).

36 For FY2019, the lone deficiency was in the number of acres of agricultural lands directly managed by ADC, which fell from 31,031 acres to 22,161 acres. The decrease in acreage was blamed on "an input error" in FY2018 that erroneously counted 8,870 acres of land as directly managed by ADC which ADC had yet to acquire, but intended to do so in the future.

a serious omission. If the end goal of ADC is to increase diversified agricultural production, one must know how much more agricultural output is actually produced as a result of ADC's activities.

In addition, measures of ADC effectiveness are self-reported.³⁷ For years ADC has rebuffed any formal state audit of its operations arguing that it is too busy to be audited because of its small staff of 10 employees in FY2019.³⁸ In 2019 the Legislature voted to require an audit of ADC and a report is due from the State Auditor in early 2021.

IMPORTANT AGRICULTURAL LANDS

Article XI of the Hawaii State Constitution ("Conservation, Control, And Development Of Resources") succinctly addresses several important issues pertaining to "Agricultural Lands":

Section 3. The State shall conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands. The legislature shall provide standards and criteria to accomplish the foregoing.

Lands identified by the State as **important agricultural lands** needed to fulfill the purposes above shall not be reclassified by the State or rezoned by its political subdivisions without meeting the standards and criteria established by the legislature and approved by a two-thirds vote of the body responsible for the reclassification or rezoning action. [Add Const Con 1978 and election Nov 7, 1978] [Bold emphasis added.]

This provision was added to the State Constitution at the 1978 Constitutional Convention.³⁹ Despite the Constitution's mandate, the State Legislature put off the task of identifying important agricultural lands for 27 years. The State Legislature took the first important step in 2005 when it passed Act 183 which defines important agricultural lands and outlines a process for land owners, the counties, and the state to identify and protect such lands. Act 183 defines "Important Agricultural Lands" as lands that:

- "Are capable of producing sustained high agricultural yields when treated and managed according to accepted farming methods and technology.
- Contribute to the State's economic base and produce agricultural commodities for export or local consumption.
- Are needed to promote the expansion of agricultural activities and income for the future, even if currently not in production."

Act 183 specifies that counties are to identify lands for IAL status and to submit maps identifying IAL properties to the LUC. Kauai County started its IAL designation process in 2015 but as of December 2020, the Kauai County Council had not approved plans and maps showing additional private lands for IAL designation. Maui and Hawaii counties have also not completed their initial process evaluating agricultural lands for potential IAL designation. The City and County of Honolulu submitted its maps to the LUC in August 2019. As of December 2020, the LUC had not approved the Oahu IAL plans and maps.

³⁷ The Department of Agriculture also self-reports effectiveness measures. HDOA's FY2019 Annual Report lists only one "significant measure of effectiveness": Total farm value of agriculture in Hawaii in current dollars. The annual report is available at <https://hdoa.hawaii.gov/wp-content/uploads/2019/01/DOA-HDOA-Annual-Report-2019.pdf> (last access on 11 Jan. 2021).

³⁸ Stewart Yerton, "State Agribusiness Agency Says It's Too Busy To Be Audited," Civil Beat, April 12, 2018. See also "Editorial: An eye on agribusiness," Honolulu Star-Advertiser, November 16, 2019. Available at <https://www.staradvertiser.com/2019/11/16/editorial/our-view/editorial-an-eye-on-agribusiness/> (last access on 11 Jan. 2021).

³⁹ See David Callies (2010), *Regulating Paradise*, Ch. 2 for a good summary of the IAL program.

One stumbling block for the counties is that Act 183 provides a list of criteria that counties had to figure out how to operationalize. Criteria included loosely defined items like “sufficient quantities of water,” “land consistent with general plan,” “land associated with traditional native Hawaiian uses,” and “land with soil qualities and growing conditions that support agricultural production.” Even seemingly straight forward criteria such as “land currently used for agricultural production” have proven difficult to precisely define given the limited state and county data on agricultural production in the 2010s decade. Kauai created a stakeholder group (farmers, landowners, community members) to help define these criteria over a two-year period, and then numerically ranked lands as to how well they fit the IAL criteria.⁴⁰ Oahu took a different approach, and used the sparse available data and engaged stakeholders less.

Land owners also have the option to petition the State Land Use Commission (LUC) to voluntarily designate their land as IAL. One advantage of a voluntary declaration is that it avoids a contested case hearing before the LUC, which can be much more costly for the land owner than a hearing for the voluntary petition. As of December 2020, the LUC has approved IAL designation for a total of 15 private land tracts owners comprising 136,489 acres. (By comparison, the 2017 U.S. Census of Agriculture reported 1,135,352 acres of agricultural land in Hawaii.⁴¹)

Lands designated as IAL are restricted to agricultural uses unless water required for farming becomes unavailable or the Legislature votes to reclassify the lands. What would land owners gain from having their lands—already classified as agriculture lands by the LUC—designated as Important Agricultural Lands? Owners of land with IAL status are eligible for several state-provided benefits (Act 233 (2008), HRS § 205).⁴²

1. Landowners are allowed “to develop farm dwellings and employee housing for their immediate family members and their employees. There is a limit of 5% of the total IAL designation or 50 acres, whichever is less.”
2. Landowners are allowed to claim a refundable qualified agricultural cost tax credit.
3. Board of Agriculture can provide an 85 percent loan guaranty on commercial loans.
4. State Agricultural Water Use and Development Plan is to be modified to reflect need by IAL lands for water.
5. Priority processing of permit applications and renewals “at no additional cost” for agricultural processing facilities.
6. Landowners can reclassify up to 15% of the IAL area into a rural, urban, or conservation district.

In 2014, a Kauai stakeholder advisory board expressed concerns about the potential for two of the above provisions to be misused by IAL land owners.⁴³ They worried that provision (1) would open the door to gentleman estates and that provision (6) would allow the possibility of converting high-quality IAL lands to urban use. With respect to provision (6), we examined all of the designated IAL lands as of January 2021

⁴⁰ County of Kauai (2015), *Important Agricultural Lands Study*, August 2015. Available at https://luc.hawaii.gov/wp-content/uploads/2017/05/Ex.-21_IAL-Study.pdf (last access on Jan. 11 2021).

⁴¹ See U.S. Department of Agriculture, National Agricultural Statistics Service (2018), 2017 Census of Agriculture – State Data: Hawaii, Table 9. Available at https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Hawaii/st15_1_0009_0010.pdf (last access on 31 Dec. 2020).

⁴² Description of benefits relies on County of Kauai (2015), *Important Agricultural Lands Study*, August 2015 at pp. 9-10.

⁴³ County of Kauai (2015), *Important Agricultural Lands Study*, August 2015. Available at https://luc.hawaii.gov/wp-content/uploads/2017/05/Ex.-21_IAL-Study.pdf (last access on Jan. 11 2021).

and found that each land owner had permanently waived rights to reclassification of IAL lands or other agricultural lands via use of provision (6).⁴⁴

Counties are also required to enact incentives to assist farming on IAL lands (HRS §205-46 (c)). The County of Kauai's Important Agricultural Lands Study provides a nice summary: "HRS §205-46 (c) provides eleven (11) mechanisms that incentive and protection programs should include at minimum, in order to "provide a mutually supporting framework of programs and measures that enhance agricultural viability on IAL."

1. "Grant assistance;
2. Real property tax systems that support the needs of agriculture, including property tax assessments based on agricultural use valuation;
3. Reduced infrastructure requirements and facilitated building permit processes for dedicated agricultural structures;
4. Tax incentives to offset operational costs, promote agricultural business viability, and promote the long-term protection of IAL;
5. Agricultural business planning, marketing, and implementation grants;
6. Tax incentives and programs for equity investments and financing for agricultural operations, including agricultural irrigation systems;
7. Other programs and mechanisms that promote investment in agricultural businesses or agricultural land protection, such as the purchase of development rights;
8. State funding mechanisms to fund business viability and land protection programs;
9. Water regulations and policies that provide farmers of IAL access to adequate and cost-effective sources of water;
10. Other measures that would ensure that state capital investments, projects, programs, and rules are consistent with this part; and
11. Agricultural education and training for new farmers; upgrading the skills of existing farmers and other agriculture-related employees through the use of mentoring, business incubators, and public or private scholarships; and increasing the returns of farming by adding value to food processing and other tools and methods."

Our far-from-comprehensive review shows that counties have failed to provide such incentives to IAL land owners. Consider, for example, differential property tax rates for IAL lands. All land classified by the counties as agricultural land is taxed at lower property tax rates than (other) commercial properties, but no county has adopted a lower tax rate for lands with IAL designation.⁴⁵

⁴⁴ The Hawaii Land Use Commission posts all declaratory IAL decisions on its website. Available at <https://luc.hawaii.gov/completed-dockets/declaratory-orders-decisions-and-order/declaratory-orders-oahu-county/declaratory-orders-important-agricultural-lands-designations/> (last access on 11 Jan. 2021).

⁴⁵ For a comparison of county property tax rates, see City and County of Honolulu, Department of Budget and Fiscal Services, Real Property Assessment Division (2020). Real Property Tax Rates for Tax Year July 1, 2020 to June 30, 2021. July 30, 2020. Available at <https://www.realpropertyhonolulu.com/media/1723/ratesfy21.pdf> (last access on 4 Jan. 2021).

Consider now one of the state-provided benefits, the Important Agricultural Land (IAL) Tax Credit (HRS Section 235-110.93), which was established in 2008. The credit is refundable (i.e., available to land owners without any Hawaii corporate income tax liabilities), available on a first-come, first-serve basis, and can be claimed by IAL land owners with qualified expenses.⁴⁶ The stated purpose of this credit is “to protect agricultural lands by stimulating the viability of agriculture.”⁴⁷

To qualify for the IAL tax credit, more than 50 percent of the land of an agricultural business must be deemed “important agricultural land.”⁴⁸ The tax credit is best characterized as an investment tax credit as it can be claimed “for costs such as roads or utilities, agricultural processing facilities, water wells, reservoirs, dams, pipelines, agricultural housing, feasibility studies, legal and accounting services, and equipment.”⁴⁹ The credit is paid out over three years, with each claimant limited to \$1 million in credits. In the first year, the tax credit per taxpayer is the lesser of 25% of qualified agricultural costs or \$625,000; in the second year the credit is the lesser of 15% of qualified costs or \$250,000; and in the third year, the credit is the lesser of 10% of the qualified costs or \$125,000. The credit must be certified by the Department of Agriculture and the aggregate amount of credits claimed cannot exceed \$7.5 million in any tax year. The credit sunsets on December 31, 2021.

Information available on claims for this credit was sparse initially but has become more available over the last half of the 2010s decade.⁵⁰ The Hawaii Department of Taxation did not issue annual tax credit reports between 2008 and 2010. In 2011, six tax returns claimed a total of \$20,653. Between tax years 2012 and 2014, the Hawaii Department of Agriculture did not certify any claims. In tax year 2015, an undisclosed number of recipients claimed \$388,000 in credits. In 2016, data on claims were “suppressed to prevent potential disclosure of confidential taxpayer information.” HDOA reported 2 claims for 2017 with \$1,125,000 paid; 3 claims for 2018 with \$625,000 paid; and 1 claim for 2019 with \$125,000 paid.⁵¹ The small value of credits claimed in recent years is surprising given the annual \$7.5 million cap on the credit and that it is also

46 For a brief explanation of how “important agricultural land” is identified and where these lands are located, see State of Hawaii Department of Land and Natural Resources (2019), *Agricultural Water Use and Development Plan Update*, December 2019, Ch. 2. Available at <https://dlnr.hawaii.gov/cwrm/planning/hiwaterplan/awupd/> (last access on 11 Jan. 2021).

47 State of Hawaii, Department of Agriculture (2013), *Final Report on the Incentives for Important Agricultural Lands*, Act 183, SLH 2005. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2013/07/IAL-Final-Report-07.pdf> (last access on 11 Jan. 2021).

48 State of Hawaii, Department of Taxation, *Tax Credits Claimed by Hawaii Tax Payers, Tax Year 2018* (January 1, 2018 – December 31, 2018), p. 22. Available at <https://files.hawaii.gov/tax/stats/stats/credits/2018credit.pdf> (last access on 11 Jan. 2021).

49 University of Hawaii-Mānoa, College of Tropical Agriculture and Human Resources (2008), *Key Points to Understand Important Agricultural Lands (IAL)*. Available at <https://www.ctahr.hawaii.edu/AgLand/ial.html> (last access on 31 Dec. 2020).

50 State of Hawaii, Department of Taxation (2020), *Tax Credits Claimed by Hawaii Taxpayers*. Available at https://tax.hawaii.gov/stats/a5_1annual/a5_4credits/ (last access on 11 Jan. 2021).

51 For 2017 data, see State of Hawaii, Department of Agriculture (2018). *Report on the State’s Progress Toward Meeting the Milestones and Objectives of the Important Agricultural Land Tax Credit Program*. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2019/01/DOA-IAL-Tax-Credit-Report-2018.pdf> (last access on 31 Dec. 2020). For 2018 data, see State of Hawaii, Dept of Agriculture (2019). *Report on the State’s Progress Toward Meeting the Milestones and Objectives of the Important Agricultural Land Tax Credit Program*. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2019/01/DOA-IAL-Tax-Credit-Report-2019.pdf> (last access on 31 December 2020). For 2019 data, see State of Hawaii, Department of Agriculture (2020). *Report on the State’s Progress Toward Meeting the Milestones and Objectives of the Important Agricultural Land Tax Credit Program*. Available at https://hdoa.hawaii.gov/wp-content/uploads/2020/12/DOA-IAL-Tax-Credit-Report-2019_final.pdf (last access on 31 Dec. 2020).

a refundable tax credit. The small number and small value of credits claimed could be due to difficulty with qualifying for credit eligibility or be due to a lack of investment by some IAL land owners in their farms.⁵² So far, the IAL tax credit has benefited very few producers and, until actual production data on IAL lands become available, it appears to be much ado about very little.⁵³

3. THE FUTURE OF AGRICULTURE IN HAWAII

The state's efforts to revive agriculture are currently centered around ADC and its efforts to increase agricultural production by providing land and downstream services to farm enterprises. ADC is still a minor, though not an insignificant, player in Hawaii agriculture. In 2019 ADC directly managed 18,679 acres of land in Hawaii, with 8,890 acres occupied by tenants.⁵⁴ By comparison the 2017 U.S. agricultural census for Hawaii reported 191,000 acres of crop land in the state of which nearly 85,000 acres were harvested cropland. ADC's prospects for increasing its contribution to reviving agriculture are clouded by a number of challenges the corporation faces. First, it seems unlikely that ADC will be able to find legislative appropriations to continue to acquire land at the pace and scale of recent years. In 2019, there were still over 75,000 acres of former sugar and pineapple lands available for ADC to acquire over the next decade. As of January 2021, the State of Hawaii is in severe short-term fiscal crisis due to sharp declines in revenue during the COVID-19 pandemic.⁵⁵ The state also faces significant long-term fiscal constraints, in part linked to funding of present and future public employee pensions and health care.⁵⁶ Funding for ADC to acquire more land to expand agricultural production looks to be many years away.

52 Ulupono Initiative received \$875,000 in IAL tax credits for expenses related to preparing land for a proposed dairy farm on Kauai. After regulatory difficulties and community opposition to the presence of a dairy in the vicinity, Ulupono withdrew its project and kept the credits. See Andrew Gomes, "Isle taxpayers take loss on failed Kauai dairy plan," *Honolulu Star-Advertiser*, March 18, 2019. Available at <https://www.staradvertiser.com/2019/03/18/hawaii-news/isle-taxpayers-take-loss-on-failed-kauai-dairy-plan/> (last access on 11 Jan. 2021).

53 A second tax credit designed to help revive Hawaii agriculture is The Organic Food Production Tax Credit (HRS Section 235-110.94). The Act allows "a qualified taxpayer incurring qualified expenses associated with the production and handling of organic food" to claim a non-refundable organic food production tax credit beginning in 2017. The tax credit reimburses 100 percent of qualified expenses up to a maximum of \$50,000 per qualified tax payer. The total amount of credits available in any tax year is \$2 million. The Hawaii Dept. of Taxation suppressed the claims data for tax year 2017; for tax year 2018 six tax returns claimed credits for a total of \$14,000. State of Hawaii, Department of Taxation (2020), *Tax Credits Claimed by Hawaii Tax Payers, Tax Year 2018 (January 1, 2018 – December 31, 2018)* at p. 22. Available at <https://files.hawaii.gov/tax/stats/stats/credits/2018credit.pdf> (last access on 11 Jan. 2021). The \$2 million annual cap suggests that the program is too small to have a major impact on economic diversification in Hawaii. In 2017 there were 146 organic farms in Hawaii with total sales of \$15.4 million. See USDA, National Agricultural Statistics Service (2017). *Census of Agriculture, Vol. 1, Ch. 1, Hawaii, Table 51*. Available at [https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Hawaii/](https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Hawaii/usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/Hawaii/) (last access on 11 Jan. 2011).

54 See State of Hawaii, Agribusiness Development Corporation (2019), *Annual Report of the Agribusiness Development Corporation* at p. 14. Available at <https://hdoa.hawaii.gov/wp-content/uploads/2019/01/DOA-ADC-Annual-Report-2019.pdf> (last access on 15 Dec. 2020).

55 James Mak, Robert D. Ebel, and Carl Bonham, *How Can the State Government Restore Fiscal Balance?* UHERO Research Brief, June 18, 2020. Available at <https://uhero.hawaii.edu/wp-content/uploads/2020/06/HowCanTheStateGovernmentRestoreFiscalBalance3.pdf> (last access on 11 Jan. 2021).

56 James Mak and Robert D. Ebel, *Charting a New Fiscal Course for Hawaii: Fiscal Architecture Approach*, UHERO Research Brief, January 29, 2020. Available at <https://uhero.hawaii.edu/wp-content/uploads/2020/03/ChartingANewFiscalApproach.pdf> (last access on 14 Jan. 2021).

Moreover, we question whether it makes financial sense to purchase more land, particularly given the willingness of private land owners to lease land to individual farmers. Kamehameha Schools leases over 160,000 agricultural acres in Hawaii of which nearly 15,000 acres are on Oahu.⁵⁷ On Kauai, Grove Farm, one of the island's largest land owners, also leases land to others for farming. Another example on Oahu is Aloun Farms, one of the largest produce farms in Hawaii that began in 1977 with just five acres of leased land in Lualualei. Today, Aloun Farms leases approximately 3,000 acres of former plantation land in Central Oahu, and hires 180 full-time employees to grow fresh produce for the Honolulu market.⁵⁸

Arguably, no one has a bigger stake in finding productive uses of fallow plantation lands than the former sugar and pineapple companies (reconfigured as land companies) that own them. Vacant lands yield no income, although land owners may decide to keep them vacant for extended periods if there is a good chance that they can eventually be rezoned and developed for a use that will yield higher income to their owners, such as housing, resort development, or a renewable energy site.

If land acquisition were to stop for the foreseeable future, ADC might instead focus on enhancing the downstream and ancillary services that are already a focus of its Whitmore Village project. Providing conditions such that vital intermediate services, such as cold storage and product packaging, or assistance with meeting regulatory requirements are available to all farmers in the Central Oahu area and beyond would be highly beneficial to reviving agriculture and keeping important agricultural lands in production.

Second, innovations in agricultural production are completely changing the way some people farm. In the near future in Hawaii, we could see increased use of climate-controlled greenhouses that exclude most pests, carefully control application of water, nutrients, and light, use modern robotic technology, and grow more vegetables and melons using a mix of less land and more capital. Such “precision” farms could find it easier to comply with federal safety regulations mandated by the Food Safety Modernization Act which governs the supply of raw and processed foods from seed to shelf. “This is the new generation of farming,” observed James Nakatani, executive director of ADC.⁵⁹ Sensei Ag, a venture of Oracle cofounder Larry Ellison and physician and scientist Dr. David Agus, is using a variety of new technologies in its greenhouses on its pilot farm in Lanai to produce hydroponic crops that require less space and 90 percent less water than traditional farming. Its current plan is to produce a million pounds of food per year. Sensei Ag currently distributes five types of lettuce, lettuce heads, cherry tomatoes, mini plum tomatoes and mini cucumbers to, among others, Foodland Super Market, Don Quijote, and Friendly Market. Sensei Ag management asserts the Lanai pilot farm is “just the first step in its global expansion.”⁶⁰ Costco Hawaii has also been evaluating growing produce in greenhouses on Oahu to supply its Honolulu stores.

Then there is urban farming. Hawaii’s first urban farm, MetroGrow Hawaii, was started in 2014 in Kakaako, and uses aeroponics and hydroponics in controlled environments to produce a variety of lettuces, shoots, and microgreens for restaurants and gourmet markets in Honolulu. It is still in business after six

57 The Kohala Center (2019), *Agricultural Land Lessors*. Available at https://gofarmhawaii.org/wp-content/uploads/2019/10/Land-Lease-Options-for-Farmers-in-Hawaii_Final.pdf (last access on 31 Dec. 2020).

58 See Aloun Farms website. Available at <https://www.alounfarms.com/aboutus.html> (last access on 11 Jan. 2021).

59 State of Hawaii Agriculture, Governor David Ige and Agricultural Development Corporation, Public Opinion 2018 Kalipekona Investigates, Sept. 18, 2018. Available at <https://www.slideshare.net/cliftonmhasegawa/governor-david-ige-agricultural-development-corporation-adc-doubling-local-food-production-sustained-development> (last access on 11 Jan. 2021).

60 See Sensei Farms website. Available at <https://sensei.com/farms/> (last access on 15 Dec. 2020). See also: Andrew Gomes, “Billionaire’s greenhouse now exporting produce statewide,” Honolulu Star Advertiser, October 19, 2020. Available at <https://www.staradvertiser.com/2020/10/19/hawaii-news/billionaires-greenhouse-now-exporting-produce-statewide/> (last access on 11 Jan. 2021).

years and has so far survived a downturn in demand for its products during the COVID-19 pandemic.⁶¹ Note that both Sensei Ag and MetroGrow Hawaii are private rather than publicly-supported ventures. Whether such ventures will prove to be both profitable and scalable is still pretty speculative. If these types of farms start to expand rapidly over the next few years, then the role of fertile lands in production of fresh produce could become much smaller.

In conclusion, Act 100 enacted in 1999 directs HDOA to diversify Hawaii's economy, protect resources for agricultural production, and gain greater self-sufficiency in food production. By creating ADC and the Important Agricultural Land program, the state has made concerted efforts to "protect resources for agricultural protection". Even though the total real value of agricultural production decreased (Table 1), between 2007 and 2017 total agricultural land in Hawaii actually increased from 1,121,329 acres to 1,135,352 acres, and cropland acreage increased from 177,626 acres to 191,175 acres.⁶² We believe that Hawaii's strategies to revive agriculture are flawed and extremely costly because they focus on bringing more agricultural land under state ownership. When the State purchases land from plantation landowners, the risks associated with land ownership shift from landowners of former plantation lands to the state government and Hawaii taxpayers.

The IAL program is also deeply flawed. Landowners of prime agricultural land dedicate their land to long-term use in agriculture in exchange for an array of benefits supplied by the state and counties. Promised benefits from the state and counties have, however, not materialized. Not only have the state and counties not kept their end of the bargain, but the question of why owners of prime agricultural lands need subsidies to operate has never been answered. The state's policy of dedicating both private and public lands to agricultural use is an expensive one and it ought to be reassessed in light of the ineffectiveness of ADC and IAL programs as well as the challenging long-term fiscal situations of the state and the counties.

In his classic 1953 book on diversified agriculture in Hawaii, agricultural economist Perry Phillip identifies several supply factors as vital for the expansion of diversified agriculture in Hawaii: "Increase Labor Productivity; Better Management and Buying Practices; Larger Farms; Greater Diversification of Farms; and Increase Functional Specialization on the Farm". In addition to these supply considerations, Perry also lists, among other things, "Market Development".⁶³ ADC's land purchase program and the IAL tax credits focus on the supply side and not the market development side of both the Hawaii market and potential export markets. Within the Department of Agriculture, the Agricultural Development and Marketing Division (AGR171) is responsible for marketing Hawaii products locally and overseas.⁶⁴ In FY2018-2019, the Division's operating expenditures were a modest \$3.0 million. If the state in cooperation with farmers cannot do more to develop demand in Hawaii and overseas for Hawaii agricultural products, hundreds of thousands of acres of land restricted by state zoning for agriculture use are likely to remain uncultivated.⁶⁵

61 Susan Oakley, "Vertical farming rising to meet food needs," *The Garden Island*, November 27, 2020. Available at <https://www.thegardenisland.com/2019/04/24/lifestyles/vertical-farming-rising-to-meet-food-needs/> (last access on 11 Jan. 2021).

62 U.S. Department of Agriculture, Economic Research Service (2020). State Fact Sheets: Hawaii. December 2, 2020. Available at https://data.ers.usda.gov/reports.aspx?StateFIPS=15&StateName=Hawaii&ID=17854#.U9_yAmM4LzQ (last access on 31 Dec. 2020).

63 See Perry F. Phillip (1953), *Diversified Agriculture of Hawaii: An Economist's View of its History, Present Status, and Future Prospects*. See a brief summary in State of Hawaii, Dept. of Land and Natural Resources (2019), *Agricultural Water Use and Development Plan Update, Main Report* at p. 206. Available at <https://dlnr.hawaii.gov/cwrm/planning/hiwaterplan/awupd/> (last access on 11 Jan. 2021).

64 See State of Hawaii Department of Agriculture, Annual Report on the Agricultural Development and Food Security Fund, December 2020, pp. 6-7. At <https://hdoa.hawaii.gov/wp-content/uploads/2020/12/2020-Ag-Development-and-Food-Security-Special-Fund-Report-final.pdf> (Last access on January 14, 2021)

65 On the other hand, leaving some agriculture lands unused could be efficient if they do not have profitable

To date the state has not been very successful in “gaining greater self-sufficiency in food production.” In 2016 Governor Ige set a (new) goal for the state to double its food production by 2030. It is not easy to quantify exactly what this goal means because the state has failed to collect sufficient statistics on crop production in the last decade.⁶⁶ And, does the doubling goal include papayas, or macadamia nuts or coffee, all of which are primarily grown for export markets? Suppose that food production equals two-thirds of the \$415.4 million value of Hawaii agricultural production in 2017 (or \$278.4 million in \$2019), the last year for which we have data (Table 1). Some of this value is generated by imported inputs such as fertilizers, tools, tractors, etc. Adjusting for the imported inputs, about 48 percent of the total, the value added in Hawaii from doubling food production would amount to \$144.7 million dollars, or about 0.15 percent of a \$96 billion economy.

Unless owners of fallow agricultural land, entrepreneurial farmers, and state researchers identify a set of new field crops that could take the place of sugar and pineapple, say, hemp, biofuels, or a new forest product, it seems highly unlikely that agriculture can be a major source of economic growth over the next decade. That said, it doesn’t mean that HDOA taking actions to repair and maintain irrigation systems, promote agriculture, help farmers deal with state and federal regulatory burdens, or facilitate provision of services preparing and bringing goods to local and export markets are wasted activities. Taking additional steps to revive an antiquated system of regulating farming, promoting Hawaii agricultural products and enforcing environmental and safety measures is long overdue. Still, the bottom line is that even if HDOA and ADC succeed in their ambitious ventures, policymakers and citizens seeking a more diversified economy in the next 10 or 15 years will need to look well beyond a revival of Hawaii agriculture if their vision is to be fulfilled.

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agricultural uses and effectively serve as a break on population growth and development beyond what a particular island is able to sustain.

⁶⁶ According to Phyllis Shimabukuro-Geiser, chairperson of the Hawaii Board of Agriculture, the HDOA has baseline data from 2010 that show significant growth in several commodities, including vegetables and melons, farmed seafood, and eggs. “Q&A with Phyllis Shimabukuro-Geiser, Head of Hawaii Board of Agriculture,” Honolulu Star Advertiser, June 26, 2020. Available at <https://www.staradvertiser.com/2020/06/26/editorial/5-questions-with/phyllis-shimabukuro-geiser-the-head-of-the-hawaii-board-of-agriculture-hopes-to-build-on-the-current-demand-for-locally-grown-food/> (last access on 13, January, 2021).

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