

Spinach and Basil Grow Beds seen from Exterior of Vertical Harvest facility

Vertical Harvest of Jackson, Wyoming

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ABSTRACT

In response to the perceived need for fresh produce during the harsh winters of Jackson, Wyoming, two women entrepreneurs used a combination of public and private funding to bring a three-story, hydroponic, greenhouse to reality.

In this case seven key challenges that were faced in Jackson are discussed:

- Physical setting
- Political and legal environment
- Managing the time line
- Location/Space
- Integrating public/private involvement
- Fundraising
- Market acceptance

Teaching points:

This case provides an illustration of the critical importance of being able to develop a marketing strategy, perform a SWOT analysis, conduct environmental scanning, and manage forces in the external environment. Successful entrepreneurs must be able to do these things. This case illustrates how some entrepreneurs in Jackson, Wyoming were able to adapt to, organize, and manage forces beyond their control in order to bring the project to a successful conclusion. For further reference, see Lamb, Hair, and McDaniel (2014).

Case notes are provided.

Terms:

- SWOT analysis realization of internal strengths and weaknesses and external opportunities and threats in the environment
- Environmental scanning the collection and interpretation of information about forces, events, and relationships in the external environment that affect the implementation plan

• Environmental management – the ability to implement strategies that shape the external environment within which it operates

INTRODUCTION

Vertical Harvest of Jackson, Wyoming, is a multi-store hydroponic greenhouse facility in downtown Jackson. The vision of the Vertical Harvest organization is "to cultivate an empowered, healthy, sustainable and connected community, and its mission describes it as "an impact driven business that provides employment for people with intellectual and physical disabilities by cultivating nutritious food for the community¹. This case presents how two young, female, entrepreneurs developed a package of public and private funding over almost eight years to create value in an isolated part of the country.

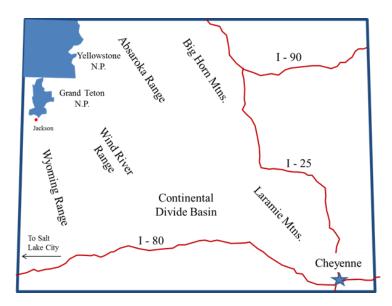
The Vertical Harvest project was conceived in 2008 by Penny McBride and Nona Yehia (March (2016)). McBride had substantial experience in agriculture and food production and Yehia was co-owner of a local architectural firm. Knowing the importance of sustainable food sources (Jung (2000) and Hollander (2011)) and concerned about the availability of fresh food in a growing community with little land for farming, the women developed a vision for a local vertical farm as described in Dizik (2013). These kinds of projects have been undertaken with varying degrees of success in other space-restricted locations like Edenworks in Brooklyn, N.Y. (Dale (2014) and Garfield (2016)), BrightFarms in Washington, D.C. (Simon (2016) and Gould (2014)), and AeroFarms in Newark, N.J. (Rothman (2015)).

THE EXTERNAL ENVIRONMENT

Physical Setting (DEMOGRAPHIC ENVIRONMENT)

Jackson is physically isolated from the rest of the country, the state capitol, and large cities by large mountain ranges. (See Figure 1 below.)

Figure 1
Map of Wyoming Showing location of Jackson



Jackson is located in Northwest Wyoming and is the county seat of Teton County (2016 population: 23,191). It is located in a mountain valley named Jackson Hole. The average low temperature is below freezing from September to May. Its January average high is 27 degrees Fahrenheit, and the average low is 5. In July these average temperatures are 81 and 40. During the long winter, it is not uncommon for land routes into Jackson to be closed, resulting in no goods or produce coming in from California, Utah, or other markets (Henderson (2015)).

Most of the land (more than 95 percent) in Teton County is owned by the U.S. government (Henderson (2015). This land includes much of Yellowstone National Park and all of Grand Teton National Park, both major tourist destinations. In addition, there are several ski resorts for use in winter and an airport that is open most of the year. During summer, fishing and water sports on the Hoback and Snake rivers make it the peak season of the year for the local economy. Jackson is the state's leading tourist destination (Moen (2010)) and leads the rest of the state in real estate sales (Huffman (2016)). A top-rated ski destination, it has a large amount of luxury real estate. A small town (10,529 in 2016), it is located in one of the nation's highest income counties (2012-2016 per capita: \$46,499). The Jackson Metropolitan Statistical Area is composed of Teton County, Wyoming and Teton County, Idaho. ("Over Wyoming" by Wyoming PBS at https://www.youtube.com/watch?v=jo40xoJP1hQ provides many insights into the State of Wyoming.)

THE POLITICAL AND LEGAL ENVIRONMENT

Town Council Involvement

Some unique challenges had to be addressed from the beginning of the project. These included:

- (1) Location a suitable site had to be located in a city with absolutely no excess space
- (2) Construction Jackson is located in a seismic zone with frequent earthquakes, so construction had to be reinforced to meet earthquake standards

Both of these challenges required cooperation from the Town of Jackson, since any zoning or building code issues would need town government approval. Larry Pardee, Director of Public Works, would be a key person in getting the project off the ground³.

Unfortunately, the project did not lend itself to a simple linear timeline. Several challenges were interrelated and had to be dealt with iteratively. For example, the funding to go forward depended on cooperation from the Town of Jackson. The Town of Jackson had to consider competing uses for any property that it agreed to consider leasing for the project. Construction would require large donations and grants, but the exact amounts required would not be known until the construction was well underway. State economic development grants would be desirable for construction, but required the Town of Jackson as a sponsor of the project as well as outside sources of funding for a match, such as crowdfunding. Vertical Harvest management undertook the task of managing the project through its various stages, including funding, construction, acquisition of suitable equipment and varieties, promotion, and hiring.⁴

This is consistent with Morris, et. al. (2001), pp. 248-249, who stated that "innovations never happen as planned because no one can accurately plan something that is truly new." Later, they point out that "the process is not linear." (p. 257) In the case of Vertical Harvest, the New Product Development Process roughly followed the following steps:

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Idea Generation \rightarrow 2008
Idea Fermentation \rightarrow 2008 – April 2009
Risk Assessment (Business Analysis) \rightarrow 2009 – 2015
Funding \rightarrow 2009 - 2015
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Market Launch \rightarrow 2012

But even in the midst of these steps, the following had to be considered throughout:

Life-Cycle Management:

Changes in Funding Mix
Changes in Organizational Structure
Deciding on vendors for specialized seeds/equipment

A Hybrid Organizational Model

It was clear to Vertical Harvest's founders that the project would have to be the product of a public/private collaboration. Large amounts of funds would need to be

raised for construction through grant funding, crowdfunding, and equity positions. Once construction was complete, the project could be sustained with a smaller cash flow stream. This could be achieved in several alternative ways, including a for-profit firm combined with a public foundation. The way in which the product was ultimately organized was as an L3C, or low-profit, corporation.

STATE LEGISLATION

L3C corporations are legal in Wyoming. For such an entity, private foundations may make non-taxable grants if they exercise expenditure responsibility in making a program-related investment (PRI) that qualifies as fulfilling a charitable purpose. In Vertical Harvest's cases, this purpose would be employing disabled workers, for whom the state unemployment rate was nearly 90 percent. Wyoming has a "people-first" model in which independence of people with disabilities and job-training receives priority consideration. However, merely producing income or increasing value of property cannot be considered a PRI and would instead be treated as an equity investment Cohen (2014), Field (2012), Williams (2009), Witkin (2009), Zouhali-Worrall (2010). On April 29, 2011, Vertical Harvest became the ninth of 48 L3C entities formed in Wyoming.⁵

Fundraising

The fundraising for Vertical Harvest took several different forms. First, an equity investor provided \$300,000. Second, grants from various entities were obtained, including a technical assistance grant for a feasibility study from the Wyoming Business Council, a \$20,000 seed funding grant from the local economic development group, 1% for the Tetons, a \$1,000 nationally competitive grant from Green America, a \$300,000 energy efficiency grant (originally a 0 percent loan) from the Jackson Hole Energy Conservation Works Board, and a \$1,500,000 Wyoming Business Council construction grant. During the grant process, Vertical Harvest conducted several local fundraisers and attracted dozens of donors. Additionally, a kickstarter campaign from December, 2012, to January, 2013, raised more than \$36,000.

Market (ECONOMIC) Environment

A favorable business environment led to high demand for the firm's product. Because of Jackson's economic environment, Vertical Harvest was able to charge a premium for products sold in its store, including merchandise with Vertical Harvest's unique logo, seeds and growing kits, and locally-produced agricultural products. To put this environment into perspective, The Tax Foundation has rated Wyoming as having the best business tax climate in the nation in 2016. Wyoming has no personal or business income tax. Furthermore, Teton County, of which Jackson is the county seat, has the fourth-lowest unemployment rate among counties in Wyoming, well below the state and national unemployment rates. (See Table 1 below.). Personal income growth, population growth, and personal income per capital growth are significantly higher in Teton County than in the state or nation (See Table 2.).

The detailed timeline for the entire Vertical Harvest project is presented in Figure 3. This timeline demonstrates the interactive nature of the private funding, public support, and construction considerations for the project, as obtained through the agendas and minutes of the Jackson Town Council at the following link:

 $\underline{\text{http://archive.townofjackson.com/agendas/index.cfm?fuseaction=displayTownCouncil\&contentID=76\&navID=76}$

It should be noted that the sources and timing of funding depended at all stages on strong support from the Jackson Town Council. For example, the Wyoming Business Council grant application required sponsorship from the Town Council. On several occasions, public hearings were heard about the feasibility and desirability of the project. Several competing projects with substantial merit were considered for the space, including much-needed housing and pet care facilities. In addition, competition for grant funding was significant, including the popular Snow-King ski facility adjacent to town.

SOCIAL AND CULTURAL CHARACTERISTICS OF WYOMING, JACKSON, AND TETON COUNTY

Table 1
Unemployment Rate and Labor Force

	Percent	Labor Force		Percent	Labor Force
Entity	Unemployed	(Thousands)	Entity	Unemployed	(Thousands)
United	4.7	158,466.0			
States					
Wyoming	5.6	299.8	Big Horn	5.1	5.5
Albany	3.2	20.7	Hot Springs	5.1	2.4
Goshen	3.5	7.1	Crook	5.1	3.8
Niobrara	3.5	1.3	Johnson	5.3	4.2
Teton	3.8	14.7	Weston	5.8	4.0
Laramie	4.3	47.6	Uinta	6.1	9.3
Washakie	4.7	4.2	Sublette	6.2	4.6
Carbon	4.7	8.4	Sweetwater	6.4	22.0
Sheridan	4.8	15.9	Converse	6.5	8.2
Platte	4.9	4.7	Fremont	7.5	20.4
Park	4.9	15.6	Natrona	7.7	40.8
Lincoln	5	8.5	Campbell	8	25.5

Source: Federal Reserve Bank of Kansas City, Wyoming Economic Databook https://www.kansascityfed.org/~/media/files/publicat/research/indicatorsdata/regionaldatabook/2016/07-2016/2016-07-22-wyrdb.pdf

Table 2
Personal Income, Population, and Per Capita Personal Income Growth
Comparison

	2013	2014	Growth			
	United States					
Personal income	\$14,064,468,000	\$14,683,147,000	4.40%			
(thousands)						
Population	316,497,531	318,857,056	0.75%			
Per capita personal income	\$44,438	\$46,049	3.63%			
	Wyoming					
Personal income	\$30,205,928	\$31,885,231	5.56%			
(thousands)						
Population	583,223	584,153	0.16%			
Per capita personal income	\$51,791	\$54,584	5.39%			
	Teton County					
Personal income	\$4,100,321	\$4,459,532	8.76%			
(thousands)						
Population	22,375	22,930	2.48%			
Per capita personal income	\$183,255	\$194,485	6.13%			

Source: U.S. Bureau of Economic Analysis Regional Economic Accounts http://bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrdn=7#reqid=70&step=25 &isuri=1&7022=20&7023=7&7024=non-industry&7001=720&7029=20&7090=70

SWOT ANALYSIS (INTERNAL STRENGTHS AND WEAKNESSES: EXTERNAL OPPORTUNITIES AND THREATS)

Figure 3 Vertical Harvest, Jackson, Developmental Timeline

2007:

The entrepreneurs developed the concept of a community greenhouse and began public meetings to gauge interest in such a project.

2008:

McBride and Nona Yehia met and discussed the idea of locally-grown produce during winter.

ENVIRONMENTAL SCANNING (The collection and interpretation of information about forces, events, and relationships in the external environment that affect the implementation plan.)

REGULATORY AGENCIES

2009:

April 20, Jackson Town Council (JTC) heard discussion from representatives from local organizations for alternative uses of the open space south of the parking garage. The council directed PAWs to present a detailed dog park proposal for the property, but PAWs subsequently withdrew proposal, citing size constraints imposed by the site. **May 18**, JTC tabled a staff recommendation to issue RFP for parking garage open space.

June 15, Mayor Mark Barron appointed Yehia to the Design Review Committee.

2010:

January 4, The entrepreneurs asked JTC to consider supporting a Community Development Block Grant for a greenhouse project to be called Vertical Harvest (VH) on the open space.

January 19, VH presented a full proposal to the JTC as a follow-up to January 4 query. **February 1**, JTC voted unanimously to pursue a Wyoming Business Council (WBC) grant for VH.

February 16, JTC held a public hearing on the proposed application for a Technical Assistance Grant from the WBC on behalf of VH for \$7,500 for a study of the feasibility of using the 28 X 150' parcel for the project. Resolution supporting application passed unanimously.

May, VH applied for seed funding from 1% for the Tetons.

July 14, 1% for the Tetons announced a \$20,000 grant to VH.

July 29, Green America announced a \$1,000 nationally competitive grant to VH.

2011:

February 7, JTC was informed that the feasibility study concluded that the open site was appropriate for the construction of the VH project. JTC voted 3-2 to issue an RFP for the site.

March 7, JTC reviewed two proposals for use of the open space: VH and Jackson Hole Community Housing Trust. JTC voted 4-1 to allow VH use of the open space for greenhouse operations.

July 28, VH conducted fundraiser near final site of facility.

Studies indicated that the structure must be steel-reinforced to allow for seismic activity in the area. While this was expected, it nonetheless indicated a delayed opening date for the project.

October 17, JTC unanimously approved 330 square feet of retail operations at VH site, subject to a business plan.

2012:

April 16, JTC unanimously approved a VH request for a one-year extension of its Memorandum of Understanding (MOU).

July 19, VH conducted fundraiser near final site of facility.

October 15, VH presents a revised budget with estimated construction cost of \$2,250,000.

VH raised \$815,000 through private donations before December.

December 3, Yehia and McBride began a Kickstarter campaign to raise \$30,000 in 40 days under the name: "Vertical Harvest of JH: A Growing System for Change"

2013:

January 7, JTC called for a public hearing on applications for WBC grant funding of \$1.5 million. The four competing proposals were from VH, Snow King Recreation, CMI, Inc., and Imagine Jackson. The public hearing was scheduled for February 4.

January 12, VH closed Kickstarter campaign having raised \$36,270 from 323 backers, 66 of whom are from Jackson, Wyoming, and 128 of whom had never participated in a Kickstarter campaign before.

February 4, VH submitted revised Business Plan to JTC in preparation for WBC grant application.

June 20, VH presented a proposal to the Wyoming State Lands and Investment Board to approve a \$1,500,000 WBC Grant. The Board voted 3-1 in favor of the grant proposal.

August 5, VH applied for grant funding from Old Bill's Fun Run 2013. JTC unanimously approved application.

August 19, VH requested a 0% loan for \$300,000 for energy efficiency measures from 2010 Jackson Hole Energy Sustainability Project funds. This proposal received backing of the JHESP board. The repayments were to be \$2,083.34 per month for 144 months. JTC unanimously approved loan.

August 19, JTC directed staff to advertise for Request for Qualifications for Construction Manager at Risk (CMAR). The CMAR would be the single point for all contract responsibilities relating to Preconstruction and Guaranteed Maximum Price (GMP) and Construction phases for VH project.

September 2, JTC approved VH budget, clearing the way for construction.

December 19, 12:15 p.m. VH had its long-awaited groundbreaking ceremony with Governor Matt Mead and other dignitaries.

2014:

August 14, VH requested that the Energy Conservation Works Board and JTC consider converting the \$300,000 to a grant, citing increasing construction costs as one reason. JTC approved the measure in a 4-2 vote.

September 2, VTC awarded a contract to SHAW Construction with a GMP of \$3,131,638. This was consistent with the VH project budget with the following sources of funds:

Source Amount

Wyoming Business Council	\$1,500,000
Existing VH accounts	243,384
Energy Conservation Works	300,000
Investor Equity	500,000
David Sokol	125,000
May Ahab	300,000
US Bank Loan	164,616
Total Funds	<u>\$3,133,000</u>

December 1, VTC amended GMP for VH project to \$3,175,774, with the growing system component of the project withdrawn from the GMP and entirely funded, owned, and depreciated by VH rather than by the Town of Jackson.

2015:

January, foundation was laid for VH facility

March 6, Jackson Whole Grocer and Café hosted 5 percent donation day for VH **May through early June**, VH encouraged supporters to lobby State Farm for \$25,000 grant.

July 25, the greenhouse facility was roofed.

September 11, local YMCA hosted Cultivate Wellness campaign to raise funds for VH. **December**, VH ribbon-cutting ceremony with dignitaries.

VH began growing tomatoes on the third floor of the new facility.

2016:

February, VH began growing lettuce and herbs **March 10**, VH retail store opened. **May 26**, VH Grand Opening and Tour.

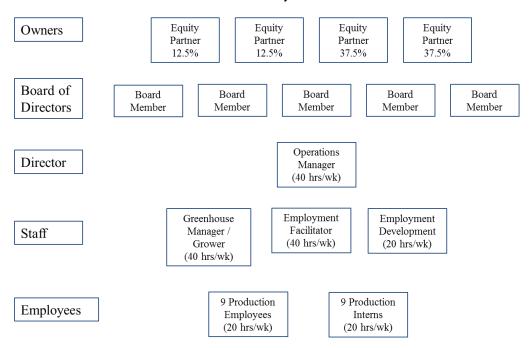
That Vertical Harvest of Jackson was able to succeed in the face of all these challenges speaks volumes for all the stakeholders involved, including the Town of Jackson, the private investors, and entrepreneurs Penny McBride and Nona Yehia. The challenges faced by these entrepreneurs are typical of what any entrepreneur is likely to find when considering a new venture. The specifics are, of course, peculiar to this particular venture; but, the nature and types of challenges are common.

ENVIRONMENTAL SCANNING (The collection and interpretation of information about forces, events, and relationships in the external environment that affect the implementation plan.)

Figure 4 below illustrates the change in structure that Vertical Harvest underwent from October, 2012, until February, 2013, between iterations of its business plan. Initially, the L3C structure had raised concerns about public funds going to private individuals. When officials and citizens were made familiar with the daunting

requirements of the project, the concerns became more muted and support more effusive. Using citizen input, Vertical Harvest revised its business plan as reflect in Figure 4 below. This highlights the thousands of hours of time invested that a sweat equity entrepreneur has at risk when a public entity is involved, since both city and state agencies represent unequal partners in a joint public/private venture. Finally, Figures 5 and 6 below provide the final pro forma income and cash flow statements with which Vertical Harvest was able to obtain Wyoming Business Council funding and complete the project.

Figure 4
Vertical Harvest, Jackson, Initial Management Structure (October 2012)



Vertical Harvest, Jackson, Revised Management Structure (February 2013)

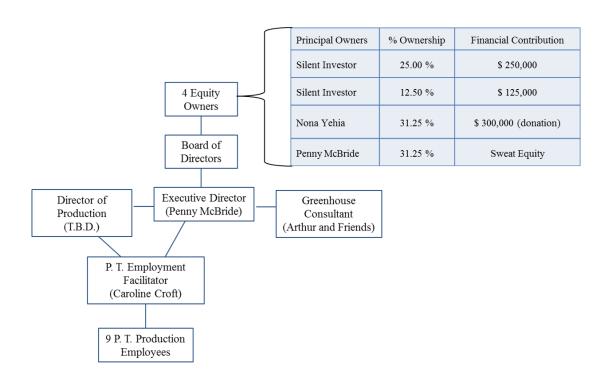


Figure 5
Vertical Harvest, Jackson, Revised Pro Forma Income Statements
(February 2013) (in dollars)

	Year 1	Year 2	Year 3	Year 4	Year 5
Sales	514,516	593,872	623,566	654,744	687,481
COGS	18,523	21,379	22,448	23,571	24,749
Direct Labor	124,800	131,040	137,592	144,472	151,695
Gross Profit	371,193	441,453	463,525	486,702	511,037
Operating Expenses					
Accounting/ Legal	10,000	10,000	10,000	10,000	10,000
Advertising	10,000	3,750	4,000	4,250	4,500
Automobile Expenses	6,240	6,283	6,328	6,374	6,421
Computer/Copier Maintenance	1,000	1,000	1,000	1,000	1,000
Dues/Subscriptions	500	500	500	500	500
Health Insurance	12,000	12,000	12,000	12,000	12,000
Liability Insurance	10,000	10,700	11,449	12,250	13,108
Greenhouse Consulting	10,000	5,000	5,000	5,000	5,000
Lease	100	100	100	100	100
Postage	150	150	150	150	150

Printing	1,000	1,050	1,103	1,158	1,216
Repairs and Supplies	15,000	15,250	15,513	15,788	16,078
Managing Expense	120,000	124,800	129,792	134,984	140,383
Payroll Taxes	18,727	19,476	20,255	21,066	21,908
Office Supplies	1,500	1,575	1,654	1,736	1,823
Revenue Recapture	20,000	80,000	80,000	60,000	60,000
Software	1,000	1,000	1,000	1,000	1,000
Telephone	1,260	1,323	1,390	1,460	1,533
Utilities	45,201	48,365	51,751	55,373	59,249
Water	1,400	1,470	1,544	1,621	1,702
Website Management	1,000	1,000	1,000	1,000	1,000
Contingency	31,998	31,576	32,345	33,157	34,013
Total Operating Expenses	318,076	376,369	387,872	379,966	392,684
Total Operating Income	53,117	65,084	75,653	106,736	118,353
Other Income					
Pledge Memberships	215,700	-	-	-	-
Donations	300,000	-	-	-	-
Equity for Start-up	125,000	-	-	-	-
Total Other Income	640,700	-	-	-	
Depreciation	75,699	76,260	76,660	77,060	77,460
Net Income	<u>618,118</u>	(11,176)	<u>(1,007)</u>	<u>29,676</u>	<u>40,893</u>

Figure 6
Vertical Harvest, Jackson, Projected Cash Flows (February 2013) (in dollars)

Operating Activities	Year 1	Year 2	Year 3	Year 4	Year 5
Net Income	618,118	(11,176)	(1,007)	29,676	40,893
Depreciation Expense	75,699	76,260	76,660	77,060	77,460
Change in Inventory	(23,887)	(1,516)	(1,270)	(1,334)	(1,400)
Net Cash Flow from Operating Activities	669,930	63,567	74,383	105,402	116,953
Investing Activities					
Equipment Purchases	(502,389)	(3,611)	(2,000)	(2,000)	(2,000)
Leasehold Improvements	(359,400)	-	-	-	-
Net Cash Flow from Investing Activities	(861,789)	(3,611)	(2,000)	(2,000)	(2,000)

Financing Activities

Low Interest Loan	300,000	-	-	-	-
Member Capital	250,000	-	-	-	-
Repayment of Low Interest Loan	(25,000)	(25,000)	(25,000)	(25,000)	(25,000)
Net Cash Flow from Financing Activities	<u>525,000</u>	(25,000)	(25,000)	(25,000)	(25,000)
Beginning Cash Balance	-	333,141	368,098	415,481	493,883
Ending Cash Balance	<u>333,141</u>	<u>368,098</u>	<u>415,481</u>	<u>493,883</u>	<u>586,836</u>

CONCLUSIONS

That Vertical Harvest of Jackson was able to succeed in the face of all these challenges speaks volumes for all the stakeholders involved, including the Town of Jackson, the private investors, and entrepreneurs Penny McBride and Nona Yehia.

The challenges faced by these entrepreneurs are typical of what any entrepreneur is likely to find when considering a new venture. The specifics are, of course, peculiar to this particular venture; but, the nature and types of challenges are common.

The following photos show how Vertical Harvest, Jackson appeared in full operation as of July, 2016.



Jackson's Vertical Harvest is one of the world's first vertical greenhouses. It is located on a sliver of vacant land next to a parking garage. This 13,500 sq. ft. three-story stacked greenhouse utilizes a 1/10 of an acre to grow an annual amount of

produce equivalent to 5 acres of traditional agriculture. Vertical Harvest sells locally grown, fresh vegetables year round to Jackson area restaurants, grocery stores, and directly to consumers through on-site sales. Vertical Harvest replaces 100,000 lbs of produce that is trucked into the community each year. In addition to fresh lettuce and tomatoes, Vertical Harvest produces jobs, internships, and educational opportunities. The greenhouse employs 15 people.

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Vertical Harvest's Kickstarter profile is available at

https://www.kickstarter.com/projects/2056017617/vertical-harvest-of-jh-a-growing-system-for-change



¹ http://verticalharvestjackson.com/

² https://weather.com/weather/monthly/I/USWY0088

³ Interview with Larry Pardee, Jackson, Wyoming, Thursday, July 28, 2016.

⁴ Interview with Penny McBride, Jackson, Wyoming, Wednesday, July 27, 2016.

⁵ https://www.intersectorl3c.com/

⁶ The Wyoming Business Council website is extensive. Its profile on Vertical Harvest is at