From the Business Conception to the Bank: Application of Interactive model in Estimating the Financial Feasibility of Anthurium cut Flowers

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Abstract. The main objective is to provide investors and other existing farms with an accurate method for estimating the financial feasibility for agribusiness in Hawaii, customized to their farm operation and financial analysis to help banker access its profitability.This project provides an easy way to estimate the economic feasibility of starting agribusinesses or other enterprises. An innovative interactive model has been developed to estimate the financial feasibility of starting agribusiness projects. Data on the cost of establishing a business is entered into the webpage, then the model estimates the Pro forma Income Statement, Pro forma Balance Sheet, Cash Flow Statement, and conducts some financial analyses that are needed to approve a loan. This model can be used to conduct feasibility analyses and look at the profitability of the business by changing some or all of the assumptions in estimating the profitability simultaneously.

The model is published in our website, HawaiianAgriculturalProducts.com, allowing agribusiness owners to access to the model as well recognize the other benefits of using the website in marketing and obtaining other information. The model and the website could be duplicated by other universities as a model to serve their community.

Keywords, interactive, economic, feasibility, anthurium, hawaiianagriculturalproducts.com

1. Introduction

The purpose of this project is to develop interactive financial feasibility of anthurium cut flower farms in Hawaii. The main objective is to provide investors and other existing farms with an accurate method for estimating the financial feasibility of producing anthurium cut flowers, customized to their farm operation and financial analysis to help banker access its profitability. The software is located at the website www.hawaiianagriculturalproducts.com, under the anthurium economic feasibility. This website provides convenient and fast methods in accessing the viability of growing anthurium cut flowers. It can be used for planning new anthurium farms and expanding the existing operation. It can also be used for various managerial decisions, such as sensitivity analysis, annual evaluations and farm budgeting.

II. Methodology and Cost Assumptions

Production coefficients are estimated based on the information provided by the growers surveyed and validated with researchers at CTAHR and previous publications. These coefficients are kept constant in estimating the production function equation. The costs of these coefficients are variable, and vary with size, and inflation rate. The program allows individuals to enter their value in inputs sheet; and is written to enter these values in the production function and calculate their total cost. These variables such as labor cost per plant, fertilizer cost per plant, chemical cost per plant, plants per SF, packaging material cost per plant, pot cost per plant, and media cost per plant etc are given in Figure 1. Other fixed cost such as establishment cost, deprecation, administrative salaries is treated as fixed cost but vary with given size of operation.

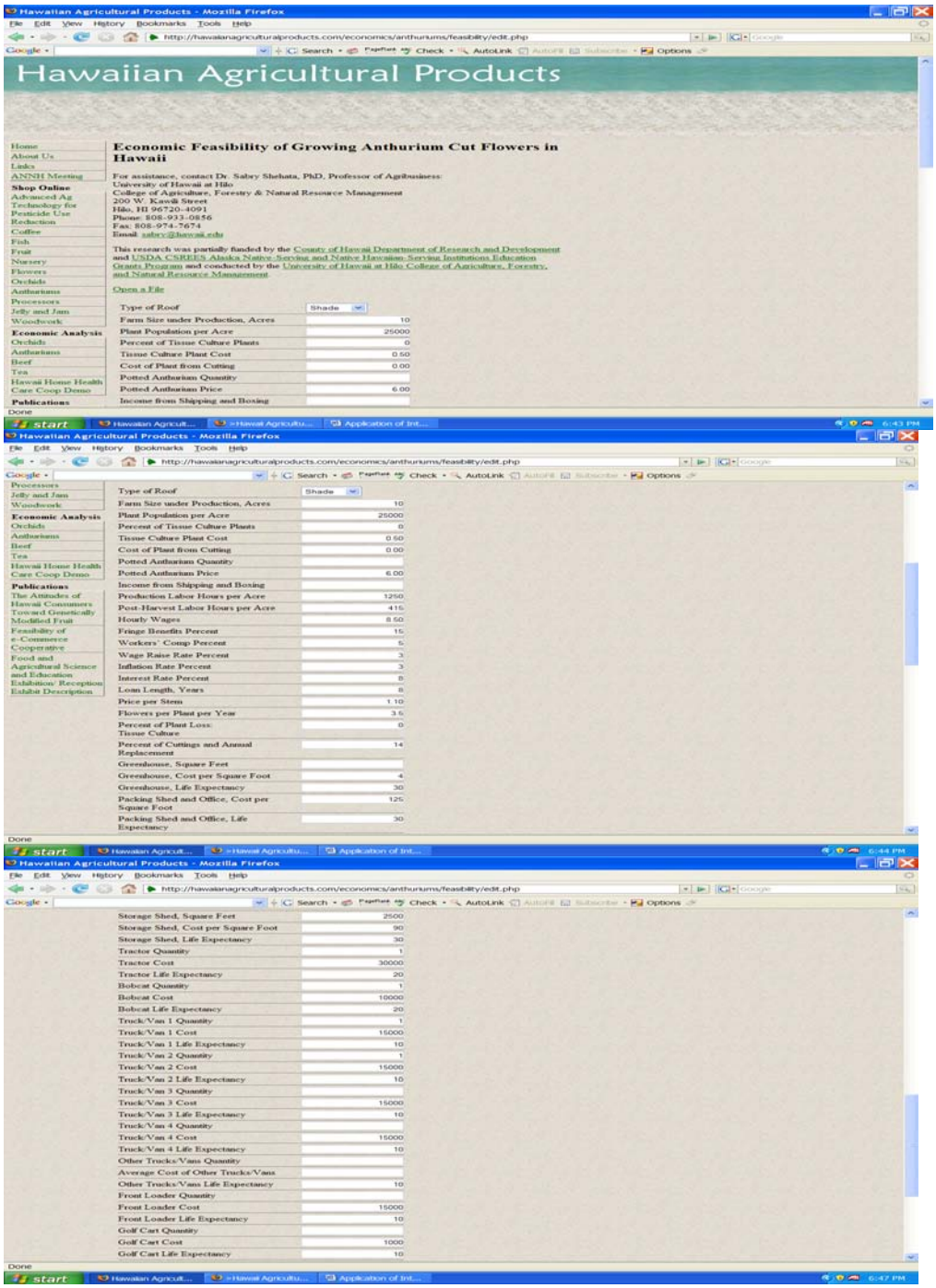

Figure 1. : Physical Inputs Needed its Cost to Calculate the Financial Feasibility

III. Application of the Model

3.1 Capitalization Cost

The following assumptions were made:

- Price of inputs remained constant
- Amount used per acre is liner related to the size
- Simple interest rate is used by the end of the accounting period.
- Jump start of operation is one year to complete the development

- No payment is required in the fist year of operation
- 100% of the project is financed through financial institutions.

Table 1 shows the capitalization cost for 4 acres anthurium farm. Individual can calculated the capitation cost for different size of operation. The total establishment cost for 4 acres anthuriums amounted to about $640,000, $160,000 per acre and $3.68 per square foot

Table 1. Capitalization cost for 4 acres anthurium farm.

	Per SF	Per Acre	Farm Total
Land Clearing	0.06	2,500	10,000
Surveying	0.03	1,200	4,600
Cinder	1.15	50,000	200,000
Cinder Labor	0.02	800	3,100
Irrigation System	0.07	3,000	12,000
Irrigation System Labor	0	200	800
Shadecloth	2.32	101,000	404,000
Shadehouse Frame Labor	0.01	400	1,400
Shadehouse Panels Labor	0.02	700	2,900
Shadehouse Hole Labor	0.01	200	900
Capitalization Total	3.68	159,900	639,800

3.2 Profitability Analysis in the Next Five Years of Operation

The following assumptions were made:

- Average farm size of 4 acres was used (Statistics of Hawaiian Agriculture 2003)
- 3% inflation rate annually.
- 3% wages and salaries increase annually.
- The collection rate is 99%.
- Interest rate is 8%, the same as the present interest in 2006 for financing fixed assets.
- The average hourly wage paid is $8.50 for unskilled workers
- The health insurance, sick leave, paid vacation and other fringe benefits are calculated at 30% for full time workers only. Part-time and non member will not received fringe benefits.
- Capital expenditure depreciates at 10 years period.
- Workers' Compensation at 3%.
- No production in the first year of operation and 72% in the second year, 86% in the third year and full production will be reached in the 4th year of operation. In the fifth year, 14% of the plants are replaced and 1% percent cinder will be lost during replacing there plants. The same replacements operation will continue years after.

Table 3 lists the annual costs and return associated with producing cut anthurium for 4 acres farm. The gross sales amounted to $372,700 in the fifth year of operation. The total variable cost amounted to $97,800. The gross margin amounted to $274,800 that pays for overhead cost. The net income from operation amounted to $39,400. The breakeven price is 0.997 per stem (Table 3)

Table 2. Profit and loss in the First Five Years of operation

Items	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Per acre*	*Stem*	*SF*
Cut Anthuriums Sales	0	281,600	351,300	420,700	372,700	93,200	1.065	2.142
Total Revenue	**0**	**281,600**	**351,300**	**420,700**	**372,700**	**93,200**	**1.065**	**2.142**
Variable Costs								
Production labor cost	48,900	50,300	51,900	53,400	55,000	13,800	0.157	0.316
Post-Harvest labor costs	0	11,900	14,800	17,700	18,300	4,600	0.052	0.105
Workers' Comp	3,800	4,500	4,800	5,100	5,200	1,300	0.015	0.03
Chemicals	600	600	700	700	700	200	0.002	0.004
Fertilizer (Low-Release)	3,600	3,700	3,800	3,900	4,100	1,000	0.012	0.023
Liming	1,200	1,200	1,300	1,300	1,300	300	0.004	0.008
Disease Control Chem.	2,700	2,700	2,800	2,900	3,000	800	0.009	0.017
Cinder	0	0	0	0	3,200	800	0.009	0.018
Sanitation	200	200	300	300	300	100	0.001	0.002
Harvesting Material/Boxes	0	100	200	200	200	100	0.001	0.001
Fuel	2,300	4,100	4,600	5,100	5,200	1,300	0.015	0.03
Water	1,200	1,200	1,300	1,300	1,400	300	0.004	0.008
Total Variable Costs	**64,500**	**80,800**	**86,300**	**91,900**	**97,800**	**24,500**	**0.279**	**0.562**
Gross Margin	**-64,500**	**200,800**	**264,900**	**328,800**	**274,800**	**68,700**	**0.785**	**1.58**
Fixed Costs								
Administrative Salaries	27,600	28,400	29,300	30,200	31,100	7,800	0.089	0.179
Util./Tel./Internet	6,800	6,900	7,100	7,300	7,400	1,900	0.021	0.043
Depreciation	91,500	91,500	91,500	91,500	91,500	22,900	0.261	0.526
Total Fixed Costs	125,900	126,800	127,900	128,900	130,000	32,500	0.371	0.747
EBIT	-190,400	73,900	137,100	199,900	144,900	36,200	0.414	0.833
Interest Cost	110,800	127,600	126,500	118,800	105,400	26,400	0.301	0.606
Net Income	**-301,200**	**-53,700**	**10,600**	**81,100**	**39,400**	**9,900**	**0.113**	**0.227**

3.3. Pro-forma Balance Sheet

The following assumptions are used to come with balance sheet:

- The account receivable represents one month of the total annual revenue.
- Accrual methods is used to estimate of the profitably of the business, we applied all net income to the payment of the loan.
- Depreciation on capital expenses is 10 years.
- For simplicity, no interest is paid on saving accounts.
- One month collectable rate is used to estimate the account receivable.

Table 3. Pro-forma Balance Sheet for Four Acres Farms

Balance Sheet	*Initial year*	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Cash	0	1,000	1,000	1,000	1,000	5,000
A/R	0	0	23,500	29,300	35,100	31,100
Total Current Assets	0	1,000	24,500	30,300	36,100	36,100
Net Fixed Assets	1,384,800	1,293,300	1,201,800	1,110,300	1,018,900	927,400
Total Assets	1,384,800	1,294,300	1,226,300	1,140,600	1,054,900	963,400
Loans	1,384,800	1,595,500	1,581,200	1,484,900	1,318,100	1,187,200
Retained Earnings			-301,200	-354,900	-344,300	-263,200
Net Profit	-64,000	-301,200	-53,700	10,600	81,100	39,400
Total Equity	-64,000	-301,200	-354,900	-344,300	-263,200	-223,800
Liab. and Net Worth	1,320,800	1,294,300	1,226,300	1,140,600	1,054,900	963,400

To establish anthurium farm a loan of $1.321 million plus interest is needed, this include establishing cost and running the farm in initial year. There is no revenue is generated the first year of operation.

3.4 Cash Flow Projection for the First Five years of Operation

The cash flow is calculated base in the following assumptions:

- Interest rate is 8%
- Equal principle

Table 4. Cash Flow Projection for the First Five years of Operation

	Year 0	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Cash from Services	0	0	258,100	322,000	385,600	341,600
From Account Receivable			0	23,500	29,300	35,100
From Loan + one year interest	1,384,800	0	0	0	0	0
Total Cash	1,384,800	0	258,100	345,500	414,900	376,700
Operating Expenses	0	98,900	116,100	122,700	129,300	136,300
Loan Principle		173,100	173,100	173,100	173,100	173,100
Interest		96,900	83,100	69,200	55,400	41,500
Total Cash Disbursement	0	368,900	372,300	365,000	357,800	351,000
Cash Balance	1,384,800	-368,900	-114,200	-19,600	57,100	25,700

Positive Cash flow accrues in the fourth year of operations and will continue years after.

3.5 Loan Analysis of Anthurium Farm Operations

In order to assess the financial feasibility from the lending institution and investors point view, the model also provides additional financial analysis. These are debts service, collateral, and cash coverage, outstanding loan and collateral coverage. Income before interest, taxes, deprecation was used. Debt service cost (interest charges) is calculated at given interest rate (8.00%), cash conversion ratio is calculated by dividing EBITDA by debt service. The collateral used her is the 90% account receivable of the pervious year earning. From the above the financial institution will requires investor to come with past of equity to finance such venture.

Table 5. Loan Analysis of Anthurium Farm Operations

Loan Analysis	Year 1	Year 2	Year 3	Year 4	Year 5
EBITDA	-98,900	165,400	228,600	291,400	236,300
Debt Service	234,900	234,900	234,900	234,900	234,900
Cash Coverage	-0.42	0.7	0.97	1.24	1.01
Collateral	0	17,600	22,000	26,300	23,300
Principal Outstanding	1,595,500	1,581,200	1,484,900	1,318,100	1,187,200
Collateral Coverage	0	0.01	0.01	0.02	0.02

Table 6. Payoff period for Four Acres Anthurium Operation

Payoff Period	Year 1	Year 2	Year 3	Year 4	Year 5
Loan Due, Beginning	1,384,800	1,595,500	1,581,200	1,484,900	1,318,100
Interest	110,800	127,600	126,500	118,800	105,400
Revenue	0	281,600	351,300	420,700	372,700
Exp. Excluding Depr. & Int.	98,900	116,100	122,700	129,300	136,300
Loan Due	1,595,500	1,581,200	1,484,900	1,318,100	1,187,200

IV. Conclusion

The software for cost of production and financial feasibility for cut anthuriums has been developed, and is located at the website, www.hawaiianagriculturalproducts.com, and can be modified to include other horticultural commodities. This will provide a convenient and fast method for estimating the cost of production. The growers need to be trained to use this site as part of a farm management training program that can be conducted statewide.

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References

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