



INMED Caribbean – Who are we?

- ❖ Non-Profit Organization registered in Jamaica since 2010
- ❖ Working in Jamaica in adaptive agriculture, health and youth development since 2002
- ❖ Affiliated with INMED Partnerships for Children
- ❖ For more information about INMED, visit www.inmed.org



Aquaponics Production in Jamaica

THE BUSINESS CASE

(Aquaponic farming has been identified as a best practice method of food production that is sustainable, socially acceptable, environmentally friendly, lucrative, and can be pursued in either urban or rural areas)

Presented by Lloyd Brown

On behalf of **INMED Partnership for
Children**

DEVELOPMENT - NATIONAL PERSPECTIVES

Objective: This business model is to assist in the initialization of a programme of financing and project implementation that will promote sustainable farming and provide a channel to economic independence for individuals in both the urban and rural areas of Jamaica

It aligns with national objectives for agriculture set out in:

- **Jamaica 2030 Vision Plan** with core goal of:
- ***national food sufficiency and food sustainability by the year 2030.***

The most recent initiatives in respect to this vision are :

- **National Food and Nutrition Security Policy and Action Plan :**
 - Availability of a sufficient quantity and appropriate quality of nutritional foods
 - All individuals reaching a state of nutritional well being **through food choice**
 - All people have **access to adequate, safe nutritional food** at all times.

National Youth in Agriculture Policy and Implementation Plan (2016) which seeks to provide

- A framework for youth participation in the agricultural sector through engagement of all relevant ministries, department and agencies, private sector and **donor agencies**
- A policy to **assist in creating an enabling environment** for the realization of the sector vision 2030

National Stakeholders

- **Youths, Women, Small Scale Farmers:** *National unemployment rate of 12.9% (Youths 28.6%) . Over 40,000 school leavers annually with over 50% unemployed in the first 2 years. GDP@p J\$611,572, GDI \$648,458 . (Ref: ESSJ 2016).*
- **Government – MICAF, Ministry of Environment** - *Active extension support through RADA, Input material (fingerlings and production support).*
- **Financing entities– DBJ and AFI's** - *provide and manage the venture capital needed for initial capital inputs to start-ups, lacking the collateral. Participating AFI's to support programme, gain information and experience.*
- **Hotels, Restaurants , Agro Processors, Food Distributors–** *increasing number of rooms by over 3,000 in the last year, increasing use of local foods, increasing demand for Jamaican sauces , health food awareness.*

Basis of choice (Why Aquaponics)

- Promulgation of most project or system requires three (3) major conditions – Demand, Economic viability and Social acceptance.
- Agriculture in Jamaica is particularly trying because of real or perceived physical, financial and social challenges, the more prominent of which are:
 - Availability of arable land and water (irrigation)
 - Unpredictable weather conditions,
 - Pollution - Overuse of pesticides, weedicides and fertilizers
 - Unavailability of affordable financing
 - Stigmatization of rural and subsistence farming
 - Perception of low economic returns

Basis of choice (Why Aquaponics) (contd)

- **Aquaponics production mitigates or overcome most of these challenges by:**

- Being practical and applicable in any geographical area
- Using “Closed water cycling” ensures minimum loss and no need for replenishment of irrigation water source
- Uses natural fertilizer (fish waste) , no chemical contamination of land, water or plants.
- Scientific production/practice - social acceptance - (*no perception of “dirty uneducated hands, toiling in the sun”*)
- Reasonably high return per square chain.

The system however requires significant financial support for initial start-up/capitalization

System Description

- The business case advances a “Media Bed” system containing nine (9) raised (30”) concrete trays (4ft x 24ft x 1ft each) filled with river gravel ($\frac{1}{4}$ ” media) along with five (5) tanks for water (app 4,000 gals) and fish (5ft x 6ft x 4ft each) utilizing solar energy for water and air pumps. The total area is approximately 2,178 square feet (1/2 sq. chain) with growing space (media bed) of 768 sq ft. (additional tray used to grow fish feed, may spawn fish or make seedling bed), which is all covered with ‘40% greenhouse plastic ‘.
- **Below – Uncovered Aquaponics system**



System Costs – Set-up

- The infrastructural cost may vary considerably for different geographical areas of the island dependent on labour cost material availability and construction system, however the calculations presented are based on urban rates using a contractor to carry out the construction.

Table 1b: Summary of Construction Works by Inputs for 768 sq. ft. Media Bed Aquaponic System	
Concrete	368,560.00
Steel & Mesh	352,478.00
Masonry Works	348,993.00
Carpentry/Formwork	110,160.00
Labour	256,500.00
Stones & Marl	78,778.00
Pipes & Pump	160,523.50
Termite Treatment	93,483.00
	J\$1,769,475.50
Superstructure & Shade plastic	192,000.00
Total Cost	J\$1,961,475.50
<i>Prepared by: Davidson Hanna Quantity Surveyors</i>	
Approximate Operational Cost (To first revenues)	\$320,000

Operational Costs

- The operational of the system can be carried out by one individual with daily requirement being, checking water quality, feeding the fish, ensuring pumps and equipment are working properly and examining the plants to check growth status or any infestation. Maximum costs are computed as follows.

Operational Costs – (pepper, tomato, scallion, fish)					
DIRECT COSTS	Year 1	Year 2	Year 3	Year 4	Year 5
Planting Materials	23,950	8,525	9,378	10,315	11,347
Fish and Feed	178,150	199,731	202,074	222,620	228,264
Supplements & Pesticides	47,935	52,729	58,001	63,801	70,182
Total Direct Costs	250,035	260,984	269,453	296,737	309,792
EXPENSES					
Wages ****	133,800	140,490	147,515	154,890	162,635
Maintenance	20,000	22,000	24,200	26,620	29,282
Travelling & Transportation	60,000	66,000	72,600	79,860	87,846
Telephone, stationery etc	60,000	66,000	72,600	79,860	87,846
Interest - New Loan	186,420	155,880	116,971	74,200	27,184
Deferred Expenses	6,000	6,000	6,000	6,000	6,000
Depreciation	56,675	56,675	56,675	56,675	56,675
Total Expenses	522,895	513,045	496,560	478,105	457,467
*** Wages apportioned for time required for system - 2 hours or 25% of days pay					

Revenue Returns

- The projected out turns for the model in the cultivation of sweet pepper, tomato, scallion and fish are summarized as follows.

AQUAPONIC PRODUCTION (2,178 sq ft -1/2 sq chain)					
PROJECTED PROFIT & LOSS ACCOUNTS					
	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
	<u>₹</u>	<u>₹</u>	<u>₹</u>	<u>₹</u>	<u>₹</u>
REVENUE					
Produce	798,660	878,526	966,379	1,063,016	1,169,318
Fish	270,000	283,500	421,200	510,300	337,500
Total Revenues	1,068,660	1,162,026	1,387,579	1,573,316	1,506,818
Total Direct Costs	250,035	260,984	269,453	296,737	309,792
Gross Profit	818,625	901,042	1,118,125	1,276,580	1,197,026
Total Expenses	522,895	513,045	496,560	478,105	457,467
Net Profits	295,730	387,997	621,565	798,475	739,559
Cash Available	358,405	450,672	684,240	861,150	802,234
EBITDA	544,825	606,552	801,211	935,349	829,417

- This level of profitability will give the system the capacity to afford debt financing of approximately \$3 million and consequently provide a debt coverage ratio averaging 1.5 for the debt of \$2 million (at up to 9.5%) that may be used for the set-up.**

Summary

- In summary a viable business will exist when:
 - **A gap/need identified** - *Unemployment reduction, food production*
 - **Efficient means of delivery** – *Aquaponics production - (versatility)*
 - **Costs are determined** - *Establishment \$1.9M, operations \$320k - (2,178 sq ft)*
 - **Technical support available** - *Inmed Training, MICAF, MoE*
 - **Financing available** - *Loans of up to \$2m made available*
 - **Product take-up assured** - *Commitments from potential product users*
 - **Revenue Returns** - *Minimum revenue starting at average \$1.35 providing average net profit at 43% (\$586k) (after debt servicing ie. operational net profits at 50%)*
 - **Has scalability** - *Easily duplicated with assured maintenance or improvement of Net Profit Margins. - (over 50%)*

Social Benefits

- ❖ Reduction of “idle” youths through the provision of gainful employment.
- ❖ Provides viable alternative to “Urban Drift”
- ❖ Fosters good work ethics
- ❖ Lower labour intensity allows participation of elderly, youths, and the physically challenged.
- ❖ Enhances Jamaican food security - (lower imports , F/E savings)
- ❖ Very high scaling potential as there are few limitations
- ❖ Job generation and assured steady income
- ❖ Not limited to arable land (flexibility in location and lower competition)
- ❖ Sustainable technology for future generations
- ❖ Healthy and nutrient rich food that supports current trends and campaigns



Thank you!

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