

Hydroponics



May 2019



GREEN
CLIMATE
FUND



Empowered lives.
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Why should I consider this option?

CURRENT MARKET SITUATION

Samoan importation of lettuces and tomatoes alone exceeded SAT\$1.4 million in 2017.

The development of hydroponic agricultural systems has the potential to increase the consistency of domestic supply and quality of vegetables, thereby reducing Samoa's reliance on imports.

Hydroponic systems are adaptable to many types of crops and offer potential for agriculture diversification.

POTENTIAL CUSTOMERS

Vegetables of consistent quality and supply can be sold to Food Markets, Supermarkets or directly to Restaurants. Organically grown vegetables usually have greater values.

- 01 > WATER EFFICIENCY**
 Water is one of the most significant expense in irrigated agriculture and hydroponic systems provide up to 90% reduction in water use compare to traditional practices.
- 02 > MINIMIZE PESTS & DISEASES**
 I want to grow vegetables at working height with reduced to no requirement for pesticide use.
- 03 > VULNERABLE SITE**
 I live in a vulnerable site (flowing prone area, contaminated soil, small land size, low agricultural suitability area).
- 04 > EXTRA SOURCE OF INCOME**
 Hydroponics systems are less labour intensive than traditional farming technics but requires closer monitoring.
- 05 > EXPAND PRODUCTION PERIOD**
 I want to increase vegetables production efficiency by growing crops faster.



Lettuce Example


PHASE 1 + 2

1/4 Acre




Minimum Exploitation Size

> 5 Weeks



First Harvest

\$32,600*



Setup Cost

\$33,400*



Net Annual Revenue





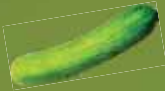







J | F | M | A | M | J | J | A | S | O | N | D

Expected Harvest Time





WHICH PLANTS CAN I GROW in a Hydroponic System

Most suitable for Rockwool or Vermiculite Medium

				
Basil	Capsicum	Cucumber	Eggplant	Parsley
pH 5.5 - 6.5	6.0 - 6.5	5.5	6.0	5.5 - 6.0
cF* 10 - 16	18 - 22	17 - 25	25 - 35	8 - 18
				
Bok Choy	Coriander	Dwarf Beans	Lettuce	Thyme
pH 7.0	6.5 - 6.7	6.0 - 6.5	6.0 - 7.0	5.5 - 7.0
cF* 15 - 20	16 - 18	20 - 40	10 - 14	8 - 16

Most suitable for Coconut Coir Medium

	
Strawberry	Tomato
pH 5.5 - 6.2	6.0 - 6.5
cF* 18 - 22	20 - 50

* **Conductivity Factor (cF)** is a measurement used to estimate nutrients concentration. Crops will have a lower nutrient requirement when exposed to higher temperature as they transpire more water to lower leaves' temperature.

Tomato plants' leaves are particularly sensitive to humidity. Both tomatoes and strawberries grow substantially better in greenhouse. Please refer to the brochure on "Year-Round Vegetable Production" for costing examples of Hydroponics and Greenhouses projects.

The most significant risk for hydroponic production are:



- **Power Cuts** (power generator)
- **Equipment Failure** (spare pump)
Mature plants will not survive one day without water
- **Heavy Rain**



Growing Lettuce in Hydroponics Two Phase Example

PHASE 1 Hydroponic + Sanitation Systems

Description	Total
(1) Hydroponic System	
3 x Timber Table + Concrete	\$3,000
72 NTF Gully, 100 x 50 x 5.8m (1656 plant holes)	\$11,833
Gully end caps + Gully couplers 100 x 50	\$735
Nutrient tank + 2 Pumps + all PVC Pipe, valves and fittings	\$7,800
3 x Gully catchment Grommets + Riser tubing	\$608
Flood and Drain table complete with tank and pump	\$2160
pH Tester + CF Nutrient tester	\$520
(2) Sanitation System	
Sanitation System	\$3,500

2000 grow cups	\$775
2 box x 6000 rockwool cubes	\$1,980
4 Box x 20Kg A + B Nutrient	\$1,400
20L Container Nitric Acid	\$395
10,000 Pilled Lettuce seeds	\$1,404
Electric Power & Delivery	
SAT\$	\$36,110



One qualified worker would be sufficient to run a small commercial system (Phase 2).

PHASE 2 System Automatization

Description	Total
(1) Full Automatization	
Automatization System	\$5,100
SAT\$	\$5,100



Full automatization is only recommended after 12 months of use as there is a risk of relying entirely on the automatic system.



An import permit will be required from Samoan Quarantine Service for the importation of seeds (<http://www.samoaquarantine.gov.ws/index.php/live-plants>).

Suppliers of hydroponic systems in New Zealand includes: Aquaflow water solution (kees@ciws.co.ck - above quotation), Easy Grow (Easygrow.co.nz) and Stocker Horticulture (hydroponics.co.nz). High quality seeds for hydroponic systems can be ordered from suppliers such as Terranova (<http://terranovaseeds.com/>).

The GCF team would like to sincerely thanks M Kees van Wijk from Aquaflow Water Solutions trading for is valuable inputs for the production of this brochure.