



**Spire** USA Inc.

*"where hope transmutes into reality"*

*19 W 34th St, New York, NY 10001*

*Tel: +1 646 470 9917. Email: [info@spireinc.us](mailto:info@spireinc.us)*

**ABCDE**  
**A**quaculture/**A**griculture **B**ased **C**ommunity  
**D**evelopment **E**xport City Program

*Backyard Applied Macrobiotic Module (BAMM™)  
Technology Operated*



# Highlights of the Project

- **NO OF BENEFICIARIES: *2500 FAMILIES.***
- **MONTHLY REVENUE: *USD \$2850.00.***
- **EMPLOYMENT: *MINIMUM TWO PERSONS OF THE FAMILY.***

## **OTHER BENEFITS:**

- **FREE WATER.**
- **FREE ELECTRICITY.**
- **VEGETABLES.**
- **FISH.**
- **TRAINING TO MANAGE THE SELF EMPLOYMENT.**
- **FREE TECHNICAL SUPPORT 24/7 BASIS.**
- **NO FERTILIZER FOR VEGETABLES PRODUCTION.**
- **NO TRANSPORT COST TO SELL PRODUCT. (BUY-BACK AGREEMENT)**
- **INVESTMENT FOR BENEFICIARY: NO INVESTMENT.**
- **MARKETING OF FISH/VEGETABLES: BUY-BACK AGREEMENT TO BUY PRODUCE AT DOORSTEP.**

# WHAT IS Backyard Applied Macrobiotic Module – BAMM™?



**A BACKYARD UNIT OF 6X6  
M2 FOOTPRINT THAT  
CONSISTS OF THE  
FOLLOWING -**



**FOUR 12,000 LITRE TANKS &  
ONE 5000 LITER TANK.**



**BIOFLOC REACTOR.**



**VEGETABLE GROW BEDS.**



**SOLAR POWERED BORE  
HOLE WATER PUMP.**



**SOLAR POWER  
GENERATION UNIT WITH  
INVERTERS.**



**ACCESSORIES, AERATORS,  
AIR PUMPS, OXYGENATORS,  
SENSORS & MONITORING  
EQUIPMENT.**

# WHAT DOES Backyard Applied Macrobiotic Module – BAMM™ PRODUCE?



*100 KILOS OF TILAPIA FISH PER MONTH.*



*800 KILOS OF VEGETABLES PER MONTH.*



*5000 LITERS OF WATER. (DEPENDANT ON  
THE UNDERGROUND WATERBED OF THE  
LOCATION)*



*ELECTRICITY (TO BURN 5 X75 WATTS  
BULBS FOR 5 HOURS EVERYDAY)*



*AFTER 1<sup>ST</sup> FOUR MONTHS PRODUCTION  
OF FISH/VEGETABLES ON  
WEEKLY/MONTHLY BASIS.*

# EMPLOYMENT OPPORTUNITIES?

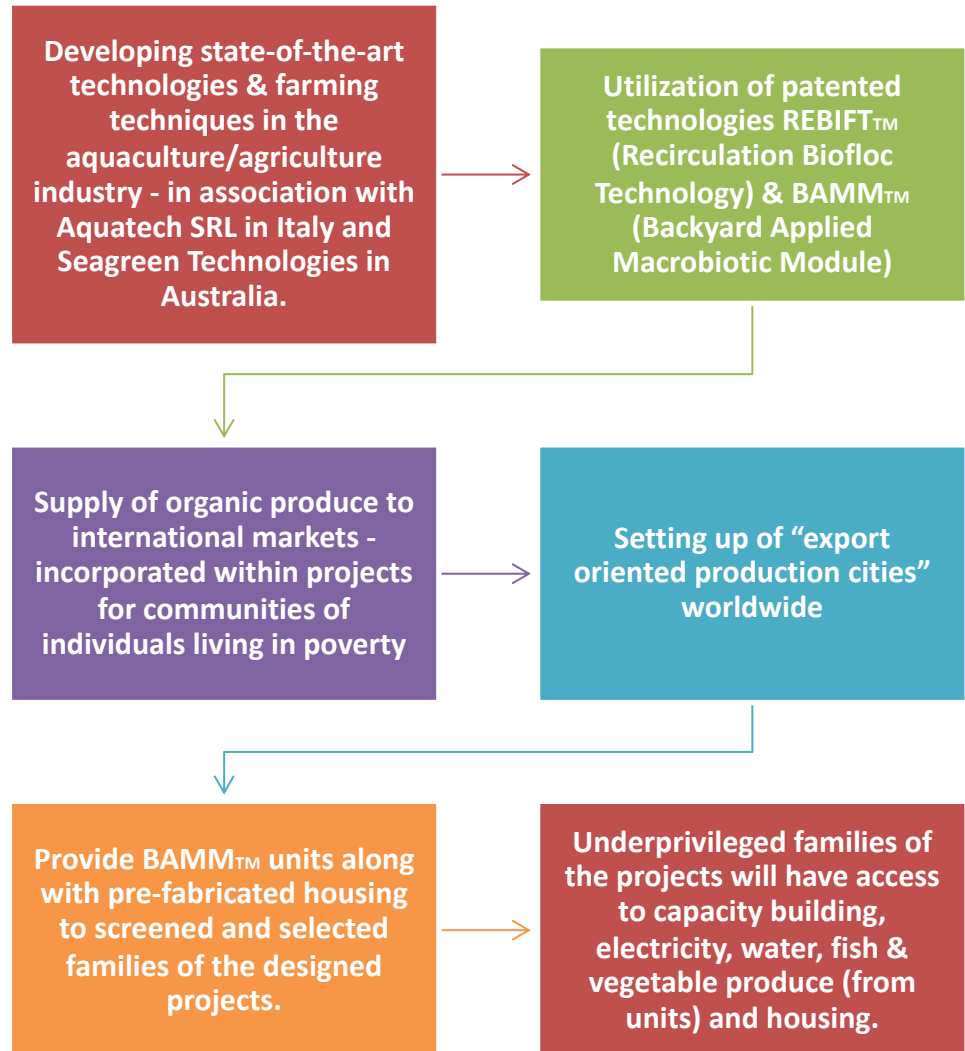
Direct Approximate Employment from 2500 families =  
*6000*

Additional Approximate Employment within Export City =  
*500*

Total Approximate Employment =  
*6500*

*FREE TRAINING PROVIDED.*

# *What we do...*



# Community Development Project



The *ABCDE City Project* meets



of the Sustainable Development Goals



# Community Development Project

## *Amenities within the gated community development project site:*

A vocational training  
and educational  
center

A recreational club  
with an auditorium

A daycare center and  
a primary school

Medium sized  
supermarket

A Bank Branch

A center for religious  
activities

Primary health care  
unit with medical  
supplies

Security and project  
office

A hatchery

A fish feed mill

A seedlings nursery

Vegetable and fish  
processing plant  
along with a cold  
room

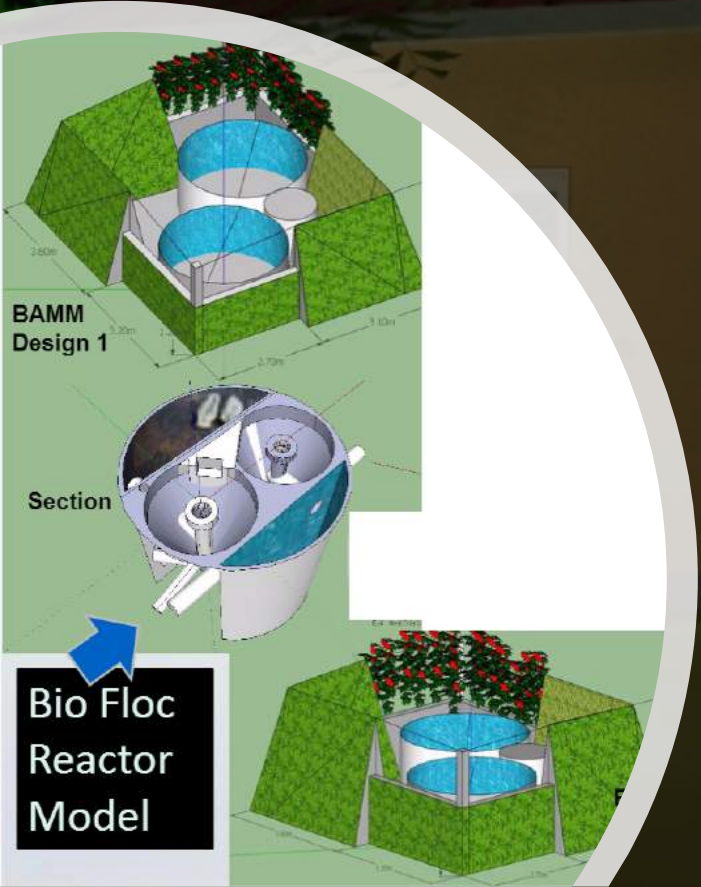
Logistics office to  
provide  
transportation within  
the project site

Roads and public  
safety features



The background features a series of thin, concentric circles in light gray and white, some solid and some dashed, creating a ripple effect. A large, solid orange circle is positioned in the center-right of the frame. A thick, dark gray curved line sweeps from the left side, partially overlapping the orange circle.

**What is the Project  
City Comprised Of?**



# 2500 BAMM™ Units & Houses

BAMM  
Design 1

Section

Bio Floc  
Reactor  
Model



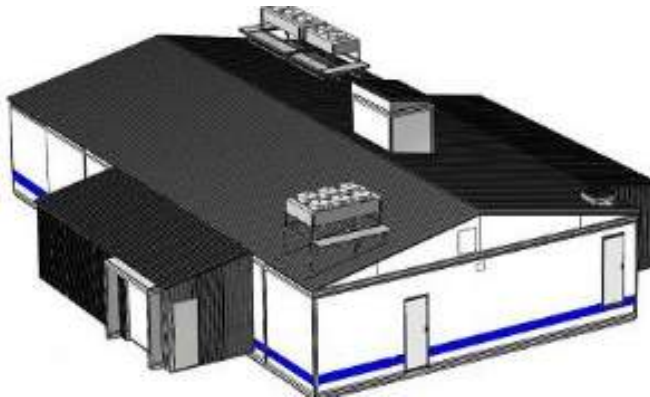
Pre-Fabricated Housing



## **Community Recreation/Education/Training Centre**

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**Processing Plant,  
Hatchery, Feed Mill,  
Seedlings Nursery**

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## Day Care Centre



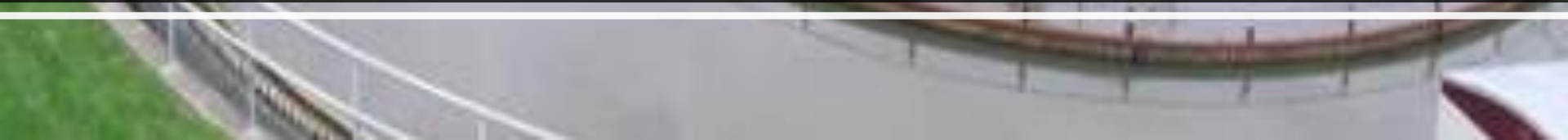


**Garbage Recycle Plant**





**Sewerage**

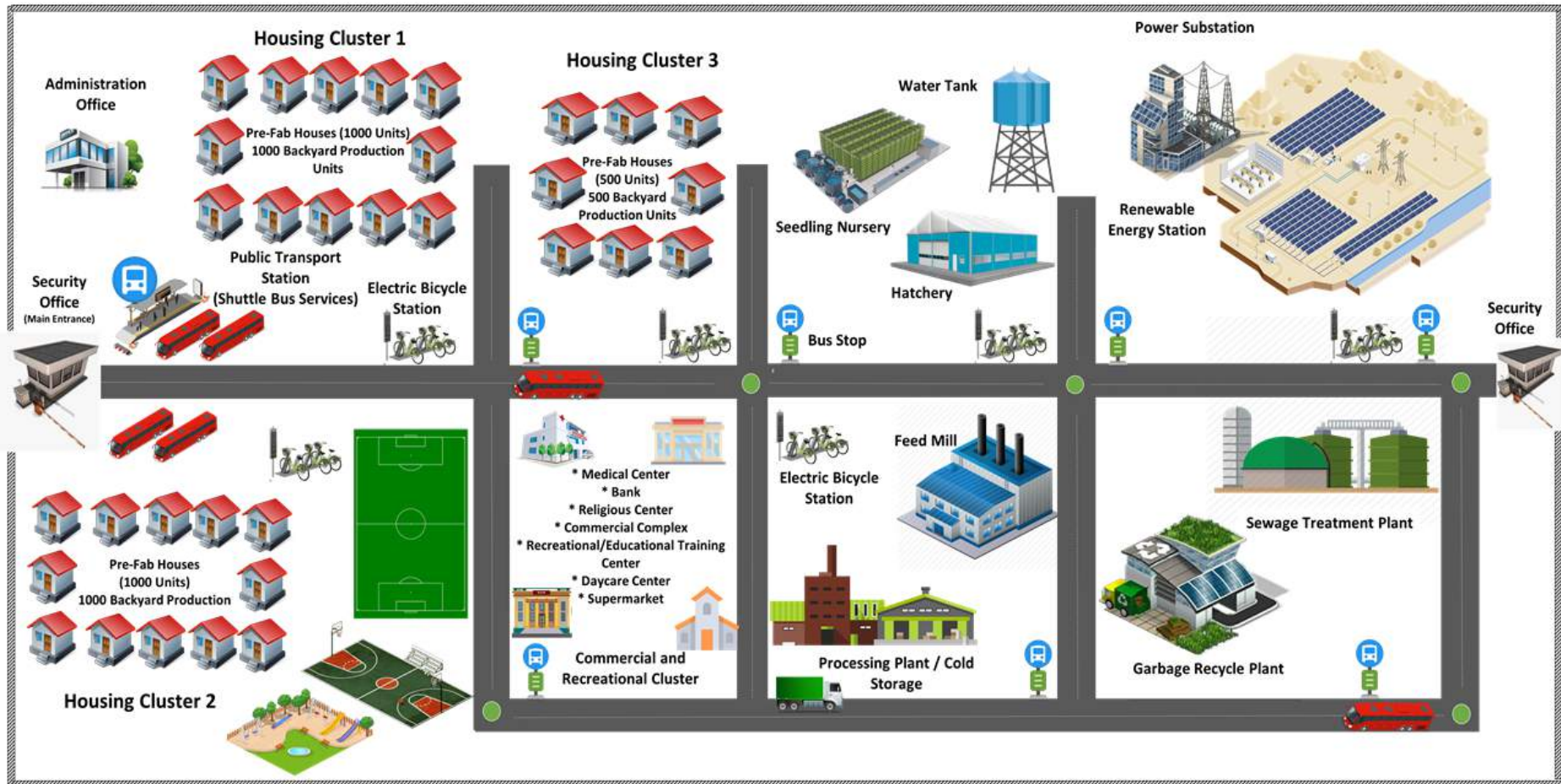




# Security Offices



# Sample of Export City Layout



# List/Key of Features in Project City – Within 607,000 M2

*\*Total Area of 300,000 M2 @  
120 M2 Required for Each  
House + BAMM Unit*

*\*\*Rest of the Land Space I.E.  
307,000 M2 is Allocated for  
All Other Buildings/Amenities*

- Admin Office
- Security Office (2)
- BAMM Houses & Units (2500)
- Community  
Recreation/Education/Training  
Center
- Park/Playground
- Bank
- Medical Centre
- Centre for Religious Activities
- Commercial Complex
- Supermarket
- Daycare Centre
- Solar Power Plant
- Water Tower
- Processing Plant
- Hatchery
- Fish Feed Mill
- Seedlings Nursery
- Sewerage
- Garbage Recycle Plant



A close-up photograph of a tomato plant with green leaves and several ripe red tomatoes. The image is slightly blurred, creating a soft background for the text.

***FOOD FIRST WITH  
“BAMM<sub>TM</sub>”  
BACKYARD APPLIED MACROBIOTIC MODULE<sub>TM</sub>***

**SELF-SUFFICIENCY  
&  
SELF-EMPLOYMENT**

**THROUGH  
AQUACULTURE & AGRICULTURE**

# THIS IS TRULY A BACKYARD SYSTEM



WHAT DOES IT DO FOR A FAMILY?

*IT PROVIDES:*



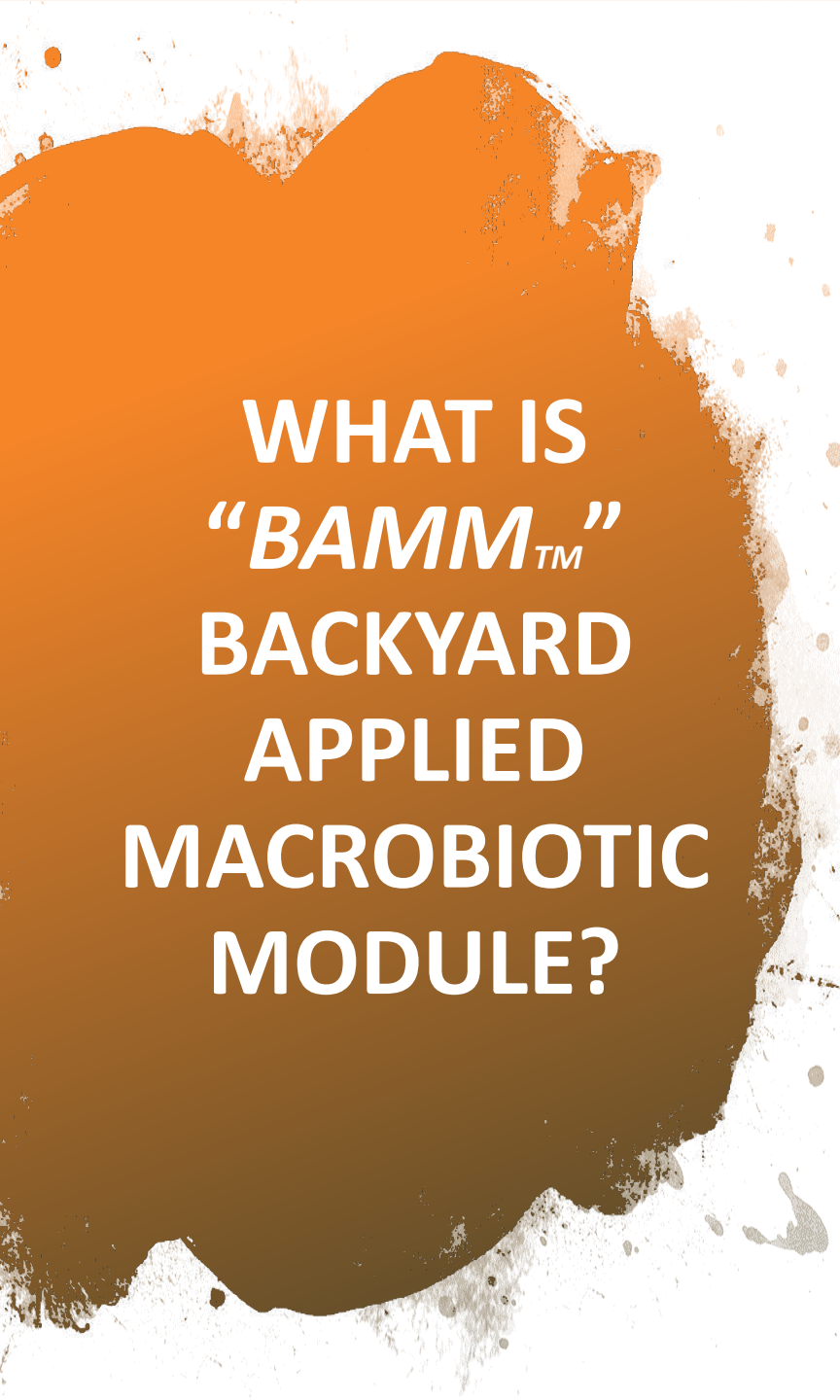


***ELECTRICITY:*** 500 Watt standalone solar unit.

***WATER:*** 20,000 liters initially, & 5000 liters per day.

***FISH:*** 100 Kilos per month.

***VEGETABLES:*** 800 Kilos per month.

An orange paint splatter graphic on the left side of the slide, with the text 'WHAT IS "BAMM™" BACKYARD APPLIED MACROBIOTIC MODULE?' written in white capital letters inside it.

# WHAT IS "BAMM<sup>TM</sup>" BACKYARD APPLIED MACROBIOTIC MODULE?

## A SYSTEM THAT:

- HAS 02 TANKS + 01 BIO-FLOC REACTOR
- CAN HOLD 1200 FISH FINGERLINGS  
(TILAPIA – CATFISH or BARRAMUNDI )
- INCORPORATES VEGETABLE GROW BEDS.
- REQUIRES NO SOIL AND NO FERTILIZER.



# HOW DOES “*BAMM*™” WORK?

- THE SYSTEM IS POWERED BY A SOLAR UNIT.
- SOLAR SYSTEM POWERS A BORE HOLE WATER PUMP TO SUPPLY WATER AND ELECTRICITY REQUIRED FOR THE SYSTEM TO RUN.
- EXCESS ELECTRICITY AND WATER ARE BEING USED FOR HOUSEHOLD DAILY NEEDS.
- WHEN THE FISH ARE BEING FED, THE FISH WASTE IS DRAINED THROUGH THE BIO-FLOC REACTOR TO VEGETABLE BEDS FEEDING THE PLANTS WITH NUTRITION FROM FISH TANKS AND THEN FILTERED WATER IS CIRCULATED BACK TO THE FISH TANK WHERE FISH WILL BREED COMFORTABLY.



# Major benefits of BAMM™ food production:

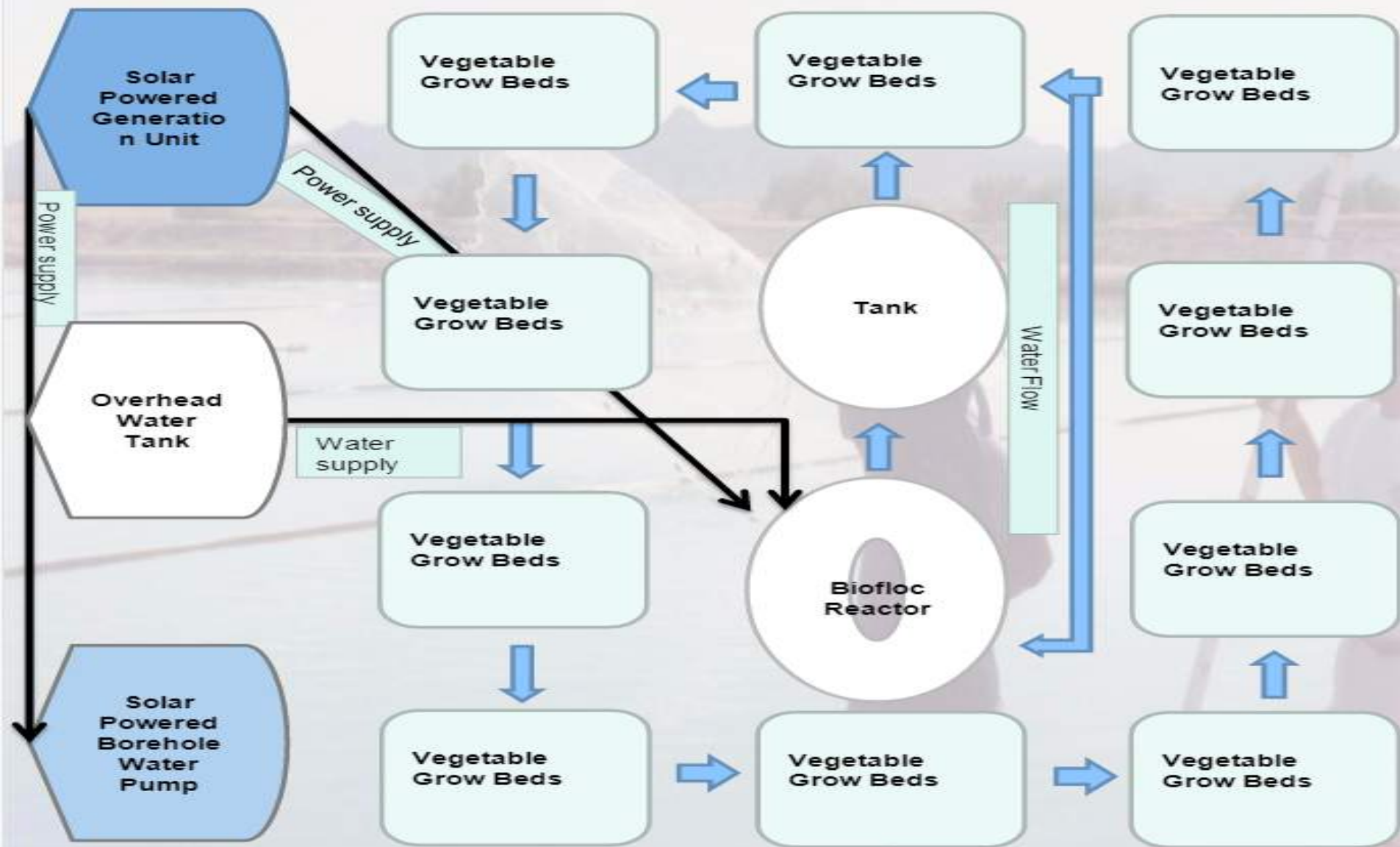
- Sustainable and intensive food production system.
- Two agricultural products (fish and vegetables) are produced from one nitrogen source (fish food) in a symbiotic system.
- Extremely water-efficient.
- Does not require soil.
- Does not use fertilizers or chemical pesticides.
- Higher yields and qualitative production.
- Organic production system.
- Higher level of biosecurity and lower risks from outer contaminants.
- Higher control on production leading to lower losses.
- Can be used on non-arable land such as deserts, degraded soil or salty, sandy islands.
- Creates little waste.
- Daily tasks, harvesting and planting are labour-saving and therefore can include all genders and ages. System somewhat automated. Remote-controlled feeding system + automatic water quality monitoring system
- Economical production of cash crops in many locations.

# IS THIS A SUSTAINABLE SYSTEM?

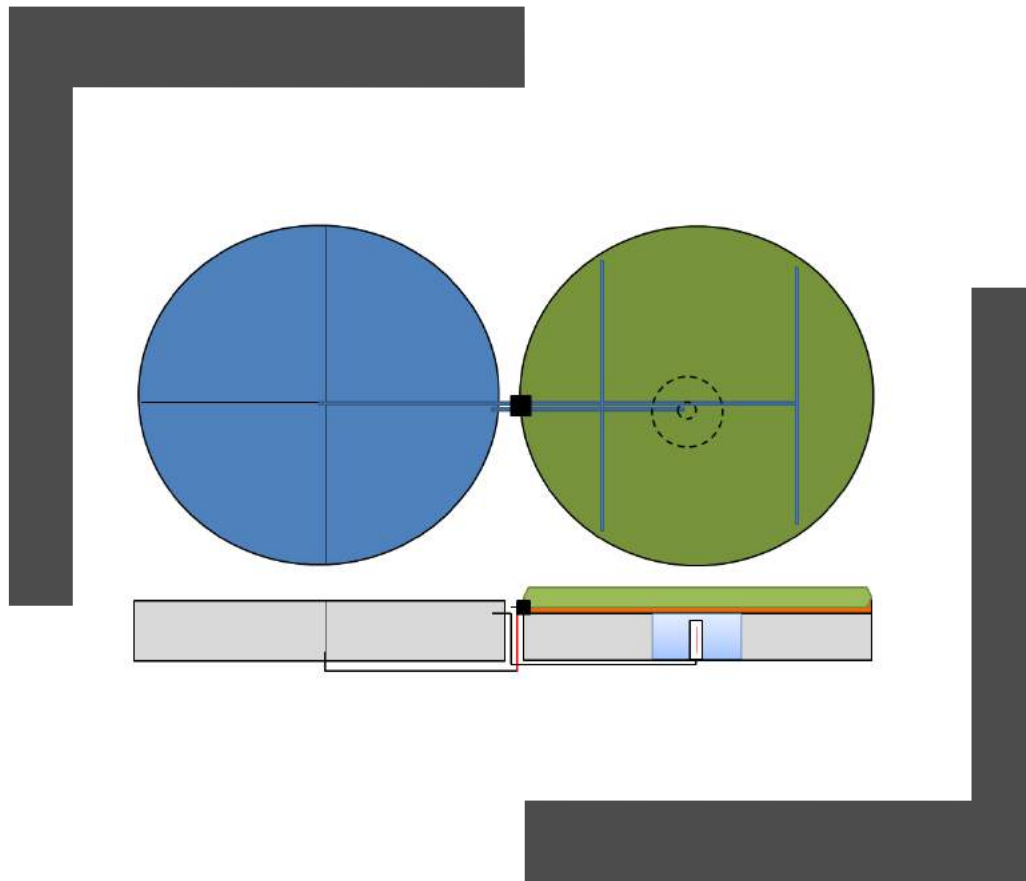
- ANYTHING THAT ADDS TO AND IS IN COORDINATION WITH NATURE IS SUSTAINABLE - THIS SYSTEM EMPLOYS AND INCORPORATES WHAT NATURE PROVIDES WITHIN A SYMBIOTIC ECO-SYSTEM.
- NO CHEMICAL IS USED FOR VEGETABLE PLANTATIONS HENCE THE ENTIRE PRODUCTION IS CERTIFIED “ORGANIC”.
- THERE IS NO CARBON EMISSION OF THE PRODUCTION THEREFORE IT IS ENVIRONMENTALLY FRIENDLY.



# Project Design



# WHAT FOOTPRINT IS REQUIRED FOR BACKYARD APPLIED MACROBIOTIC MODULE™?



A 6 M X 6 M (36 m<sup>2</sup>)  
OPEN OR CLOSED  
AREA IS REQUIRED.



# BAMM System & Technology Overview

**BAMM  
Design 1**

**Section**

**Bio Floc  
Reactor  
Model**

**VEGETABLE GROW BEDS**

**BAMM  
design  
2**

# HOW DOES THE SYSTEM PRODUCE 100 KILOS OF FISH/MONTH?



STOCKING DENSITY: 60/m<sup>3</sup>



$60/5\text{m}^3 = 300$  fingerlings -25% mortality  
rate =  $225 \text{ fingerlings} \times 450 \text{ grams} = 101$



VOLUME OF WATER IN ONE TANK:  
12,000 liters



FEEDING RATE: 0.75% of body weight  
maximum.



MORTALITY: 25%

Assumptions:	Description & Comments:	2500
3,000	50gm Fingerlings Per Yr (Ex Hatchery @ 375# x 8/ yr)	7,500,000
\$ 0.14	~Approx USD/ 50 gm Fingerling	\$ 0.14
\$ 420.00	\$USD Cost Fingerlings/ Yr	\$ 1,050,000.00
	Tank Stocking Demand (42 day intervals)	937,500
	Quarterly Annual Demand	1,875,000
	Weekly Demand	144,231
89%	Survival Rate per Yr	89%
1200	Kg Fish Biomass Harvest per Yr	3000000
0.45	Kg Avg Biomass / Fish	0.45
2667	Avg # Fish Harvested per Yr	6,666,667
1.33	Feed Conversion Ratio (FCR - Estimated)	1.33
1596	Kg Feed utilised per Yr	3990000
\$ 0.50	Cost Estimate \$USD/ Kg Feed	\$ 1,995,000.00
33%	Kg - Fillet Yield (Tilapia)	990000
\$ 1.40	Avg Whole Revenue \$/Kg Market Price \$USD	\$ 4,200,000.00
\$ 4.24	Avg Fillet Revenue \$/Kg Market Price \$USD	\$ 4,200,000.00
\$ 27.30	USD \$/Kg @ UK RRP Fillet (Waitrose @ \$4.49GBP/ 200gm)	\$ 27,027,000.00
6	m2 Footprint per system - Fish Production	15000
\$ 280.00	\$USD Revenue/ m2 Footprint - Fish Production	\$ 280.00
36	m2 Footprint per system - Total Production System	90000
200	Kg- Fish Yield/m2 Footprint per Year	200
2,000,000	Kg- Fish Yield/Hectare Equivalent Hectare Footprint per Year	





## HOW DOES THE SYSTEM PRODUCE 800 KILOS OF VEGETABLES/MONTH?

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**LAND = 6M X 6M FOOTPRINT  
CONSISTING OF 10 A FRAME  
VEGETABLE BEDS PLUS VEGETABLES  
BEDS EMBEDDED ON ALL 4 WALLS:  
 $36 \times 4 = 144$  plus 10 A-frames  $(4 \times 3) =$   
 $120 = \text{total } 264 \text{ m}^2$**



# Traditional Farming vs BAMM

## Traditional farming

## BAMM

### Eggplants

- 36m<sup>2</sup> Yield = 144 Plants ≥ 720kg
- 36m<sup>2</sup> Yield = 1,000 Plants ≥ 5,000kg\*

### Iceberg Lettuce

- 36m<sup>2</sup> Yield = 1,400 Heads ≥ 140kg
- 36m<sup>2</sup> Yield = 10,000 Heads ≥ 1,000kg

### Tomatoes

- 36m<sup>2</sup> Yield = 40 Plants ≥ 150kg
- 36m<sup>2</sup> Yield = 315 Plants ≥ 1,100kg

### Bell Peppers

- 36m<sup>2</sup> Yield = 230 Transplants ≥ 115kg
- 36m<sup>2</sup> Yield = 1700 Transplants ≥ 800kg

\*Refer to slide 51

Assumptions:	Description & Comments:	2500
2400	<i>~ Avg Plants # per System - Mixed Crop</i>	6,000,000
187	<i>Estimate KG Yield - Greens / Month</i>	467500
2244	<i>Estimate KG Yield - Greens per Yr</i>	5610000
520	<i>Estimate KG Yield - Micro/ Herbs/ Month</i>	1300000
6240	<i>Estimate KG Yield - Micro/ Herbs/ Yr</i>	15600000
156	<i>Estimate KG Yield - Fruiting Crops/ Month</i>	390000
1872	<i>Estimate KG Yield - Fruiting Crops/ Yr</i>	4680000
863	<i>Estimate KG Yield - Month</i>	2,157,500
10356	<i>Estimate KG Yield - Yr</i>	25,890,000
\$ 2.00	<i>Avg Revenue \$ / Kg Plant production \$USD</i>	\$ 51,780,000.00
	<i>Total Revenue: \$/kg USD per Yr</i>	\$ 55,980,000.00
	<i>USD Total Revenue/ m2 Footprint:</i>	\$ 622.00
30	<i>m2 Footprint per system - Plant Production</i>	75000
\$ 690.40	<i>\$USD Revenue/ m2 Footprint - Plant Production</i>	\$ 690.40
36	<i>m2 Footprint per system - Total Production System</i>	90000
345	<i>Kg - Plant Crop Yield / m2 Footprint per Year</i>	345
3,452,000	<i>Kg - Plant Crop Yield / Equivalent Hectare Footprint per Year</i>	

# HOW MUCH REVENUE IS EXPECTED FROM THE MONTHLY OUTPUT?

- 100 KILOS OF FISH WILL HAVE A MARKET PRICE OF US\$ 450.00 per month.
- 800 KILOS OF ALL THE VEGETABLES IN ASSORTED FORM WILL HAVE AN AVERAGE MARKET VALUE OF US\$ 2400.00 per month.
- ***TOTAL MONTHLY REVENUE:***  
***US\$: 2850.00.***





SHOULD A FAMILY OF FIVE PERSONS CONSUME  
30 KILOS OF FISH AND 100 KILOS OF VEGETABLES  
PER MONTH –

70 KILOS OF FISH AND 700 KILOS OF VEGETABLES  
FOR SALE SHALL REMAIN

LEADING TO A COMBINED TAX-FREE REVENUE OF  
**US\$2415.00 PER MONTH.**

# CASH FLOW

2500 units program		Salaries	312.00
		Self- Consumption:	
		Cost of Fish	45.00
Assumptions:	US\$	Cost of Vegetables	180.00
			633.12
Price of Live Tilapia Fish per kilo ex-farm ( Aquatech buying price)	4.50	Administrative Expenses:	
Price of assorted vegetables ex-farm ( Aquatech buying price)	3.00		
Kilo of Fish Feed	0.21	Insurance 1.5% of stock value	42.75
One piece of fish fingerlings	0.10	Interest	147.50
Price of assorted vegetable seedlings	0.0625	Savings	71.25
Kilos of fish per BAMB P/Mo	100.00 kgs	Communication	0.32
Kilos of assorted vegetables per BAMB p/Mo	800.00 kgs	Maintenance	0.32
Self- consumption quantity fish p/mo kgs	10.00 kgs	Loan repayment	1852.50
Self- consumption quantity Vegetables p/mo kgs	60.00 kgs		2114.65
FCR	.80>1.00		
Quantity feed required for 100 kgs	80.00 kgs		
Stoking density per tank of 3000 liters p/mo	300.00 pcs	Grand total of expenses	2747.75
Insurance cost on Value	1.50%		
Savings ( Mandatory)	2.50%		
Loan repayment ( Deducted when buying the produce by Aquatech)	65.00%	Balance per month cash on hand to continue purchase of feed etc	102.25
Interest per annum	6.00%		
BAMB Unit + prefab house value IN US\$	US\$ 38,800.00	# of months to recoup the investment	24
Total Project cost for 2500 prefab houses + BAMB units	US\$97,000,000.00		
		At the end of each calendar month benefits for the BAMB operator:	
Revenue	US\$	Value of food	
		Fish	45.00
Live Fish	US\$ 450.00	Vegetables	180.00
Fresh Vegetables	US\$ 2400.00	Salary	312.50
	US\$ 2850.00	Mandatory saving	71.25
Operational Expenses:		Cash on Hand for continuation of purchases etc	102.25
		Total gross revenue	711.00
Fish feed	17.50		
Vegetable seedlings	50.00		
Fish fingerlings	28.00		

# WHEN COULD THE FIRST HARVEST OF FISH AND VEGETABLE BE EXPECTED?

FIRST HARVEST DEPENDS ON THE SPECIES OF FISH AND VEGETABLES, HOWEVER, AT THE MOST IN 04 MONTHS TIME THE MONTHLY HARVESTS OF FISH AND VEGETABLES SHOULD BE POSSIBLE CONTINUING FOR EVERY MONTH OF THE YEAR THEREAFTER.





# WHAT SPECIES OF FISH?

- TILAPIA
- BARRAMUNDI
- CAT FISH
- OTHER  
FRESHWATER  
SPECIES OF FISH

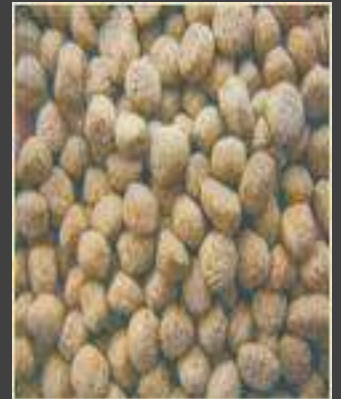


# HOW DO WE FEED THE FISH?

FISH CAN BE FED WITH USUAL FISH FEED  
AVAILABLE IN THE MARKET (25% - 50%  
REDUCED FCR)

## HOW DO WE FERTILIZE THE VEGETABLE?

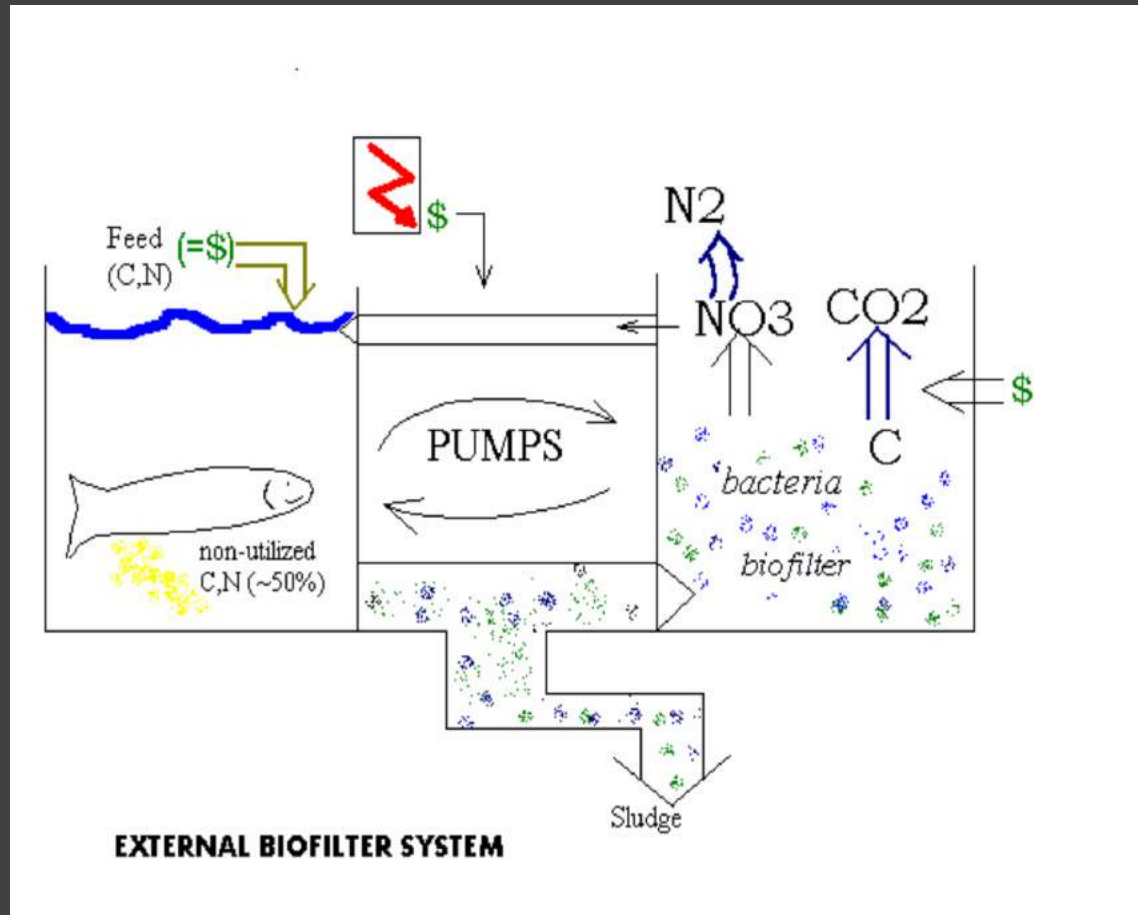
VEGETABLE BEDS REQUIRE NO FERTILIZER AS  
THE WATER FROM FISH TANKS THROUGH **BIO-  
FLOC REACTOR** CARRIES CONTROLLED &  
SUFFICIENT NUTRIENTS.





# WHAT IS BFT?

- LIMITS WATER EXCHANGE
- ORGANIC RESIDUES ACCUMULATE
- MIXES AND AERATES
- IDEAL CONDITIONS FOR BACTERIA
- BACTERIA CONTROLS WATER QUALITY
- FISH EAT BACTERIA
- FEED IS RECYCLED



# BFT Composition

**Table 5** Biochemical composition (dry weight basis) of biofloc in different treatments and control (means  $\pm$  SE,  $n = 9$ )

Parameter (mg kg <sup>-1</sup> )	Treatment			
	Control	BFT <sub>s</sub>	BFT <sub>T</sub>	BFT <sub>w</sub>
Iron	4918.33 $\pm$ 69.17 <sup>b</sup>	4417.33 $\pm$ 45.04 <sup>c</sup>	11200 $\pm$ 179.50 <sup>a</sup>	4479 $\pm$ 204.86 <sup>bc</sup>
Zinc	161.5 $\pm$ 0.43 <sup>b</sup>	146.2 $\pm$ 0.40 <sup>c</sup>	200.77 $\pm$ 0.26 <sup>a</sup>	200.63 $\pm$ 0.58 <sup>a</sup>
Magnesium	3537 $\pm$ 7.77 <sup>d</sup>	7315 $\pm$ 61.582 <sup>b</sup>	6302.33 $\pm$ 10.14 <sup>c</sup>	12300 $\pm$ 124.23 <sup>a</sup>
Potassium	5773.87 $\pm$ 60.84 <sup>c</sup>	6162.7 $\pm$ 75.51 <sup>b</sup>	6057.21 $\pm$ 66.93 <sup>b</sup>	7982.96 $\pm$ 58.83 <sup>a</sup>
Phosphorous*	14 $\pm$ 2.00 <sup>b</sup>	23.8 $\pm$ 1.20 <sup>ab</sup>	27 $\pm$ 3.0 <sup>a</sup>	31.5 $\pm$ 3.50 <sup>a</sup>
Calcium*	18.9 $\pm$ 1.04 <sup>c</sup>	23.9 $\pm$ 3.78 <sup>b</sup>	37.1 $\pm$ 3.66 <sup>a</sup>	22.7 $\pm$ 2.070 <sup>b</sup>
Sodium*	15.45 $\pm$ 2.73 <sup>b</sup>	16.52 $\pm$ 1.91 <sup>a</sup>	15.71 $\pm$ 1.81 <sup>b</sup>	16.81 $\pm$ 1.82 <sup>a</sup>

# Plants grown in BAMM™ vs. in Soil

Summary table comparing soil-based and soil-less plant production

Category		Soil-based	Soil-less
Production	Yield	Variable, depending on soil characteristics and management.	Very high with dense crop production.
	Production quality	Dependent on soil characteristics and management. Products can be of lower quality due to inadequate fertilization/treatments.	Full control over delivery of appropriate nutrients at different plant growth stages. Removal of environmental, biotic and abiotic factors that impair plant growth in soil (soil structure, soil chemistry, pathogens, pests).
	Sanitation	Risk of contamination due to use of low quality water and/or use of contaminated organic matter as fertilizer.	Minimal risk of contamination for human health.
Nutrition	Nutrient delivery	High variability depending on the soil characteristics and structure. Difficult to control the levels of nutrients at the root zone.	Real time control of nutrients and pH to plants at the root zone. Homogeneous and accurate supply of nutrients according to plants' growth stages. Needs monitoring and expertise.
	Nutrient use efficiency	Fertilizers widely distributed with minimum control of nutrients according to growth stage. Potentially high nutrient loss due to leaching and runoff.	Minimal amount used. Uniform distribution and real time adjustable flow of nutrients. No leaching.
Water use	System efficiency	Very sensitive to soil characteristics, possible water stress in plants, high dispersal of nutrients.	Maximized, all water loss can be avoided. Supply of water can be fully controlled by sensors. No labour costs for watering, but higher investment.
	Salinity	Susceptible to salt build up, depending on soil and water characteristics. Flushing salt out uses large amounts of water.	Depends on soil and water characteristics. Can use saline water, but needs salt flush-out that requires higher volumes of water.
Management	Labour and equipment	Standard, but machines are needed for soil treatment (ploughing) and harvesting which rely on fossil fuels. More manpower needed for operations.	Expertise and daily monitoring using relatively costly equipment are both essential. High initial set-up costs. Simpler handling operations for harvest.



# Plants grown in BAMM™ vs. in Soil



Soil Garden



BAMM





# Our BMM™ A Frames





# Our BAMM™ A Frames & Walls

Swiss chard (*Beta* sp.) suspended on a polystyrene raft in a deep water culture canal



A nutrient film technique unit using vertical space





# Our BAMM™ A Frames & Walls





# Our BAMM™ A Frames & Walls







**HOW DOES THE SYSTEM  
PRODUCE 800 KILOS OF  
VEGETABLES/MONTH?**

---

**LAND = 6M X 6M FOOTPRINT  
CONSISTING OF 10 A FRAME  
VEGETABLE BEDS PLUS  
VEGETABLES BEDS  
EMBEDDED ON ALL 4 WALLS.**



# WHAT KIND OF VEGETABLES?

- SPINACH
- OKRA
- CHILIES
- TOMATOES
- GREEN AMARANTH
- BELL PEPPERS
- BROCCOLI
- EGGPLANT
- CHINESE PAKCHOI.
- & various additional Herbs & vegetables.....



# BAMM<sup>TM</sup> Vegetable Varieties

**EGGPLANT** pH: 5.5–7.0 Plant spacing: 40–60 cm (3–5 plants/m<sup>2</sup>)  
Germination time and temperature: 8–10 days; 25–30 °C Growth time: 90–120 days. Light exposure: full sun



Growing eggplant in **BAMM<sup>TM</sup>** units: Eggplant is a summer fruiting vegetable that grows well in media beds owing to the deep growth of the root systems. **Plants can produce 10–15 fruits for a total yield of 3–7 kg.**

# BAMM<sup>TM</sup> Vegetable Varieties

**BASIL** pH: 5.5–6.5 Plant spacing: 15–25 cm (8–40 plants/m<sup>2</sup>) Germination time and temperature: 6–7 days with temperatures at 20–25 °C Growth time: 5–6 weeks. Light exposure: Sunny or slightly sheltered





# BAMM<sup>TM</sup> Vegetable Varieties

**CUCUMBERS** pH: 5.5–6.5 Plant spacing: 30–60 cm (depending on variety; 2–5 plants/m<sup>2</sup>)  
Germination time and temperature: 3–7 days;  
20–30 °C Growth time: 55–65 days. Light  
exposure: full sun



# BAMM<sup>TM</sup> Vegetable Varieties

**TOMATO** pH: 5.5–6.5 Plant spacing: 40–60 cm (3–5 plants/m<sup>2</sup>) Germination time and temperature: 4–6 days; 20–30 °C Growth time: 50–70 days till first harvest; fruiting 90–120 days up to 8–10 months (indeterminate varieties).  
Light exposure: full sun



# BAMM<sup>TM</sup> Vegetable Varieties

**PARSELY** pH: 6–7 Plant spacing: 15–30 cm (10–15 plants/m<sup>2</sup>) Germination time and temperature: 8–10 days; 20–25 °C. Growth time: 20–30 days after transplant. Light exposure: full sun



# BAMM™ Vegetable Varieties

**SWISS CHARD** pH: 6–7.5 Plant spacing: 30–30 cm (15–20 plants/m<sup>2</sup>) Germination time and temperature: 4–5 days; 25–30 °C optimal  
Growth time: 25–35 days Light exposure: full sun





# BAMM<sup>TM</sup> Vegetable Varieties

**BROCCOLI** pH: 6–7 Plant spacing: 40–70 cm (3–5 plants/m<sup>2</sup>) Germination time and temperature: 4–6 days; 25 °C Growth time: 60–100 days from transplant. Light exposure: full sun; can tolerate partial shade but will mature slowly.



# BAMM<sup>TM</sup> Vegetable Varieties

**BEANS & PEAS** pH: 5.5–7.0 Plant spacing: 10–30 cm dependent on variety (bush varieties 20–40 plants/m<sup>2</sup>, climbing varieties 10–12 plants/m<sup>2</sup>) Germination time and temperature: 8–10 days; 21–26 °C Growth time: 50–110 days to reach maturity depending on variety. Light exposure: full sun



# High Value BAMM™ Crops

Vegetable	USD Value/SF
Cilantro	\$ 21.20
Arugula-Roquette	\$ 20.92
Green Salad Mix	\$ 17.55
Chives	\$ 16.40
Dill	\$ 16.40
Lettuce	\$ 16.20
Tomato, Cherry, small & medium	\$ 15.57



# DOES A PERSON REQUIRE A PARTICULAR TRAINING?

- YES, A BASIC TRAINING AND A KNOWLEDGE OF AQUACULTURE AND AGRICULTURE, INCLUDING A STRONG APTITUDE TO THE JOB IS NECESSARY.
- WE PROVIDE ON THE JOB TRAINING AS PART OF THE ASSEMBLY OF THE UNIT.





# TRAINING OF FARMERS

TRAINING AND CAPACITY BUILDING BY OUR  
TRAINING TEAM IN-

- EDUCATION OPERATING BAMB SYSTEM
- UNDERSTANDING OF UTILIZING THE APP,  
BASIC BOOKKEEPING, KNOWLEDGE &  
COMPETENCE RUNNING A SUCCESSFUL,  
PROFITABLE INDEPENDENT ENTERPRISE.

# THE SMARTPHONE APP

- CONNECTS FARMERS, TECHNICAL TEAM & ADMINISTRATION
- INTEGRATED SYSTEM BRINGING EVERYONE ON ONE PLATFORM FOR:
- TECHNICAL DIFFICULTIES, MALFUNCTIONS, MONITORING FAMILIES/CROPS/FISH/SALES, ETC.
- FUNCTIONS AS A LOGBOOK FOR FARMER TO RECORD ALL ASPECTS OF OPERATION

# TECHNICAL SUPPORT

- 24 HOUR TECHNICAL SUPPORT SERVICE THROUGH APP
- ASSISTANCE AND SUPPORT BY ON SITE TEAM IF ISSUES UNSOLVED ONLINE.
- CCTV MONITORING OF EACH FISH & VEG PRODUCTION UNIT

# MARKETING

- BUY BACK AGREEMENT BUYS FARMERS EXCESS FISH & VEG PRODUCE AT GUARANTEED PRICE.
- FARMERS GIVEN SEEDS TO PRODUCE VEGETABLES IN ACCORDANCE WITH OUR MARKET RESEARCH & DEMAND.





***BAMM™***  
***BACKYARD APPLIED***  
***MACROBIOTIC MODULE™***

SELF-SUFFICIENCY  
&  
SELF-EMPLOYMENT

THROUGH  
AQUACULTURE & AGRICULTURE