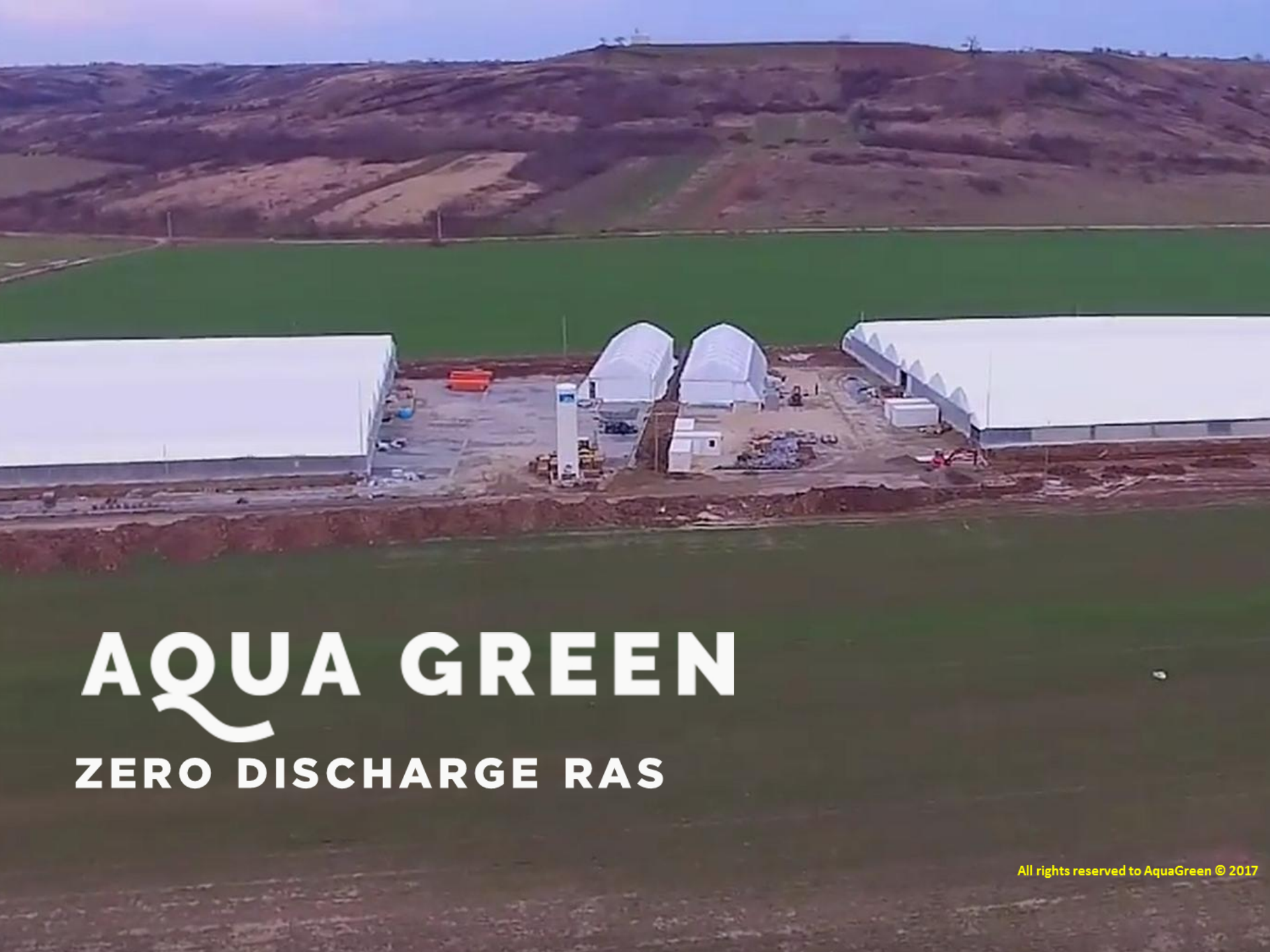
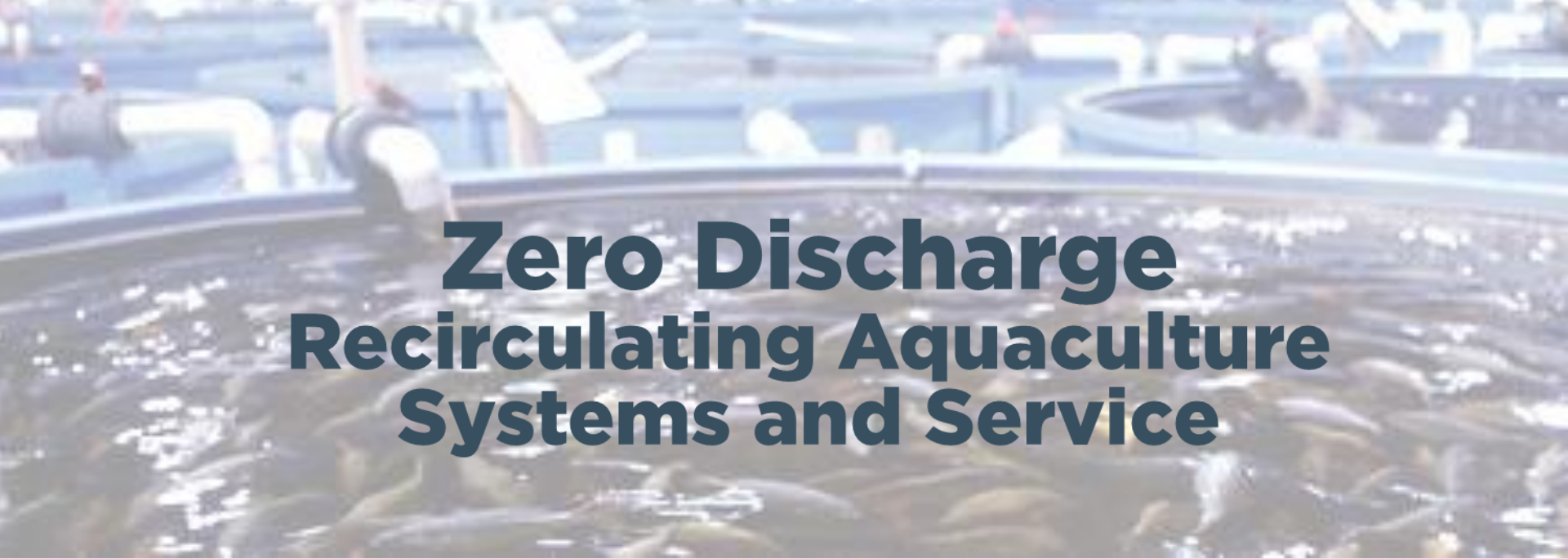




# AQUA GREEN

## ZERO DISCHARGE RAS



# **Zero Discharge Recirculating Aquaculture Systems and Service**

**Zero discharge recirculating aquaculture is a land-based fully enclosed green technology for raising fish, which replaces the traditional method of growing fish in open ponds, tanks or net cages.**

**Our systems use minimal water resources and are based on principles of low energy usage, with no wastes or effluent released into the surrounding environment.**

**This also eliminates the bio-hazard risks of non-native species escapes.**

**Aqua Green's system uses little energy, saves water, meets stringent environmental regulations, and cultivates fish in commercial volumes.**

We provide a unique technology solution that effectively opens up all in-land areas worldwide to an economically-viable, resource-efficient and sustainable form of marine aquaculture development.

We provide a unique technology solution that effectively opens up all in-land areas worldwide to an economically-viable, resource-efficient and sustainable form of marine aquaculture development.



Build  
The facility



Training  
and supervising



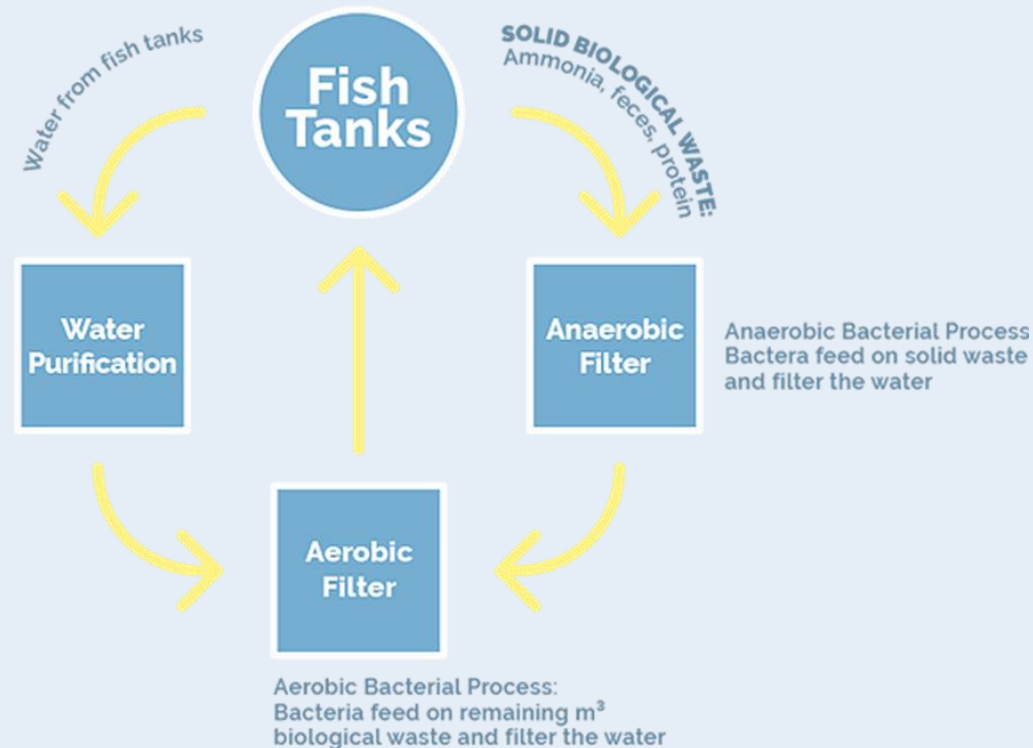
Support  
the operation



# Aqua Green is a world leader in zero-discharge aquaculture

We operate fully contained, zero-discharge aquaculture facilities. The use of microbial and plant filters allows water and nutrients to circulate through the system.

Water never leaves our system. Our facilities prevent the release of toxic pollutants into the surrounding environment and keep the consumption of water to a minimum.



AEROBIC NITRIFICATION  $\text{NH}_4^+ \rightarrow \text{NO}_2^- \rightarrow \text{NO}_3^-$

ANEROBIC DENTRIFICATION  $\text{NO}_3^- \rightarrow \text{NO}_2^- \rightarrow \text{NO} \rightarrow \text{N}_2\text{O} \rightarrow \text{N}_2$



**Fish are grown within a controlled environment, in any location, in any climate.**

Fish can be cultivated in the **desert** or in the **coldest climates** with the growing environment controlled by **Aqua Green's energy efficient heating and cooling solutions**





## **Environmentally sound and highly cost effective heating and cooling solutions**

**Fish can be safely stocked and raised at high densities in fully controllable indoor tanks. Any accreditation (ISO, HACCP, Organic) or statutory requirements (Quarantine, Bio-security) can be easily met when applying Aqua Greens zero-discharge design.**

**Fish species can be selected to suit site climate or market demand, independent of farm location. We offer flexibility in species choice, as the system can support a variety of either freshwater or saltwater species.**

### **SALT WATER SPECIES**



European Sea Bass



Yellowtail



Cobia



Grouper



Flatfish



Barramundi



Gilthead Seabream

### **FRESH WATER SPECIES**



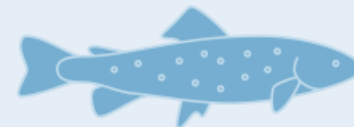
Carp



Red Tilapia



Catfish



Rainbow Trout



Guildenstaali Sturgeon

# **Aqua Green can also grow local fish**



**Fresh water Magul**



**Salt water Pomfret**



**Fresh Water Ompok**



**Fresh Water Knife Fish**

## Salt Water system

Unlike closed systems, suitability is related to location.

Suitable for saltwater fish species that can tolerate the incoming water temperature at the location (see next bulleted item)

Site must be located close to the sea OR close to a saltwater well/river/lake This means that sites must be located no further than a few hundred meters from the site- this is so that water can be easily pumped in.

Growing water is brought in from the sea and returned to the sea after it passes through algae filtration so returned water is clean with similar requirements for freshwater

This type of system can combine fish/shrimps/algae fish-vegetables-flowers

Added value sale of micro and macro-algae AND/ OR salicornia (used as cattle feed, human food) AND / OR mangrove (grows as bushes, trees so can be sold for firewood etc.) can all be grown from filtered water discharged from the system, same for vegetable by-product

## Fresh water system

Multi-module system allows growth of multiple species simultaneously. Each module produces 150 metric tons annual production

Capable of growing freshwater or saltwater finfish

Can be located anywhere - does not need to be next to large water bodies; located close to markets

Operators have full control over all culture parameters, including temperature, salinity, ph. water flow rates, production volumes and harvest scheduling

Intensive biosecurity measures (remote quarantining, continuous ozone and UV water treatment) secured and monitored facility, best practice operations protocols) ensure contaminant and disease-free operation.

Fish produced are "day fresh" for market

# Pools are tailor-made to any required size

Aqua Green takes care of the design and construction of freshwater or saltwater (marine) zero discharge recirculating fish farm systems and components including filtration, oxygenators and pools.

Polypropylene is our material of choice for cost effectiveness, durability, rapidity and ease of construction. Pools are built using corrosion-proof plastic products while filtration and oxygenation systems are designed for low energy operational usage.



|                                |                                         |                 |      |
|--------------------------------|-----------------------------------------|-----------------|------|
| Pipes, Valves, Accessories     | 10" 6" 4" 2" 1"                         | 600 m           | 100m |
| Cal Tubes                      | Oxygenation                             | 18              |      |
| Tunnels                        | Upper,Lower Water                       | 4+              | 2    |
| Purging Pre-Marketing Tank     | PP: Pre-marketing tank, clear water     | 4               |      |
| Settling Pond/                 | Denitrification                         | 2               |      |
| Oxygen Reduction               | Reduces oxygen to zero saturation       | 2               |      |
| Lower Water Outflow/           | 6"                                      | 18+             | 2    |
| Fish Release Pipe/             | 10" or live fish pump                   | 18              |      |
| Bridge/                        | Fish Viewing Walkway                    | 18+             | 1    |
| Feeders/                       |                                         | 18              |      |
| Fish Tank Dividers/            | Creates Raceway                         |                 |      |
| Framed Nets - Removable/       | For Collecting Fish/                    | 5+              | 3    |
| Emergency Oxygen/              | Back Up in case of electricity failure/ | 18+             | 1    |
| Upper Water Outflow/           |                                         | 18 +            | 1    |
| Greenhouse/Heating/Cooling     | 5000 sq m + 400 sq m                    | 2               |      |
| Pumps/                         | 400cu.m/hr + 60 cu.m/hr                 | 8+2             |      |
| Biofilter/                     | PVC ; Nitrification, ammonia nitrate/   | 1000m3          |      |
| BioFilter Water Distribution/  | Distributes water to Biofilter/         | 3               |      |
| Biofilter Support/             | Support for Biofilter media/            | 3               |      |
| Electrical Board/              | Various Sizes/                          | 10              |      |
| Foam Fractionator/             | Protein skimmer                         | 4+              | 1    |
| Circulation Pumps/             |                                         | 5               |      |
| Venturi /                      |                                         | 5               |      |
| Mixer/                         | Creates clouds of air bubbles/          | 5               |      |
| Common Pool/                   |                                         | 2               |      |
| Lighting/                      | Low lighting/                           | 2               |      |
| Control System/                | For Electricity, Water level, Oxygen/   | 2               |      |
| Ozone Generator/               | 400gr/h+40gr/h                          | 2               | 1    |
| Blowers/                       |                                         | 2               |      |
| Liquid Oxygen Tank/            | Liquid Rental Oxygen / Oxygen Generator | 1               |      |
| Concrete Works/                | Up to 500 cu.m./                        |                 |      |
| Small Forklift/                | Electric or Human-Powered/              | 1 vendor supply |      |
| Ice-Making Machine/            |                                         | 1               |      |
| Fish handling Equipment/       | Nets, Graders etc/                      |                 |      |
| Packing Cartons/               | Various Sizes/                          |                 |      |
| OxyGard/                       |                                         | 2               | 1    |
| Computers + Remote Cameras/    |                                         |                 |      |
| Laboratory/                    | Microscope, electrophotometer etc       |                 |      |
| Office/                        |                                         | vendor supply   |      |
| Electricity Generator/         | 180kva                                  | 1               |      |
| Fresh Drinking Water Supply/   |                                         |                 |      |
| Equipment Storage/             |                                         |                 |      |
| Vehicles/                      |                                         |                 |      |
| Access Roads/                  |                                         |                 |      |
| Road Lighting/                 |                                         |                 |      |
| Worker Accommodation/          |                                         |                 |      |
| Communications Infrastructure/ |                                         |                 |      |
| Security Alarm System/         |                                         |                 |      |
| Water Storage Containers/      | 100 cu.m.                               | 4               |      |
| Commercial Weighing Equipment/ |                                         |                 |      |
| Labor Unskilled/               |                                         |                 |      |
| Quarantine                     | not included the green house            |                 |      |
| Shipping/Freight/              |                                         |                 |      |
| Miscellaneous/                 | 10%                                     |                 |      |
|                                |                                         |                 |      |
| supervision                    | 2 for the building time                 | 2               |      |

## Aqua Green

### Modular & Scalable Design

**Any production capacity can be realized by multiplying the standard modules, avoiding scaling-up risks.**

**Our modular- designed system can support parallel growth of different species.**

**Annual production of 1000 ton freshwater fish require 4 modules  
1000 ton annual production requires a land area of 24000sqm**

# Modular & Scalable Design

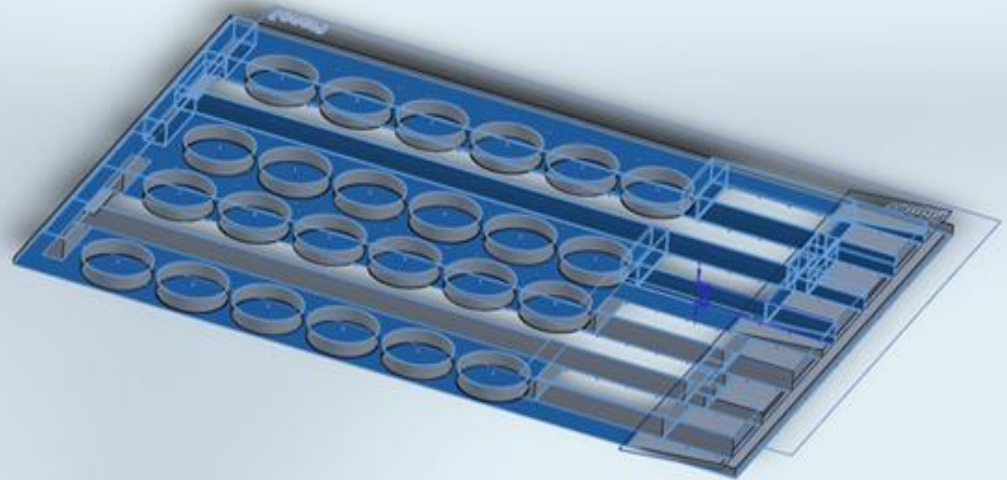
Fish produced in self-contained grow-out modules. Production easily scaled by adding new modules. Fresh or saltwater production.

Modular system with advanced water treatment and decontamination increases biosecurity, and reduces management and operational risk.

System uses automated grading and harvesting for maximum production efficiency and greatly reduced fish stress.

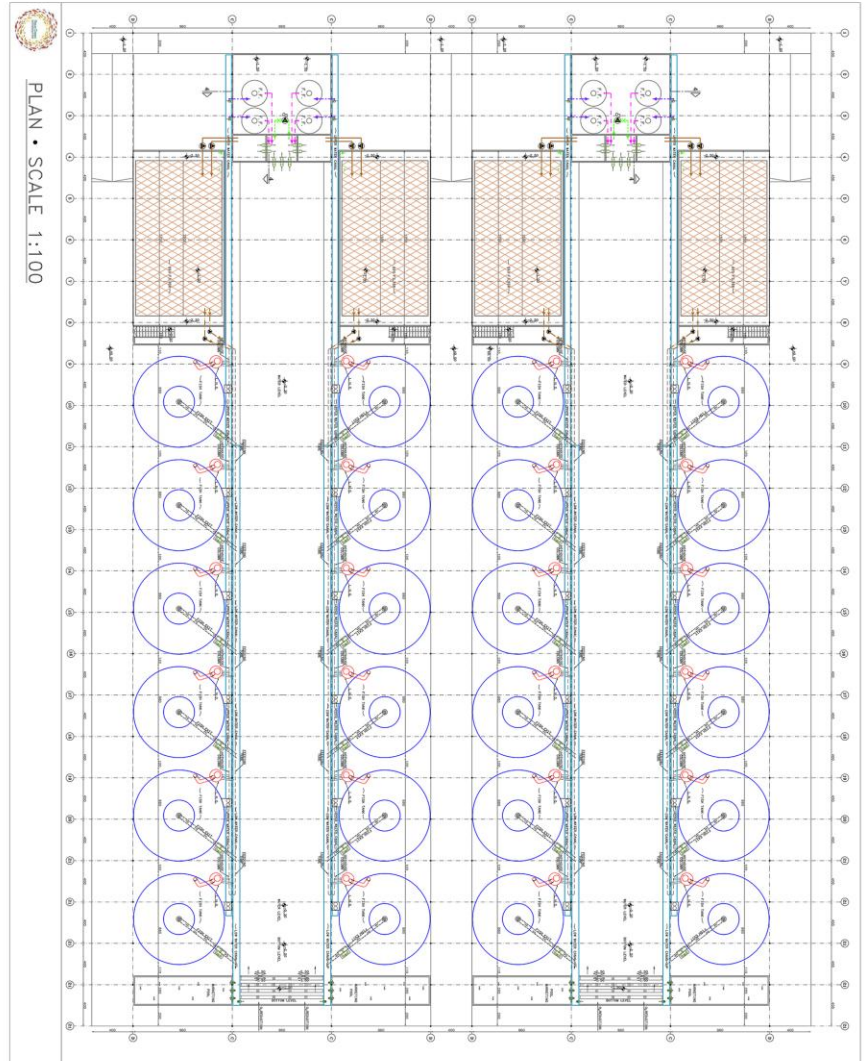
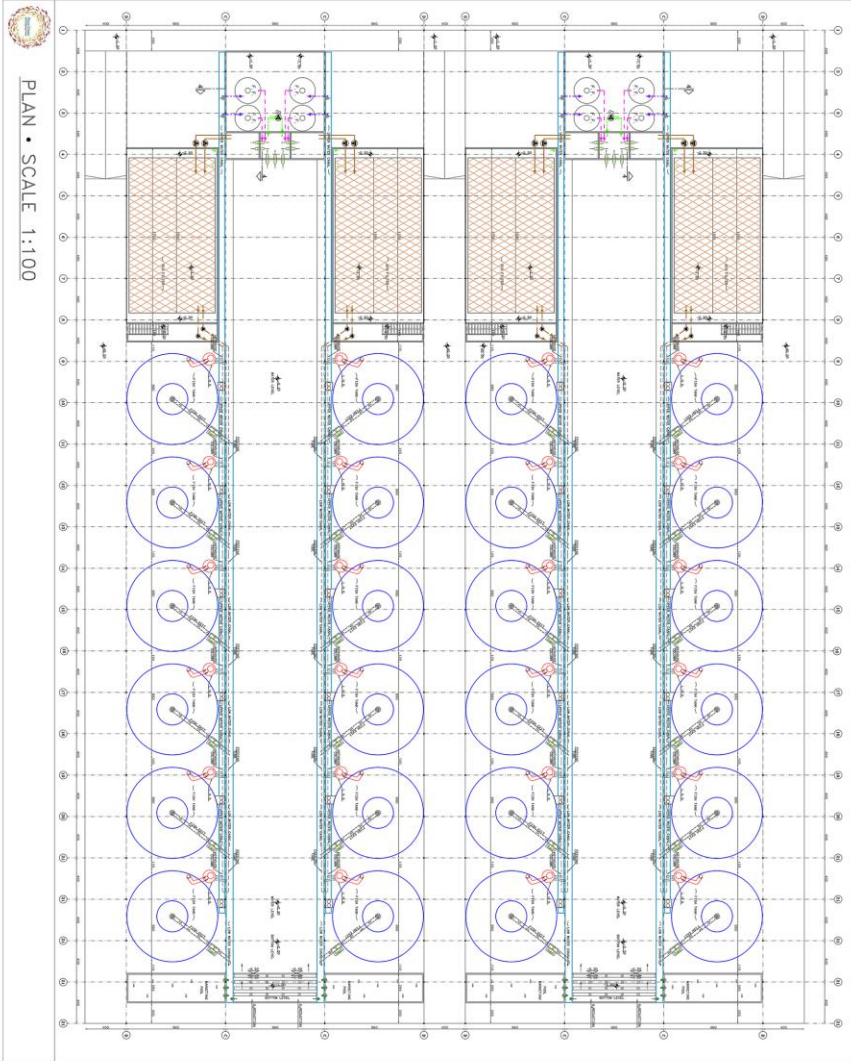
## Biosecure Culture Environment

- Grow Out Tanks
- Denitrification Bioreactor
- Aerobic Filter Complex
- Advanced Ozone decontamination



TOP VIEW FLOOR PLAN  
- 1000 TON-

# AQUA GREEN



# Hatchery > Quarantine | Nursery

Optional production of salt water and fresh water fingerlings – local and / or foreign species.

Ongoing production management, technical support and veterinary services.

Livestock will be put in isolation for a period of observation to ensure they are disease free, acclimatize to the new environment and also to ensure an optimum breeding strategy in order to create an extremely high quality, premium fish product.



# Professional Training and Support

For management of the zero discharge system, technical and biological guidance by our dedicated, experienced setup staff.

**These services are available for any period required.**



**Build  
The facility**



**Training  
and supervising**



**Support  
the operation**



# **Cost-effective greenhouse construction services**

**Supplied by a well-established greenhouse construction-dedicated company with an international portfolio of completed agricultural and aquaculture projects.**



## **Species can be grown close to markets**

**Year round, constant and predictable outputs with the advantage of frequent, up to weekly, fish harvest and supply to market.**

### **Return of Investment**

**Ingenious, innovative design that results in a very cost effective culture system, with return of capital investment after 2 to 3 growth cycles for most species**



# **AQUA GREEN**

## **Environmental Benefits**

### **ENERGY EFFICIENCY**

We develop innovative ways to reduce the consumption of energy including replacing energy intensive processes with energy efficient ones and looking into sources of renewable energy such as solar and wind.

### **SUPERIOR WATER QUALITY**

Monitoring and controlling water quality is critical to our success. The water in our facilities goes through an anaerobic and an aerobic filtration process where microorganisms break down and eliminate biological waste which allows for the recycling of tank water. Superior water quality contributes to the more efficient conversion of feed toward optimum growth and strengthens natural resistance to disease.

### **LOCAL DISTRIBUTION**

The freshness of our product depends on our commitment to local distribution. In addition to the unrivaled quality of our fish and the advantage of offering a premium product, local distribution provides cost savings and contributes to a significantly smaller carbon footprint compared to that of traditional aquaculture distribution.



# **Environmental Benefits**

## **FRESH, HEALTHY, HIGH-QUALITY FISH**

With rising awareness of the health-benefits of sustainable-grown animal protein, our customers recognize the health value of consuming the highest quality, fresh, healthy fish.

Our product meets global and local quality standards and contains below FDA-detectable levels of mercury and lead. The fish we raise is safe to consume as frequently as our customers wish without risk of exposure to toxins or heavy metals. It is our goal to contribute to the health and vitality of the communities where we operate.

## **RELIABLE SUPPLY OF FISH PROTEIN**

Global demand for healthy fish protein combined with the decline of marine fisheries and the health risks posed by traditional aquaculture, creates a growing need for a predictable, sustainable-sourced local supply of salt-water fish. Aqua Green provides the technology and production model to power facilities which will meet local demand consistently and reliably.

## **GREEN JOB CREATION**

Green jobs are expected to fuel economic growth in the next several decades. We at Aqua Green are doing our part by creating new green jobs in the communities where we operate. In addition to providing employment, we offer training and equip our workers with unique skills which support personal and professional growth.



**The application was filed in March, 2012.**

- GO TO PATENT LINK -

[illegible]

# Plug & Play System



| plug and play |                         | salt/fresh      |         |              |                       |
|---------------|-------------------------|-----------------|---------|--------------|-----------------------|
| water         | 100m <sup>3</sup> /h    | H=10m max       |         |              |                       |
| feed          | up to 50kg/day          | 45% PRO. 10%fat |         |              |                       |
| energy        | 5-6kw/h max.            |                 |         |              |                       |
| discharge     | 1m <sup>3</sup> /DAY    |                 |         |              |                       |
| co2           | reduce from 65 to 5mg/l |                 |         |              |                       |
| O2            | inlet 65% outlet 95%    |                 |         |              |                       |
| nitrite       | 6mg/l to 0,1mg/l        |                 |         |              |                       |
| ammonia       | 8mgr/l to 0.1mgr/l      |                 |         |              |                       |
| size          | 2.4m diameter hight 5m  |                 |         |              |                       |
| air           | 1000m <sup>3</sup> /h   |                 |         |              |                       |
| weight        | 600kg                   |                 |         |              |                       |
| outlet water  | along 50m               | option          | 4" pipe | 50x2mm holes | 2m <sup>3</sup> /hx50 |
| solid base    | 3x3mx0.1m               | concrete        |         |              |                       |
| ozon          | reduce BOD              |                 |         |              |                       |

# Plug & Play System

## Aquaculture Solutions

Aqua Green 'Plug and Play' all-in-one water treatment systems for aquaculture increases fish productivity, has a minimal ecological footprint, enhances water conditions and significantly increases profitability.

## The System

The system overcomes two key aquaculture challenges: limited water availability and buildup of toxic ammonia (excreted by the fish). The system biologically treats the water used to eliminate the ammonia buildup and oxygenates the water. This substantially cuts the amount of water needed. By enhancing water conditions, the system improves the overall ability of the fish to survive, grow, and reproduce, which significantly increases profitability and sustainability.

## Advantages

Aqua Green cost-effective, plug-and-play water treatment system for land-based aquaculture costs a fraction of high-end water treatment systems. It requires minimal infrastructure and technical expertise.

The Aqua Green unit operates with a variety of different aquaculture systems such as: extensive (land ponds), intensive (constructed ponds), and recirculated. Aqua Green system enables fish growers to upgrade existing facilities whilst using already installed infrastructure and working methods.

## The Bottom Line

Reduces water use by 85%

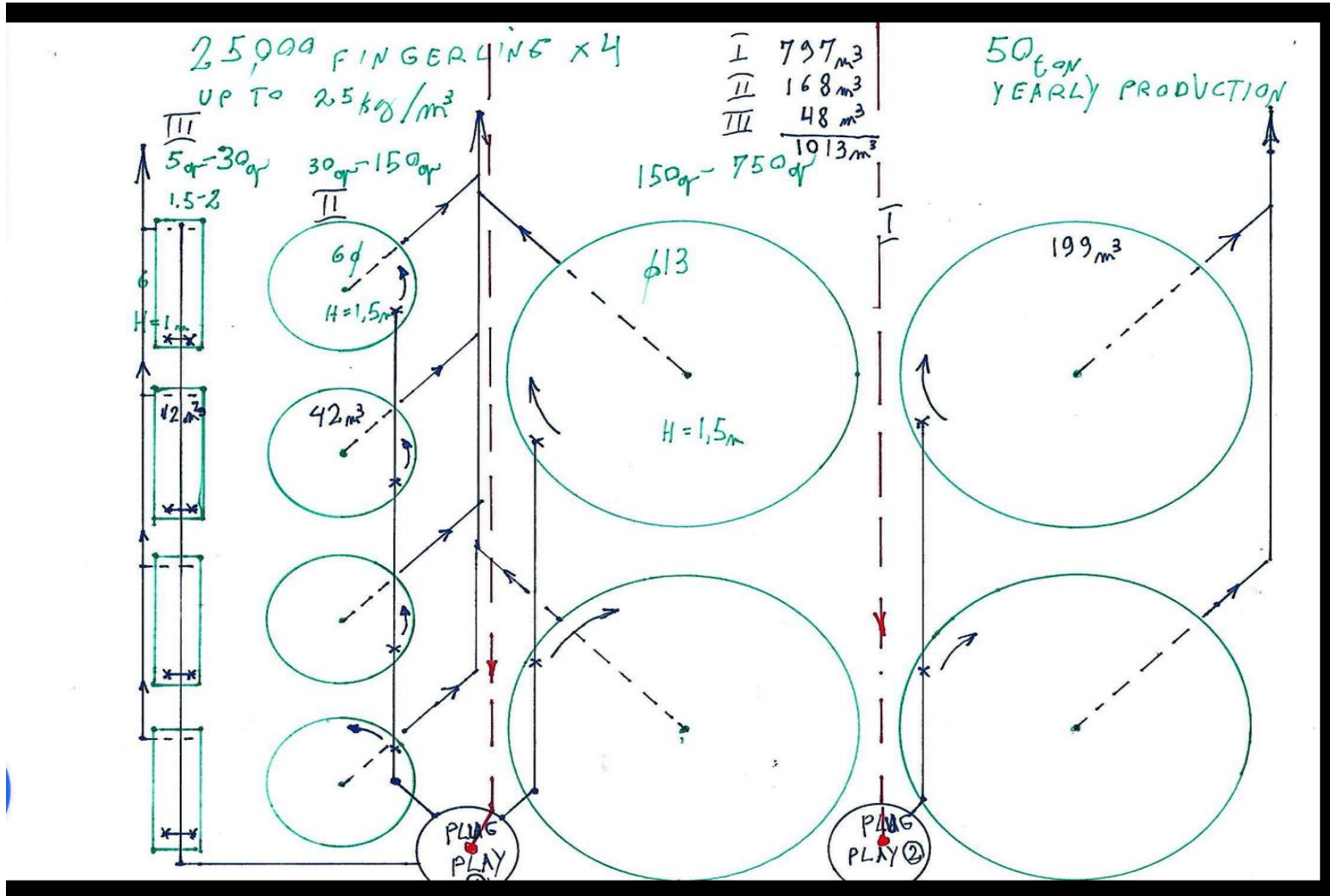
Increases fish yields

Upgrades existing facilities

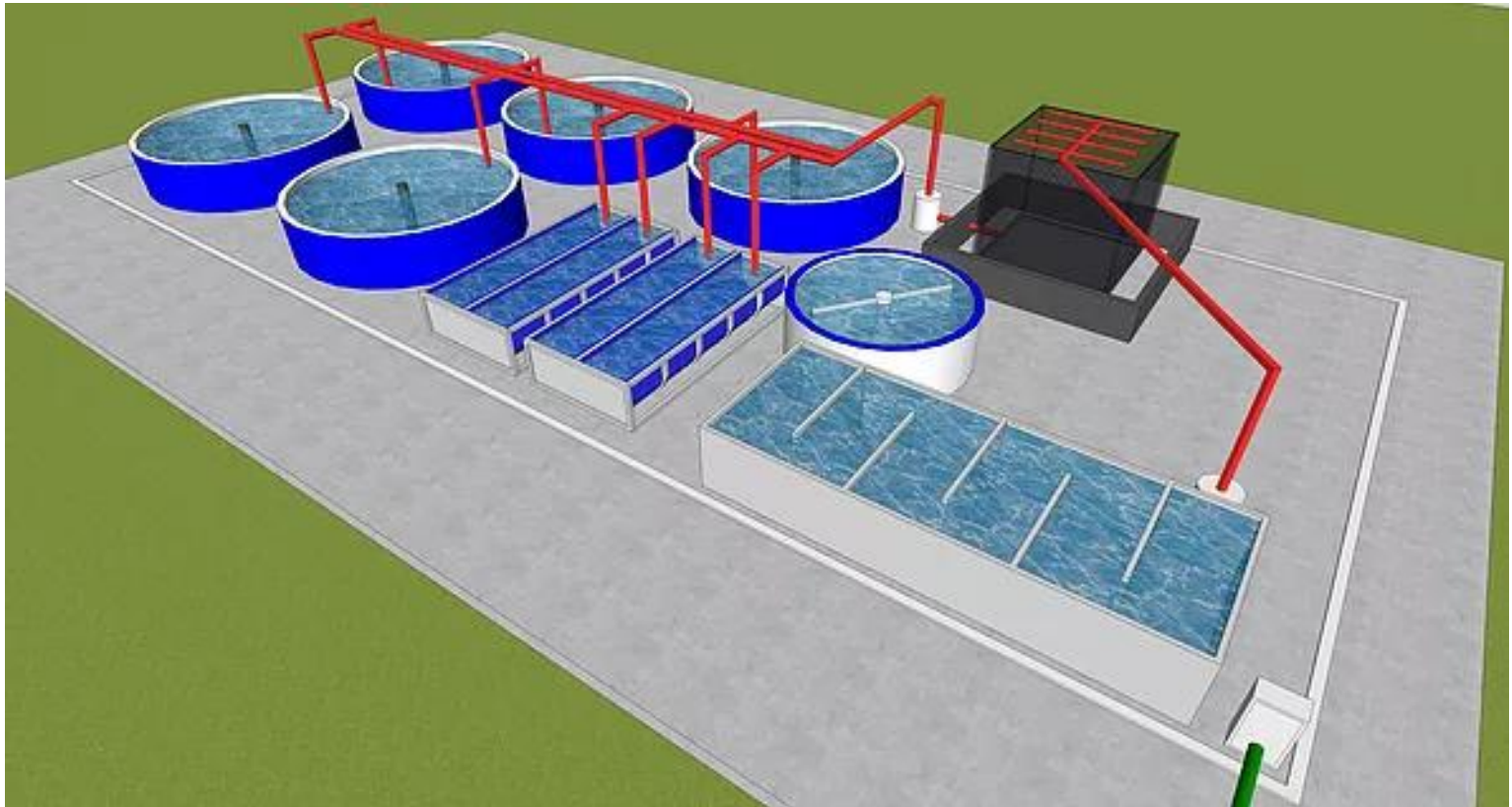
Small footprint, low maintenance

Low energy consumption

# Plug & Play 50 Ton Open System



# Aqua Green Small-Scale Fish Farms 10-20 ton



# Aqua Green Small-Scale Fish Farms

## Introduction :

The Aqua Green Single Pass Biofilter (SPB) system is designed to make highly-effective water treatment accessible and appropriate for widespread use in land-based aquaculture. In Aqua Green 's proprietary plug-and-play, all-in-one system, the water flows from the top down, filtering particles, removing CO<sub>2</sub> and ammonia, and oxygenating the water before being recycled back into the pond. The improved water quality from ongoing filtering/cleaning and recycling increases the ability of the fish to feed and grow.

# Aqua Green Small-Scale Fish Farms

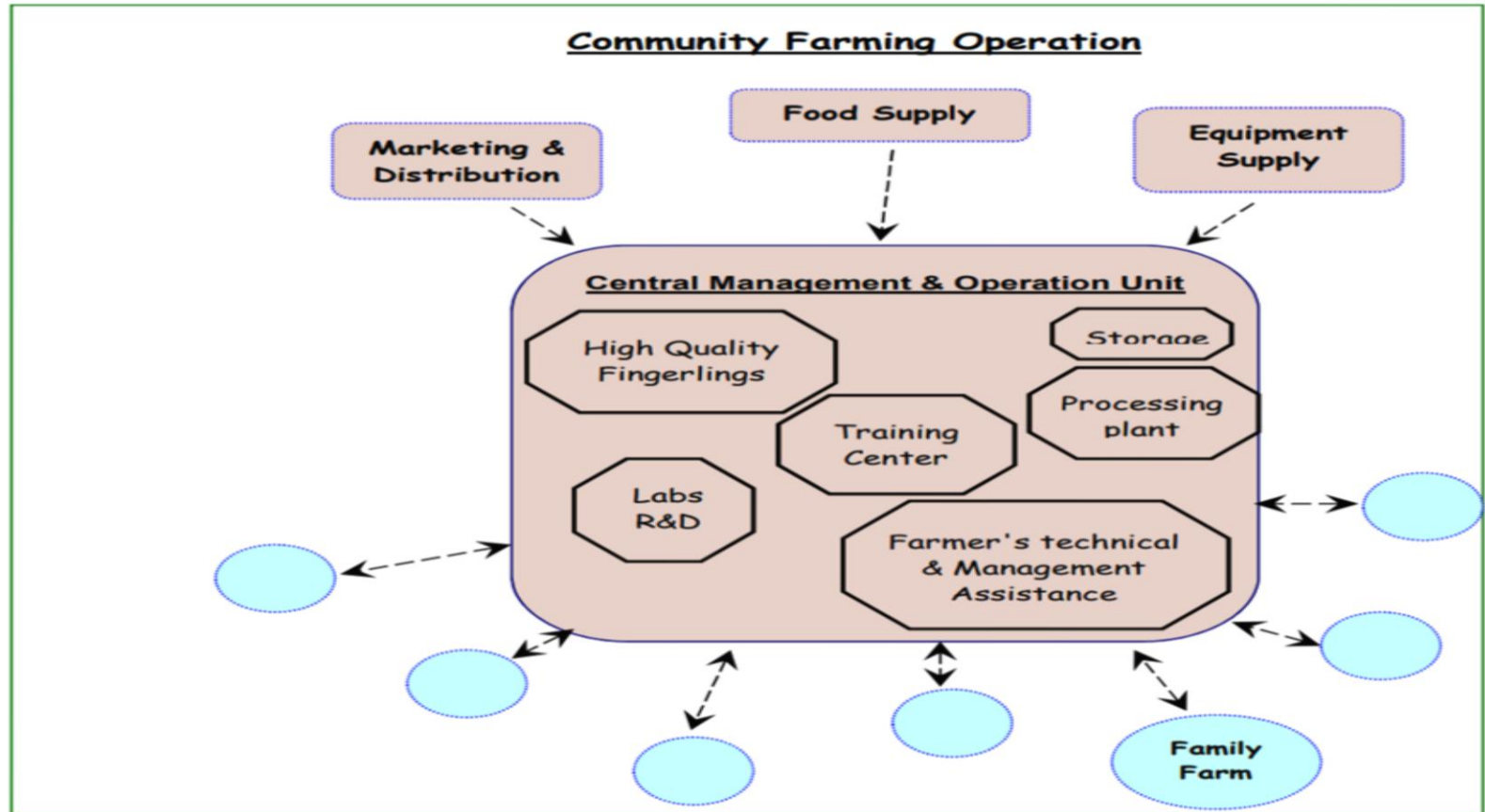
**The system's water treatment includes four elements:**

- o Mechanical filtration.
- o CO<sub>2</sub> removal & Atmospheric O<sub>2</sub> enrichment.
- o TAN (total ammonia nitrogen) removal with proprietary substrate.

**Advantages of the system include:**

- o Easy to install, low maintenance
- o Can be used with existing infrastructure or new structures
- o Increases sustainability for a variety of aquaculture systems and methods (extensive, intensive, recirculated).
- o Low investment – especially as compared to other products and systems in the market – actively low-energy consumption Small footprint.

# Community Fish Farm



# Community Fish Farm

## **Introduction:**

Fish is the main source of animal protein in some countries in Africa, especially tilapia and catfish, with dramatically increasing demand worldwide. This is a tremendous business opportunity that can benefit many families within a short period.

Based on our extensive aquaculture experience, we offer a practical, cost-effective and commercially viable fish farming model that recognizes and addresses the social and economic needs of the community, including development of employment opportunities and SME (Small Medium Enterprise) business opportunities.

# Community Fish Farm

## **The Community Farming Initiative:**

Small scale aquaculture farming (family fish farm) attracts more and more attention worldwide. Community farming relies on the family working capacity for daily operation that relying on central powerful data support and supply of inputs.

The initiative will set its production system among families who are living around a source of water. Using small modular tanks, a family can operate a number of tanks according to its ability. Each family will be supported by the center unit that will supply raw materials, services and will purchase fish for processing and marketing.

# Community Fish Farm

## **Project Model:**

In a vertically-integrated aquaculture system, typically a high investment and mass production environment, all operational elements are carried out by a single core investor or corporation. But there is an alternative business model under which production is generated by small autonomous entities operating within a co-operative environment.

This model is based on a strategy that has a “Central Farm & Training Center” offering management support and production coordination to “Satellite Farms.” The proposed strategy is based on this business philosophy, which has been proven to work successfully in a number of developing agricultural / aquaculture economies and consists of the following production elements:

1. Central Farm & Training Center
2. Satellite farmers

# Community Fish Farm

## **Central Farm & Training Center” (CF):**

This Central Farm provides farmers with comprehensive commercial, operational and marketing support. The aims of the Central Farm & Training Center are:

1. Produce and provide high quality fingerlings to farmers enabling them to attain high yields
2. Supply high quality feed
3. Training center to farmers enabling them to practice scientific, sustainable aquaculture
  - Formal Training
  - Knowledge and technology transfer
  - Practical Aquaculture courses for trainees and farmers
4. Marketing
5. Research and trial of different fish species

# Community Fish Farm

## **The Satellite Farms (SF):**

The satellite farmers focus on a single step within the overall production cycle - mainly the “Grow Out” or “fattening” of fingerlings supplied from the Central Farm until they reach an optimum size for the intended target market.

The Central Farm provides Satellite farmers with the confidence, ability and resources to overcome any set-up or operational challenges that may be experienced, and thus allow them to grow their own businesses under the expert management and supervision of Central Farm personnel.

# Community Fish Farm

## Rationale & Benefits:

### National/State Benefits:

- Development in rural areas through new & expanded aquaculture production industries.
- Increased income generation in rural areas in primary and supporting industries.
- Increased employment opportunities for technicians and labor in rural areas.
- Establishment of a base for expansion in regional and wider markets
- The initiative can be quickly implemented, with production starting within a few months.
- Short production cycles, which are less than 6 months, enable immediate impact on society.

# Community Fish Farm

## Individuals Benefits:

- Access to highest quality inputs – fingerlings / fish feed / equipment.
- Access (guaranteed) to markets & growth potential in market share.
- Access to industry best practices, standards and resultant production quality.
- Access to training & management resources.
- Knowledge to improve profitability and equity growth

# Company Profiles:

## **Aqua Green Ltd.:**

Aqua Green “s founders have been working on aquaculture projects around the world for nearly 30 years. The company has extensive experience in aquaculture.

The company developed a cost-effective, all-in-one water treatment system & first successfully scale a zero-discharge system for land-based aquaculture which costs a fraction of the cost of high-end water treatment systems and requires minimal infrastructure and expertise. It operates with different aquaculture methods and enables fish growers to upgrade their existing facilities while using installed infrastructure and working methods.

The Aqua Green “s system enhances water conditions, increasing fish production with minimal investment.

# Team Members:

## **Mr. Michael Rachin ( Founder )**

*Land-based recirculating aquaculture systems designer with over 35 years of experience, specializing in design of zero discharge systems & plug & play water treatment system..*

## **Mr. Yossi Tal PhD**

*More than 20 years of experience in technology development and projects Management of large-scale aquaculture marine systems for mass production of marine fish. Experience includes water quality control, Fish health, feed, business plan developing and economical evaluation.*

# Team Members:

## ***Mr. Zamir Tribelsky***

An accomplished creative technology expert with several successful inventions used in various fields. Founder of “Atlantium Ltd” A leading Israeli company producing and providing UV water disinfection systems worldwide.

## ***Mr. Haim Hyman***

Former CEO of Dan Fish Farms, Israel’s largest trout farm. Haim has over 20 years of experience in all aspects of trout production and processing, including international project development.

## ***Dr. Ofir Menashe***

Environmental microbiologist specializing in the research, development, and operation of agricultural effluent discharge treatment systems.

# Team Members:

## ***Mr. Arvind Dubey***

Having started from a humble home and ending as a well known journalist in Key companies such as ABC News Network, Star India News , Investigation Post , Times of India , etc. As a journalist have successfully conducted and finished a lot of sting operations.

The passion for Aquaculture & Agriculture business and helping the farmers led to the formation of RASponic Technology with help of Israeli experts & join hand with AQUA GREEN LTD ( Israel) to indigenously their technology in India.

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