HATCHARY ESTABLISHMENT FOR AFRICAN CATFISH FRY PRODUCTION IN MUKONO DISTRICT, UGANDA

Business Description & Proposal

Compiled by: The Directors

This project is the outcome of a group efforts to whom credit and technical responsibility goes. This project is based on an assignment which was given to course participants and supervised by Dr. Abdel Rahman El Gamal as a part of “Fish Development Training course”. This annual course is organized by the Egyptian International Centre for Agriculture - Egypt (EICA). The Name and photos of the team members are shown in the last slide

2008

Executive Summary

Currently:

There is demand for Catfish fingerlings by the commercial and rural farmers in the East African Region.

The Government of Uganda through the Central bank provides grants to agricultural investment through loans managed by qualified commercial banks in Uganda.

It has prompted the partners and management of Aqualand International to come up with a business idea to expand and for a catfish hatchery to contribute towards the supply of fingerlings to the market.

With an aquaculture background the company is well equipped with the necessary skills to implement this project however there is need to purchase farm inputs to reach break even at the required moment of one year in operation.

The company already has 2 acres of land with a hatchery building and three earthly ponds. In order to produce 850,000 fry for the first financial year, the company needs to expand through purchase of hatchery materials, construction and recruitment of more staff.

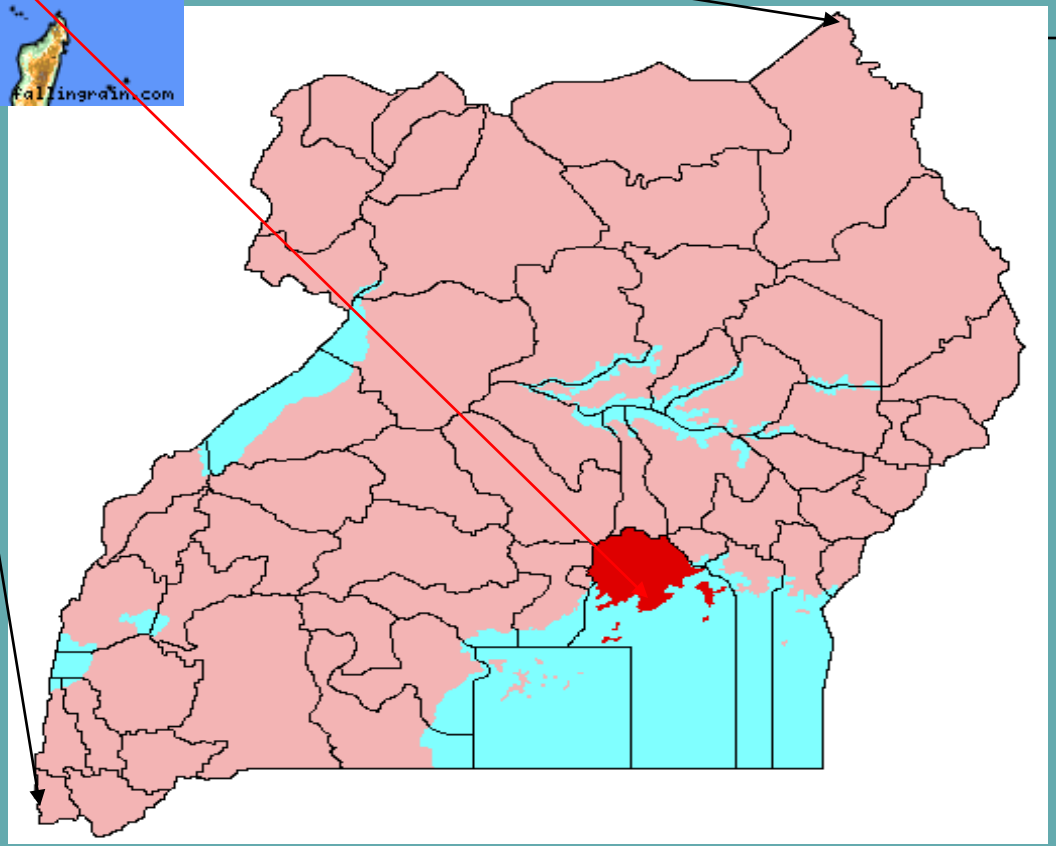
With increased fry production the company will contribute to the current catfish production in Mukono District which lies between 500million fry annually to about 502 million by the end of 2009. The company requires 10,000US Dollars about 34,000,000 Uganda Shillings to enable the project a success. The funds will be required between January and March 2009 and loan payment will depend on the terms and conditions of Cairo International Bank.

With a farm to farm marketing strategy, the company will build its market through supply of quality fingerlings throughout the year.

Background

- Aqualand International was established in 1996 by Mr. Mukalazi Francis to deal in ornamental fish and aquariums. During the year 2000 it acquired state of incorporation when the sole proprietor acquired a business partner.
- It was through use of unaided glass tanks with an idea that fish can be kept in water as long as they have space to move around.
- It was discovered that there are some factors that cause fish mortality other than space. BOD, pH, salinity and cannibalism were proved thorough air diffusion, gradual water change and species selection.
- It is officially located in Kampala, with an industrial plot in Buikwe Sub-county, from 40km Kampala in Mukono District. the plot and entire region has with a lot of springs and running water with little settlements but a good road network.
- The region is mostly agricultural with sugarcane plantations for sugar production. With a ten year work experience in aquaculture and particularly breeding of gold fish, the company has the capacity and a positive idea to produce catfish fingerlings for sale to farmers within the Nile basin region.

Mukono District Location



Buli Kyokola
Kola Mangu!

Mukono Town Council

Introduction

- Uganda produces up to 15,000 tones of fish from aquaculture, including production from small-scale fish farmers, emerging commercial fish farmers and stocked community water reservoirs and minor lakes. There are an estimated 20,000 ponds throughout the country with an average surface area of 500 m^2 per pond. Production ranges between 1500 kg per hectare per year for subsistence farmers to 15,000 kg per hectare per year for emerging commercial fish farmers. With improved market prices for fish, government intervention for increased production and stagnating supply from capture fisheries, aquaculture has begun to attract entrepreneurial farmers seeking to exploit the business opportunity provided by the prevailing demand for fish. This recent expansion in aquaculture has also resulted in the transformation of 20 percent to 30 percent of the smallholder subsistence ponds into profitable small-scale production units through developments in management as well as scale of production. It is estimated that there are 2,000 such farmers who own nearly 5,000 ponds, with an average pond size of 1,500 m^2 per-pond.
- The new entrants, mostly from the middle and working class as well as a few businessmen, target specific and established markets. They have adopted improved production systems. Aquaculture industry in Uganda lacks the diversity of culturable species. Although, there are numerous (about 10 commercial) freshwater fishes in Uganda, only three species, Tilapia, catfish and Mirror Carp (are being used for commercial aquaculture. Increase in diversity of culture species depends largely on the availability and consistent supply of fish seeds.

Introduction (Cont.)

- North African catfish (*Clarias gariepinus*) has recently overtaken Nile tilapia as the most popular species for aquaculture in Uganda. Rural farmers have grown fond of it, and there is a growing regional market for this species. Its main characteristics are its fast growth and ability to literally feed on anything organic available at household level. This species is found in all waters of Uganda, especially those linked to swamps, and it has traditionally been a primary target for a good segment of the fishing community. North African catfish currently contributes an estimated 60 percent of aquaculture production in Uganda. The most limiting aspect of the culture of the catfish in Uganda is the availability of good quality and sufficient fish seed as when required by the grow-out farmers.
- The hatchery technology developed elsewhere for fin fish, such as cat fish with an export potential is needed to be modified to local conditions with special attention of increasing the larval and post-larval survival rates and testing to develop market aspects with aquaculture. Hence, seed production technology of important fish species for both domestic and export production needs to be promoted.
- It is paramount to transform Aqualand International previously an ornamental fish company into a multi-exertion limited liability company out to produce catfish fingerlings for sale to all categories of farmers ranging from rural, small scale and the emerging commercial fish farmers in Uganda and the export market. It was established in 1996 to produce ornamental aquariums and fish for the local market in Uganda. With an aquaculture background the company has decided to expand and form a food fish hatchery as the diversification entity.

Introduction (Cont.)

- With funds solicited from the old and new partners, the company will be able perform infra structure development, purchase equipment and employ new staff. In order to produce 900,000 catfish fingerlings 2-10 g in size, the company annual income is predicted at about 35,000 US dollars and a gross turn over of about 15,000 US$.
- The hatchery will be located in Mukono District 25Km from Kampala, the Capital City of Uganda. The area that lies in the North of Lake Victoria tropical climatic conditions suitable for this venture. Mukono district has a population of 807,923 people, 403,117 of which are females and 141,990 males. The district lies on a high plateau of 1000 – 1300m above sea level. The relief is much higher in the south; Buikwe is located on a high plateau of 2440m above sea level. This area is drained by the rivers Sezibwa and Musambya. The mean annual rainfall is 1100mm and is distributed over two rainfall peak seasons in March – May and September – November.The district temperatures range from 160C to 280C through out the year. The gentle relief and the good climate have favoured the growing of both cash and food crops in the district. Commercial farming has flourished in the district due to these favourable factors. Job creation and development of fish production as one of the main branches of sustainable agriculture is our main objectives.

BUSINESS DESCRIPTION

Name: Aqualand International Ltd.

Business scope

Aquatic and garden systems, accessories and services

Particulars

- **Aquatic systems:**
  Complete operational systems of fish tanks, fish ponds, fish cages, Aquariums for growing or keeping live fish and other water living animals and plants. Accessories include: parts thereof; **fish**, aquatic plants, fish feeds, phyto and zoo planktons.

- **Garden systems:**
  Green houses, irrigation systems for gardens and farms, water fountains. Garden accessories include: water pipes, pumps and garden ornaments.

Business Idea

- Our precise business idea is a Catfish hatchery production in Uganda.
- It will involve artificial & semi artificial breeding to produce a batch of about a million juveniles which are fed on juvenile feed to about 2g before wining.
- Selective feeding proceeds until about 5g each fish fry, the batches will be graded ready for sale.

Objectives

Mission, goals and strategies

- There will be an increase in the standard of living of professionals and all rural people in Uganda by the year 2010 as a result of better aquaculture production.

Specific objective

- Households living in the Nile basin and having fish farms improve their standard of living by the end of 2010 through the production of fish throught the year as a result of continuous cat fish fingerling production. This will enable them to do commercially viable and ecologically sustainable fish farming.

PROPOSED PROJECT ACTIVITIES

- Utilization of a co-existing facility used to breed ornamental gold fish to perform breeding of cat fishes.
- Brood stock raising, rearing and conditioning
- Indoor live food rearing
- Mass rearing of live food
- Induced breeding of catfish
- Rearing of fry to fingerling size which is marketable size in concrete ponds.
- Market the fry/fingerlings
- Grow out trials in mud ponds

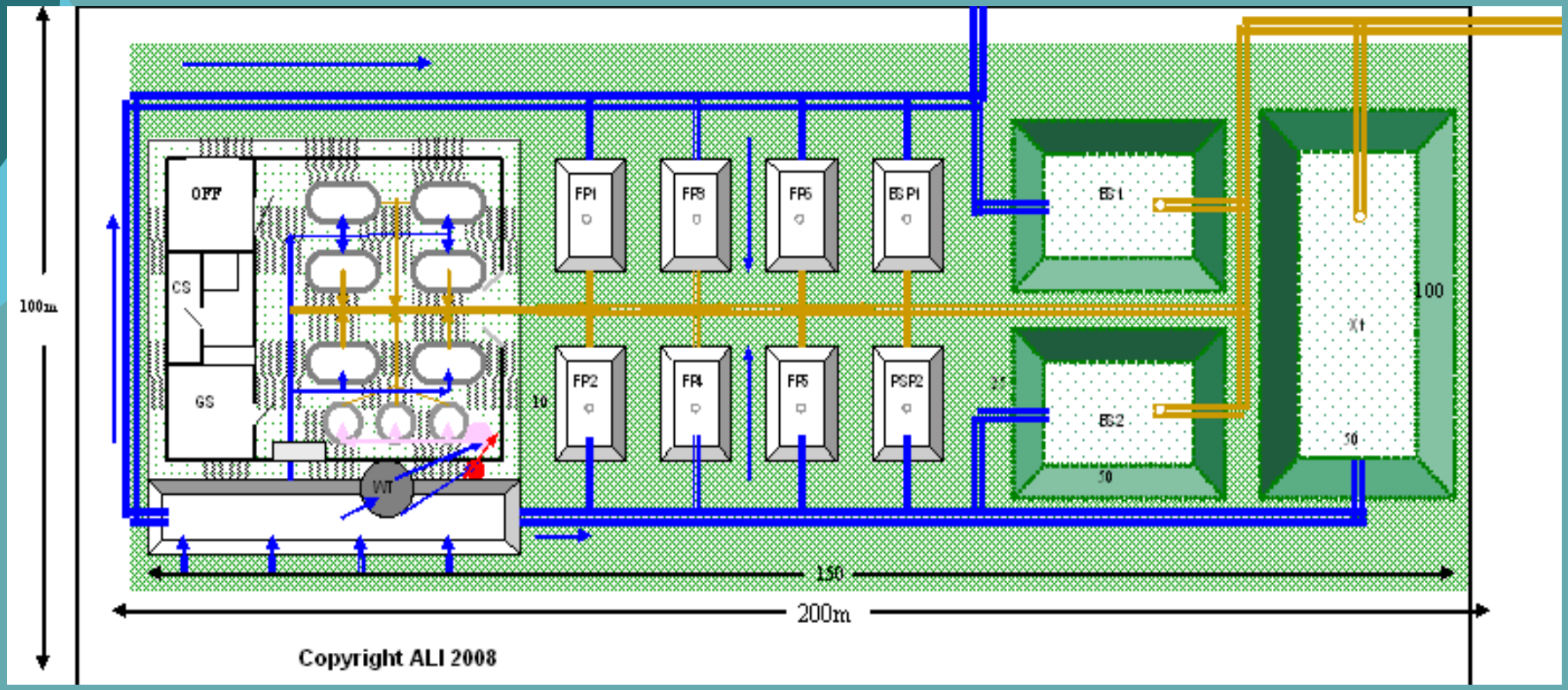
PROJECT PLAN FOR THE PRELIMINARY STAGE

ITEM	SIZE/POWER	QUANTITY
Land	(200x100)m2	1
hatchery building	80’x 40’	1
Fresh ater tank with complete plumbing work	60 m^3 capacity	1
Semi-closed shed for live food rearing	30’X 20’	1
Pump house	2x2m	1
Blower	2.1Kw	1
sea water pump -	4”	2
Sand filter	500m3	1
mud ponds -	(40x30)m2	1
brood stock rearing ponds	(50x25)m2	2
Brood stock preparation & Nursing ponds	(10x5)m2	2
Mud ponds for >1g larval rearing	(10x5)m2	6
Fiber tanks for <1g larval rearing	(3x1x1)m3	6
Tanks for egg incubation	250m3	3
Tanks for Rotifer culture	250m3	2

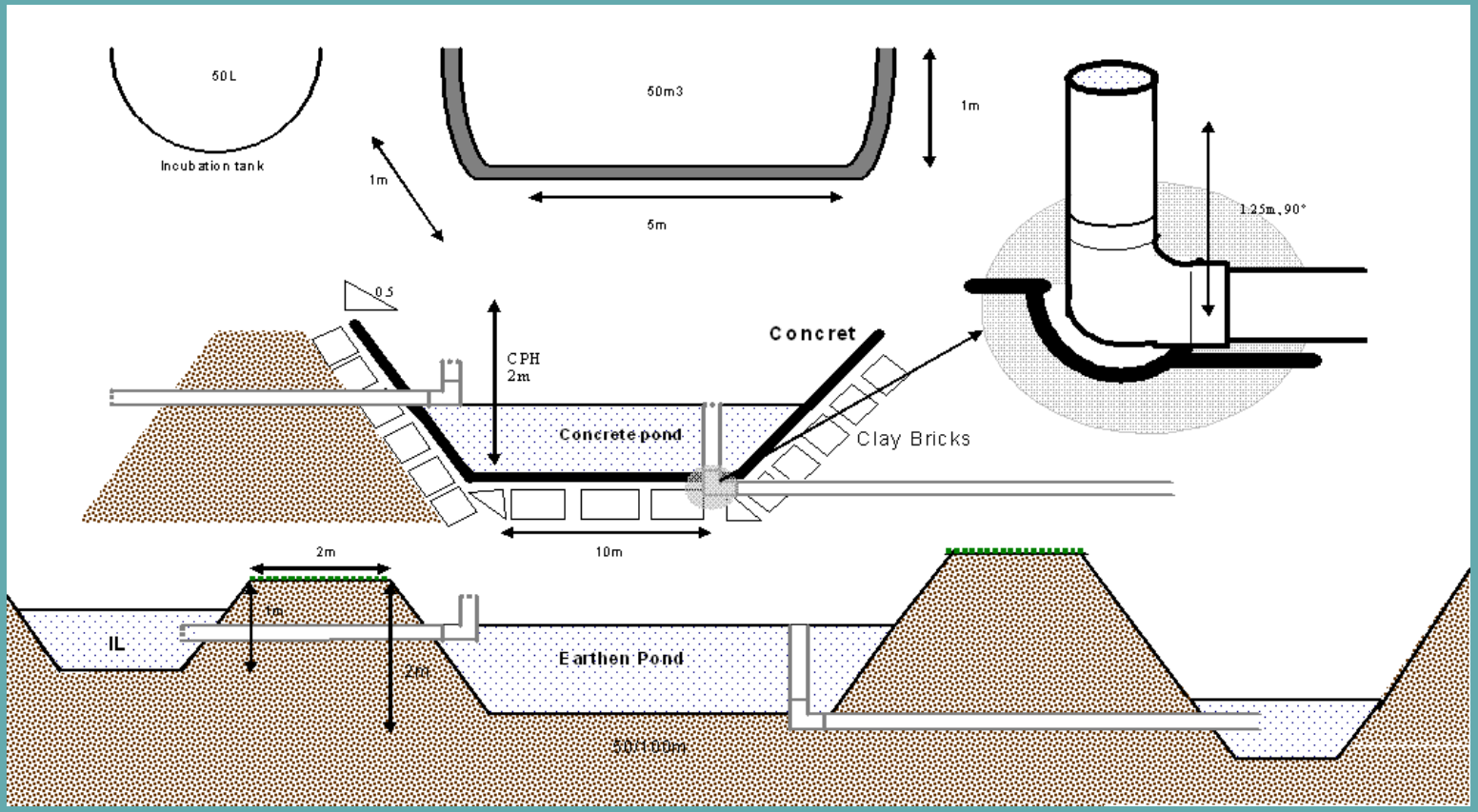
PROJECT PLAN FOR THE PRELIMINARY STAGE (Cont.)

ITEM	SIZE/POWER	QUANTITY
Fiber tanks for Rotifer culture	500L	2
Fiber tank for algae culture	500L	2
Hatchery jars for Algae culture	150L	4
Hatchery jars for Algae culture	30L	4
Fiber tanks for *Artemia* culture	600L	2
Hatchery jars for *Artemia* culture	30L	4
Refrigerator	500W	1
Deep freezer	1000w	1
2 – phase power supply	Domestic line 240V, 50HZ	1
Generator	2.1 Kva	1
Solar water heater	3000L/ Day	1
Premises for office facilities & Laboratory	(50x50)m	1
Premises for security	(2x2)	1

Hatchery Technical Map Plan



Cross Section Technical Plan



Source of Brood Stock

- Brood stock will be collected in three ways:
- From the wild
- Purchase from other farmers.
- From Government research centre.
- Wild Brooders
- Wild brooders can be collected from local sources and they will be maintained in cement tanks and floating net cages and in mud ponds under controlled conditions providing necessary photoperiod and temperature for maturation. .
- (b)Brooders from farmers will be surveyed and sampled for age, size and traceability.
- Government Research Brooders will be purchased fro The National Resources Research Institute- Kajjansi on Entebbe Road.

Table1. Some technical information on proposed hatchery of African Cat Fish *Clarias gariepinus* in Uganda

Item	Quantity
Type of hatchery	Semi-artificial
Number of brood fishes	100
Sex ratio use when spawning	1:2 (male:female)
Relative fecundity	100,000/ 1 Kg body weight of female
Fry rearing period	01 month
Marketable size	3.0-5.0 g
Intensity of grading	Once a ten day (3 time per one cycle)
Survival rate (expected)	25 % (30% second year)
Production target 1st year 2nd year	850,000 fry 2,000,000 fry
Recovery period of brooders	One month
Shutdown period of hatchery	Dec-Jan, May-June
Grow-out trials	
Stocking fry size	7.0 g (after 42 day period rearing)
Stocking density	70 fry/ m^2
Required fry for 1 ha pond	700,000

REQUIREMENTS

Required Human Resources:

- 1 Site manager/Supervisor/ Farm Manager (B.Sc. Fisheries and Aquaculture)
- 2 Technicians Aquaculture
- 1 Technician maintenance
- 4 Laborers

Required Equipments

- Water pumps 02 No's
- Microscope
- Air Blower
- Oxygen Cylinder
- Desktop computer
- Refrigerator
- DO meter
- pH meter
- Ammonia Kit

Activity Schedule

Quarter	1	2	3	4	5	6	7	8
1. Pond preparation								
2. Modification to the hatchery building								
3. Brood stock collection and conditioning		x	x	x	x	x	x	x
4. Live Feed culture								
5. Spawning								
6. Fry and larval rearing								
7. Marketing								
8. Grow out trials			x	x	x	x	x	x
9. Harvesting				x		x		x
10. Shutdown of hatchery				x	x	x	x	**x**

Budget Breakdown

Item	Quarter								Total US $
	1	2	3	4	5	6	7	8	
Brooder fishes collection and maintenance	30	10	10	10	10	10	10	10	2,000
Feeds				11,000				25,000	36,000
Chemicals	-	500	500	500	500	500	500	500	3,500
Consumables	250	250	250	250	500	500	500	500	3,000
	6	6	6	6	6	6	6	6	48
Construction (Infrastructure Development)	10,000								10,000
Maintenance	10	20	10	10	1,000	1,000	1,000	1000	7000
Equipment	2000				500				2500
Vehicle hire	25	50	50	50	50	25	25	25	300
Labor	18	20	20	20	20	18	15	15	146
Electricity & Fuels			1,000			500			1,500
Overheads	500		6			6			12
Total									4,842

Costs benefit analysis:

Description	Amount (US$)
Fixed Costs	
Construction (ponds, security huts, fence)	10,000
Equipment (water pumps, blower etc)	2,000
Interests/Taxes/Insurances	1,000
Depreciation	1,000
Total	**14,000**
Variable Costs	
Brooders	3,000
Feed	11,000
Chemicals	2,000
Consumables	1,000
Construction (Infrastructure Development)	5,000
Tools & Equipment Maintenance	3,000
Electricity & Fuels	3,000
Transport charges	2,000
Manpower	28,000
Overheads	3,000
Total	**61,000**
Total Production Costs	**75,000**

Costs benefit analysis: Cont.

Description	Amount (US$)
Income	
1st year fry selling (price US$) 700,000 fry	123,500
2nd year fry selling (price US$) 2,000,000 fry	352,900
1st year selling adults (price 1kg US$) one production cycle 10,000 Kg	17,700
2nd year selling adults (price 1kg US$) two production cycle 25,000 Kg	44,000
Total	**538,100**
Gross Income	**463,100**
Net Profit	**388,100**

Outputs:

- The fingerlings which will be produced in the hatchery can be sold to local farmers. Fingerlings could also be exported to other African countries.
- The fish that will be grown to marketable size (250 g-350 g) has a good international market.
- Therefore, there is a good potential for sustainability of cat fish culture utilizing the hatchery facilities at Uganda.
- For starting our business we are best positioned to secure money from partners our business involves use of existing facilities. Returns are expected in the 1st year. After the first year of commencement, the business can finance itself for expansion purposes.

SWOT Analysis

Strengths	Weaknesses
Experienced and committed management staff	Inadequate number of staff
Opportunities	**Threats**
Government policy supportive, support to farmers through training and material inputs.	Regulation and compliance risks, Water pollution, Fish diseases, Cost inflation, Industry consolidation/ transition, consumer demand shifts, global financial shocks, theft, floods, energy shocks, corruption, late timing for current donor funds.

Market Analysis

Industry Description, Scope and Trends

Grow out & hatcheries, old and new fish farm markets, Both Genders-Adult above 10,000, Fish production and fishermen, his fish production market/ industry is in the early phase after restart.

Major Customer Profile

List the most important potential and current customers.

- Age
- Education,
- Income,
- Corporate profile.

Problems, Obstacles and Opportunities

Land is small for further expansion to diversify. Land is next to a sugar plantation of a big company and we feel insecure but with legalities are in place and the environmental laws are in the country.

Market Research - General and Specific

Include recent findings and important data as well as interpretation of this information. Use census data, surveys, trade associations, etc. If you are unfamiliar with the industry, talk to experts to establish benchmarks for further research.

Competition - Strengths and Weaknesses

Marketplace may view our competitors as having more experience and are in the books of information disseminators but after some time we will achieve this status

RISK PREVENTION

- Regulation and compliance risk will be averted by following regulations and compliance to state good aquaculture production practices (GAPP), EIAs and having HACCP systems in place.
- Water pollution may be averted by preventive measures such as water reservoirs, settlers and continuous monitoring.
- Diseases can be prevented by the HACCP systems however approved remedies should be in place.
- Cost inflation is a national phenomenon which affects all businesses and the only remedies are to increase sale price and reduce production until effect disbands.
- Consumer demand shift may be averted by finding direction of shift and following the trend.
- Theft will be averted by security at the farm while floods will be catered for during construction.
- Energy shocks as electricity problem will be backed up with a solar system.

SKILLS AND EXPERIENCE

- Aqualand International has been practicing fish farming and aquaculture since 1996 and this gives us more experience in fish farming. We are going the recruit more aquaculture professionals to ensure proper aquaculture quality management is in place.
- Quality management procedures applied in previous operations will help in operation of this business. During the past we discovered that keeping live fish is very difficult and this dependant on water quality.
- Previous experiences like water pollution will help us avoid similar occurrences.
- Book keeping and business administration are the main skills that we do not have at the moment. We will have to recruit an accountant and an administrator with work experience in a similar setting to cover-up this gap.

Appendices

- Letter of intent
- Certificate of Incorporation-2000
- Memorandum of association-1996
- Memorandum of association 2008
- Financial Statements 2000-2007
- Resolution 26th October 2008
- Future Donor contacts
- Bibliography/ References

Thank You for Your Attention

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