

ESTABLISHMENT OF A PRIVATE TILAPIA HATCHERY IN MPIGI DISTRICT – UGANDA

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This project is the outcome of a group efforts to who 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 “Warm Water Fish Production” Training course. This annual course is organized by the Egyptian International Centre for Agriculture - (EICA). Names of the team members, and countries are shown above.

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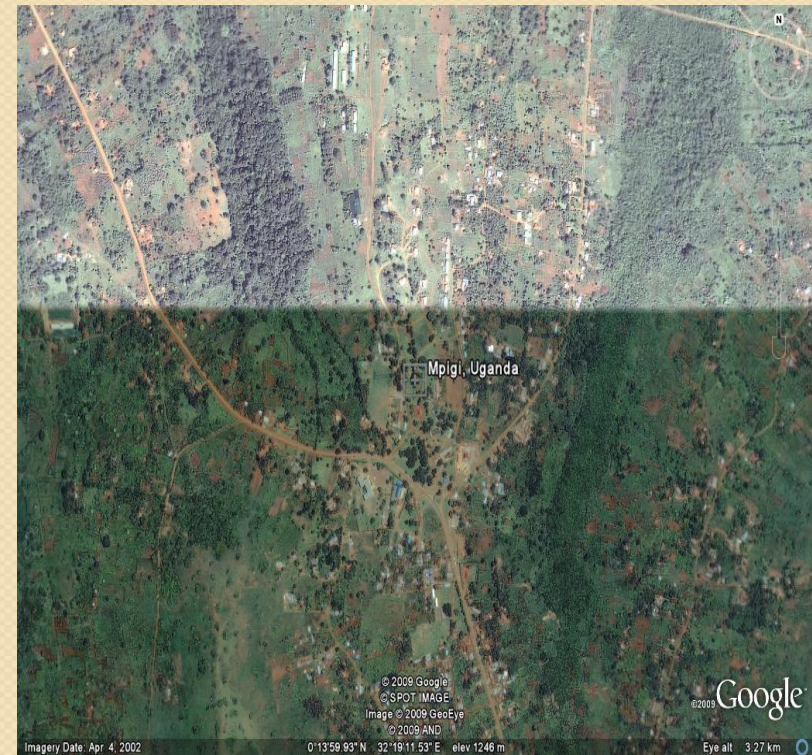
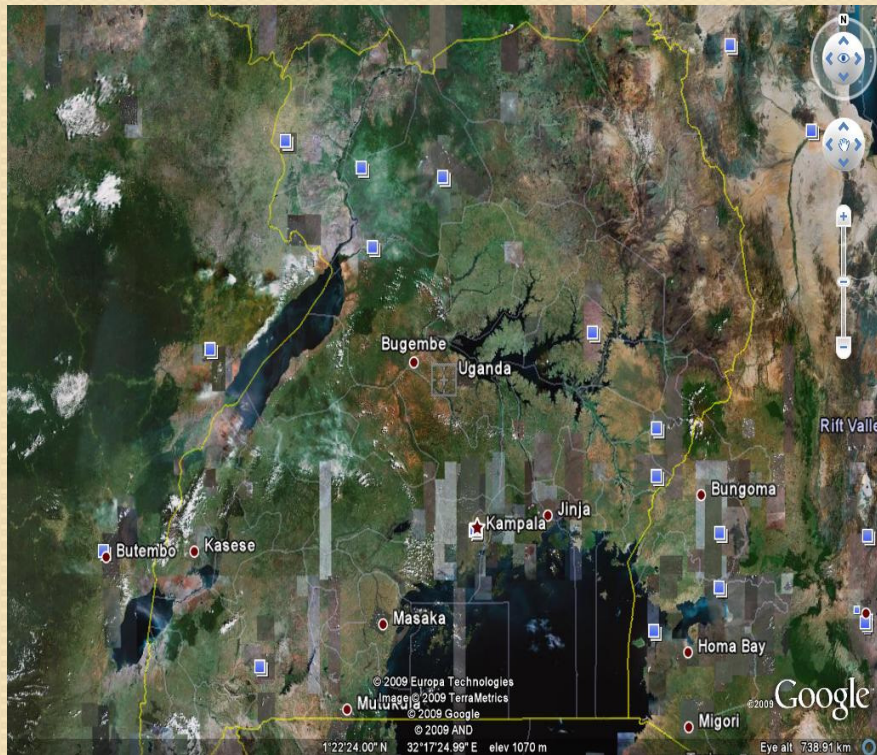
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PROJECT PROFILE

Project Name	Establishment of Private Tilapia hatchery
Location	Mpigi District, Kyanja Parish, Kaddakiro Village - Central Uganda
Proprietor	Equator Aquaculture Holdings (Uganda) Limited
Source of Funding	Equity contributions
Project Cost	USh 26,506,800
Projected production;	240,000 tilapia fingerlings per year

Ush = Ugandan shilling

SATELLITE LOCATION OF THE PROJECT AREA



1.0 INTRODUCTION

- ❑ The project is to establish a private hatchery to produce tilapia fingerlings.
- ❑ Mpigi District, located in central Uganda experiences a typical equatorial climate with two rainy seasons in a year; beginning from March to June and September to November thereby guaranteeing a continued supply of water.
- ❑ The temperatures range from 22 – 30 degrees Celsius which is ideal for the production of tilapia all year round.

2.0 JUSTIFICATION

- ❑ The investment is in response to the rapidly growing number of fish farmers in Mpigi and neighboring districts, resulting in growing demand for tilapia fingerlings.
- ❑ Currently Mpigi District has 150 fish farmers with an average pond size of 500 square meters according to District Fisheries Office 2008 annual report.
- ❑ Assuming that each farmer stocks twice a year (two production cycles) at a stocking rate of two fingerlings per square meter, then 300,000 fingerlings would be required per year.
- ❑ Additional demand by farmers from the neighboring districts within the hatchery target area could be considerable.

2.0 JUSTIFICATION CONT'D

- ❑ Fish farmers are travelling a distance of up to 80 kilometers to the government hatchery, which is the sole source of tilapia (*O. niloticus*) fry and fingerlings.
- ❑ In the process of transporting fingerlings over long distances, stress and mortality increase at the same time additional costs in terms of transport further increases the operational costs to farmers.
- ❑ The area has a big potential for aquaculture growth but the limited access to quality fingerlings is hampering growth initiatives and under stocking of the existing ponds, hence the establishment of a private hatchery.

3.0 OBJECTIVES

- ❑ To produce 20,000 tilapia fingerlings per month.
- ❑ To produce quality fingerlings that meets the farmers needs.

4.0 PROJECT DESCRIPTION

Location and land

- ❑ The hatchery establishment will be in Mpigi District, Kyanja parish, Kaddakiro village - Central Uganda.
- ❑ The hatchery infrastructure is to be established on 1-acre piece of land already identified.
- ❑ The land has permanent water supply from a spring and the soils are majorly clay making it appropriate for pond establishment.
- ❑ The location is in close proximity to River Nile and Lake Victoria, which will be the potential sources of broodstock.

Species and Production Technology

- ❑ The hatchery will produce tilapia (*Oreochromis niloticus*) fingerlings using natural spawning.
- ❑ The brood stock of average body weight ranging from 200 grams to 300grams will be collected from various natural fresh water bodies.
- ❑ The total planned number of brood stock to be maintained is 180 at the ratio of two females to one male.
- ❑ Brood stock performance is to be continuously assessed, culled and replaced at an annual rate of 30%.
- ❑ The replacement of brood stock will be from the wild fresh water bodies.
- ❑ The total planned number of ponds is 12, with total surface area of 2000 square meters as described by purpose below:

Holding and breeding ponds

- ❑ Six ponds measuring 12.5 m by 5m will receive and hold the brood stock recruited from the wild.
- ❑ The females and males will be stocked in separate ponds, each holding 30 fish.
- ❑ The broodstock will be initially fed on 35% protein content at 3% body weight daily ration for a period of 2 months to prepare them as broodstock.

Holding and breeding ponds cont'd

- ❑ At the end of this period, 30 females and 15 males will be transferred into hapas (7m by 3m) for spawning at ratio of two females to one male.
- ❑ The rest of brood stock is to be put on a maintenance ration of 0.5% body weight as they wait for subsequent spawning cycles.
- ❑ The fry shall be harvested and graded by size then transferred to hapas in the nursing ponds within a period of 15- 20 days.
- ❑ To prepare subsequent sets of brood stock for spawning, they will be fed on 3% of body weight for two weeks prior to spawning.

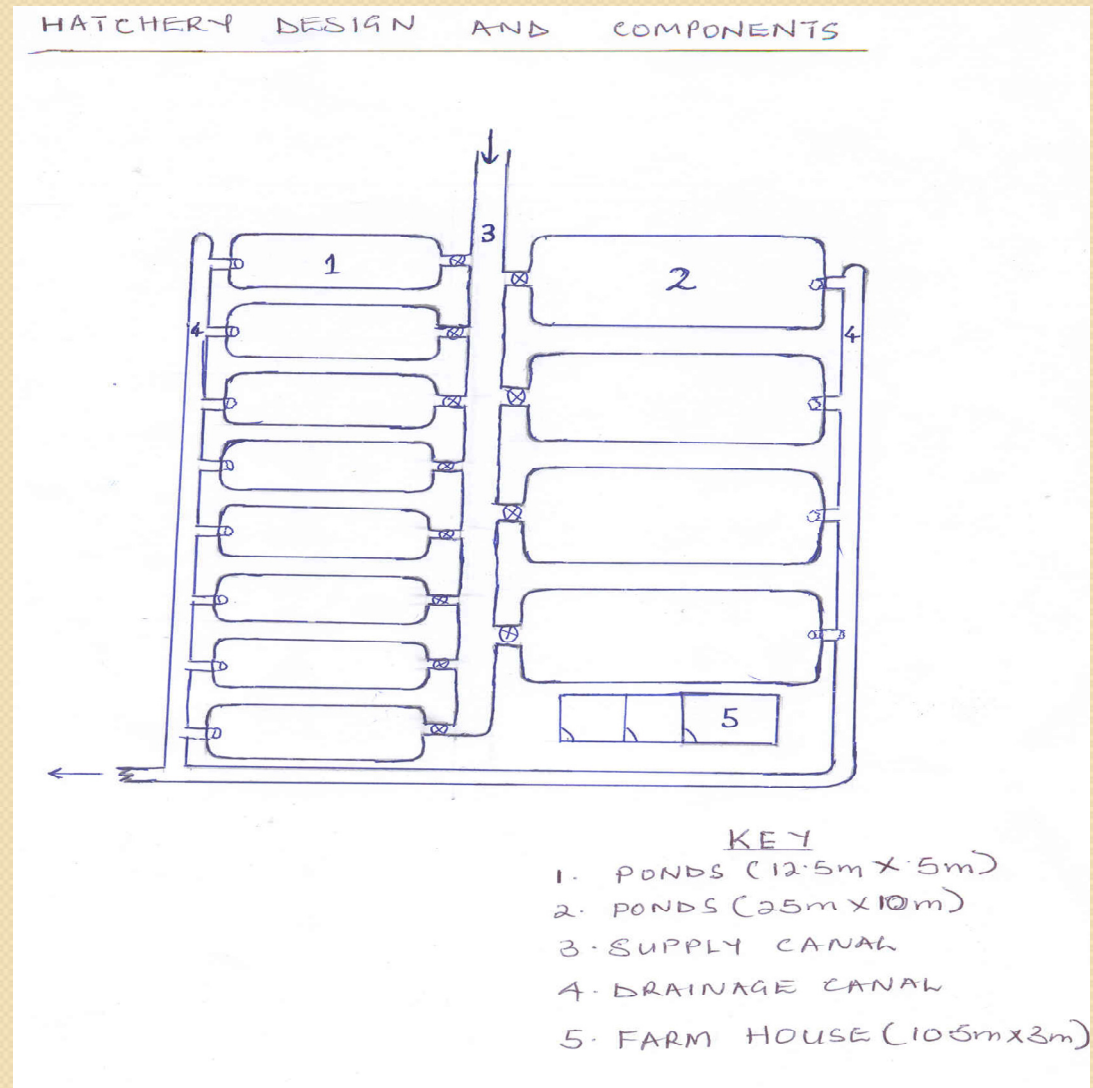
Nursing ponds

- ❑ In the nursing ponds, there shall be two happas each 2 by 4 meters. Each hapa will be stocked with 15,000 fry with projected 10 percent mortality.
- ❑ The fry is to be fed on 45% protein content feeds at 25 percent of their body weight, with a gradual reduction of 5 percent per week for a month before transferring them into rearing ponds.
- ❑ The fry will there after be transferred into earthen rearing ponds, where they will be reared for another month.

Rearing ponds

- ❑ There shall be four rearing ponds each measuring 25m by 10m. Each pond will be stocked with 15,000 fry to be reared for one month to attain an average size of 5 grams before being sold to farmers.
- ❑ The fingerlings will depend on natural food supplemented with artificial feed of 30% protein at 5% of body weight.

5.0 HATCHERY DESIGN AND COMPONENTS



6.0 PLANNED INVESTMENT OUTPUT

- ❑ 1-acre piece of land.
- ❑ Twelve fish ponds totaling 2000sq.m, eight of them measuring 12.5m by 5m each and four of them measuring 25m by 10m.
- ❑ A farm house with an office, a store and a rest room.
- ❑ Two sets of hapas, one for spawning and the other for fry nursing.
- ❑ A set of hatchery implements and equipments.
- ❑ 180 broodstock.

7.0 Capital cost; (Land, pond construction and Farm house)

No	Item / description	Unit	Qty	Unit Cost (USh)	AMOUNT (USh)
1	Purchase of land	Acre	1	1,620,000	1,620,000
2	Water & soil analysis	Consultancy	1	300,000	300,000
3	Site clearing	Man days	20	4,000	80,000
4	Slashers	Pieces	5	3,000	15,000
5	Hoes	Pieces	10	5,000	50,000
6	4 "heavy duty PVC pipes	Pieces	24	50,000	1,200,000
7	4 "PVC elbow joints	Pieces	12	10,000	120,000
8	Pond construction works	Man/day	2000	4,000	8,000,000
9	Channel construction	Man/day	100	4,000	400,000
10	Construction of a farm house (31.5m2)	Number	1	1,000,000	750.000
					11,536,500

Capital cost; Equipment and Broodstock

No	Item / description	Unit	Qty	Cost USh	TOTAL
1	Broodstock hapas	Set	6	80,000	480,000
2	Fry/ Fingerling hapas	Set	6	50,000	300,000
3	Broodstock purchase	Piece	180	2000	360,000
4	Sampling nets	No	1	300,000	300,000
6	Oxygen cylinder	Set	1	260,000	260,000
7	Assorted Sieves	Set	1	10,000	10,000
8	Scoop nets	No	5	2,000	10,000
8	Basins and buckets	No	5	5,000	25,000
9	Weighing scale	Piece	1	100,000	100,000
10	Thermometer	Piece	1	15,000	15,000
					1,860,000

Annual Recurrent costs

No	Item / description	Unit	Qty	Cost USh	TOTAL
1	Farm manager's Salary	Month	12	400,000	4,800,000
2	Salary – laborers'(2)	Month	12	80,000	960,000
3	Casual laborers wages	Man-day	180	4,000	720,000
4	Fish feeds- broodstock	Kg	655	1,200	786,000
	Fry feed & fingerlings feed	Kg	108	2,000	216,000
		Kg	3285	1,500	4,927,500
5	Fertilizer- Urea	50-Kg bag	2	65,000	135,000
	Fertilizer -SSP	50-Kg bag	2	75,000	150,000
	Fertilizer – compost	Kg	1008	100	100,800
6	Oxygen refilling	Cylinder	2	50,000	100,000
7	Packing materials	200-m roll	2	25,000	50,000
8	Lime	25-Kg bag	11	15,000	165,000
TOTAL					13,110,300

Investment Budget Summary

SN	Expenditure category	Amount (Ush)	Replacement period
1 a)	Capital costs: Procurement of Land	1,620,000	-
b)	Ponds and farm house construction	9,916,500	10 years
c)	Equipments and implements and brood stock	1,860,000	3 years
2	Recurrent costs: - annual total	13,110,300	-
	Total Project Cost	26,506,800	

8.0 PRODUCTION AND MARKETING

- ❑ Projected fingerling output is 20, 000 of high quality *Oreochromis niloticus* fingerlings per month (240,000 annual)
- ❑ Fingerlings will be sold at USh. 80/piece.
- ❑ Projected annual income is therefore USh.19.2 million generated from fingerling sales.

9.0 PROJECT ECONOMIC EVALUATION

- ❑ Returns above variable costs (GR – TVC) $19,200,000 - 7,350,300 = 11,489,700$.
- ❑ Net Returns (GR- TC) $19,200,000 - 13,110,300 = 6,089,700$.
- ❑ Break Even Price(BEP) above total variable cost (TVC) = UShs. 30.60.
- ❑ Break -even price above total cost = UShs. 54.60.
- ❑ Break even yield above total variable cost (TVC/unit price) = 91,879.
- ❑ Break even yield above total cost (TC/unit price) = 163,879.
- ❑ Pay back period (total investment cost/annual net returns) = 4years

DISCOUNTED CASH FLOW STATEMENT

Cash flows (‘000)	Period in years									
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Cash Inflows	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200
Cash out flows	13,110	13,110	13,110	14,970	13,110	13,110	13,110	14,970	13,110	13,110
Net Returns	6,089	6,089	6,089	4,230	6,089	6,089	6,089	4,230	6,089	6,089
Discounting factor	0.870	0.756	0.658	0.572	0.497	0.432	0.376	0.327	0.284	0.247
Net Present Value	5,298	4,604	4,007	2,420	3,027	2,631	2,290	1,383	1,729	1,504
NB: - Net present value = 28,892,334 -Net Present Value – Total investment cost (28,892,334 – 26,506,800) = 2,385,534 -The discounting factor is based on interest rate of 15% per year.										

10 : ACTION PLAN

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CONCLUSION

- ❑ From an economic variance analysis, the undertaking is deemed to be viable in view that within four years of operation the business will to have recuperated all the investment costs thereby sustaining itself.
- ❑ The discounted net present value of the project is positive at the prevailing commercial interest rates. The project is therefore economically viable.

THANK YOU,

MERCI,

SHUKRAN