Detailed Project Report

On

Bio-Floc Fish Farming (10 Tanks)

Under MKUY

Name of the Entrepreneur/Entity:

Address:

Contents

1. Project Summary

1	Name of the Enterprise (as per the Illustrative List of Enterprises)	Bio-Floc Fish Farming
2	Sector (as per the Illustrative List of Enterprises)	Fishery
3	Project Capacity[1]	10 Tanks
4	Key components of the project	Production of Fish
5	Project Address (Village/Ward, Gram Panchayat/Municipality, Block, District)	
6	Products/Output from the project	Fish
7	Total Project Cost	Rs. 22,08,000
8	Fixed Capital Cost	Rs. 21,57,000
9	Working/Recurring capital (for one month)	Rs. 51,000
10	Bank Finance/ Self Finance	Self- Finance
11	Bank Loan Amount	-
12	Promoter Contribution	Rs. 22,08,000
13	Assumed Rate of Interest	11%
14	Subsidy Eligibility (40%, 50%)	
15	Repayment Terms (Tenure, Moratorium, Frequency, Mode of Repayment: equal principal/equal instalment)	
16	Key Financial Indicators: 1. Average Annual Net Profit 2. Debt Service Coverage Ratio (DSCR) 3. Internal Rate of Return 4. Break Even Year	 Rs. 7,94,216 32.65% 3 Years 0 Month
17	Estimated employment to be generated (nos.)	2

Note:

1. Customized DPR is to be prepared as per the information given by the beneficiary.
2. The CIS will be calculated as per the cost norm of MKUY guideline.
3. All the prices quoted here are indicative in nature.
4. The particulars under each component of the Capital Investment may be changed as per the requirement of the project.

[1] Capacity can be in terms of area or quantity

2. Project Profile

2.1 Entrepreneur/Entity Profile

1	Name of the Entrepreneur/Entity	
2	Legal status (Individual/ Group/ FPO/ FPC/ Proprietorship/ Partnership firm/ Company/ Cooperative/ Federation/ Society/ Trust)	
3	Name of Representative[2] in Ease of entity	
4	Gender (Male/ Female/ Third Gender/ Not Applicable)	
5	Date of Birth of Individual/Representative of Entity	
6	Date of Incorporation/Registration of Entity	
7	Category opted for (Women/ ST/ SC/ Differently Abled/ Third gender/ Agri & Allied Graduate)	
8	Educational Qualification of Individual/Representative of Entity	
9	Passport size photograph of the Individual/ Representative of entity	
10	Local Address for Correspondence of the Individual/ Representative of entity	
11	Registered Address of Entity	
12	Main Office/Branch Address of Entity	
13	Phone no. of Individual/Representative of Entity	
14	Email Id of Individual/Representative of Entity	
15	AADHAR No. of Individual/Representative	
16	PAN of Individual/Representative of Entity, if available	
17	Farmer Id of Individual, if available	
18	Details of other Partner/Director/ President/Secretary	
19	Registration No./ CIN of the Entity[3]	
20	PAN/TAN of Entity	
21	GSTIN of Entity, if available	
22	Details of experience and exposure relevant to the proposed enterprise/project (family business, work experience, e-learning/certificate courses, trainings undertaken etc.)	

[2] Representative should be authorized by the board/governing body of the entity.

[3] Registration document:
Groups (SHG/PG/: FPO: Proprietorship firm: Registration Certificate under Shops & Establishment Act, Partnership firm: Registration Certificate from IGR of state, Company (Pvt. Ltd., Public Ltd., LLP, OPC, FPC): Certification of Incorporation, Cooperative/ Federation: Certificate of Registration from Registrar of Cooperative Societies, Society/Trust: Darpan Unique Id

2.2. Project Consultant Details

DPR prepared by: APICOL, Baramunda, Bhubaneswar

2.3. Concept and Scope of the Project

"Bioflocs" are a consortium of particulate matter formed predominantly by a biota of aerobic and heterotrophic bacteria, protozoa, microalgae (diatoms), metazoans, detritus, faeces, remnants of feed and remains of dead organisms

Principle on which Bio-floc works

Bio-floc system is a wastewater treatment, which has gained vital importance as an approach in aquaculture.

- It combines the removal of nitrogenous metabolites from the water by addition of carbon source externally for the production of microbial biomass under strong aeration, which then can be used by the cultured fish species as an additional food source.
- The principle of the technique is to maintain the higher C-N ratio by adding carbohydrate source and the water quality is improved through the production of high-quality single cell microbial protein.
- In such condition, heterotrophic microbial growth occurs which assimilates the nitrogenous waste that can be exploited by the cultured species as a feed and also works as bioreactor controlling of water quality.
- Immobilization of toxic nitrogen species occurs more rapidly in biofloc because of the growth rate and microbial production per unit substrate of heterotrophs are ten-times greater than that of the autotrophic nitrifying bacteria.
- This technology is based on the principle of flocculation within the system.

Major requirements of BFT

- High stocking density
- High aeration (To keep DO level >6ppm)
- Sludge/waste disposal system
- Poly-lined ponds /poly-tarpaulin or cemented tanks
- Indoor/Outdoor
- Suitable candidate species (Fin/Shellfish & FW/BW/MW)
- Zero water exchange
- Zero tolerance to antibiotics

Basic Requisites for BFT

- Biofloc tank installation
- Air pump and supply
- Feed, probiotics, molasses & chemicals
- Water quality test kit & equipment

Nutritional value of Bio-floc

- Dry weight protein ranges from 25–50%
- Fat ranges from 0.5–15%
- Good source of vitamins and minerals, particularly phosphorous

- It has an effect similar to gut probiotics
- The dried bio-floc meal is proposed as an ingredient to replace the fishmeal or soybean meal in the feed.

Advantage of Bio-floc technology

- It is an eco-friendly fish farming system and it reduces environmental impact.
- Judicial use of land and water
- Limited or zero water exchange system thus reducing the pollution
- Higher productivity (it enhances survival rate, growth performance and feed
- conversion in the culture systems of fish).
- It provides higher bio-security thus minimizing the risk of disease
- outbreaks.
- It reduces utilization of protein rich feed and cost of standard feed.
- It reduces the pressure on capture fisheries i.e., use of cheaper food fish and
- trash fish for fish feed formulation.

Fish Species Suitable for Bio-floc Technology

Bio-floc system works best with species that are able to derive some nutritional benefits from the direct consumption of floc. Bio-floc system is most suitable for species that can tolerate high solids concentration in water and are generally tolerant of poor water quality. Some of the species that are suitable for bio-floc technology are:

- Air breathing fish like Singhi (Heteropneustes fossilis), Magur (Clarias batrachus), Pabda (Ompok pabda), Anabas/Koi (Anabas testudineus), Pangasius (Pangasianodan hypophthalmus).
- Non-air-breathing fishes like Common Carp (Cyprinus carpio), Rohu (Labeo rohita), Tilapia (Oreochromis niloticus), Milkfish (Chanos chanos).
- Shellfishes like Vannamei (Litopenaeus vannamei) and Tiger Shrimp
- (Penaeus monodon) - in brackish water systems.

Bio-floc Fish Farm Infrastructure

Under the scheme promoted by the Department, the technical standards of circular tanks constructed from cement concrete or PVC/HDPE polyliners with metallic/PVC frames is a minimum of 4-meter diameter, 1.3-meter depth and with central drain. The tanks should be housed in a shed constructed from shade net. Good sunlight is essential for bio-floc 04 Bio-floc Technology in Fish Farming culture. Transparent polyliners can also be used by replacing shade nets to increase the sunlight and to protect the tanks from rainwater. Freshwater can be sourced from borewell or municipal tap water line. In case of municipal tap water, care should be taken to remove all the chlorine content from source water. Each tank should be provided with ample aeration line with air blower. Air blowers should have to power backup from inverter with battery or mini genset for continuous aeration.

Example of GIFT farming in Bio-floc system: Seed stocking density, feed management and water quality management

S. No.	Component	Details
1	Bio-floc Tank size (1.20 m water depth)	4 metre diameter and 1.5-meter height
2	Water holding capacity of each tank	15,000 Litres capacity
3	Water quality parameters	Dissolved Oxygen - 5mg/L; Temperature-26-34°C, pH-7.5 to 8, TDS-600ppm, Floc density-25-40mg/l, Ammonia-0.5 ppm, Nitrite-0.3 ppm, Nitrate-150 ppm, Alkalinity-120-280 ppm
4	Stocking density depending on species)	100 nos/m3(1000 nos. of fingerlings per tank)
5	Common Species cultured	GIFT Tilapia *(Oreochromis niloticus)* - mono-sex fingerlings bought from licensed hatcheries should be stocked for fast and uniform growth
6	Survival (%)	80
7	Type of feed to be used Fat 3%)	Floating pellet feed (Crude Protein 22-24%;
8	% of feed per day	2-3% of Average Body weight per day
9	Feeding frequency	4 times early stage, later 2 times per day
10	FCR	1:1.25
11	Duration of culture	4 months
12	Size/ weight of the fish at harvest (gram)	500 g average weight
13	No. of crops per year	3

How to Prepare the Inoculum:

METHOD I:

For 15000 Litres of fresh water 150 Litres of inoculum is required for the floc development

Step 1

Take clean tub/can with 150 Litres of water and continue vigorous aeration

Step 2

Add 3 Kg of pond soil

+

1.5 gm of Ammonium sulphate /Urea

+

30 gm of carbon source (Jagerry /Wheat flour /Tapioca flour)

Step 3

Mix it well with water in tub and provide adequate aeration

Step 4

The inoculum will be ready after 24-48 hrs and it can be transferred to main tank

- Daily addition of carbon source is required for the development of floc. For every 1 kg of feed given (with 25 % of crude protein), 600 gm of carbon source is to be added to the system to maintain C: N of 10:1.
- Once the floc volume reaches 15-20ml further addition of carbon source is not required

METHOD II:

Step 1

Take clean tub/can with 130 Litres of water and continue vigorous aeration

Step 2

Add 20 Litres of pond water/RAS water (before filtration)

+

30 gm of carbon source (Jagerry /Wheat flour /Tapioca flour)

+

10 gm of probiotic (with Bacilus Sp., Aspergilus Sp. etc with a total concentration of 10x109 CFU/gm)

Follow the remaining steps as mentioned in **method 1**

***NB: Well developed inoculum will be turbid with foam on the water surface (Ideal Volume of Floc in Imhoff cone for shrimp is 10-15 ml/L**

Techno-commercial Assumptions

Sl. No.	Parameter	Value	Unit
1	Increase in Rate of Product	5	%
2	Increase in Electricity consumption	3	%
3	Collection from Debtors (First Year)	15	Days
4	Collection from Debtors	15	Days
5	Payable to Creditors	20	Days
6	Drawing By Promoter	20	%
7	Increase in Staff Salary	5	%
8	Rate of Interest on TL	11	%
9	Rate of Interest on WC	9	%
10	Loan Repayment (in year)	7	Days
11	Raw Material in Stock (on sales)	7	Days
12	Finished Goods in stock (on sales)	10	Days
13	Promoter's Contribution (Term Loan)	100	%
14	Promoter's Contribution (Working Capital)	100	%
15	Working Capital Requirement	1	Months
16	Working Capital Utilisation	100	%
17	No. of Working days	360	Days
18	No. of Tanks	10	Nos.
19	No. of fingerlings per tank (Stocking)	1200	Nos.
20	Production per tank per crop of Tilapia/ Pangasius/ Catfish/ Amur carp/ Scampi/ shrimp/ barb etc.	600	kg
21	No. of crop per year	3	Nos.
22	Feed per Tank per Year	400	Kg
23	Cost of Feed per kg	36	Rs
24	Cost of one Fingerling	4	Rs
25	Cost of probiotic per tank per annum	1600	Rs
26	Office Space	50	Sq. ft
27	Store Space	50	Sq. ft
28	Cost of Office construction per sq. ft	850	Rs
29	Cost of Store construction per sq. ft	400	Rs
30	Space required for one Tank	345	Sq. ft
31	Cost of construction of one Tank	45000	Rs
32	Cost of construction of shed with flooring per sq. ft.	320	Rs
33	Survival Rate	80	%
34	Size /Weight of Fish at harvest	0.5	Kg
35	Selling price of one kg fish	130	Rs

3. Financial Details

4.1. Project Fixed Capital

Details of Fixed Assets					
Sl. No.	**Particulars**	**Unit**	**Qty.**	**Cost per unit (Rs)**	**Total (Rs)**
A	**Land**				
1	Land Development	Sq. ft	5000	0.70	3,500
2	Fencing (Barbed wire)	ft	200	60.00	12,000
	Sub Total				**15,500**
B	**Civil Construction**				
1	Construction of Shed including installation charges with flooring	sq. ft	3450	320.00	1,104,000
2	Setup of Bio-Floc Tanks: Brick Masonary with frames, solid base, drain pipe fish net covering (4m dia x 1.5 m depth tank with 1.2 m water depth =15,000 lts Capacity each Tank) with 150 cum capacity	Nos.	10	45,000.00	450,000
3	Store	sq. ft	50	400	20,000
4	Office	sq. ft	50	850.00	42,500
	Sub Total				**1,616,500**
C	**Water Supply**				
1	Water Supply with borewell, pump (3 HP) and PVC pipe fittings for air and water flow	Nos	1	LS	**200,000**
D	**Electrification**				
1	Electrical Installation & DG Set/ Power Generator/ Any other back up system				**100,000**
E	**Plant & Machinery (all machinery items to be specified as per requirement)**				
Sl. No.	**Particulars**	**Specification**	**Qty**	**Unit Price (Rs)**	**Total (Rs)**
1	Ring Blower (2 nos of 3 HP)/ High pressure air pump and other accessories				100,000
2	Nets & Accessories (Air Oxi tube/ Air Oxi Spider etc.)				75,000
3	Electronic weighing balance				1,000
4	Other accessories				24,000
	Total Machinery Cost				**200,000**
G	**Miscellaneous Expenditure**				
1	Insurance premium of assets				15,000
2	Cost of DPR Preparation				5,211
3	Other miscellaneous exp.				4,789
	Total Miscellaneous Expenditure				**25,000**

4.2. Project Variable Expenses

Details of Recurring Expenditure						
A	**Details of raw material (per annum @ 100%)**					
Sl. No.	**Items**	**Unit**	**Rate/Unit (in Rs)**	**Qty/day**	**Qty/annum(kg)**	**Total (Rs)**
1	Fish Fingerlings Tilapia/ Pangasius/ Catfish/ Amur carp/ Scampi/ shrimp/ barb etc.	Nos	4		36,000	144,000
2	Formulated Feed (24-30% crude protein & 3% fat)	Kg	36		4,000	144,000
3	Probiotics, Carbon source test kits	Rs			LS	16,000
	Total				**40,000**	**304,000**

Details of salary and other benefits				
Sl. No.	**Type of Workers**	**No. of Worker**	**Salary Per Month/head (Rs)**	**Total Salary per Annum (Rs)**
1	Unskilled	1	10,000	120,000
2	Skilled	1	12,000	144,000
	Grand Total	**2**		**264,000**

4.3. Details of Sales

Details of sales						
Sl. No.	**Type of products**	**Unit**	**Rate/Unit (Rs)**	**Quantity/day**	**Quantity/annum**	**Total (Rs)**
1	Tilapia/ Pangasius/ Catfish/ Amur carp/ Scampi/ shrimp/ barb etc. production	Rs	130		14,400	1,872,000
	Total				**14,400**	**1,872,000**

4.4. Project Balance Sheet

Liabilities	I	II	III	IV	V	VI	VII
Opening Capital	**-**	**2,027,408**	**2,072,457**	**2,197,755**	**2,454,179**	**2,751,854**	**3,033,002**
Add: Introduced	2,208,000						
Add: Profit	326,408	564,050	675,298	870,424	986,675	1,040,148	1,096,512
Less: Drawing	507,000	519,000	550,000	614,000	689,000	759,000	826,000
Closing Capital	**2,027,408**	**2,072,457**	**2,197,755**	**2,454,179**	**2,751,854**	**3,033,002**	**3,303,514**
Term Loan from Bank	-	-	-	-	-	-	-
Current Liabilities							
Cash Credit from Bank	-	-	-	-	-	-	-
Sundry Creditors	12,160	16,000	17,933	21,200	23,533	24,733	26,000
Expenses Payable	34,900	37,400	39,600	42,100	44,500	46,700	49,100
Current Provisions	4,021	31,637	59,450	108,231	155,003	177,921	202,077
Total Current Liabilities	**51,081**	**85,037**	**116,983**	**171,531**	**223,037**	**249,354**	**277,177**
Total Liabilities	**2,078,489**	**2,157,495**	**2,314,738**	**2,625,710**	**2,974,891**	**3,282,356**	**3,580,691**
Assets							
Fixed Assets	2,132,000	2,132,000	2,132,000	2,132,000	2,132,000	2,132,000	2,132,000
Less Depreciation	226,650	403,470	583,119	743,177	885,848	1,013,078	1,126,586
Net Fixed Assets	**1,905,350**	**1,728,530**	**1,548,881**	**1,388,823**	**1,246,152**	**1,118,922**	**1,005,414**
Current Assets							
Sundry Debtors	56,200	73,800	82,600	97,600	108,200	113,700	119,400
Inventories	34,800	35,900	46,272	52,089	61,122	67,411	70,739
Cash and Bank Balance	11,300	14,800	16,600	19,600	21,700	22,800	23,900
Other Current Assets	70,839	304,465	620,385	1,067,599	1,537,717	1,959,522	2,361,237
Total Current Assets	**173,139**	**428,965**	**765,857**	**1,236,888**	**1,728,739**	**2,163,433**	**2,575,276**
Total Assets	**2,078,489**	**2,157,495**	**2,314,738**	**2,625,710**	**2,974,891**	**3,282,356**	**3,580,691**

4.5. Calculation of Depreciation

Rates of Depreciation		10%	15%	Total depreciation for the year (Rs)
Year	1	181,650.00	45,000	226,650
	2	163,485.00	38,250	201,735
	3	147,136.50	32,513	179,649
	4	132,422.85	27,636	160,058
	5	119,180.57	23,490	142,671
	6	107,262.51	19,967	127,229
	7	96,536.26	16,972	113,508

4.6. Projected P&L

Description	Year ending March 31st						
	I	II	III	IV	V	VI	VII
No of Working months	12	12	12	12	12	12	12
Capacity Utilisation	**60**	**75**	**80**	**90**	**95**	**95**	**95**
Revenue							
Sales	1,123,200	1,475,000	1,652,000	1,952,000	2,164,000	2,273,000	2,387,000
Opening Stock of Finished Goods	-	(31,200)	(40,972)	(45,889)	(54,222)	(60,111)	(63,139)
Closing Stock of Finished Goods	31,200	40,972	45,889	54,222	60,111	63,139	66,306
Total Income (A)	**1,154,400**	**1,484,772**	**1,656,917**	**1,960,333**	**2,169,889**	**2,276,028**	**2,390,167**
Expenditure							
Opening stock of Raw Material	**-**	**3,600**	**4,700**	**5,300**	**6,200**	**6,900**	**7,300**
Purchase (Net) of Material	182,400	240,000	269,000	318,000	353,000	371,000	390,000
Closing Stock of Raw material	**3,600**	**4,700**	**5,300**	**6,200**	**6,900**	**7,300**	**7,600**
Raw Material Consumption	**178,800**	**238,900**	**268,400**	**317,100**	**352,300**	**370,600**	**389,700**
Repair & Maintenance- Machinery (@5% of Cost)	105,825	111,200	116,800	122,700	128,900	135,400	142,200
Utility expense	22,464	29,500	33,100	39,100	43,300	45,500	47,900
Insurance cost	15,000	15,800	16,600	17,500	18,400	19,400	20,400
Administrative salaries and wages	264,000	277,200	291,100	305,700	321,000	337,100	354,000
Other Misc Expenses [@1% of sales]	11,232	14,750	16,520	19,520	21,640	22,730	23,870

Description	Year ending March 31st						
	I	II	III	IV	V	VI	VII
No of Working months	12	12	12	12	12	12	12
Total Cost	**597,321**	**687,350**	**742,520**	**821,620**	**885,540**	**930,730**	**978,070**
Profit Before Depreciation, Interest and Tax	**557,079**	**797,422**	**914,397**	**1,138,713**	**1,284,349**	**1,345,298**	**1,412,097**
Depreciation	226,650	201,735	179,649	160,058	142,671	127,229	113,508
Profit Before Interest and Tax	**330,429**	**595,687**	**734,748**	**978,655**	**1,141,678**	**1,218,069**	**1,298,589**
Interest on Term Loan	-	-	-	-	-	-	-
Interest on Working Capital Loan	-	-	-	-	-	-	-
Total Interest Paid	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Profit Before Tax	**330,429**	**595,687**	**734,748**	**978,655**	**1,141,678**	**1,218,069**	**1,298,589**
Income Tax	4,021	31,637	59,450	108,231	155,003	177,921	202,077
Profit after Tax	**326,408**	**564,050**	**675,298**	**870,424**	**986,675**	**1,040,148**	**1,096,512**

4.7. Projected Cash Flow

Period Ending:	I	II	III	IV	V	VI	VII
Cash & Bank Balance at Beginning	-	11,300	39,715	41,515	44,515	46,615	47,715
Cash Inflow during the Period	2,330,606	660,420	784,650	1,007,864	1,123,688	1,166,604	1,232,933
Cash Outflow during the Period	2,319,306	632,005	782,850	1,004,864	1,121,588	1,165,504	1,231,833
Closing Cash & Bank Balance	**11,300**	**39,715**	**41,515**	**44,515**	**46,615**	**47,715**	**48,815**

4.8. Calculation of BEP and IRR

Calculation of Break-Even Point (BEP)							
Sales	**1,154,400**	**1,484,772**	**1,656,917**	**1,960,333**	**2,169,889**	**2,276,028**	**2,390,167**
Variable Cost	190,032	253,650	284,920	336,620	373,940	393,330	413,570
Contribution	**964,368**	**1,231,122**	**1,371,997**	**1,623,713**	**1,795,949**	**1,882,698**	**1,976,597**
Fixed Cost	633,939	635,435	637,249	645,058	654,271	664,629	678,008
BEP Sales	**758,859**	**766,355**	**769,585**	**778,789**	**790,499**	**803,482**	**819,870**
Average BEP sales	**783,920**						

Calculation of Internal Rate of Return (IRR)				
Sl. No.	**Year**	**PAT**	**Depreciation**	**Cash Accrual**
	Cash outflow at beginning			-2,208,000
1	31/03/2024	326,408	226,650	553,058
2	31/03/2025	564,050	201,735	765,785
3	31/03/2026	675,298	179,649	854,947
4	31/03/2027	870,424	160,058	1,030,482
5	31/03/2028	986,675	142,671	1,129,345
6	31/03/2029	1,040,148	127,229	1,167,377
7	31/03/2030	1,096,512	113,508	1,210,020
IRR		**32.60%**		
Payback Period		**3 Years 5 Months**		

4.9. Summary of Project Cost

Sl No	Name of Assets	Amount
1	Land Development	15,500
2	Civil Construction	1,616,500
3	Irrigation/Water Supply	200,000
4	Electrification	100,000
5	Plant & Machinery	200,000
6	Livestock	-
7	Insurance	15,000
8	DPR Cost	5,211
9	Other Miscellaneous Exp.	4,789
	Total Fixed Cost	**2,157,000**
	Recurring (for one month)	**51,000**
	Cost of Project	**2,208,000**