

A FEASIBILITY REPORT

FOR

**THE ESTABLISHMENT OF SELECTED
AGRICULTURAL ENTERPRISES IN UNICAL
INTEGRATED FARMS LIMITED**

PREPARED FOR

**THE GOVERNING COUNCIL
UNIVERSITY OF CALABAR
CALABAR – NIGERIA**

JULY, 2011.

EXECUTIVE SUMMARY

The increasing operational cost vis-à-vis the dwindling and unstable funding in Nigerian universities has forced many universities including the University of Calabar to devise means of boosting their internally generated revenue base. For the University of Calabar, one of the ways to achieve this will be through investments in agricultural projects as a result of her location and comparative advantage in agricultural production over other enterprises. Given this scenario the Governing Council of the University of Calabar mandated the Chair Person of the newly constituted University of Calabar Farms to prepare a feasibility report on some potential viable agricultural enterprises that the University of Calabar can invest in (using the available structures and equipment in the present Poultry and Livestock Farm) to engender her desire to diversify her internally generated revenue base and therefore increase her income. It is based on this mandate that this study was carried out and the report presented. Information on inputs and outputs as well as their respective prices were obtained from various sources within and without the State. The data obtained for each enterprise were subjected to some economic and financial analyses of projects such as costs and returns, cash flows and some feasibility indices. The indices of feasibility often considered in project analysis which is also used in this study were; Net Present Value (NPV), Benefit-Cost Ratio, Internal Rate of Return (IRR) and Pay Back Period (PBP). A sensitivity analysis was also carried out to ascertain the viability of the projects at higher discount rates. The results indicate that in Broiler enterprise, to produce 10,000 birds, an initial investment of N37,953,039.9 (fixed and operating cost) will be required. The revenue streams are presented in Table 3. The NPV is positive (N 18, 283,377.27), the IRR (70%) is far higher than interest charged on loans by commercial banks, while the BCR (1.15) shows that for every naira investment 0.15 naira will be earned. The pay back period of this investment given the income streams would be 16 months (1.3 years). The sensitivity analysis showed that the project is viable even at 25 percent. For the Layer enterprise (using deep litter), with 10,000 birds, the initial cost would be about N62,895,834.00 for one production cycle of 18 months. The NPV is positive (23,321,348.63) , while the BCR, IRR, and PBP are 1.11, 68.26% and 1.3 years respectively. The Mushroom enterprise with an initial investment of N3,659,670.00 equally recorded a positive NPV (N16,235,069.00) and a very high IRR (296%); BCR (2.83) and a PBP of one year and three months. The analysis for the Hatchery/Parent stock enterprise shows that an initial investment of about N17,716,560.00 would be required. The NPV, BCR, IRR and PBP are N3,182,103.19 , 1.07, 25 % and 1 year and 7 months respectively. Initial investment for the Feed Mill is about N211,363,600 . Annual production of poultry feed is about 2534.4 tons, while the average price per ton is about N82,000.00. The values of NPV, BCR, IRR and

PBP are N 1,870,607.60, 1.0, 11% and one year and two months respectively. Sensitivity analysis indicates that, a rate of interest above 11 percent will render the enterprise unviable for investment in the short term. In the fish farm enterprise, given the existing facilities in the Institute of Oceanography farm, the NPV is positive, while the IRR is very high (328%), BCR (1.3) and PBP (1.07 years) are indicative of the feasibility of this project. The ranking of the project in terms of feasibility/profitable shows that Mushroom comes first followed by Fish Farm, Broiler and so on. Feed mill comes last on the ranking.

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STUDY TEAM

- 1) Prof. M.G.Solomon - Chair Person (Unical Farm Committee)**
- 2) Dr. I.C.Idiong - Agricultural Economist**
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SECTION ONE

INTRODUCTION

1.1 PROJECT RATIONALE

The increasing operational cost vis-à-vis the dwindling and unstable funding in Nigerian universities has forced many universities including the University of Calabar to devise means of boosting their internally generated revenue base. For the University of Calabar, one of the ways to achieve this will be through investments in agricultural projects. This is done with the belief that the University by reason of its location has a comparative advantage in agricultural production enterprises over other enterprises.

Apart from enhancing the revenue base of the university, these enterprises will create employment and income for participant along the value chain. It will also engender research activities of staff and students and as well as bridging the supply demand gap of the agricultural products in the State. The presence of these projects will complement the practical training activities of the proposed Entrepreneurial Development Centre of the University of Calabar, there by making graduates of the university self employed, employable and employers of labour.

1.2 FARM LOCATION/PRESENT STATUS

The proposed project is an integrated farm that shall comprise; Broiler and Layer enterprises, Hatchery/Parent stock enterprise, Indoor Mushroom production, Livestock Feed Mill and Fish farming. Apart from the Fish Farm which will be located, the other enterprises will use the facilities available in the University of Calabar Poultry and Livestock Farm.

The University of Calabar Poultry and Livestock Farm which was established with the following unit Broiler and Layer units, Parent Stock/Hatchery unit, Feed Mill and Piggery units have been operating under capacity and therefore unable to achieve the objectives for which it was established. More so, Hatchery/ Parent Stock and Piggery units have never been in operation and the structures have fast deteriorated without commensurate income generated to replace

them. These structures and equipment would require complete replacement in some instances and renovation in others. The need to provide security will demand the erection of perimeter fencing around the farm. All these have been captured in this report appropriately.

1.3 FUNDING

The proposed project will be financed from with a credit facility provided by the Central Bank of Nigeria's (CBN) for Commercial Agriculture at an interest rate of 9 percent. Discussions on the modality for sourcing the loan had already commenced with the Zenith Bank Plc in Calabar (one of the facilitating banks).

1.4 METHOD OF DATA COLLECTION

Data used for this report were obtained through personal interviews, literature search in books and the internet. Visits were made to some notable agricultural firms in Calabar, Lagos and Ibadan.

1.5 DATA ANALYSIS

Data obtained for the study are presented in tables. Some indices were estimated to ascertain the feasibility of the proposed project. These indices include: Net Present Value (NPV), Internal Rate of Return (IRR), Benefit Cost Ratio (BCR) and Pay Back Period (PBP). A sensitivity analysis was also carried out to ascertain the feasibility of the projects even at higher rates of interest. The analyses were carried out using the Microsoft EXCEL 2003 computer software.

1.6 INPUT SOURCES

For the layers and birder enterprises day old chicks will be gotten from Agrited Nig Ltd in Ibadan. The feeders and drinkers will be obtained from Pfizer in Lagos fingerlings and feed shall be sourced from institute of oceanography of the University of Calabar, while spawned and

seeded compost bags will be gotten from the Royal International Farms in Calabar. Other equipment and machinery will be sourced locally.

1.7 ECONOMIC FEASIBILITY ANALYSIS

The project satisfies the University of Calabar Governing Council's policy regarding diversification of the internally generated revenue base of the University. It also satisfies the Federal government's policy on 'employment generation, entrepreneurial spirit development, poverty alleviation and food security via commercial agricultural production. The project shall benefit from the subsidized credit facility earmarked for commercial agriculture by the Federal government of Nigeria.

1.7.1 Market Analysis

The existing markets for the products (eggs & birds, day old chicks, fresh fish and mushroom) of these enterprises include several hotels and fast food business, individuals and corporate organisations in Cross River and Akwa Ibom States. It shall also include the university community and its environs as well as investors in production and agro processing within and outside the State.

Apparently there is no known potential competitor within the area of this project. Would **be competitors** appear to have folded up their businesses in the last 5 years. With respect to the **Hatchery enterprise** there is no known competitor within Akwa Ibom and Cross River State.

The hatchery unit will make day old chicks easily available to the farmers who depend on vendors that procure same from farms in far places like Ibadan and Benin.

The farm will establish sales depots for its products within and outside Calabar. This will include places like Ugep, Ikom, Ogoja and Obudu. Within 5 years of operation the farm shall integrate some processing enterprises.

SECTION TWO

FINANCIAL ANALYSIS OF THE ENTERPRISES

2.1 BROILER ENTERPRISE

2.1.1 COST AND REVENUE ESTIMATES

TABLE 1: INVESTMENT COST ESTIMATES FOR PROPOSED BROILER ENTERPRISES (10,000 BIRDS)

S/N	Item	Amount (₦)
1	Buildings (renovation) including gates and perimeter Fencing, borehole, security post and driveway	9,652,049
2	Slaughter house	1,460,760
3	Equipment	
	i) Lantern	45,000.00
	ii) Stove	51,000.00
	iii) Deep freezer	1,700,000.00
	iv) Thermometer	8,000.00
	v) Feeders	630,000.00
	vi) Drinkers	886,000.00
4	Preliminary/pre-operation expenses	450,000.00
5	Total investment cost	14,837,809.00

TABLE 2: A FIVE-YEAR OPERATING COST ESTIMATES OF THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

S/N	COST ITEMS	YEARS				
		0	1	2	3	5
1	Purchase of day old broiler birds 10000 @N250	7,500,000	10,000,000	10,000,000	10,000,000	10,000,000
2	Medication	1,119,000	1,119,000	1,119,000	1,119,000	1,119,000
3	Feed	9,360,000	12,480,00	12,480,00.00	12,480,00	12,480,00
4	Other inputs	360,000	360,000	360,000	360,000	360,000
5	Depreciation i)					
	Building @ 10%/annum	965204.9	868684.41	781815.96	703634.37	633270.93
	ii) Equipment @15%/ annum	498,000	423300.00	359505.00	305579.25	259742.36
	iii) Slaughter house@ 10%	146,076	131,468.4	118321.156	106489.04	95840.14
7	Contingency @5% Of variable cost	916950	916950.00	916950.00	916950.00	916950
8	Interest on loans N25m @9 %/ annum + principal payments	2,250,000	1,800,000	1,350,000	900,000.00	450,000
9	Total variable cost	23,115,230.9	28,099,402.81	27,485,592.12	26,891,652.66	25,681,532.50

The total investment cost of the propose broiler project is N14,837,809.00 only, while operating cost varies from N23.12 m in the first year to about N25.68m in the fifth year . The revenue profile (Table 3) shows an increasing trend from N7.29m in the first year to about N 28.9 m in subsequent years.

TABLE 3: A FIVE-YEAR REVENUE PROJECTIONS FOR PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

S/N	ITEMS	YEARS				
		0	1	2	3	4
	Sales of mature birds (9000) @ N1000 by 4 production cycles	27,000,000*	36,000,000	36,000,000	36,000,000	36,000,000
	Sales of poultry wastes 800bags@N150	90,000.00	120,000.00	120,000.00	120,000.00	120,000.00
3	Total Revenue	27,090,000	36,120,000	36,120,000	36,120,000	36,120,000

* Revenue for the first year (being investment year) is for three production cycles (8 weeks)

2.1.2 CASH FLOW ANALYSIS

In Tables 4 (a and b) and 5, a five-year cash flow analysis and the estimates of net present values (NPV), Internal Rate of Return (IRR), Benefit Cost Ratio (BCR) and Pay Back Period (PBP) respectively are presented.

TABLE 4A: CASH FLOW ANALYSIS FOR THE ESTIMATION OF NET PRESENT VALUE (NPV) AND INTERNAL RATE OF RETURN (IRR) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

Year	Cash outflow (CO) (N)	Cash inflow (CI) (N)	Net cash flow (NCF) (N)	Discounted net cash flow (DNCF) @ 9%
0	37953039.9	27,090,000.00	-10,863,039.90	-10,863,039.90
1	28,099,402.81	36,120,000.00	8,020,597.19	7,358,095.86
2	27,485,592.12	36,120,000.00	8,634,407.88	7,267,581.11
3	26,891,652.66	36,120,000.00	9,228,347.34	7,126,129.82
4	25,681,532.50	36,120,000.00	10,438,467.50	7,394,610.38
	NPV			18,283,377.27

TABLE 4B: SENSITIVITY ANALYSIS: ESTIMATES OF NET PRESENT VALUE (NPV) AND INTERNAL RATE OF RETURN (IRR) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

S/N	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow @ 25%
0	37953039.9	27,090,000.00	-10,863,039.90	-10,863,039.90
1	28,099,402.81	36,120,000.00	8,020,597.19	6,416,477.75
2	27,485,592.12	36,120,000.00	8,634,407.88	5,526,021.04
3	26,891,652.66	36,120,000.00	9,228,347.34	4,724,913.84
4	25,681,532.50	36,120,000.00	10,438,467.50	4,275,596.29

$$NPV = 10,079,969.02$$

TABLE 4C: CASH FLOW ANALYSIS FOR THE ESTIMATION OF BENEFIT COST RATIO (BCR) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

Year	Cash outflow (Cost)-N	Cash inflow (Revenue)-N	Discounted cash out flow (DCO) @ 9%	Discounted cash inflow (DCI) @ 9%
0	37953039.9	27,090,000	33,185,308.95	27,090,000
1	28,099,402.81	36,120,000	25,778,392.14	33,136,488
2	27,485,592.12	36,120,000	23,134,622.89	30,402,204
3	26,891,652.66	36,120,000	20,765,734.18	27,891,864
4	25,681,532.50	36,120,000	18,192,797.62	25,587,408
			125,824,586.73	144,107,964

Net Present Value (NPV) @ 9% = ₦18,283,377.27 Internal Rate of Return (IRR) = 70%:
Benefit Cost Ratio (BCR) @ 9% = 1.15

TABLE 4 D: SENSITIVITY ANALYSIS: ESTIMATES OF BENEFIT COST RATIO (BCR) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

S/N	Cash outflow	Cash inflow	Discounted cash out flow @ 25%	Discounted cash inflow @ 25%
0	37953039.9	27,090,000.00	37,953,039.90	27,090,000.00
1	28,099,402.81	36,120,000.00	22,479,522.25	28,896,000.00
2	27,485,592.12	36,120,000.00	17,590,778.96	23,116,800.00
3	26,891,652.66	36,120,000.00	13,768,526.16	18,493,440.00
4	25,681,532.50	36,120,000.00	10,519,155.71	14,794,752.00
			102,311,022.98	112,390,992.00

BCR= 1.1 @25%

TABLE 4B: SENSITIVITY ANALYSIS: ESTIMATES OF NET PRESENT VALUE (NPV) AND INTERNAL RATE OF RETURN (IRR) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

S/N	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow @ 25%
0	37953039.9	27,090,000.00	-10,863,039.90	-10,863,039.90
1	28,099,402.81	36,120,000.00	8,020,597.19	6,416,477.75
2	27,485,592.12	36,120,000.00	8,634,407.88	5,526,021.04
3	26,891,652.66	36,120,000.00	9,228,347.34	4,724,913.84
4	25,681,532.50	36,120,000.00	10,438,467.50	4,275,596.29

NPV = 10,079,969.02

TABLE 4C: CASH FLOW ANALYSIS FOR THE ESTIMATION OF BENEFIT COST RATIO (BCR) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

Year	Cash outflow (Cost)-N	Cash inflow (Revenue)-N	Discounted cash out flow (DCO) @ 9%	Discounted cash inflow (DCI) @ 9%
0	37953039.9	27,090,000	33,185,308.95	27,090,000
1	28,099,402.81	36,120,000	25,778,392.14	33,136,488
2	27,485,592.12	36,120,000	23,134,622.89	30,402,204
3	26,891,652.66	36,120,000	20,765,734.18	27,891,864
4	25,681,532.50	36,120,000	18,192,797.62	25,587,408
			125,824,586.73	144,107,964

Net Present Value (NPV) @ 9% = N18,283,377.27 Internal Rate of Return (IRR) = 70%:
Benefit Cost Ratio (BCR) @ 9% = 1.15

TABLE 4 D: SENSITIVITY ANALYSIS: ESTIMATES OF BENEFIT COST RATIO (BCR) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

S/N	Cash outflow	Cash inflow	Discounted cash out flow @ 25%	Discounted cash inflow @ 25%
0	37953039.9	27,090,000.00	37,953,039.90	27,090,000.00
1	28,099,402.81	36,120,000.00	22,479,522.25	28,896,000.00
2	27,485,592.12	36,120,000.00	17,590,778.96	23,116,800.00
3	26,891,652.66	36,120,000.00	13,768,526.16	18,493,440.00
4	25,681,532.50	36,120,000.00	10,519,155.71	14,794,752.00
			102,311,022.98	112,390,992.00

BCR= 1.1 @25%

TABLE 5: ESTIMATED PAY BACK PERIOD (PBP) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

Years	0	1	2	3	4
Revenue (N)	27,090,000	36,120,000	36,120,000	36,120,000	36,120,000

Initial investment = ₦37,953,039.9; Revenue in 1st year of production = ₦27,090,000.00;

Balance required = ₦10,863,039.9 ; Revenue in 2nd Year of production = ₦36,120,000.00

Pay back period = **One year and four months (1.3 years)**

The estimated NPV (₦18,283,377.27) is positive indicating that the proposed broiler enterprise is technically and economically feasible. The IRR (70%) is far higher than the interest charged on loans by commercial banks in the country and therefore the project is feasible. The value of the IRR (70 %) implies that the project can only cease to be feasible if the interest rate charged by commercial banks in the country is greater than 70%. On the other hand, the Benefit Cost Ratio (BCR) is 1.15 implying that for every one naira investment in this broiler enterprise, a return of 0.15 naira will be made. Since this value is greater than unity the project is economically feasible and worth investing in.

The Pay back Period (PBP) for this investment worth ₦37,953,039.9 is just one year and four months given the expected income stream shown in Table 5

21.3 CONCLUSION

Going by values of the NPV, IRR, BCR and PBP, the proposed broiler enterprise is technically and economically feasible even at a 25 percent rate of interest and therefore should be considered for investment.

TABLE 4B: SENSITIVITY ANALYSIS: ESTIMATES OF NET PRESENT VALUE (NPV) AND INTERNAL RATE OF RETURN (IRR) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

S/N	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow @ 25%
0	37953039.9	27,090,000.00	-10,863,039.90	-10,863,039.90
1	28,099,402.81	36,120,000.00	8,020,597.19	6,416,477.75
2	27,485,592.12	36,120,000.00	8,634,407.88	5,526,021.04
3	26,891,652.66	36,120,000.00	9,228,347.34	4,724,913.84
4	25,681,532.50	36,120,000.00	10,438,467.50	4,275,596.29

NPV = 10,079,969.02

TABLE 4C: CASH FLOW ANALYSIS FOR THE ESTIMATION OF BENEFIT COST RATIO (BCR) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

Year	Cash outflow (Cost)-N	Cash inflow (Revenue)-N	Discounted cash out flow (DCO) @ 9%	Discounted cash inflow (DCI) @ 9%
0	37953039.9	27,090,000	33,185,308.95	27,090,000
1	28,099,402.81	36,120,000	25,778,392.14	33,136,488
2	27,485,592.12	36,120,000	23,134,622.89	30,402,204
3	26,891,652.66	36,120,000	20,765,734.18	27,891,864
4	25,681,532.50	36,120,000	18,192,797.62	25,587,408
			125,824,586.73	144,107,964

Net Present Value (NPV) @ 9% = N18,283,377.27 Internal Rate of Return (IRR) = 70%:
Benefit Cost Ratio (BCR) @ 9% = 1.15

TABLE 4 D: SENSITIVITY ANALYSIS: ESTIMATES OF BENEFIT COST RATIO (BCR) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

S/N	Cash outflow	Cash inflow	Discounted cash out flow @ 25%	Discounted cash inflow @ 25%
0	37953039.9	27,090,000.00	37,953,039.90	27,090,000.00
1	28,099,402.81	36,120,000.00	22,479,522.25	28,896,000.00
2	27,485,592.12	36,120,000.00	17,590,778.96	23,116,800.00
3	26,891,652.66	36,120,000.00	13,768,526.16	18,493,440.00
4	25,681,532.50	36,120,000.00	10,519,155.71	14,794,752.00
			102,311,022.98	112,390,992.00

BCR= 1.1 @25%

TABLE 5: ESTIMATED PAY-BACK PERIOD (PBP) FOR THE PROPOSED BROILER ENTERPRISE (10,000 BIRDS)

Years	0	1	2	3	4
Revenue (N)	27,090,000	36,120,000	36,120,000	36,120,000	36,120,000

Initial investment= ₦37,953,039.9; Revenue in 1st year of production = ₦27,090,000.00;

Balance required = ₦10,863,039.9 ; Revenue in 2nd Year of production = ₦36,120,000.00

Pay back period = **One year and four months (1.3 years)**

The estimated NPV (₦18,283,377.27) is positive indicating that the proposed broiler enterprise is technically and economically feasible. The IRR (70%) is far higher than the interest charged on loans by commercial banks in the country and therefore the project is feasible. The value of the IRR (70 %) implies that the project can only cease to be feasible if the interest rate charged by commercial banks in the country is greater than 70%. On the other hand, the Benefit Cost Ratio (BCR) is 1.15 implying that for every one naira investment in this broiler enterprise, a return of 0.15 naira will be made. Since this value is greater than unity the project is economically feasible and worth investing in.

The Pay back Period (PBP) for this investment worth ₦37,953,039.9 is just one year and four months given the expected income stream shown in Table 5

21.3 CONCLUSION

Going by values of the NPV, IRR, BCR and PBP, the proposed broiler enterprise is technically and economically feasible even at a 25 percent rate of interest and therefore should be considered for investment.

2.2 LAYERS ENTERPRISE

2.2.1 COST AND REVENUE ESTIMATES

The investment and operating costs and revenue estimates of the proposed layer enterprise are presented in Tables 6, and 8 and 7 respectively.

TABLE 6: INVESTMENT COST ESTIMATES FOR THE PROPOSED LAYER ENTERPRISE (10,000 BIRDS)

S/No.	Item	Amount (₦)
1	Buildings (renovation)	10,878,540.00
2	Equipment	
	i) Feeders	630,000.00
	ii) Drinkers	886,000.00
	iii) Lantern	30,000.00
	iv) Stove	34,000.00
	v) Crates	30,000.00
3	Total Investment Cost (TIC)	12,488,540.00

TABLE 7: A FIVE-YEAR OPERATING COST ESTIMATES OF PROPOSED LAYER ENTERPRISE (10,000 BIRDS)

S/N	COST ITEMS	CYCLES (18 months)				
		0	1	2	3	4
1	Purchase of day old pullets 10,000 @N250	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000
2	Medication	390,000	390,000	390,000	390,000	390,000
3	Feed	30,072,800	30,072,800	30,072,800	30,072,800	30,072,800
4	Depreciation i) Building @ 10%/annum	1,087,854	978,978.60	881,080.74	792,972.67	713,675.40
	ii) Equipment @15%/annum	1,368,500	1,163,225	988,741.25	840,430.06	714,365.55
5	Contingency @ 5 percent of variable cost	1,648,140	1,648,140	1,648,140	1,648,140	1,648,140
6	Interest on loan N46m @9 %/ annum + principal payments	13,340,000	12,512,000	11,684,000	10,856,000	10,028,000
7	Total	50,407,294	49,265,143.60	48,164,761.99	47,100,342.73	46,066,980.95

The Table shows that a total of twelve million four hundred and eighty eight thousand, five hundred and forty naira (₦12,488,540.00) only will be required for capital investment. The initial total operating cost would be fifty million, four hundred and seven thousand, two hundred

and ninety four naira (N50,407,294.00) only. The projected revenue stream for five years is as shown in Table 8.

TABLE 8: A FIVE-YEAR REVENUE PROJECTIONS FOR PROPOSED LAYER ENTERPRISE (10,000 BIRDS)

Cycles (18 months)	%age egg lay	Total eggs laid/year (365 days)	No. of crates	Revenue @ N600/ crate	Revenue from sales of spent layers @ 700 for 9000 birds	Revenue from sales of poultry wastes @ 150 for 3000 bags	Total Revenue
1	70	2299500	76,650	45,990,000	5670000	450,000	52,740,000
2	70	2299500	76,650	45,990,000	5670000	450,000	52,740,000
3	75	2463750	82,125	49,275,000	5670000	450,000	56,025,000
4	80	2792250	93,075	55845000	5670000	450,000	62,595,000
5	80	2792250	98,550	55845000	5670000	450,000	62,595,000

2.2.2 CASH FLOW ANALYSIS

Tables 9, 10 and 11 show the cash flow analysis and the estimates of NPV, IRR, BCR and PBP respectively.

TABLE 9A: CASH FLOW ANALYSIS FOR THE ESTIMATION OF NET PRESENT VALUE (NPV) AND INTERNAL RATE OF RETURN (IRR) OF THE PROPOSED LAYER ENTERPRISE (10,000 BIRDS)

Cycle (18 months)	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow @ 9%
0	62,895,834.00	52,740,000.00	-10,155,834.00	-10,155,834.00
1	49,265,143.60	52,740,000.00	3,474,856.40	3187833.26
2	48,164,761.99	56,025,000.00	7,860,238.01	6615962.33
3	47,100,342.73	62,595,000.00	15,494,657.27	11964974.34
4	46,066,980.95	62,595,000.00	16,528,019.05	11708448.7
				23,321,384.63

NET PRESENT VALUE (NPV) @ 9% = N23,321,384.63
 INTERNAL RATE OF RETURN (IRR) = 68.26 %

TABLE 9B: SENSITIVITY ANALYSIS: ESTIMATES OF NET PRESENT VALUE @ 25 PERCENT INTEREST RATE IN LAYERS PRODUCTION (10000 BIRDS)

S/N	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow @ 25%
0	62,895,834.00	52,740,000.00	-10,155,834.00	-10,155,834.00
1	49,265,143.60	52,740,000.00	3,474,856.40	2,779,885.12
2	48,164,761.99	56,025,000.00	7,860,238.01	5,030,552.33
3	47,100,342.73	62,595,000.00	15,494,657.27	7,933,264.52
4	46,066,980.95	62,595,000.00	16,528,019.05	6,769,876.60
NPV @ 25%				12,357,744.57

TABLE 10: CASH FLOW ANALYSIS FOR THE ESTIMATION OF BENEFIT COST RATIO (BCR) FOR THE PROPOSED LAYER ENTERPRISE (10,000 BIRDS)

Cycle (18 months)	Cash outflow (₦)	Cash inflow (₦)	Discounted net cash outflow @ 9%	Discounted net cash inflow @ 9%
0	62,895,834.00	52,740,000.00	62895834	52740000
1	49,265,143.60	52,740,000.00	45195843	48383676
2	48,164,761.99	56,025,000.00	40540280	47156242.5
3	47,100,342.73	62,595,000.00	36370885	48335859
4	46,066,980.95	62,595,000.00	32633849	44342298
Present values (PV)			217,636,691	240,958,075.5

BENEFIT COST RATIO (BCR) = 1.11

TABLE 10B: SENSITIVITY ANALYSIS: ESTIMATES OF BENEFIT COST RATIO (BCR) @25 PERCENT INTEREST RATE IN PROPOSED LAYERS PRODUCTION (10000 BIRDS)

Cycle (18 months)	Cash outflow	Cash inflow	Discounted cash out flow @ 25%	Discounted cash inflow @ 25%
0	62,895,834	52,740,000	62,895,834	52,740,000
1	49,265,143.60	52,740,000	39,412,114.88	42,192,000
2	48,164,761.99	56,025,000	30,825,447.67	35,856,000
3	47,100,342.73	62,595,000	24,115,375.48	32,048,640
4	46,066,980.95	62,595,000	18,869,035.40	25,638,912
Present values (PV)	BCR = 1.07		176,117,807.43	188,475,552.00

**TABLE 11: ESTIMATED PAY BACK PERIOD (PBP) OF LAYER ENTERPRISE
(10,000 BIRDS)**

Cycles	0	1	2	3	4
Revenue (₦)	52,740,000	52,740,000	56,025,000	62,595,000	62,595,000

Initial investment = ₦62,895,834.00 : Revenue in 1st year of production = ₦52,740,000.00,

Balance required = ₦62,895,834.00 - ₦52,740,000.00 = ₦10,155,834.00

Revenue in 2nd Year of production = ₦52,740,000.00

PBP = One cycle (18 months) and 4 months i.e. 22 months

The NPV is positive (₦ 23,321,348.63) and the IRR is quite high (68.26%). The BCR indicates that for every one naira invested, about 0.11 naira will be obtained as returns. The Pay Back Period (PBP) also shows that the project would recoup its initial investment of ₦62,855,834.00 in one year and four months all things being equal. These indices indicate that investment in this Layers' enterprise is economically feasible.

2.2.3 CONCLUSION

The Layer enterprise given the feasibility indices, is technically and economically viable and therefore a worth the while investing the required funds. The sensitivity analysis further indicates that with an increase in rate of interest to 25 % the enterprise is still feasible.

2.3 INDOOR MUSHROOM PRODUCTION ENTERPRISE

2.3.1 COST AND REVENUE ESTIMATES

Tables 12, 13 and 14 present the investment and operating cost as well as the revenue profile in mushroom production. The investment cost of setting up a mushroom enterprise of this size is about ₦1.94 million. Initial operating cost is about ₦1.7million making a total cost of the enterprise to be about ₦ 3.3 million. The revenue stream over five years is shown in Table 14.

TABLE 12: INVESTMENT COST ESTIMATES FOR THE PROPOSED INDOOR MUSHROOM PRODUCTION ENTERPRISE

S/N	Items	Qty	Amount
1	Mushroom cropping house with bricks and thatched roof	1	1,690,000.00
2	Equipment		
	Plastic basins @ N400	3	1200.00
	Table @ N15000	2	30,000.00
	Kitchen scales @ N 900.00	3	2700.00
	Kitchen knives @N100	3	300.00
	Knapsack sprayer	1	75,000.00
	Pre-operation expenses		135,000.00
	Perforated polythene for packaging @ N450/kg	20kg	9000.00
3	Total investment cost		1,943,200.00

TABLE 13: A FIVE-YEAR OPERATING COST ESTIMATES OF PROPOSED INDOOR MUSHROOM PRODUCTION ENTERPRISE

S/N	COST ITEMS	CYCLES (18 months)				
		0	1	2	3	4
1	Purchase of spawned and seeded compost 3200 bags @N400	1,280,000	1,280,000	1,280,000	1,280,000	1,280,000
2	Adverts	100,000	100,000	100,000	100,000	100,000
3	Contingency @ 5% of variable cost	67,000	67,000	67,000	67,000	67,000
4	Depreciation					
	Building @ 10 %	169,000	152,100	136,890	123,201	1108,80
	Equipment @ 15 %	100,470	85,399.5	72,589.58	61,701.14	52,445.97
5	Total	1,716,470	1,684,500.50	1,656,481.58	1,591,905.14	1,499,449.97

TABLE 14: A FIVE-YEAR REVENUE PROJECTION FOR THE PROPOSED INDOOR MUSHROOM PRODUCTION ENTERPRISE

S/N	ITEMS	YEARS				
		0	1	2	3	4
1	Sales of mushrooms 14,400kg/annum @ N500 /kg	1,800,000	7,200,000	7,200,000	7,200,000	7,200,000

NB: Revenue for the first year (being investment year) is for three months @ 1200kg/months

2.3.2 CASH FLOW ANALYSIS

Table 15 shows the projected revenue and expenditure streams as well as the incremental benefit (net income) over five years. The NPV is positive (₦ 16,235,069.00) and therefore justifies investment in the project. The IRR is extremely high (296%) and the BCR (2.83) indicates that for every one naira investment, a return of ₦ 1.83 will be generated. The PBP indicates that the invested capital can be recovered in 15 months (1.3 years).

TABLE 15: CASH FLOW ANALYSIS FOR THE ESTIMATION OF NET PRESENT VALUE (NPV), INTERNAL RATE OF RETURN (IRR) AND BENEFIT COST RATIO (BCR) FOR THE PROPOSED INDOOR MUSHROOM PRODUCTION ENTERPRISE

Yr	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow @ 9 %	Discounted cash inflow @ 9%	Discounted cash outflow @ 9 %
0	3,659,670	1,800,000	-1,859,670	-1859670	1800000	3659670
1	1,684,500.50	7,200,000	5,515,499.50	5059919.241	6605280	1545360.759
2	1,656,481.58	7,200,000	5,543,518.42	4665979.454	6060240	1394260.546
3	1,591,905.14	7,200,000	5,608,094.86	4330570.851	5559840	1229269.149
4	1,499,449.97	7,200,000	5,700,550.03	4038269.641	5100480	1062210.359
				16,235,069.19	25,125,840	8,890,770.812

Net Present Value (NPV) = ₦16,235,069.00

Internal Rate of Return (IRR) = 296% and Benefit Cost Ratio (BCR) = 2.83

TABLE 15: SENSITIVITY ANALYSIS FOR THE ESTIMATION OF NET PRESENT VALUE (NPV), INTERNAL RATE OF RETURN (IRR) AND BENEFIT COST RATIO (BCR) @25% FOR THE PROPOSED INDOOR MUSHROOM PRODUCTION ENTERPRISE

Year	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow (a) 25%	Discounted cash inflow (a) 25%	Discounted cash out flow (a) 25%
0	3,659,670.00	1,800,000	-1,859,670	-1,859,670.00	1,800,000	3,659,670
1	1,684,500.50	7,200,000	5,515,499.50	4,412,399.60	5,760,000	1,347,600.40
2	1,656,481.58	7,200,000	5,543,518.42	3,547,851.79	4,608,000	1,060,148.21
3	1,591,905.14	7,200,000	5,608,094.86	2,871,344.57	3,686,400	815,055.43
4	1,499,449.97	7,200,000	5,700,550.03	2,334,945.29	2,949,120	614,174.71
	BCR - 2.5			11,306,871.25	18,803,520	7,496,648.75

NPV = 11,306,871.25 ; BCR = 2.5 and IRR = 296%

TABLE 16: ESTIMATED PAY BACK PERIOD (PBP) OF PROPOSED INDOOR MUSHROOM PRODUCTION ENTERPRISE

Year	0	1	2	3	4
Revenue (₦)	1,800,000	7,200,000	7,200,000	7,200,000	7,200,000

Initial investment = ₦3,659,670.00

Revenue in 1st year of production = ₦1,800,000

Balance required = ₦1,859,670.00

Revenue in 2nd Year of production = ₦7,200,000.00

Pay Back Period = One year and 3 months

2.3.3 CONCLUSION

Based on the estimates of NPV, IRR, BCR and PBP, of the proposed indoor mushroom production enterprise is very viable and worth investing the sum of three million, six hundred and fifty nine thousand, six hundred and seventy naira (₦3,659,670.00) only. The sensitivity analysis further confirms that investment in this enterprise even at 25 percent interest is a worth the while.

2.4 HATCHERY/PARENT STOCK ENTERPRISE

2.4.1 COST AND REVENUE ESTIMATES

The costs and revenue estimates for the establishment of a hatchery/parent stock enterprise is presented in Tables 17, 18 and 19.

TABLE 17: INVESTMENT COST OF HATCHERY/ PARENT STOCK ENTERPRISE (1,000 BIRDS)

S/N	Item	Amount (₦)
1	Buildings (renovation) Hatchery and Parent stock	2,431,450.00
2	Rehabilitation of existing Incubator (2500 capacity)	600,000.00
3	Equipment	
	i) Lantern	30,000.00
	ii) Stove	17,000.00
	iii) Deep freezer	1,700,000.00
	iv) Thermometer	8,000.00
	v) Feeders	78,750.00
	vi) Drinkers	110,750.00
	vii) Automatic syringe	40,000.00
	viii) Debeaking machine	56,000.00
	ix) Wheel barrow	12,000.00
	x) Egg Candler	30,000.00
4	Preliminary/pre-operation expenses	350,000.00
5	Total Investment cost	5,463,950.00

TABLE 18: A FIVE-YEAR OPERATING COST ESTIMATES OF PROPOSED PARENT STOCK/HATCHERY ENTERPRISE (1,000 BIRDS)

S/N	COST ITEMS	CYCLES (18 months)				
		0	1	2	3	4
1	Purchase of day old pullets 1,000 @N1250	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
2	Medication	100,000	100,000	100,000	100,000	100,000
3	Feed	4,075,800	4,075,800	4,075,800	4,075,800	4,075,800
4	Depreciation					
	i) Building @ 10%/annum	303,145	272,830.5	245,547.45	220,992.7	198,893.43
	ii) Equipment @15%/annum	312,375	265,518.75	225,690.94	191,837.29	163,061.70
5	Contingency @ 5 percent of variable cost	271,290	271,290	271,290	271,290	271,290
6	Salaries	2,640,000	2,640,000	2,640,000.00	2,640,000.00	2,640,000
	Interest on loans N10m @9 %/ annum + principal payments	3,300,000	2,900,000	2,810,000.00	2,729,000.00	2,656,100
7	Total	12,252,610	11,775,439.25	11,618,328.39	11,478,919.99	11,355,145.13

TABLE 19: A FIVE-YEAR REVENUE PROJECTIONS FOR PROPOSED PARENT STOCK /HATCHERY ENTERPRISE (1,000 BIRDS)

Yr	Total eggs laid/year @ 80% egg lay	No. of day old chicks @ 80% hatchability /year	Sales of day old chicks at N180	Excess eggs No. of crates/year	Revenue from sales of excess eggs @ N650.00	Revenue from sales of poultry wastes @ 150 for 300 bags	Sales of spent parent stock, 900 birds @ 1000.00	Total Revenue
0	226,296	34830	3134700	7536	4,898,400	45000	900,000	9,246,762
1	226,296	34830	6269400	7536	4,898,400	45000	900,000	12,381,463
2	226,296	34830	6269400	7536	4,898,400	45000	900,000	12,381,464
3	226,296	34830	6269400	7536	4,898,400	45000	900,000	12,381,465
4	226,296	34830	6269400	7536	4,898,400	45000	900,000	12,381,466

The total amount required for capital investment is about N5463950.00. In Table 18, a five year operating cost estimates are presented. The initial operating cost is about N12,252,610.00 and declines marginally to about N11,355,145.13 in the fifth year. The revenue projected revenue profile is presented in Table 19. It is expected that the enterprise will generate about 9.35 million naira in the first year (Table 19) and subsequently about 12.4 million naira in the remaining 4 years.

CASH FLOW ANALYSIS

The cash flow analyses for the estimation of the feasibility indices are presented in Tables 20, 21 and 22. The analyses show that the Net Present Value (NPV = N3,182,103.19) is positive, while the Benefit Cost Ratio (BCR) is 1.07 and the Internal Rate of Return (IRR) is 25 percent.

TABLE 20: CASH FLOW ANALYSIS FOR THE ESTIMATION OF NET PRESENT VALUE (NPV) AND BENEFIT-COST RATIO (BCR) FOR THE PROPOSED HATCHERY/PARENT STOCK ENTERPRISE

Yr	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow @ 9%	Discounted cash in flow @ 9%	Discounted cash out flow @ 9%
0	17,716,560.00	9,246,762.00	-8,469,798.00	-8469798	9,246,762.00	17,716,560.00
1	8,952,610.00	12,381,463.00	3,428,853.00	3145629.742	11,358,754.16	8,213,124.41
2	8,609,920.50	12,381,464.00	3,771,543.50	3174508.164	10,421,478.25	7,246,970.08
3	8,808,328.39	12,381,465.00	3,573,136.61	2759176.09	9,560,967.27	6,801,791.18
4	8,749,919.99	12,381,466.00	3,631,546.01	2572587.193	8,771,030.51	6,198,443.32
NPV = N3,182,103.19 and BCR = 1.07				3,182,103.19	49,358,992.19	46,176,889.00

TABLE 21: SENSITIVITY ANALYSIS FOR THE ESTIMATION OF NET PRESENT VALUE (NPV) AND BENEFIT-COST RATIO (BCR) FOR THE PROPOSED HATCHERY/PARENT STOCK ENTERPRISE

S/N	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow (@ 25%)	Discounted cash inflow (@ 25%)	Discounted cash out flow (@ 25%)
0	17,716,560.00	9,246,762.00	-8,469,798.00	-8,469,798.00	9,246,762.00	17,716,560.00
1	8,952,610.00	12,381,463.00	3,428,853.00	2,743,082.40	9,905,170.40	7,162,088.00
2	8,609,920.50	12,381,464.00	3,771,543.50	2,413,787.84	7,924,136.96	5,510,349.12
3	8,808,328.39	12,381,465.00	3,573,136.61	1,829,445.94	6,339,310.08	4,509,864.14
4	8,749,919.99	12,381,466.00	3,631,546.01	1,487,481.25	5,071,448.47	3,583,967.23
				3,999.43	38,486,827.91	38,482,828.48

NPV 3,999.43 ; BCR 1.0 and IRR 25 %

TABLE 22: ESTIMATED PAY BACK PERIOD (PBP) OF PROPOSED HATCHERY/PARENT STOCK ENTERPRISE

Year	0	1	2	3	4
Revenue (₦)	9,246,762	12,381,465	12,381,465	12,381,465	12,381,465.00

Initial investment = ₦17,716,560.00 ; Revenue in 1st year of production = ₦9,246,762.00

Balance required = ₦8,469,798.00

Revenue in 2nd Year of production = **₦12,381,465.00**

Pay Back Period = One year and 7 months

2.4.3 CONCLUSION

The implication is that the project is economically feasible for investment given the values of the NPV, BCR and IRR. The pay back period (PBP) shows that the investor would recoup his/her investment of about ₦17,716,560.00 in 19 months (one year and seven months) all things being equal. The sensitivity analysis indicates that an increase of the interest rate to about 25 percent will still result in a positive NPV (3,999.43) but a BCR = 1.0 and IRR = 25 %. These values indicate that a rate higher than 25 % might render the project not feasible.

2.5 FEED MILL ENTERPRISE

2.5.1: COST AND REVENUE ESTIMATES

The costs and revenue estimates for the establishment of a feed mill are presented in Tables 23, 24 and 25. The total capital investment required for feed mill enterprise is about N12.35 m.

TABLE 23: INVESTMENT COST OF FEED MILL

S/N	Item	Amount (₦)
1	Procurement and installation of new mill	10,000,000.00
2	Equipment	
	i) Weighing scale	2,000,000.00
	ii) 3 Sewing machine	150,000.00
	iii) Other tools	50,000.00
3	Preliminary/pre-operation expenses	150,000.00
4	Total Investment cost	12,350,000.00

TABLE 24: A FIVE-YEAR OPERATING COST ESTIMATES OF PROPOSED FEED MILL ENTERPRISE

S/ N	COST ITEMS	YEARS				
		0	1	2	3	4
1	Purchase of feed ingredients (Raw materials)	190,080,000	190,080,000	190,080,000	190,080,000	190,080,000
2	Repairs and maintenance	2,534,400	2,534,400	2,534,400	2,534,400	2,534,400
3	Fuel	1,478,400	1,478,400	1,478,400	1,478,400	1,478,400
	Amortization on fixed cost	1,220,000	1,220,000	1,220,000	1,220,000	1,220,000
4	Contingency @ 1 percent of variable cost	1,900,800	1,900,800	1,900,800	1,900,800	1,900,800
5	Salaries	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000
6	Total	199,013,600	199,013,600	199,013,600	199,013,600	199,013,600

The operating cost projections shown in shown in Table 24 indicate that about N199,013,600 will be required annually in the first five years of operation. The revenue profile is shown in Table 25.

TABLE 25: A FIVE-YEAR REVENUE PROJECTION FOR THE PROPOSED FEED MILL ENTERPRISE

S/N	ITEMS	YEARS				
		0	1	2	3	4
1	Sales of Feeds 2534tons/annum @ N82,000 /ton	155,865,600	207,788,000	207,788,000	207,788,000	207,788,000

Note: Revenue for the first year (being investment year) is for 9 months of production

The revenue profile shows an increasing trend from N155.87m in the first year of investment to about N207.79m in the fifth year.

2.5.2: CASH FLOW ANALYSIS

The estimates of the NPV, IRR, BCR and PBP as determined from the cash flow analysis (Tables 26 and 27) are N1,870,607.60, 11%, 1.00 and 1.2 years respectively.

TABLE 26: CASH FLOW ANALYSIS FOR THE ESTIMATION OF NET PRESENT VALUE (NPV) FOR THE PROPOSED FEED MILL ENTERPRISE

Year	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow @ 9%
0	211,363,600	155,865,600	-55,498,000.00	-55,498,000.00
1	190080000	207,788,000	17,708,000.00	16,245,319.20
2	190080000	207,788,000	17,708,000.00	14,904,823.60
3	190080000	207,788,000	17,708,000.00	13,674,117.60
4	190080000	207,788,000	17,708,000.00	12,544,347.20
	NPV @ 9%			1,870,607.60

TABLE 27: CASH FLOW ANALYSIS FOR THE ESTIMATION OF BENEFIT-COST RATIO (BCR) FOR THE PROPOSED FEED MILL ENTERPRISE

Year	Cash outflow	Cash inflow	Discounted cash out flow @ 9%	Discounted cash in flow @ 9%
0	211,363,600	155,865,600	211,363,600.00	155,865,600.00
1	190080000	207,788,000	174,379,392.00	190,624,711.20
2	190080000	207,788,000	159,990,336.00	174,895,159.60
3	190080000	207,788,000	146,779,776.00	160,453,893.60
4	190080000	207,788,000	134,652,672.00	147,197,019.20
			827,165,776.00	829,036,383.60

BCR= 1.00

TABLE 28: SENSITIVITY ANALYSIS FOR THE ESTIMATION OF NET PRESENT VALUE (NPV) FOR THE PROPOSED FEED MILL ENTERPRISE

Year	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow @ 25%
0	211,363,600	155,865,600	-55,498,000.00	-55,498,000.00
1	190080000	207,788,000	17,708,000.00	14,166,400.00
2	190080000	207,788,000	17,708,000.00	11,333,120.00
3	190080000	207,788,000	17,708,000.00	9,066,496.00
4	190080000	207,788,000	17,708,000.00	7,253,196.80
	NPV @ 25%			-13,678,787.20

TABLE 29: SENSITIVITY ANALYSIS FOR THE ESTIMATION OF BENEFIT COST RATIO (BCR) (@ 25 %) FOR THE PROPOSED FEED MILL ENTERPRISE

S/N	Cash outflow	Cash inflow	Discounted cash in flow @25%	Discounted cash out flow @ 25%
0	211,363,600	155,865,600	155,865,600.00	211,363,600.00
1	190080000	207,788,000	166,230,400.00	152,064,000.00
2	190080000	207,788,000	132,984,320.00	121,651,200.00
3	190080000	207,788,000	85,109,964.80	97,320,960.00
4	190080000	207,788,000	190080000	77,856,768.00
	BCR = 1.02		646,577,740.80	660,256,528.00

TABLE 30: ESTIMATED PAY BACK PERIOD (PBP) OF PROPOSED FOR THE PROPOSED FEED MILL ENTERPRISE

	YEARS				
	0	1	2	3	4
Revenue (N)	155,865,600	207,788,000	207,788,000	207,788,000	207,788,000

Initial investment= ₦211,363,600.00; Revenue in 1st year of production = ₦155,865,600.00

Balance required = ₦55,000.00; Revenue in 2nd Year of production = ₦207,788,000.00

Pay Back Period = One year and 3 months

2.5.3: CONCLUSION

Based on the estimates of the NPV, IRR, BCR and PBP, an investment of the sum of ₦211.36m in the Feed Mill enterprise is technically and economically feasible at a rate of 9%. However, the sensitivity analysis shows that at an interest rate of 25 % the NPV becomes negative and therefore renders the project not feasible.

2.6 FISH FARM

2.6.1 COST AND REVENUE ESTIMATES

The cost and revenue estimates of the proposed fish farm are presented in Tables 31 and 32. The analysis shows that with existing facilities, an investment of about 18.28 million naira would be required that would yield about 25.02 million naira annually.

TABLE 31: A FIVE-YEAR OPERATING COST ESTIMATES OF PROPOSED FISH FARM

S/N	COST ITEMS	YEARS				
		0	1	2	3	4
1	Purchase of feed	6,255,000	12510000	12510000	12510000	12510000
2	Cost of fingerlings	500,400	1000800	1000800	1000800	1000800
3	Other cost*	795,340	755074	755074	755074	755074
4	Amortization on fixed cost	100,000	200,000	100,000	100,000	100,000
5	Interest on N15m @ 9% + principal payments	4350000	4080000	3810000	3540000	3270000
6	Total	12,000,740	18,545,874	18,275,874	18,005,874	17,735,874

TABLE 32: A FIVE-YEAR REVENUE PROJECTION FOR THE PROPOSED FISH FARM

S/N	ITEMS	YEARS				
		0	1	2	3	4
1	Sales of Fish 41700 kg/annum @ N600/kg	10,008,000*	25,020,000	25,020,000	25,020,000	25,020,000

* Revenue from one production cycle (6 months) being investment year @ 100% capacity

2.6.2: CASH FLOW ANALYSIS

The cash flows as well as the revenue profile of proposed fish farm production enterprise are presented in Tables 33, 34 and 35 respectively. Estimates of the NPV, IRR, BCR and PBP are 20,199,537, 329%, 1.3 and one year and one month respectively.

TABLE 33: CASH FLOW ANALYSIS FOR THE ESTIMATION OF NPV AND IRR FOR THE PROPOSED FISH FARM ENTERPRISE

Year	Cash outflow	Cash inflow	Net cash flow	Discounted net cash flow @ 9%
0	12,000,740	10,008,000	-1,992,740.00	-1,992,740.00
1	18,545,874	25,020,000	6,474,126.00	5,939,363.19
2	18,275,874	25,020,000	6,744,126.00	5,676,530.85
3	18,005,874	25,020,000	7,014,126.00	5,416,308.10
4	17,735,874	25,020,000	7,284,126.00	5,160,074.86
IRR = 328%			NPV = 20,199,537.00	

TABLE 34: CASH FLOW ANALYSIS FOR THE ESTIMATION OF BENEFIT COST RATIO (BCR) FOR THE PROPOSED FISH FARM ENTERPRISE

Year	Cash outflow	Cash inflow	Discounted cash inflow @ 9%	Discounted cash out flow @ 9%
0	12,000,740	10,008,000	10,008,000.00	12,000,740.00
1	18,545,874	25,020,000	22,953,348.00	17,013,984.81
2	18,275,874	25,020,000	21,059,334.00	15,382,803.15
3	18,005,874	25,020,000	19,320,444.00	13,904,135.90
4	17,735,874	25,020,000	17,724,168.00	12,564,093.14
BCR = 1.30			91,065,294.00	70,865,757.00

TABLE 35: REVENUE PROJECTION FOR THE ESTIMATION OF PBP OF PROPOSED FISH FARM

S/N	Years	YEARS				
		0	1	2	3	4
1	Revenue	10,008,000*	25,020,000	25,020,000	25,020,000	25,020,000

Initial investment = ₦12,000,740.00; Revenue in 1st year of production = ₦10,008,000

Balance required = ₦1,992,740.00; Revenue in 2nd Year of production = ₦25,020,000

Pay Back Period = One year and 1 month

2.6.3. CONCLUSION

Given that results of the analysis shows a positive NPV, a very high IRR and a BCR greater than unity, it can be concluded that investing in fish farm using the available ponds is very feasible/ profitable even at rates as high as 85 percent.

SECTION THREE

ENTERPRISE RANKING AND RECOMMENDATIONS

3.1 RANKING

The ranking of the proposed enterprises with respect to their feasibility /profitability is presented in Table 36. In the ranking pay back period is not considered due to the fact that it does not consider the time value of money. The result in Table 36 shows that Mushroom production is ranked first, followed by Fish farm and then broiler and layers. Feed mill came last. The sensitivity analysis of this project shows that an increase in the rate of interest above 11 percent will render the investment unviable at least in the 5 year period considered.

TABLE 36: FEASIBILITY RANKING OF PROPOSED ENTERPRISES

Enterprise	FEASIBILITY INDEXES			Ranking
	NPV	IRR	BCR	
Broiler	18,283,377.27	70	1.15	3 rd
Layers	23,321,348.63	68.26%	1.1	4 th
Mushroom	16,235,069.00	296	2.83	1 st
Hatchery/ Parent stock	3,182,103.19	25	1.07	5 th
Feed Mill	1,870,607.60,	11	1.00	6 th
Fish farm	N 20,199,537.00	328	1.3	2 nd

RECOMMENDATION

Based on the cash flow analysis and the estimated feasibility indices, we recommend that the University of Calabar, should invest in the enterprises in phases. In the first phase the university should consider Mushroom, Fish farm and Broiler enterprise for investment. Layer and Hatchery/Parent Stock enterprise should be considered in the 2nd phase. For the Feed mill to be considered for investment, the installed capacity of the mill should be somewhat higher than the one available in the farm. More so its ability to generate enough funds to offset its investment capital should be seen from a long term perspective.

APPENDIX
SCHEDULE ONE

1.3.1 NET PRESENT VALUE

This is the present worth of the income stream generated by an investment or project over a period. It is either negative or positive. A project is technically and economically feasible if the NPV is positive i.e. the present worth of the income stream is greater than the present worth of the expenditure stream and therefore sufficient to recover the investment cost.

This index is calculated using the Formula

$$NPV = \frac{\sum(B_t - C_t)}{(1 + r)^n}$$

Where B_t	=	Benefit (inflow or revenue)
C_t	=	Cost (on flow or expenditure)
r	=	Discount rate
n	=	No. of years

1.3.2 INTERNAL RATE OF RETURN (IRR)

This represents the maximum interest that a project could pay for the resources used if the project is to cover its investment and operating costs or still breakeven. It is estimated by linear interpolation as shown;

$$IRR = L_{DR} + (H_{DR} - L_{DR}) \left(\frac{NPV_{LDR}}{NPV_{HDR} + NPV_{LDR}} \right)$$

Where:	L_{DR}	=	Lower discount rate
	H_{DR}	=	Higher discount rate
	NPV_{HDR}	=	NPV at higher discount rate
	NPV_{LDR}	=	NPV at lower discount rate

A project is economically feasible if the internal rate of return is greater than the interest charged on loans by banks.

1.3.3 BENEFIT COST RATIO

This is an indicator of a projects' worthiness. It gives an indication of what a unit return will be given a unit level of investment cost. It is calculated as the sum of discounted benefits divided by the sum of discounted costs. For a projected to be adjudged as being feasible, the ratio is expected to be above unity. It is estimated using the formula;

$$\frac{\sum B_t}{(1+r)^n} / \frac{\sum C_t}{(1+r)^n}$$

1.3.4 PAY BACK PERIOD

This indicates the time period required for the investment to recover its cost especially for borrowed funds. This criterion for project analysis has been highly criticized for not taking into cognizance the time value of money.

* The analyses were carried out using the Microsoft EXCEL 2003 computer software.

SCHEDULE TWO

ASSUMPTIONS

1. BROILER ENTERPRISE

The revenue to be realized from broiler production enterprise is based on the following assumptions;

- i) Production will be 4 cycles in a year
- ii A cycle will be 8 weeks
- (iii) Expected mortality will be 10 percent =N 9,000
- (iv) Average market price of Broiler = N1,000.00
- v) Mature birds will be sold as from the 8th week.
- vi) The birds will be sold as live chicken and or dressed.
- vii) Dressed chicken will attract an additional charge of N50.00.
- (viii) Additional Revenue would be generated from the sales of poultry manure @ N150/Bag (1000 bags)

2. LAYER ENTERPRISE

- i) In one production cycle (18 months) 10% mortality will be recorded and therefore total number of laying birds = 10,000 – 1000 = 9,000 pullets.
- ii) Percentage egg lay per bird = 70% in the first year and reaches 80 % in the 5th year
- iii) A crate of egg is sold for N600 each.
- iv) 10% mortality will again be recorded from point of lay to end of one year of production and therefore a total of 8,100 spent layers will be available for sale.
- v) Price of spent layer is N700.00.
- vi) Additional revenue will be realized from sales of about 3,000 bags of poultry manure @ N150 per bag.

3. MUSHROOM ENTERPRISE

- i) About 1200kg of mushroom will be produced every month
- ii) The price per Kg is currently N500.00

4. HATCHERY/PARENT STOCK ENTERPRISE

- i) Total capacity of incubators (4)= 12,000 eggs
- ii) Number of eggs set every 6 days @ 80% fertility= 2721
- iii) Day old hicks are hatched per cycle of 36 days@ 80% hatchability=3483 chicks
- iv) 10 cycles will be done in one year.
- v) Excess eggs (crates)/year = 7536
- vi) Crate of eggs is sold for N650.
- vii) 10 percent mortality of chick and after one year of lay respectively is allowed for.

5. FEED MILL ENTERPRISE

- i) Capacity utilization of mill is 80 percent
- ii) Produces 12 tons per day
- iii) Mill runs for 22 days per month
- iv) Produces 2534.4 tons annually
- v) Average cost of production of all types of feeds= N72,000.00/ton
- vi) Average selling price/ton N82,000.00

6 FISH FARM

- i) Stocking density = $75/m^3$
- ii) Loss of 20% due to mortality and cannibalism
- iii) Existing tanks in the Institute of Oceanography fish farm will be used in its production.
- iv) Fingerlings cost N20.00 each
- v) Production cycle is 6 months
- vi) Feed cost is N200/kg
- vii) Weight of fish 1-1.5kg
- viii) Total fish output is 20,850kg
- ix) Price/kg is N600.00

SCHEDULE THREE

Table A.1: CONSTRUCTION OF MUSHROOM CROPPING HOUSE/RENOVATION AND MAINTENANCE OF POULTRY PENS 1, 2, 3 & 4

S/N	ACTIVITY	COST (₦)
1	Carpentry and block work for pens 1, 2, 3 & 4-	888,810.00
2	Electrical maintenance (existing brooding unit, pens 1,2,3 & 4)	46,500.00
3	Renovation of security post	557,210.00
4	Electrical maintenance at security post and gate	11,700.00
5	Farm Entrance(drive way)	608,300.00
6	Perimeter fencing*	1,195,000.00
7	Renovation of bore-hole unit (block D)	543,360.00
8	Refurbishing of administrative block and plumbing repairs	450,000
9	Construction of mushroom cropping house	750,000.00

TABLE A2: INVESTMENT COST FOR BROILER ENTERPRISE (10,000 BIRDS)

S/N	Item	Qty	Unit cost (₦)	Amount (₦)
1	Equipment			
	i) Lantern	30	1,500.00	45,000.00
	ii) Stove	30	1,700.00	51,000.00
	iii) Deep freezer	20	85,000.00	1,700,000.00
	iv) Thermometer	4	2,000.00	8,000.00
	v) Feeders	200	3150.00	630,000.00
	vi) Drinkers	200	4430.00	886,000.00
2	Preliminary/pre-operation expenses			450,000.00

TABLE A3: VARIABLE INPUT COST FOR BROILER PRODUCTION (10,000 BIRDS in one cycle)

S/N	Item	Quantity	Unit price(₦)
I	Stock		
	a) Broiler chicks	10,000	250
ii	Feeds		
	a) Broiler starter	480 bags	2,200
	b) Broiler finisher	960 bags	2,150
iii	Medication		
	a) Antibiotics	186 sachets	750
	b) Vitamin supplements	80 sachets	650
	c) Coccidiostats	106 sachets	750
	d) Dewormer	14 sachets	500
iv	Vaccination		
	a) New Castle (i/o) vaccine	60 vials	400
	b) Gumboro Vaccine	120 vials	400
	c) Lasota (NDV)	700 vials	400
V	Wood shaving	200 bags	300

TABLE A4 INVESTMENT INPUTS FOR TABLE EGG PRODUCTION IN ONE PRODUCTION CYCLE (A PRODUCTION CYCLE IS APPROXIMATED AT 18 MONTHS)

S/No.	Item	Qty	Unit cost (₦)	Amount (₦)
1	Buildings (renovation)	2 pens		10,878,540.00
2	Equipment			
	i) Feeders	200	3150.00	630,000.00
	ii) Drinkers	200	4430.00	886,000.00
	iii) Lantern	20	1,500.00	30,000.00
	iv) Stove	20	1,700.00	34,000.00
	v) Crates	200	150	30,000.00
3	Total Investment Cost (TIC)			12,488,540.00

TABLE A5: COST OF VARIABLE INPUTS FOR TABLE EGG PRODUCTION IN ONE PRODUCTION CYCLE (A PRODUCTION CYCLE IS APPROXIMATED AT 18 MONTHS)

S/N	Items	Qty	Unit Price (N)
i	Pullet	10,000	250
ii	Feeds		
	a) Chick mash	720 bags	2,200
	b) Grower mash	2,400 bags	1,900
	c) Layer mash	16,060 bags	2,000
iii	Drugs		
	a) Coccidiostat	80 sachets	600
	b) Antibiotics	100 sachets	750
	c) Vitamins	100 sachets	600
	Total		
iv	Vaccines		
	a) Newcastle vaccine(i/o)	60 vials	400
	b) Gumboro vaccine	120 -do-	400
	c) Lasota (NDV)	70 -do-	400
	d) Kamorov (NDV)	140 -do-	500
	e) Fowl pox	60 do-	500
v	Wood shaving	60 bags	300

**TABLE A6: INVESTMENT COST OF HATCHERY/ PARENT STOCK ENTERPRISE
(1,000 BIRDS)**

S/N	Item	Qty	Unit cost (₦)	Amount (₦)
1	Buildings (renovation) Hatchery and Parent stock	2 Blocks		2,431,450.00
2	Rehabilitation of existing Incubator (2500 capacity)	2	300,000	
3	Equipment			
	i) Lantern	20	1,500.00	
	ii) Stove	10	1,700.00	
	iii) Deep freezer	20	85,000.00	
	iv) Thermometer	4	2,000.00	
	v) Feeders	25	3150.00	
	vi) Drinkers	25	4430.00	
	vii) Automatic syringe	2	20,000.00	
	viii) Debeaking machine	2	28,000.00	
	ix) Wheel barrow	2	6000.00	
	x) Egg Candler	1	30,000.00	

TABLE A7: CAPACITY, COSTS AND REVENUE OF FISH FARM ENTERPRISE

Enclosure	Vol (m3)	Output Kg	Feed cost	Fingerlings cost	Other costs	Sales
2 Circular tanks (EEC)	30	2250	675000	54000	192,700	428300
3 Circular tanks (ETF)	48	3600	1080000	86400	116,640	2,160,000
6 Rectangular Tanks (ETF)	200	15,000	4,500,000	360,000	486,000	9,000000