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Statistical study and financial modelling of Ostrich farming based on ten years projections in Karachi, Pakistan

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Abstract

Production of ostrich is highly management dependent. Ostriches had recently been received increasing attention as meat producing animals. Profitability and losses directly depend on the management techniques of eggs and chicks. Pakistan had been experiencing a moderate rate growth in farming business of ostriches. Many investors had shown keen interest towards ostrich farming. Ostrich farming had been as an emerging favorable profitable business. In this paper, financial modeling of ostrich farms in Pakistan was done. The purpose of this financial analysis was to determine the costs and benefits of a certain farm to the society over a given period of time. Building an ostrich farm includes taking care of a newly laid egg to the newly hatched chick and up to its adulthood. A considerable capital expenditure would be required to build an ostrich farm.

Keywords: *Struthio camelus*, capital expenditure, budget modeling, EBITDA, ROE, BCR.

1. Introduction

In South Africa, the first commercial ostrich farm was established around 1860 solely for gathering the feathers every six to eight months. Gradually ostrich farms originated to spread to other countries, particularly Egypt, Australia, New Zealand, the United States and Argentina, until ostriches total number elevated commercially stretched over 1 million by 1913^[1]. The number of ostrich farms dropped considerably, with the First and Second World Wars, however, due to the smash of the ostrich feather market. The industry, nevertheless, coped to survive on a much smaller scale in South Africa. By possession ostriches not only for their feathers but also for their meat and hides, it grew more and more subsequently. In 1986, just before the economic consents were forced, South Africa exported a high record of 90 000 ostrich leathers to the United States alone^[2]. The scarcity of ostrich skins after 1986 caused prices to intensify. This made ostrich farming a striking proposal and a number of farms were recognized in Europe and more in the United States in an effort to fill part of the ever-increasing international petition. The global ostrich industry had finally begun and continues to develop steadily.

Budgets can be categorized as simulation models that are based on accounting principles and methods, rather than purely mathematics^[3]. If they are used cautiously together with other universal methods, budgets can be useful tools in evaluating essentials, supporting planning and undertaking participatory research and decision making^[4]. Budgeting methods have been cast off in agricultural economics and extension. They have been based on standard accounting methods to produce comparable information for analyses and to serve as benchmark information^[5]. Budget modeling of farm is simulated by using spreadsheet programmes. The spreadsheet programs allow complex calculations and relationships to be expressed in a simple way^[6]. It is sophisticated in the sense that it allows for detail, adaptability and user-friendliness^[7].

The budget model represents entire production process in a combined manner. The groups of factors that are often notable in production includes^[8]: Physical units of inputs used in production processes (Amounts/quantities of materials used, Labor used, Energy used, Yields and Indicators of production, such as mortality rate); Indicators for production processes, put in monetary terms (Total of all types of direct production costs, Total overhead costs and Revenue from production activities).

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This category of model articulates all of the production activities into a figure that can be used to measure the profitability of the farming system being used. The budget model creates possibility to prompt all of the production, marketing, economic and financial activities into mathematical relationships that can be used to measure the profitability of the farming systems being studied.

2. Materials and Methods

The study was carried out at two Ostrich farms owned and maintained by Pakistan Ostrich Company situated in Gadap town, one at Cheeko farm near Northern bypass for adult birds and second at Mengal Goth near Gulshan-e-Maymar for chicks. The data collected was spread at six month time period started from July 2011 to December 2011. The data were collected in order to carry out statistical analysis of an ostrich farm. By keeping in view the present status and future planning of POC, a financial model has been prepared with the assumption of 10 year plan.

2.1. Budget Modeling

Budget modeling is done in order to make a precise financial model of the farm. Usually budgets are made to easily manage the financial planning. Budgeting is a non-optimizing method and it estimates plans in physical and financial expressions [6]. The budget model included is made up of three parts, namely, input, calculation and output. The figure from the first part feeds into the following component, and the information in the second component feeds into the third component [9].

2.2. Cost-Benefit Analysis

Cost benefit analysis is a technique used to evaluate the costs and benefits of a certain project to a society over a given period of time [10]. This project gives a brief account of financial spreadsheet, profit and loss analysis, benefit cost ratio (BCR), internal rate of return (IRR). This chapter is beneficial to those who want to know about the financial & commercial aspects of ostrich farming.

The cost benefit ratio spreadsheet contains all the data summed

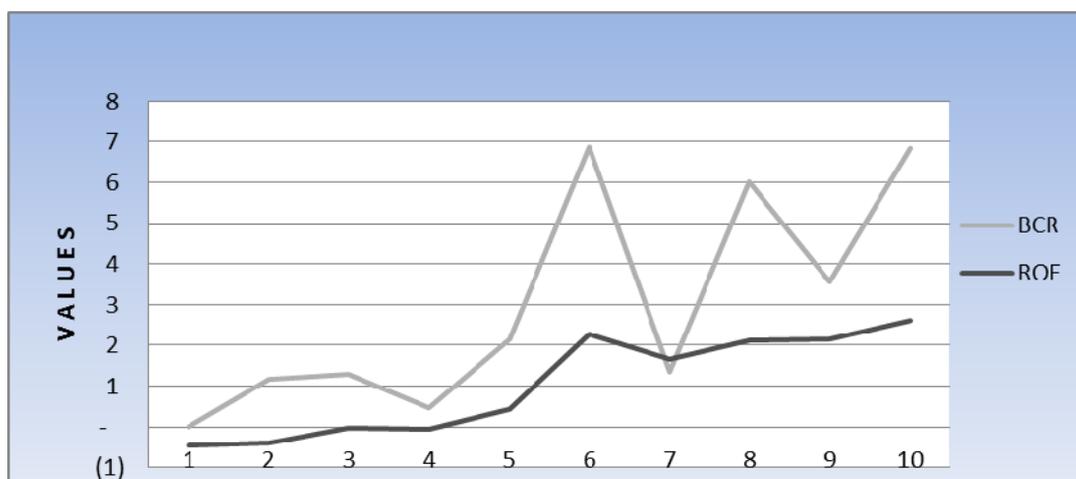
up in a short summary to present an overview of how one can start farming of ostriches. The data at first shows the number of eggs with the mortality ratio to be grown into adults for the next year.

This model is based on assumption that farmer has started with 100 chicks while the land area for farm was already available, all the basic financial & marketing data is provided by the Pakistan Ostrich Company. One day old chick is not much expensive; the only precaution is their higher fertility ratio that needs to be taken into account very carefully. Once birds crossed one & half year, groups of 1 male and 2 females are formed for females to start laying eggs. The eggs laying rate are different for every bird but the average ratio is 30 to 110 eggs per female. We assume 40 eggs per bird per season on an average. A certain number of breeders are also maintained to support the ongoing productivity process. Revenues started to flow in from the 2nd year. Around 98,500 birds are likely to be projected on hand at the end of 10th year. The marketing policy is based upon various business lines including selling eggs & chicks, meat of over one year bird, their feathers, bones & oil. Meat sales are starting from year five after having sufficient stock of birds in hand to supply regular supply of meat to the market.

2.3. Capital Expenditure

Capital Expenditures are gradually increased as business grows especially with the number of birds raised every year that resulted in more land and farm building requirements. Revenue expenditures consisted upon fixed and variable costs. The company also availed bank loan in 2nd year with three year grace period. The said bank loan is repaid in subsequent three years. Finance cost has taken net income to negative side but started from year five, some healthy profits started to inflow into the company.

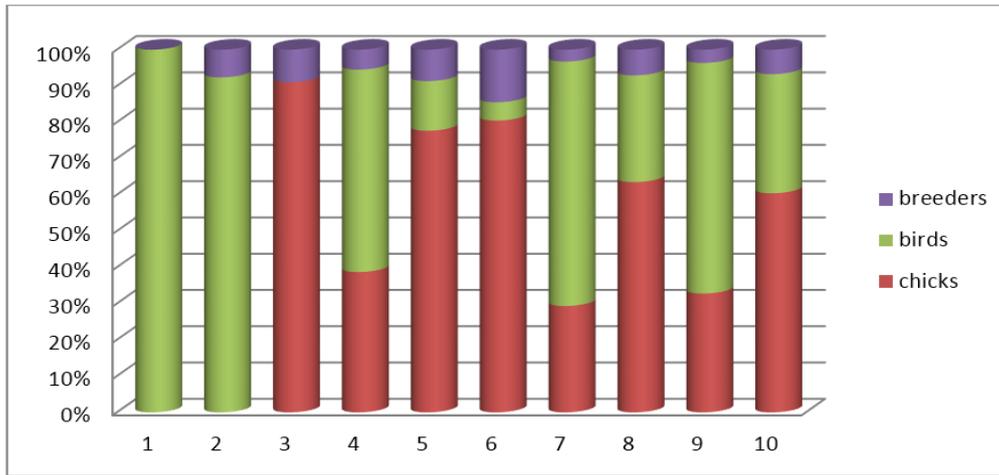
The company has also invested funds in long term deposits by using its excess cash flows. This investment also creates a healthy amount as interest income supported company's mainstream lines of business.



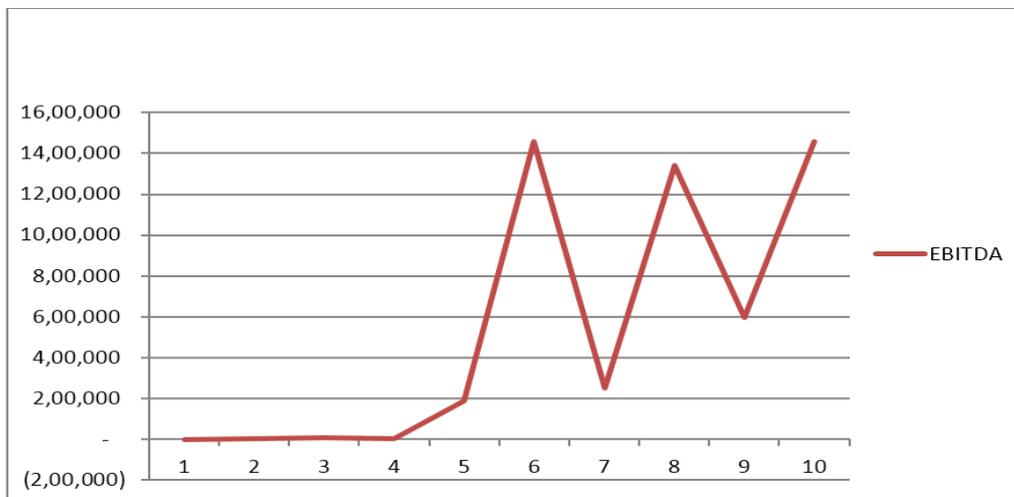
Graph 1: Year wise benefit-cost ratio & return on equity ratio analysis

BCR – Benefit Cost Ratio describes year wise return against CAPEX investment. Ideal ratio => 1

ROE – Return on Equity shows the year wise return against Capital. Ideal ratio => 1.5



Graph 2: Year wise % of chicks, birds & breeders in closing balance



Graph 3: Year wise earnings before interest, tax, depreciation & amortization (ebitda)

Table 1: Ostrich Commercial Farming Model Project 10 Years Capex Plan

PKR ('000')										
CAPEX	Y 1	Y 2	Y 3	Y 4	Y 5	Y 6	Y 7	Y 8	Y 9	Y 10
Farm Building (land is available)	200	1,746	19,478	31,770	89,891	138,463	165,311	164,843	164,603	164,160
Drinker Tubs small	2	21	234	381	1,079	1,662	1,984	1,978	1,975	1,970
Feeder Trays	2	21	234	381	1,079	1,662	1,984	1,978	1,975	1,970
Lager feeder with stands (wooden)	10	105	1,169	1,906	5,393	8,308	9,919	9,891	9,876	9,850
Larger drinker tubs (after 6 months)	10	105	1,169	1,906	5,393	8,308	9,919	9,891	9,876	9,850
Handling stick with rod	1	1	1	1	1	1	1	2	2	2
Chicks cost	400									
Total Onetime Cost	625	1,998	22,283	36,346	102,837	158,403	189,117	188,582	188,307	187,801
Working Capital Requirement	1,000	5,391	19,379	70,354	49,163	63,783	144,621	134,767	93,567	80,748
Consultancy	10									
Less: Bank Debt		(5,500)	(20,500)	(22,000)						
Total	1,635	1,890	21,162	84,701	152,000	222,186	333,737	323,349	281,874	268,549

Table 2: Ostrich Commercial Farming Model Project 10 Years Profit & Loss Statement

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
PKR ('000')										
Sales:										
Chicks	-	2,074	22,798	30,173	89,752	334,194	62,357	134,566	69,328	127,504
Meat	-	-	-	-	210,357	1,130,881	389,729	1,892,338	974,928	1,793,028
Feathers etc	-	-	-	-	3,506	18,848	6,495	31,539	16,249	29,884
Hides	-	-	-	-	7,012	37,696	12,991	63,078	32,498	59,768
Eggs	-	480	8,381	13,969	62,328	224,938	43,303	93,449	48,145	88,545
Bones	-	-	-	-	2,104	11,309	3,897	18,923	9,749	17,930
Total Revenue	-	2,554	31,179	44,142	375,059	1,757,867	518,773	2,233,894	1,150,897	2,116,659
COGS:										
<i>Add: poning birds stock:</i>										
Chicks	400	-	-	6,383	4,425	25,131	40,103	17,460	37,679	19,412
Birds	-	640	7,741	-	85,111	59,005	33,508	534,711	232,798	502,381
Breeders	-	-	768	10,058	10,058	44,876	115,683	31,178	67,283	34,664
Yearly cost of maintaining chicks upto 2 mnths	199	2,875	23,524	16,308	92,611	147,788	64,343	138,852	71,536	131,565
Yearly cost of maintaining chicks upto 3-6 mnths	180	2,435	-	14,751	-	8,377	-	58,200	-	64,706
Yearly cost of maintaining chicks upto 7-12 mnths	432	932	5,225	57,450	39,829	22,618	290,779	157,139	163,620	-
Miscellaneous expenses on birds other than breeders	88	2,052	1,064	19,728	8,025	3,455	58,080	30,857	32,178	34,436
Cost of birds sold during year	-	-	-	-	-	-	-	-	-	-
<i>Less: Closing birds stock:</i>										
Chicks	-	-	(6,383)	(4,425)	(25,131)	(40,103)	(17,460)	(37,679)	(19,412)	(35,701)
Birds	(640)	(7,741)	-	(85,111)	(59,005)	(33,508)	(534,711)	(232,798)	(502,381)	(258,825)
Breeders	-	(768)	(10,058)	(10,058)	(44,876)	(115,683)	(31,178)	(67,283)	(34,664)	(63,752)
Total Cost of Sales	659	425	21,882	25,085	111,047	121,956	19,146	630,637	48,637	428,886
Gross Profit / (Gross Loss)	(659)	2,129	9,297	19,058	264,013	1,635,911	499,627	1,603,256	1,102,260	1,687,772
Operating Expenses:										
<i>Cost of Maintaining Breeders:</i>										
Yearly cost of maintaining Birds upto 13-24 mnths	-	(1,056)	-	(12,773)	(47,875)	(145,234)	(55,288)	(78,685)	(384,117)	(73,830)
Yearly cost of maintaining Birds (25 - 36 mnths)	-	-	(1,248)	-	(15,096)	-	(171,640)	(92,991)	(92,991)	(87,253)
Yearly cost of maintaining Birds (37 - 48 mnths)	-	-	-	(1,248)	(1,248)	(16,344)	(16,344)	(16,344)	(16,344)	(16,344)
Miscellaneous expenses on breeders	-	-	-	(352)	(352)	(4,610)	(4,610)	(4,610)	(4,610)	(4,610)
Total cost	-	(1,056)	(1,248)	(14,373)	(64,571)	(166,188)	(247,882)	(192,630)	(498,062)	(182,037)

Table 3.

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
Travelling expense	(10)	(6)	(328)	(376)	(1,666)	(1,829)	(287)	(9,460)	(730)	(6,433)
Telephone expenses	(1)	(1)	(44)	(50)	(222)	(244)	(38)	(1,261)	(97)	(858)
Communication expense	(13)	(8)	(438)	(502)	(2,221)	(2,439)	(383)	(12,613)	(973)	(8,578)
Office vehicles running expense	(7)	(4)	(219)	(231)	(1,110)	(1,220)	(191)	(6,506)	(486)	(4,289)
Office expense (Misc)	(9)	(6)	(284)	(326)	(1,444)	(1,585)	(248)	(8,198)	(632)	(5,576)
Marketing / Promotional expense	(14)	(9)	(481)	(552)	(2,443)	(2,683)	(421)	(13,874)	(1,070)	(9,435)
Office vehicles insurance rate	(14)	(9)	(460)	(527)	(2,332)	(2,561)	(402)	(13,243)	(1,021)	(9,007)
Professional fees (legal, audit, consultants, etc.)	(3)	(2)	(109)	(125)	(555)	(610)	(96)	(3,153)	(243)	(2,144)
Consultancy	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
	(81)	(56)	(2,373)	(2,719)	(12,003)	(13,181)	(2,078)	(68,119)	(5,263)	(46,330)
EBITDA	(740)	1,017	5,676	1,965	187,438	1,456,542	249,667	1,342,508	598,934	1,459,406
Depreciation:										
Building depreciation rate - 70 yrs life	(3)	(28)	(306)	(760)	(2,045)	(4,023)	(6,386)	(8,741)	(11,093)	(13,439)
Office & Equipment depreciation rate	(2)	(19)	(216)	(536)	(1,442)	(2,838)	(4,504)	(6,166)	(7,825)	(9,480)
Furniture & Fixtures depreciation rate	-	-	-	-	-	-	-	-	-	-
Total Depreciation:	(5)	(47)	(522)	(1,296)	(3,487)	(6,861)	(10,890)	(14,907)	(18,918)	(22,919)
EBIT	(745)	970	5,154	669	183,952	1,449,681	238,778	1,327,601	580,016	1,436,487
Non-operating Income										
Interest Income on Long Term Deposits	-	-	-	-	-	42,000	112,000	182,000	294,000	420,000
Non-Operating Expenses										
Finance Cost on Long Term Debt	-	(825)	(3,900)	(7,200)	(6,375)	(3,300)	-	-	-	-
EBT	(745)	145	1,254	(6,531)	177,577	1,486,381	350,778	1,509,601	874,016	1,856,487
Taxation	-	-	439	(2,286)	62,152	506,233	83,572	464,680	203,006	502,771
Profit / (Loss) after Tax	(745)	145	815	(4,245)	115,425	982,147	267,206	1,044,941	671,011	1,353,717
Profit / (Loss) c/f	-	(745)	(600)	215	(4,030)	111,395	1,093,542	1,360,748	2,405,688	3,076,699
Net Profit	(745)	(600)	215	(4,030)	111,395	1,093,542	1,360,748	2,405,688	3,076,699	4,430,415

Table 4: Ostrich commercial farming model project 10 years cash flow statement

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	PRICE ('000)
CASH FLOWS FROM OPERATING ACTIVITIES										
Profit before taxation	(745)	970	5,154	669	183,952	1,449,681	238,778	1,327,601	580,016	1,436,487
Adjustments for non cash items:										
Depreciation	5	47	522	1,296	3,487	6,861	10,890	14,907	18,918	22,919
Finance cost	(825)	(3,900)	(7,200)	(6,375)	(3,900)	(3,900)				
(Gain) / loss on disposal of fixed assets										
	5	(778)	(3,378)	(5,904)	(2,888)	3,561	10,890	14,907	18,918	22,919
	(740)	192	1,776	(5,235)	181,063	1,453,242	249,667	1,342,508	598,934	1,459,406
(Increase) / Decrease in operating assets:										
Stores and spares	-	-	-	-	-	-	-	-	-	-
Stock-in-trade	(640)	(7,869)	(7,932)	(83,153)	(29,418)	(60,281)	(394,056)	245,589	(218,697)	198,178
Trade Receivables	-	(128)	(7,667)	(3,241)	(82,729)	(345,702)	309,773	(428,780)	270,749	(241,440)
Other receivables	-	-	-	-	-	-	-	-	-	-
Long-term loans and deposits	-	-	-	-	-	(300,000)	(500,000)	(500,000)	(800,000)	(900,000)
	(640)	(7,997)	(15,599)	(86,394)	(112,148)	(705,983)	(584,282)	(683,191)	(747,948)	(943,262)
Increase / (decrease) in operating liabilities:										
Trade and other payables	-	5,346	12,979	51,648	36,906	60,629	167,171	(36,230)	36,273	(132,585)
Interest and made-up accrued	-	-	-	-	-	-	-	-	-	-
Short term deposits	-	5,346	12,979	51,648	36,906	60,629	167,171	(36,230)	36,273	(132,585)
	(1,380)	(2,459)	(844)	(39,981)	105,821	807,888	(167,444)	623,087	(112,741)	383,539
Cash generated from operations	(1,380)	(2,459)	(844)	(39,981)	105,821	807,888	(167,444)	623,087	(112,741)	383,539
Income tax paid - net	-	-	439	(2,286)	62,152	506,233	83,972	464,660	203,006	502,771
Net cash from operating activities	(1,380)	(2,459)	(1,283)	(37,995)	43,670	301,654	(231,016)	1,087,747	(313,740)	(119,212)
CASH FLOWS FROM INVESTING ACTIVITIES										
Capital expenditure	(224)	(1,998)	(22,282)	(36,345)	(102,836)	(158,401)	(189,115)	(188,581)	(188,305)	(187,799)
Proceeds from sale of property, plant and equipment	-	-	-	-	-	-	-	-	-	-
Breeders Birds Available at year end	-	(1,800)	(19,154)	-	(72,539)	(147,513)	176,051	(75,218)	67,956	(60,600)
Profit / interest received	-	-	-	-	-	42,000	112,000	182,000	294,000	420,000
Net cash used in investing activities	(224)	(3,798)	(41,436)	(36,345)	(175,374)	(263,915)	98,935	(81,799)	173,651	171,601
CASH FLOWS FROM FINANCING ACTIVITIES										
Proceeds from local currency loans	1,635	7,390	41,662	106,702	146,500	201,686	311,737	323,349	281,874	268,549
Repayments of local currency loans	-	-	-	-	5,900	15,000	1,900	(22,000)	-	-
Dividend paid	-	-	-	-	-	-	-	-	-	-
Net cash used in financing activities	1,635	7,390	41,662	106,702	152,000	216,686	313,237	301,349	281,874	268,549
Net decrease in cash and cash equivalents	31	1,133	(1,057)	32,661	20,295	254,425	161,157	377,977	139,779	320,938
Cash and cash equivalents at beginning of the period	-	31	1,164	107	32,768	53,063	307,488	468,645	846,622	986,401
Cash and cash equivalents at end of the period	31	1,164	107	32,768	53,063	307,488	468,645	846,622	986,401	1,307,339
Cash and cash equivalents comprises										
Cash & bank balances	31	1,164	107	32,768	53,063	307,488	468,645	846,622	986,401	1,307,339
Short term borrowings	-	-	-	-	-	-	-	-	-	-
	31	1,164	107	32,768	53,063	307,488	468,645	846,622	986,401	1,307,339

Table 5: Ostrich commercial farming model projected 10 years stock movement

Ostrich Commercial Farming Model Projected 10 Years Stock Movement										
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
Number of Chicks (Sample quantity)	100									
Chicks to be grown up during year after mortality	80	-	-	10,639	7,376	41,884	66,839	29,100	62,798	32,353
Chicks to Birds available for breeding	-	-	-	-	-	-	-	-	-	-
Breeders available at the beginning of the year	-	-	80	1,048	1,048	4,675	12,050	3,248	7,009	3,611
Birds available at the beginning of the year	-	80	968	-	10,639	7,376	4,188	66,839	29,100	62,798
Total Birds available	-	80	1,048	1,048	11,687	12,050	16,239	70,087	36,108	66,408
Total Chicks available	80	80	-	10,639	7,376	41,884	66,839	29,100	62,798	32,353
Breeders: (1 male & 2 females)										
No. of breeders male	-	30	349	349	1,558	4,017	1,083	2,336	1,204	2,214
No. of breeders females	-	60	698	696	3,116	8,034	2,105	4,672	2,407	4,427
Eggs Laying Rate (ranging 30 - 90 eggs/bird) on avg	40	40	40	40	40	40	40	40	40	40
Number of Eggs to be laid by female breeders after 1.5 years		2,400	27,938	27,938	124,056	321,341	86,607	186,896	96,289	177,089
Number of Chicks to be produced after eggs fertility ratio applied		1,728	18,998	16,763	74,794	167,097	51,964	112,139	57,774	106,254
Sales:										
Number of eggs to be sold out per year		240	4,191	6,985	31,164	112,469	21,652	46,724	24,072	44,272
Chicks to be sold out @ 30% i		518	5,699	7,543	22,438	83,549	15,589	33,642	17,332	31,876
Birds to be sold out for meat after 1 year of age (@ 30% i till 4th year, 60% i from 5th year to be raise 10% i every after year upto 30% i max.)		-	-	-	7,012	37,696	12,991	63,078	32,498	59,768
Chicks available at the end of the year for breeding	-	-	10,639	7,376	41,884	66,839	29,100	62,798	32,353	59,502
Birds available at the end of the year	80	968	-	10,639	7,376	4,188	66,839	29,100	62,798	32,353
Breeders available at the end of the year		80	1,048	1,048	4,675	12,050	3,248	7,009	3,611	6,441
Total Stock	80	1,048	11,687	19,062	53,935	83,078	99,186	98,906	98,762	98,496
0-2 months	-	-	10,639	-	41,884	66,839	29,100	62,798	32,353	59,502
3-6 months		968	-	7,376	-	-	-	-	-	32,353
7-12 months	80		968	10,639	7,376	4,188	53,848	29,100	30,300	
13-24 months		80		968	3,627	11,003	4,188		29,100	
25-30 months			80		968		11,003	5,961	5,961	5,593
31-48 months				80	80	1,048	1,048	1,048	1,048	1,048

Table 6: Ostrich commercial farming model ratio analysis

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	PKR ('000')
										YEAR 10
Debt Equity Ratio										
Paid up Capital	1,635	3,525	24,687	109,387	261,387	483,573	817,310	1,140,660	1,422,534	1,691,082
Un-appropriated Profit	(745)	(600)	215	(4,030)	53,682	504,254	1,173,704	1,674,230	2,539,890	3,212,070
Total Debs	890	2,925	24,902	105,357	315,069	987,826	1,991,014	2,814,889	3,962,424	4,903,153
	890	8,425	50,902	153,357	357,509	1,009,826	1,991,014	2,814,889	3,962,424	4,903,153
Debt	0%	65%	51%	31%	12%	2%	0%	0%	0%	0%
Equity	100%	35%	49%	69%	88%	98%	100%	100%	100%	100%
Return on Net Fixed Assets										
Average net fixed asset: A	219	3,970	44,884	79,933	251,821	550,874	553,050	801,942	903,373	1,128,853
Profit before tax:	(745)	970	5,154	669	183,952	1,449,681	238,778	1,327,601	580,016	1,436,487
Non-operating income	-	-	-	-	-	42,000	-	182,000	294,000	420,000
Financial Charges	-	(825)	(3,900)	(7,200)	(6,375)	(3,300)	-	-	-	-
B	(745)	145	1,254	(6,531)	177,577	1,488,381	350,778	1,509,601	874,016	1,856,487
Return net fixed assets (I/A)	-339.33%	3.64%	2.79%	-8.17%	70.52%	270.19%	63.43%	188.24%	96.75%	164.46%
Acid Test Ratio/Current Ratio:										
Current Assets	671	9,801	24,343	143,397	275,840	936,249	1,181,688	1,742,855	1,830,582	2,194,782
Current Liabilities	1	5,346	18,325	69,973	106,879	167,508	334,680	298,449	334,722	202,138
Current Ratio	670.63	1.81	1.33	2.05	2.58	5.59	3.53	5.84	5.47	10.86
Acid Test Ratio	30.63	0.21	0.43	0.63	1.37	4.16	1.79	4.71	3.81	9.09
Return on Equity:										
Net Income	(745)	(600)	215	(4,030)	111,395	1,093,542	1,360,748	2,405,688	3,076,699	4,430,415
Equity	1,635	3,525	24,687	109,387	261,387	483,573	817,310	1,140,660	1,422,534	1,691,082
ROE	(0.46)	(0.17)	0.01	(0.04)	0.43	2.26	1.66	2.11	2.16	2.62
Benefit-Cost Ratio (BCR):	-	1.17	1.28	0.45	2.15	6.88	1.35	6.01	3.55	6.85
Internal Rate of Return:										
IRR of the Project on 10 years:	92%									
Net Present Value:										
NPV of the Project on 10 years:	443,787	523,111	620,844	766,662	1,005,031	1,208,850	692,222	980,312	596,388	586,105

3. Results and Discussion

In this paper ostrich farming along with some of the statistical analysis of *Struthio camelus* were described. Ostrich production was management incentive. Fatalities to producers commonly ascend from infertile eggs, poor egg handling, and incorrect storage and incubator settings (temperature, relative humidity, and air flow). Early chick mortality was also a significant factor influencing successful ostrich management. Microbial of ostrich eggs, caused by contaminated nests, inadequate egg cleaning, and poor incubator and hatcher sanitation, results in low hatchability. Adequate breeder nutrition was vital to insuring fertility, increasing the number of eggs laid and ensuring good survival rates of hatching chicks.

By visiting the farm it was observed that ostriches were fed twice a day and they had an increased level of water consumption. As per the time period from July to December, ostriches breeding behavior was witnessed. The breeding season of ostriches was summer. During courtship and breeding behavior both male and female perform a sort of dance which was referred to as mating behavior. The eggs received parental care from both male and female parents. Incubation temperature of eggs ranges from 39 – 45°C. In the natural environment, it takes forty five days for eggs to hatch and in incubators it takes forty two days. In the year 2011, eighty eggs were obtained at the farms. The maximum length attained at the farm of a newly hatched chick was 8 inch with 400 grams of weight as mentioned by the sources of Pakistan Ostrich Company. Young chicks were kept in association with rabbits so that they not only spend time in sitting and pecking but also in walking and running.

The eggs were brought from Australia in order to start ostrich

farming in Pakistan. At the time to start a minimum of 100 eggs were introduced/ subjected to artificial incubation. On the other hand an average number of chicks could be transported and kept under observation to see the survivability rate in Pakistan.

The mortality rate of eggs per annum was 10% so 10 out of a total of 100 would be discarded, usually due to many reasons which were dependent on the management of the eggs. This rate could vary simultaneously. The problems causing mortality of eggs were summarized as the displacement of egg yolk, holes in egg shells, infertility of eggs, difference in eggs incubations temperature and humidity, embryonic mortality and low hatchability. Infertility was mostly seen to be the reason of mortality of eggs at farms.

Female laid eggs at the age of two years. At the age of 11 months, the bird is about 100 – 120 kg of weight and can be slaughtered. These two aspects, fertility and slaughtering age of birds, were considered important with regard to ostrich farming.

The ideal slaughtering birds were about 10 months old that have 14 square foot wing span and 100 kg weight. Adult ostrich had 70 kg of boneless meat out of 130 kg of total meat. No fat deposition was found in the meat. The birds at the farm were given medicine Vitazec to keep their stomach clean so that they could take feed properly next time. Farming forte was also administered to birds in order to increase their immunity.

4. Conclusion

The projected financial statements and ratio analysis is self-explanatory in defining the nomenclature of the business. The crucial area is from the year 1 – 4 where only investors with financial stability will sustain. Started from fifth year market

becomes volatile with incredible high growth and returns. In year six, an investor can withdraw all of his investment from the business earnings. Since the business depends upon the livestock therefore the fertility ratio will play the major role in determining the future benefits.

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