



ANNEXURE A: DATA SUMMARY

	Minimum	Average	Maximum	Zeroes
INVESTMENT IN DAIRY CATTLE				
28/02/1998				
Cows				
Number of cows in milk	11.00	94.16	225.00	-
Value per cow in milk	1,350.00	3,713.00	8,000.00	-
Cows in milk total	28,000.00	365,597.00	1,272,000.00	-
Number of cows dry and steaming up	2.00	24.94	96.00	-
Value per cow dry and steaming up	1,350.00	3,719.00	8,000.00	-
Cows dry and steaming up total	7,500.00	93,435.00	288,000.00	-
Heifers				
Number in calf	-	24.40	120.00	2.00
Value per heifer in calf	-	2,775.00	7,000.00	2.00
Total for heifers in calf	-	67,349.00	227,500.00	4.00
Number of heifers 12 - 24 months	-	32.30	167.00	2.00
Value per heifer 12 - 24 months	-	2,294.68	17,500.00	2.00
Heifers 12 - 24 months total	-	65,133.00	334,000.00	5.00
Number of heifers born to 12 months	-	41.44	174.00	1.00
Value per heifer born to 12 months	-	992.35	4,000.00	1.00
Heifers born to 12 months total	-	39,053.24	261,000.00	3.00
Bulls and oxen				
Number of full grown bulls and oxen	-	2.29	25.00	2.00
Value per bul and ox	-	4,511.43	10,000.00	2.00
Full grown bulls and oxen total	-	5,828.00	32,500.00	17.00
Number of bulls and oxen 12 - 24 months	-	12.62	35.00	2.00
Value per bul and ox 12 - 24 months	-	1,338.46	3,000.00	2.00
Bulls and oxen 12 - 24 months total	-	4,497.00	56,000.00	39.00
Number of bulls and oxen, born - 12 months	1.00	34.45	130.00	-
Value per bul and ox, born - 12 months	100.00	629.55	4,000.00	-
Bulls and oxen born - 12 months total	-	7,873.00	72,000.00	28.00
Total value as on 28/02/1998	53,150.00	648,765.24	1,804,500.00	-
CAPITAL INVESTMENT LIVESTOCK	55,450.00	635,980.44	1,804,500.00	-
DIVISION OF LAND	66.00	361.93	629.00	-
IRRIGATION				
PASTURE				
Type				
Ha	0.60	20.53	70.00	-
Value/ha land	1,000.00	4,044.44	15,000.00	-
Production cost/ha pasture	750.00	1,784.72	3,200.00	-
Type				
Ha	4.00	16.89	80.00	-
Value/ha land	2,000.00	4,666.67	12,000.00	-
Production cost/ha pasture	600.00	1,742.50	2,500.00	-
Type				



Ha	4.00	10.25	20.00	-
Value/ha land	2,500.00	6,250.00	12,000.00	-
Production cost/ha pasture	900.00	1,875.00	2,500.00	-
Type				
Ha				
Value/ha land				
Production cost/ha pasture				
TOTAL VALUE LAND (I PASTURE)	-	51,706.00	570,000.00	32.00
TOTAL PRODUCTION COST I PASTURE	-	24,098.50	350,000.00	32.00
TOTAL HECTARE IRRI PASTURE	-	11.25	120.00	32.00
HAY				
Type				
Ha	1.00	18.67	30.00	-
Value/ha land	1,500.00	2,666.67	3,500.00	-
Production cost/ha hay	350.00	1,150.00	2,000.00	-
Type				
Ha	10.00	10.00	10.00	-
Value/ha land	1,500.00	1,500.00	1,500.00	-
Production cost/ha hay	450.00	450.00	450.00	-
Type				
Ha				
Value/ha land				
Production cost/ha hay				
Type				
Ha				
Value/ha land				
Production cost/ha hay				
TOTAL VALUE LAND (I HAY)	-	2,920.00	90,000.00	47.00
TOTAL PRODUCTION COST HAY	-	965.00	33,000.00	47.00
TOTAL HECTARES IRRI HAY	-	1.32	35.00	47.00
SILAGE				
Type				
Ha	10.00	37.67	80.00	-
Value/ha land	1,650.00	1,883.33	2,000.00	-
Production cost/ha silage	1,200.00	1,600.00	2,000.00	-
Type				
Ha				
Value/ha land				
Production cost/ha silage				
TOTAL VALUE LAND (I SILAGE)	-	4,450.00	160,000.00	47.00
TOTAL PRODUCTION COST SILAGE	-	4,176.00	160,000.00	47.00
TOTAL HECTARES IRRI SILAGE	-	2.26	80.00	47.00
CONCENTRATES				
Type				
Ha				
Value/ha land				
Production cost/ha concentrates				
TOTAL VALUE LAND (I CONCENTRATES)	-	-	-	50.00



TOTAL PRODUCTION COST CONCENTRATES	-	-	-	50.00
TOTAL HECTARES IRRIGATED CONCENTRATES	-	-	-	50.00
DRY LAND	66.00	361.93	629.00	-
PASTURE				
Type				
Ha	5.00	42.46	130.00	-
Value/ha land	350.00	2,001.79	8,000.00	-
Production cost/ha pasture	300.00	943.02	6,900.00	-
Type				
Ha	3.00	33.58	70.00	-
Value/ha land	350.00	2,388.46	8,000.00	-
Production cost/ha pasture	200.00	574.33	1,481.32	-
Type				
Ha	4.00	135.25	500.00	-
Value/ha land	200.00	1,887.50	6,000.00	-
Production cost/ha pasture	75.00	441.25	1,000.00	-
Type				
Ha	6.00	43.00	80.00	-
Value/ha land	350.00	375.00	400.00	-
Production cost/ha pasture	125.00	187.50	250.00	-
TOTAL VALUE LAND (D PASTURE)	-	82,326.00	1,040,000.00	22.00
TOTAL PRODUCTION COST D PASTURE	-	26,967.75	217,692.40	22.00
TOTAL HECTARE DRYLAND PASTURE	-	45.05	740.00	22.00
HAY				
Type				
Ha	3.00	55.82	300.00	-
Value/ha land	100.00	1,494.64	6,000.00	-
Production cost/ha hay	50.00	624.13	2,000.00	-
Type				
Ha	2.00	49.35	150.00	-
Value/ha land	100.00	1,753.85	6,000.00	-
Production cost/ha hay	50.00	533.33	950.00	-
Type				
Ha	12.00	31.00	50.00	-
Value/ha land	1,000.00	1,500.00	2,000.00	-
Production cost/ha hay	450.00	550.00	650.00	-
Type				
Ha				
Value/ha land				
Production cost/ha hay				
TOTAL VALUE LAND (D HAY)	-	59,258.00	558,000.00	22.00
TOTAL PRODUCTION COST D HAY	-	23,359.54	171,150.00	22.00
TOTAL HECTARES D HAY	-	45.33	450.00	22.00
SILAGE				
Type	-	-	-	1.00
Ha	-	41.65	100.00	1.00
Value/ha land	-	1,514.81	3,000.00	1.00
Production cost/ha silage	350.00	1,345.10	6,000.00	-
Type				



Ha	12.00	16.00	20.00	-
Value/ha land	1,000.00	1,000.00	1,000.00	-
Production cost/ha silage	950.00	1,075.00	1,200.00	-
TOTAL VALUE LAND (D SILAGE)	-	38,805.00	270,000.00	24.00
TOTAL PRODUCTION COST D SILAGE	-	31,054.00	240,000.00	24.00
TOTAL HECTARES D SILAGE	-	23.13	100.00	24.00
CONCENTRATES				
Type	-	-	-	1.00
Ha	-	36.19	200.00	1.00
Value/ha land	-	1,265.00	2,500.00	1.00
Production cost/ha concentrates	550.00	1,169.08	2,100.00	-
Type	-	-	-	-
Ha	21.00	21.00	21.00	-
Value/ha land	2,000.00	2,000.00	2,000.00	-
Production cost/ha concentrates	550.00	550.00	550.00	-
Type	-	-	-	-
Ha	-	-	-	-
Value/ha land	-	-	-	-
Production cost/ha concentrates	-	-	-	-
TOTAL VALUE LAND (D CONCENTRATES)	-	19,483.43	300,000.00	31.00
TOTAL PRODUCTION COST D CONCENTRATES	-	18,306.00	192,500.00	31.00
TOTAL HECTARES D CONCENTRATES	-	14.89	200.00	31.00
NATURAL PASTURE	66.00	361.93	629.00	-
Ha	-	156.42	575.00	1.00
Value/ha land	200.00	1,995.35	30,000.00	-
Total value	-	154,572.00	630,000.00	8.00
TOTAL LAND USED FOR DAIRY	10.00	277.56	950.00	-
HA RENTED	12.00	56.75	225.00	-
CAPITAL INVESTMENT LAND	16,000.00	413,520.43	1,428,000.00	-
FIXED IMPROVEMENTS				
Milking parlor				
Area	60.00	159.71	350.00	-
Present value	5,000.00	67,099.29	400,000.00	-
Replacement value	25,000.00	92,263.64	225,000.00	-
Feed shed				
Area	16.00	364.33	1,350.00	-
Present value	2,000.00	81,397.44	800,000.00	-
Replacement value	15,000.00	89,111.11	300,000.00	-
Dip				
Present value	-	4,250.00	10,000.00	1.00
Replacement value	-	5,000.00	10,000.00	1.00
Crush-pen				
Present value	500.00	5,478.85	20,000.00	-
Replacement value	1,000.00	9,750.00	40,000.00	-
Kraal				
Present value	-	9,222.00	50,000.00	1.00
Replacement value	-	15,062.50	80,000.00	1.00
Silage storage				
Present value	2,000.00	11,538.10	60,000.00	-
Replacement value	5,000.00	19,000.00	80,000.00	-



Water provision				
Present value	1,000.00	24,748.75	250,000.00	-
Replacement value	1,300.00	16,866.67	100,000.00	-
Calf housing				
Present value	-	7,562.05	50,000.00	1.00
Replacement value	-	10,656.80	60,000.00	1.00
Labour housing				
Present value	3,000.00	99,281.08	750,000.00	-
Replacement value	3,000.00	112,916.67	900,000.00	-
Fencing dairy				
Present value	2,000.00	41,866.67	180,000.00	-
Replacement value	4,000.00	29,287.50	120,000.00	-
Other (present value)	500,000.00	500,000.00	500,000.00	-
Other (replacement value)				
TOTAL FIXED IMPROVEMENTS (PRESENT)	15,000.00	271,494.70	1,520,500.00	-
TOTAL FIXED IMPROVEMENTS (REPLACEMENT)	-	194,514.40	1,366,000.00	16.00
EQUIPMENT	66.00	361.93	629.00	-
Electronic feeder				
Present value	20,000.00	20,000.00	20,000.00	-
Replacement value	30,000.00	30,000.00	30,000.00	-
Feeding facilities				
Present value	-	10,235.37	65,000.00	2.00
Replacement value	-	13,192.19	60,000.00	2.00
Milking machine				
Fabricate				
Handling system				
Number of points	4.00	7.87	16.00	-
Present value	1,000.00	50,208.33	500,000.00	-
Replacement value	10,000.00	93,625.00	600,000.00	-
Milk tanks				
Number	-	1.83	4.00	1.00
Total capacity	1.00	4,184.15	20,000.00	-
Present value	2,200.00	41,860.87	180,000.00	-
Replacement value	12,000.00	75,218.75	200,000.00	-
AI equipment				
Present value	-	2,575.00	8,500.00	3.00
Replacement value	-	4,180.00	10,000.00	2.00
Power generator KW	11.00	22.60	45.00	-
Present value	-	9,866.67	65,000.00	9.00
Replacement value	-	12,266.67	65,000.00	6.00
Feeding equipment				
Present value	1,500.00	42,187.50	290,000.00	-
Replacement value	3,000.00	74,448.28	495,000.00	-
Irrigation equipment				
Present value	-	56,504.78	350,000.00	3.00
Replacement value	-	52,407.14	250,000.00	3.00
Bakkie/truck %	5.00	62.56	100.00	-
Present value	5,000.00	69,040.00	331,000.00	-
Present value dairy	700.00	43,600.00	331,000.00	-
Replacement value	50,000.00	155,823.50	600,000.00	-
Replacement value dairy	-	67,925.20	600,000.00	16.00
Tractors and implements %	2.00	80.89	100.00	-



Present value	10,000.00	111,372.34	650,000.00	-
Present value dairy	-	86,876.00	650,000.00	3.00
Replacement value	35,000.00	278,156.22	1,600,000.00	-
Replacement value dairy	-	128,321.98	1,200,000.00	18.00
Workshop equipment %	1.00	56.41	100.00	-
Present value	300.00	10,233.33	50,000.00	-
Present value dairy	-	5,517.30	50,000.00	9.00
Replacement value	1,000.00	16,249.96	60,000.00	-
Replacement value dairy	-	4,449.99	60,000.00	25.00
Computer %	-	61.00	100.00	2.00
Present value	-	3,112.50	6,500.00	1.00
Present value dairy	-	983.20	5,000.00	27.00
Replacement value	-	7,131.58	12,000.00	1.00
Replacement value dairy	-	1,751.00	12,000.00	32.00
TOTAL EQUIPMENT (PRESENT)	26,500.00	300,203.70	1,374,000.00	-
TOTAL EQUIPMENT (REPLACEMENT)	-	383,175.18	2,155,800.00	16.00
GROSS VALUE OF PRODUCTION	66.00	361.93	629.00	-
PRODUCT INCOME				
Milk price in R/liter	0.80	1.24	1.52	-
Quantity of milk delivered	2,504.00	582,506.54	2,372,500.00	-
Value of milk delivered	2,003.20	759,466.26	3,179,150.00	-
Quantity of milk for household consumption	365.00	1,832.60	9,125.00	-
Value of milk for household consumption	-	2,181.96	11,497.50	1.00
Quantity of milk for labourers	-	7,065.81	28,500.00	1.00
Value of milk for labourers	-	7,662.27	37,050.00	8.00
Quantity of milk for calves	-	15,299.75	43,800.00	1.00
Value of milk for calves	-	13,841.59	55,890.00	15.00
Quantity milk privately sold	-	18,817.57	108,000.00	2.00
Value of milk privately sold	1.26	27,033.48	189,000.00	-
Total quantity of milk	21,455.00	606,663.83	2,382,355.00	-
Value of milk	22,527.75	789,099.44	3,192,355.70	-
TRADING INCOME				
LIVESTOCK SOLD				
Number of cows	-	19.93	84.00	1.00
Value per cow	-	21,001.37	410,944.00	1.00
Total value of cows	-	49,801.58	410,944.00	10.00
Number of heifers	-	7.78	20.00	1.00
Value per heifer	-	24,192.83	200,000.00	1.00
Total value of heifers	-	7,524.96	200,000.00	42.00
Number of calves	-	33.07	100.00	1.00
Value per calf	25.00	757.83	7,500.00	-
Total value of calves	-	11,807.58	150,000.00	22.00
Number of bulls and oxen	1.00	24.58	95.00	-
Value per bul and ox	70.00	4,750.65	40,000.00	-
Total value of buls and oxen	-	7,682.45	60,000.00	31.00
TOTAL VALUE OF LIVESTOCK SOLD	-	76,816.57	614,944.00	4.00
LIVESTOCK PURCHASED				
Number of cows	8.00	24.86	100.00	-
Value per cow	2,350.00	3,623.08	6,000.00	-
Total value of cows	-	11,440.32	300,000.00	43.00
Number of heifers	2.00	3.50	5.00	-
Value per heifer	860.00	3,180.00	5,500.00	-



Total value of heifers	-	584.40	27,500.00	48.00
Number of calves				
Value per calf				
Total value of calves	-	-	-	50.00
Number of bulls and oxen	1.00	1.00	1.00	-
Value per bul and ox	800.00	2,700.00	5,000.00	-
Total value of bulls and oxen	-	216.00	5,000.00	46.00
TOTAL VALUE PURCHASED	-	12,240.72	300,800.00	39.00
SLAUGHTERED				
Number for household	1.00	1.89	3.00	-
Value for household	1,350.00	3,255.26	7,000.00	-
Number for labourers	-	4.73	25.00	1.00
Value for labourers	-	9,363.33	75,000.00	1.00
Value slaughtered	-	4,128.57	75,000.00	26.00
OTHER INCOME				
EXPENCES	66.00	361.93	629.00	-
DIRECTLY ALLOCATED COST				
SELF PRODUCED FEED				
Concentrates quantity	-	132.50	450.00	1.00
Concentrates total	-	41,292.86	192,500.00	1.00
Hay quantity	38.00	1,662.17	8,000.00	-
Hay total	1,650.00	41,681.12	189,200.00	-
Silage quantity	-	2,462.50	12,000.00	1.00
Silage total	-	62,050.00	240,000.00	1.00
Pastures total	-	62,398.84	253,693.00	1.00
Total other such as rests and groundnut hay	-	22,373.45	120,000.00	3.00
Total self produced feed	-	126,939.96	380,000.00	1.00
PURCHASED FEEDS				
Concentrates quantity	-	13,858.14	275,000.00	2.00
Concentrates total	-	335,968.19	1,440,000.00	1.00
Hay quantity	10.00	202.74	480.00	-
Hay total	1,350.00	100,470.93	397,000.00	-
Silage quantity	-	105.00	180.00	2.00
Silage total	-	32,400.00	70,000.00	2.00
Licks and minerals quantity	-	2,964.15	20,000.00	2.00
Licks and minerals total	240.00	8,505.23	29,976.00	-
Milk surrogates quantity	-	3,185.71	25,410.00	2.00
Milk surrogates total	-	24,249.11	172,900.00	1.00
Self produced milk for calves	-	14,124.07	55,890.00	14.00
Total purchased feeds and surrogates	2,007.50	362,735.95	1,636,800.00	-
Total feeds	19,832.00	489,675.91	1,856,800.00	-
Vet and medicine	600.00	26,181.48	101,500.00	-
AI cost	-	20,651.57	84,000.00	2.00
Wash and sterilising agents	400.00	8,157.89	42,000.00	-
Rent of milk tank				
Marketing cost of livestock	128.00	5,699.54	25,412.00	-
Sundry (telephone, milk recording etc)	100.00	5,743.22	50,000.00	-
TOTAL VARIABLE COST	21,132.00	544,982.32	2,021,300.00	-
NON DIRECT ALLOCATED COST				
LABOUR (excluding hired management)				
Number of full day labourers	-	7.12	28.00	1.00
Cash receipts and bonuses	1,800.00	47,741.87	276,000.00	-



Rations (excluding milk and meat from dairy)	768.00	7,294.56	44,750.00	-
Other (for example medical, clothes etc)	50.00	2,908.80	13,500.00	-
Farm produce labour	-	10,471.27	112,050.00	6.00
TOTAL LABOUR	-	64,320.27	316,103.00	1.00
Hired management (Salary and benefits)	12,000.00	24,290.50	48,000.00	-
Rent for dairy animals	-	-	-	1.00
Electricity	80.00	14,180.79	77,000.00	-
Fuel and lubricants (excluding production of feed)	150.00	9,605.13	48,000.00	-
MAINTENANCE AND REPARATIONS				
Milk equipment	100.00	7,764.28	35,000.00	-
Tools, implements and equipment	-	16,977.80	118,000.00	1.00
Fixed improvements	-	7,163.57	79,160.00	2.00
Insurance and licences	-	7,036.86	65,500.00	1.00
TOTAL FIXED COST	3,550.00	123,193.46	602,103.00	-
DEBT				
Bank overdraft %	17.50	19.67	22.50	-
Bank overdraft amount	-	103,203.17	299,152.00	1.00
Interest on bank overdraft	-	7,369.34	56,261.60	32.00
Account at trade creditors %	17.00	20.66	27.00	-
Trade creditors amount	26,400.00	84,256.83	264,682.00	-
Interest trade creditors	-	2,703.32	48,966.17	42.00
Land interest %	17.00	18.88	24.00	-
Land amount	13,800.00	203,423.75	450,000.00	-
Interest on land	-	9,159.90	78,750.00	38.00
Fixed improvements interest %	20.00	20.00	20.00	-
Fixed improvements amount	100,000.00	100,000.00	100,000.00	-
Interest on fixed improvements	-	400.00	20,000.00	49.00
Equipment interest %	17.50	20.12	22.00	-
Equipment amount	10,000.00	180,592.43	694,741.00	-
Interest on equipment	-	9,873.37	138,948.20	37.00
Dairy herd interest %	10.00	19.60	24.00	-
Dairy herd amount	30,000.00	104,000.00	190,000.00	-
Interest on dairy herd	-	1,812.00	26,400.00	45.00
Carry over debt interest %				
Carry over debt amount				
Interest on carry over debt	-	-	-	50.00
TOTAL INTEREST	-	31,317.94	214,553.26	26.00
ALGEMEEN				
GENERAL INFORMATION	66.00	361.93	629.00	-
Average number of cows in herd	13.00	117.31	298.00	-
Average number of cows in milk	11.00	92.04	225.00	-
Ha for dairy	10.00	277.56	950.00	-
Liter milk/year	21,455.00	606,663.83	2,382,355.00	-
Number of labourers	-	6.69	28.00	4.00
CAPITAL INVESTMENT				
Land	16,000.00	413,520.43	1,428,000.00	-
Fixed improvements	15,000.00	271,494.70	1,520,500.00	-
Land and fixed improvements	34,500.00	685,015.13	2,250,500.00	-
Land and fixed improvements per ha	878.99	3,717.22	19,446.43	-
Equipment and machinery	26,500.00	300,203.70	1,374,000.00	-



Livestock	55,450.00	635,980.44	1,804,500.00	-
TOTAL INVESTMENT	170,250.00	1,621,199.27	4,480,500.00	-
LIABILITIES				
Short term	-	67,695.10	553,203.00	25.00
Medium term	-	62,965.88	794,741.00	32.00
Long term	-	48,821.70	450,000.00	38.00
TOTAL LIABILITIES	-	179,482.68	1,135,404.00	23.00
GROSS VALUE OF PRODUCTION	104,156.25	104,156.25	104,156.25	-
Product income	22,527.75	789,099.44	3,192,355.70	-
Trading income	(15,920.00)	94,191.45	431,794.00	1.00
Other	-	-	-	50.00
TOTAL: GROSS VALUE OF PRODUCTION	34,391.20	883,290.90	3,485,855.70	-
VARIABLE COST				
FEEDING				
Self produced	-	126,939.96	380,000.00	1.00
Purchased	2,007.50	362,735.95	1,636,800.00	-
TOTAL FEEDING	19,832.00	489,675.91	1,856,800.00	-
VET AND MEDICINE	-	25,134.22	101,500.00	2.00
AI COST	-	15,282.16	84,000.00	15.00
WASH AND STERILISING	-	7,668.42	42,000.00	3.00
RENT OF MILK TANK	-	-	-	50.00
MARKETING COST	-	1,937.84	25,412.00	33.00
SUNDRY	-	5,283.76	50,000.00	4.00
TOTAL VARIABLE COST	21,132.00	544,982.32	2,021,300.00	-
FIXED COST				
LABOUR				
Cash	-	45,832.20	276,000.00	2.00
Rations (including farm produce)	-	16,161.03	118,050.00	2.00
Other	-	2,327.04	13,500.00	10.00
TOTAL LABOUR COST	-	64,320.27	316,103.00	1.00
Electricity	-	11,750.31	77,000.00	5.00
Fuel and lubricants	-	8,644.62	48,000.00	5.00
MAINTENANCE AND REPARATIONS				
Milking equipment	-	7,453.70	35,000.00	2.00
Fixed improvements	-	6,303.94	79,160.00	8.00
Equipment, implements, tractors etc	-	14,600.91	118,000.00	8.00
Insurance and licences	-	6,192.44	65,500.00	7.00
TOTAL FIXED COST	3,550.00	119,266.20	602,103.00	-
FOREIGN FACTOR COST (FFC)				
Rent on land	18,000.00	49,221.33	107,664.00	-
Rent on livestock	-	-	-	50.00
Hired management	-	2,914.86	48,000.00	44.00
INTEREST PAYABLE ON:				



Short term liabilities	-	10,072.67	105,227.77	29.00
Medium term liabilities	-	12,085.37	160,948.20	33.00
Long term liabilities	-	400.00	20,000.00	49.00
TOTAL INTEREST	-	22,558.04	185,968.10	26.00
TOTAL FOREIGN FACTOR COST	-	28,426.18	268,612.20	24.00
PROFITABILITY ANALYSIS				
GROSS VALUE OF PRODUCTION	34,391.20	883,290.90	3,485,855.70	-
VARIABLE COST	21,132.00	544,982.32	2,021,300.00	-
MARGIN ABOVE FEED COST	(102,588.00)	393,614.98	1,629,055.70	-
GROSS MARGIN	(149,588.00)	338,308.57	1,464,555.70	-
FIXED COST	3,550.00	119,266.20	602,103.00	-
TOTAL COST (EXCLUDING FFC)	30,931.00	664,248.52	2,284,134.50	-
NET FARM INCOME	(175,228.00)	219,042.38	1,201,721.20	-
FOREIGN FACTOR COST	-	28,426.18	268,612.20	24.00
FARM PROFIT	(216,528.00)	190,616.20	1,093,136.20	-

ANNEXURE B: EIEWS 3.1 SYSTEM ESTIMATION METHODS

This Annexure outlines the System Estimation Methods utilised in the EViews Version 3.1 software, which has been applied in this study.

✚ ORDINARY LEAST SQUARES

- Minimizes the sum-of-squared residuals for each equation in the system.
- Accounts for any cross-equation restrictions on the parameters of the system.
- If there are no such restrictions, the method is identical to estimating each equation using single-equation ordinary least squares.

✚ CROSS-EQUATION WEIGHTING

- Accounts for cross-equation heteroskedasticity by minimizing the weighted sum-of-squared residuals.
- The equation weights are the inverses of the estimated equation variances, and are derived from unweighted estimation of the parameters of the system.
- This method yields identical results to unweighted single-equation least squares if there are no cross-equation restrictions.

✚ SEEMINGLY UNRELATED REGRESSION

- Estimates the parameters of the system, accounting for heteroskedasticity, and contemporaneous correlation in the errors across equations.
- Estimates of the cross-equation covariance matrix are based upon parameter estimates of the unweighted system.
- EViews estimates a more general form of SUR than is typically described in the literature, since it allows for cross-equation restrictions on parameters.

✚ WEIGHTED TWO-STAGE LEAST SQUARES

- The weighted two-stage least squares (WTLS) estimator is the two-stage version of the weighted least squares estimator.

- WTSLS is an appropriate technique when some of the right-hand side variables are correlated with the error terms, and there is heteroskedasticity, but no contemporaneous correlation in the residuals.
- EViews first applies TSLS to the unweighted system, enforcing any cross-equation parameter restrictions.
- Results from this estimation are used to form equation weights, based upon the estimated equation variances.
- If there are no cross-equation restrictions, these first-stage results will be identical to unweighted single-equation TSLS.

✚ **THREE-STAGE LEAST SQUARES**

- Three-stage least squares (3SLS) is the two-stage least squares version of the SUR method.
- It is an appropriate technique when right-hand side variables are correlated with the error terms, and there is both heteroskedasticity, and contemporaneous correlation in the residuals.
- EViews applies TSLS to the unweighted system, enforcing any cross-equation parameter restrictions.
- These estimates are used to form an estimate of the full cross-equation covariance matrix that is used to transform the equations to eliminate the cross-equation correlation. TSLS is applied to the transformed model.

✚ **FULL INFORMATION MAXIMUM LIKELIHOOD (FIML)**

- Full Information Maximum Likelihood (FIML) estimates the likelihood function under the assumption that the contemporaneous errors have a joint normal distribution.
- Provided that the likelihood function is correctly specified, FIML is fully efficient.

✚ **GENERALIZED METHOD OF MOMENTS (GMM)**

- Belongs to a class M-estimators that are defined by minimizing some criterion function.
- GMM is a robust estimator in that it does not require information of the exact distribution of the disturbances.
- GMM estimation is based upon the assumption that the disturbances in the equations are uncorrelated with a set of instrumental variables.
- Estimator selects parameter estimates so that the correlations between the instruments and disturbances are as close to zero as possible, as defined by a criterion function.



- By choosing the weighting matrix in the criterion function appropriately, GMM can be made robust to heteroskedasticity and/or autocorrelation of unknown form.
- Many standard estimators, including all of the system estimators provided in EViews, can be set up as special cases of GMM.