TYPE STUDY TO ESTIMATE THE MORTALITY RATE OF FALLEN ANIMALS

1.1 INTRODUCTION:

In India, animals of different economic values and of different productivity levels are maintained by the livestock owners of different income group. To meet the growing demand for milk, meat and the animal products, concerted measures are necessary not only to build up the Livestock population but also to arrest the decline in the availability of the stocks. For this a fair degree of knowledge about the mortality rate of livestock which die due to various causes annually and were unnoticed. There has been no machinery to collect information regarding the mortality of different species of livestock and the value of fallen carcasses. In the context of such deficiencies, the following methodology has been developed to estimate the mortality rate of fallen animals.

1.2 NEED FOR THE STUDY:

Mortality of Livestock causes heavy economic loss to the farmers. So far, scientific studies have not been conducted to estimate the mortality rates of fallen animals, which die due to natural causes. Hence it was imperative that planned studies are to be conducted to approximate the mortality rates among the various species of livestock. This would help the planners to ascertain the actual value of the fallen livestock and to device ways to curtail the mortality.

1.3.OBJECTIVE OF THE STUDY:

1. To estimate the mortality rates of different species of livestock in the different climatic zones of Tamilnadu State.
2. To ascertain the actual value of fallen animals
3. To assess the various causes of mortality.

1.4.SCOPE OF THE STUDY:

The result of the study will be useful to decision makers and planners as they need the statistics about mortality rates among the various species of livestock through out the state to plan various schemes for the welfare of livestock farmers. The data's can be useful for special studies also.

1.5.LIMITATIONS OF THE STUDY:

- Data's and information for the study were collected by enquiry method for a reference period of past 3 years and this mainly depended upon the farmers' memory and his ability to recollect the past. Hence there is a fair degree of inaccuracy of the data.
- There is fair degree of non-response owing to the reluctancy of the farmers.
- Though the methodology for the study by and large was very suitable and efficient, enumerators were not able to avoid non-response to a significant extent as they were inexperienced and doing the enumeration work for the first time.
- This study was confined to a particular geographical area of the state. Hence generalization of the results of the study has to be made with caution.

CHAPTER II

2. DESIGN OF THE STUDY:

A systematic design is the basic requirement for any scientific study. Hence sampling procedure, method of collection of data, materials and methods adopted in the study for analysis and the description of the study area are briefly discussed in this chapter.

2.1. METHODOLOGY:

This study was conducted in five Districts of five different agro climatic zones of Tamilnadu, where the livestock population is very high. Each district falls in different agro climatic zones of the state as follows.

Dharmapuri	:	North western Zone
Villupuram	:	North Eastern zone
Erode	:	Western Zone
Thanjavur	:	Cauvery Delta Zone
Tirunelveli	:	Southern Zone

From each district 10 villages were selected by random sampling method and all the households from the selected villages were covered during the study. This was the one time study with reference period of last three years and it was conducted through enquiry method.

2.2. SAMPLING PROCEDURE:

Sampling design adopted for this study was multistage stratified random sampling method. From the five different climatic zones of Tamilnadu state, one district each was selected where the livestock population was very high and then five taluks was selected by random sampling method from each district. In the third stage of sampling, a cluster of two villages was selected from each selected taluk. Thus this study has covered 50 village (ie.) ten villages each from five districts. All the households from the selected village were covered for complete enumeration.

2.3. PERIOD OF THE SURVEY:

This was the one time study with reference period of three years and it was conducted through enquiry method. This study was conducted through enquiry method for a period of one month.

2.4. METHOD OF ENQUIRY AND COLLECTION OF DATA:

This study was conducted through enquiry method for a period of one month. Relevant data were collected from all the households for the past three years like

1. No. of animals Died
2. Causes of death (Disease, Old age, others)
3. Age, Sex and Breed of the animals
4. No. of calving and lactation details (in case of cattle & buff)
5. Vaccination schedulle & feeding practices adopted in that particular livestock unit.
6. Value of the animal

This study was primarily based on the facts collected through personal interview. For this purpose, structured schedule was prepared(Annexed).

2.5 STAFF:

The field work was carried out by the unemployed local youths (like local youths, link work couples etc.,) who were the enumerators for this study. Each enumerator has covered a village during the study period. They have covered all the households in that particular village in a month. Their work was supervised by the staff of Animal Husbandry Department. They were given intensive training regarding collection of data by enquiry method.

CHAPTER III

3. DESCRIPTION OF THE STUDY AREA:

The physical and economic environments of any given region are the major determinants of production and marketing of any commodity.To understand the problems and perspectives of any state , the knowledge of the area under study is essential. With this fact in view, a brief note on the agro-climatic factors of the study area is presented below.

3.1. CLIMATE:

The climate in Tamilnadu State is tropical with moderate changes in temperature which is characterised by very hot summer and mild winter. The general climate is hot and humid. Temperature starts rising from the early March, April and May are the hottest months. Weather cools down progressively from middle June and by December, the heat declines to considerable extent on the outbreak of southwest monsoon.

3.2. RAINFALL:

Normal rainfall in the study area are presented in the table below:

Season	Normal rainfall(mm) in 2006-07 **Actual/Normal**				
	Villupuram	Dharmapuri	Erode	Thanjavur	Tirunelveli
SouthWest Monsoon (June-Sep.)	352.3/433.0	296.7/361.0	174.5/213.1	252.8/342.0	122.5/92.6
North East Monsoon (Oct.-Dec.)	599.3/484.8	262.2/316.7	386.2/323.5	445.1/545.7	797.9/429.8
Winter (Jan.-Feb.)	4.8/34.5	0.8/18.5	0.6/20.7	9.5/50.7	19.9/72.6
Summer(Mar.-May)	44.0/77.1	174.3/156.9	66.4/154.1	103.7/114.6	136.3/141.9
Average Annual Rainfall	1000.4/ 1029.4	734.0/ 853.1	627.7/ 711.4	811.1/ 1053.0	1076.6/ 736.9

Source: India Meteorological Department, Chennai.6.

3.3. LAND USE PATTERN:

The land use pattern of the study area is presented in table below:

Particulars	Area in Hectare				
	Villupuram	Dharmapuri	Erode	Thanjavur	Tirunelveli
1. Total Geographical area	722203	449777	816191	339657	682308
2. Forest area	71697	164177	228749	3390	120801
3. Barren & Uncultivable land	56651	19648	7063	2149	30961
4. Land put to non-Agricultural land	135951	51410	81300	81697	105284
5. Cultivable waste	10044	5124	558	13797	41612
6. Permanent pastures &other grazing lands	4170	6209	219	1385	5353
7. Land under miscellaneous tree crops& Groves	6109	2872	1263	5222	10049
8. Current fallow	96154	37553	101318	5692	30076
9. Other fallow	19029	3762	100977	32191	163064
10.Net area sown	322398	159022	294744	194134	175108

3.4. HUMAN POPULATION IN THE STUDY AREA:

	Villupuram	Dharmapuri	Erode	Thanjavur	Tirunelveli
Total Population	2960373	2856300	2581500	2216138	2723988
Schedule Caste	810931	416951	422204	399653	481052
Schedule Tribe	63920	59549	17693	3641	8358
Rural Population	2533456	2400354	1387537	1467577	1415742
Urban Population	426917	455946	1193963	748561	1308246

(source: Census of India,2001)

3.5. LIVESTOCK SCENARIO IN THE STUDY AREA:

Particulars	Villupuram	Dharmapuri	Erode	Thanjavur	Tirunelveli
Cattle	824136	297796	398572	489693	418694
Buffalo	49003	100074	230004	34476	78777
Sheep	227455	266720	506015	42123	487273
Goat	471428	277311	562270	339807	390570
Pigs	38672	3063	7288	4781	12752
Others	2351	538	3904	151	1206
Total Livestock Population	1613045	945502	1708053	911031	1389272

(Based on Livestock census 2004)

Chapter IV

RESULTS & SUMMARISATION

The results of the study are presented below :

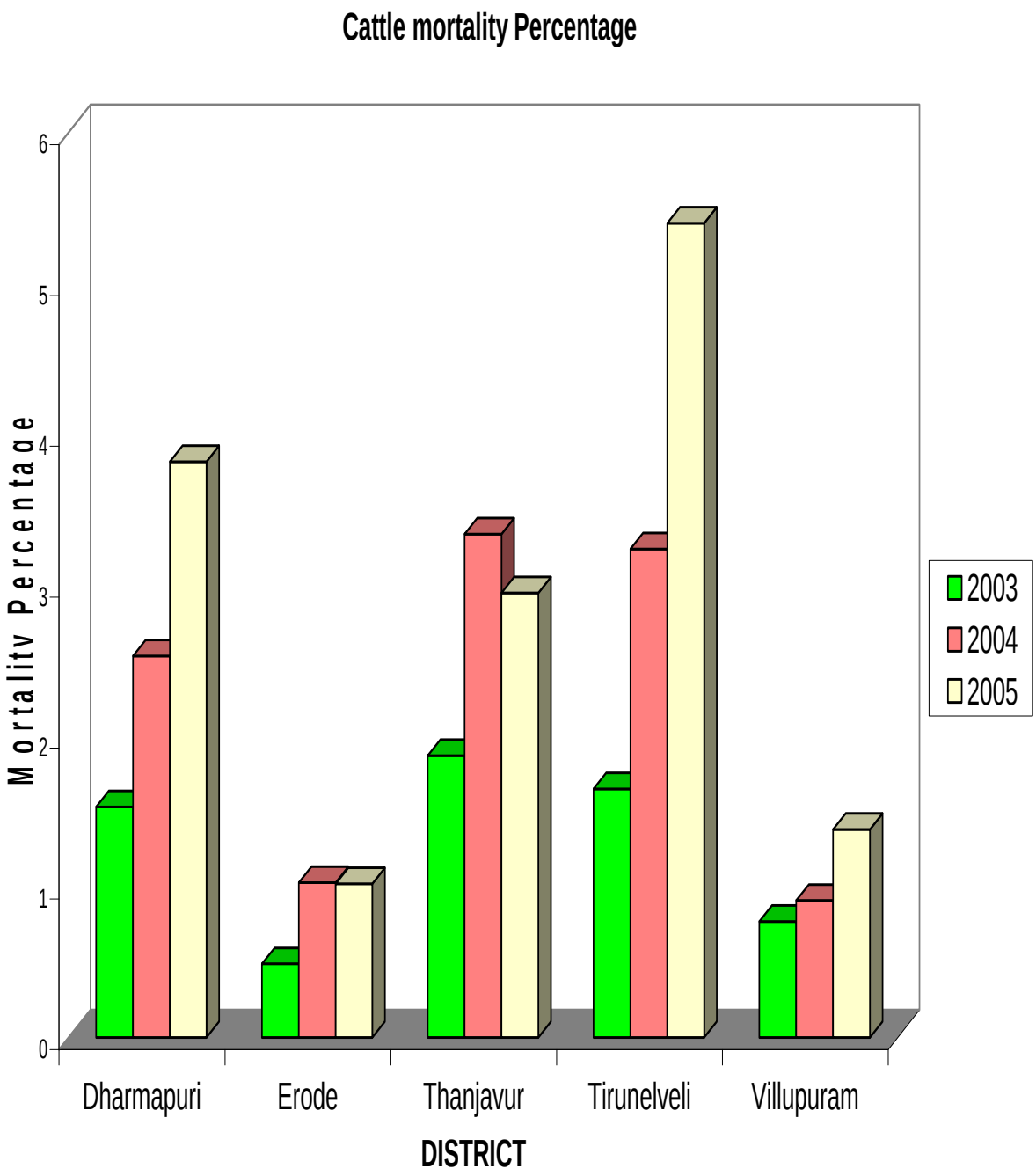
CATTLE

Total number of deaths in cattle observed during the study period 2003, 2004 and 2005 were 414, 805 and 1187 and the average value of animal died (loss per death) during the study period was Rs.6,162, Rs.5,529 and Rs.5,408, respectively (Table 1). Correspondingly, the total loss due to cattle mortality was seen to be on the rise over years with Rs.25.51 lakhs in 2003 to Rs.64.19 lakhs in 2005. It could also be seen from the table that cattle mortality was more in summer season in all the three years than other seasons, possibly due to the less availability of fodder, water, etc., during summer. Understandably, disease conditions were responsible for more number of deaths than other causes in all the years. Further death was found to be more in younger stock than animals of over 5 years of age. Mortality was more in females than males, which could be attributed to the fact that females outnumbered males in the population. It needs emphasis that mortality was more in crossbreds than indigenous cattle, as crossbreeds are usually more susceptible to the contingencies and hardships of Indian agro- climate.

The estimated percentages of mortality in cattle in the selected districts of Tamil Nadu are presented in Table 2. The mortality percentage was 1.30 in the year 2003, which increased to 2.09 in 2004 and to 2.56 in 2005, which differed significantly between years. It may also be noted from the table that the highest mortality (5.40 per cent) was found in Tirunelveli district in 2005, followed by 3.82 per cent in Dharmapuri district (2005), 3.34 per cent in Thanjavur district (2004), 3.24 per cent in Tirunelveli district (2004) and 2.95 per cent in Thanjavur district (2005). It is paradoxical that those districts which had lower cattle density

had more or less higher mortality percentages, indicating the fact that these districts have less number of cattle due to less resource endowment necessary for livestock development, resulting in poor husbandry practices and ultimately leading to more number of deaths.

Different factors believed to be predisposing to the mortality of cattle were analysed and the results are presented in Table 3. It was found that there was a significant difference with respect to cattle mortality in different three seasons viz., summer, winter and rainy in all the years, except between winter and summer seasons in 2005 and between winter and rainy seasons in 2004. It was found that the number of deaths due to disease conditions was significantly higher from that of natural and accident causes in all the years except in 2003. However, the number of deaths due to natural and accident causes did not differ significantly. The number of deaths in all the three age groups was significantly different among different age groups, except in the years 2004 and 2005, where there was no significant difference between group 1 and group 2. The number of deaths in female animals was more than males in all the years studied. Similarly, the number of deaths in crossbreds was more than that of indigenous cattle in all the years studied.


Cattle mortality Percentage
Mortality Percentage
0
1
2
3
4
5
6
Dharmapuri
Erode
Thanjavur
Tirunelveli
Villupuram
DISTRICT
2003
2004
2005

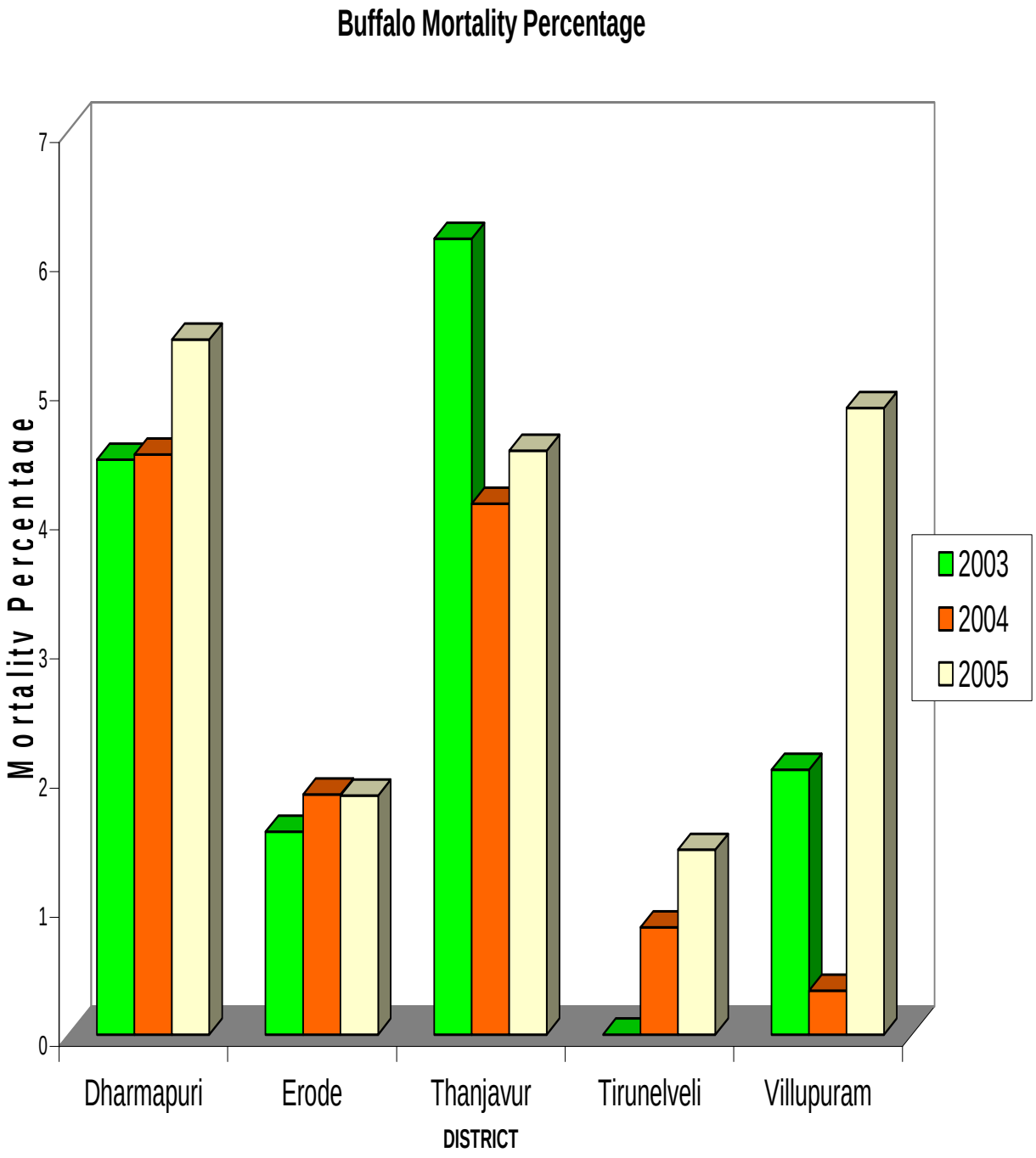
BUFFALO

Total number of deaths in buffalo during the study period 2003, 2004 and 2005 were 230, 331 and 459 and the average value of animal died (loss per death) during the study period was Rs.4,313, Rs.3,836 and Rs.4,005, respectively (Table 4). In the same way, the total was due to buffalo mortality was seen to be on the rise over years with Rs.9.92 lakhs in 2003 to Rs.18.39 lakhs in 2005. It could also be observed from the table that buffalo mortality was more in summer season in the years 2003 and 2004. However, it was found to be higher in rainy season than other seasons in 2005. Similar to that of cattle, disease conditions caused more deaths in all the years than other causes in buffalo too. Further, among all age groups, more number of younger animals of less than or equal to 5 years of age perished than that of over 5 years of age in all the years. Again, more number of she buffaloes died, as compared to that of he buffaloes, which could probably be because of less number of them in the population. But, it needs emphasis here that unlike cattle, death was more in graded buffaloes than in indigenous buffaloes, probably because the latter might have been less cared for, as they are less productive, despite their better resistance to diseases.

The estimated percentages of mortality buffaloes in the selected districts of Tamil Nadu are presented in Table 5. The mortality percentage was 2.87 in the year 2003, 2.83 in 2004 and 3.30 in 2005. However, there was no significant difference in the mortality percentage between the years studied. Although no uniform pattern could be observed in the mortality percentages of buffaloes between years and across districts, the mortality percentage was found to be higher (over 4 per cent) in Dharmapuri and Thanjavur districts in all the three years. The fact that Dharmapuri district which had a high buffalo population density was losing buffaloes at a very faster rate needs attention from planners. However, in

Erode district, in which the buffalo population is not only proportionately denser, but also keeps increasing over years, the death percentage continued to be only less than 2 per cent.

Different factors expected to be predisposing to the mortality of buffalo were analysed and the results are presented in Table 6. It was found that there was a significant difference with respect to buffalo mortality in the three seasons studied in 2004 and 2005, with the exception of 2003 in which there was no significant difference between winter and rainy seasons and in 2005 between summer and winter seasons. It was also found that the number of deaths resulting from disease conditions was significantly higher than that of natural and accident causes in all the years, except in the year 2003, where the number of deaths due to natural and accident causes did not differ significantly. Regarding the mortality in different age groups, in 2003, group 2 was significantly different from group 1 and group 3, while group 1 and group 3 did not differ significantly. In 2004, there was no significant difference of group 1 with group 2 and group 3 whereas group 2 and group 3 differ significantly. In 2005, group 1 was significantly different from group 2 and group 3, with no significant difference between group 2 and group 3. In 2005, there was no significant difference between the three groups. The number of deaths in female animals was more than that of males in all the years studied. The number of deaths in graded buffaloes was less than that of indigenous buffaloes in the year 2004 and 2005 except 2003.


Buffalo Mortality Percentage
Mortality Percentage
0
1
2
3
4
5
6
7
Dharmapuri
Erode
Thanjavur
Tirunelveli
Villupuram
DISTRICT
2003
2004
2005

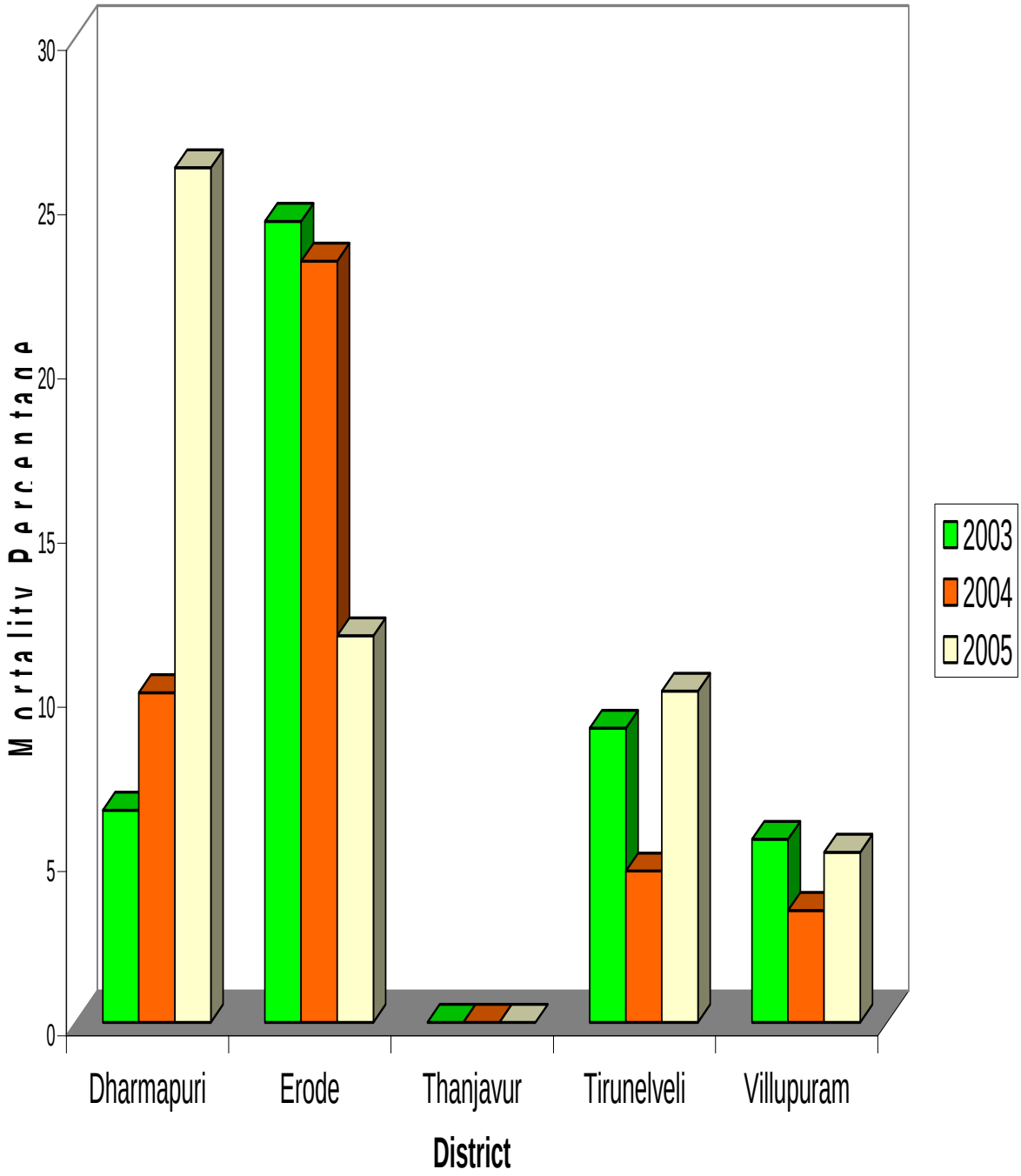
SHEEP

Total number of deaths in sheep during the study period 2003, 2004 and 2005 were found to be 1243, 2311 and 3702 and the average value of animal died (loss per death) during the study period was Rs.684, Rs.923 and Rs.956 respectively (Table 7). Also, the total loss due to sheep mortality was seen to be on the rise over years with Rs.8.50 lakhs in 2003 to Rs.35.39 lakhs in 2005. It could also be seen from the table that sheep mortality was more in winter and rainy seasons in all the three years than summer, possibly due to the diseases like enterotoxaemia which usually is prevalent in these seasons. Understandably, disease conditions were responsible for more number of deaths than other causes in all the years. Further, death was found to be more in animals of over 2 years of age. Mortality was more in females than males, which could be attributed to the fact that females outnumbered males in the population. It needs mention that mortality was more in indigenous sheep than crossbreds, as crossbreds are less in number in the State.

The estimated percentages of mortality of sheep in the selected districts in Tamil Nadu are presented in Table 8. The mortality percentage in sheep was 10.37 in the year 2003, which increased to 12.00 in 2004 and to 15.46 in 2005 (Table 8). The sheep mortality percentage was found to be very high in Erode district in the years 2003 (24.39 per cent) and 2004 (23.18 per cent), which could be attributed to the fact this district is endowed with more vegetation (it is generally believed and reported that more vegetation especially after and during rainy and winter seasons would make animals more susceptible to enterotoxaemia and other diseases), than other districts studied. However, the very high deaths in Dharmapuri district in 2005 are to be looked into more carefully to analyse the reasons behind this.

Different factors that might be responsible for the mortality of sheep were analysed and the results are presented in Table 9. It could be found from the table that there was a significant difference in mortality of sheep between different seasons. There was also a significant difference between the three causes of death considered in all the three years, except in 2003, where there was no significant difference between natural and accident causes of death. In the case of age group, there was a significant difference between the two age groups of sheep. It was found that number of deaths in ewes was more than that of rams, while the number of deaths in crossbreds was less than that of indigenous sheep in all the three years studied, as expected.

Sheep Mortality Percentage



GOAT

Total number of deaths in goat during the study period of 2003, 2004 and 2005 were 824, 1792 and 3856 and the average value of animal died (loss per death) in the study period was Rs.1,100, Rs.1,015 and Rs.1,118, respectively (Table 10). Likewise, the total loss due to goat mortality was seen to be on the rise over years with Rs.9.07 lakhs in 2003 to Rs.43.12 lakhs in 2005. It could also be seen from the table that goat mortality was more in winter and rainy seasons than summer in 2004 and 2005, with the exception of 2003 where the death was low in rainy season. Again, disease conditions were responsible for more number of deaths in goats too than other causes in all the years. Further, death was found to be more in animals of over 1 year of age. Mortality was more in females than males, which could be attributed to the fact that females outnumbered males in the population. It needs mention that mortality was more in indigenous goats than crossbreds, as crossbred goats are less in number in the State.

The estimated percentages of mortality of goats in the selected districts of Tamil Nadu are presented in Table 11. The estimated percentage of mortality in goat was 2.84 in the year 2003, which increased to 4.69 in 2004 and 8.06 in 2005. It may also be noted from the table that the highest mortality was noticed in Dharmapuri district in all the three years, which needs special mention. Although there was discernable uniform pattern, Tirunelveli district in 2005 and 2004 and Thanjavur district in all the years have suffered more goat mortality for the reasons unknown. However, it really needs emphasis that goat mortality was comparatively less in Erode district, despite its very dense goat population among the districts studied.

Different factors anticipated to be involved in the mortality of goats were analysed and the results are presented in Table 12. It can be noted from the table that there was a significant difference in goat mortality between the three seasons. There was also a significant difference in goat mortality between the three causes of death considered in all the three years, except in 2003, where there was no significant difference between the number of deaths occurred naturally and that occurred due to accidents. There was a significant difference with respect to goat mortality between the two age groups considered for the study in all the three years. It was also found that the number of deaths in does was more than that of bucks. It was again that number of crossbred deaths was less than that of indigenous.

Goat Mortality Percentage

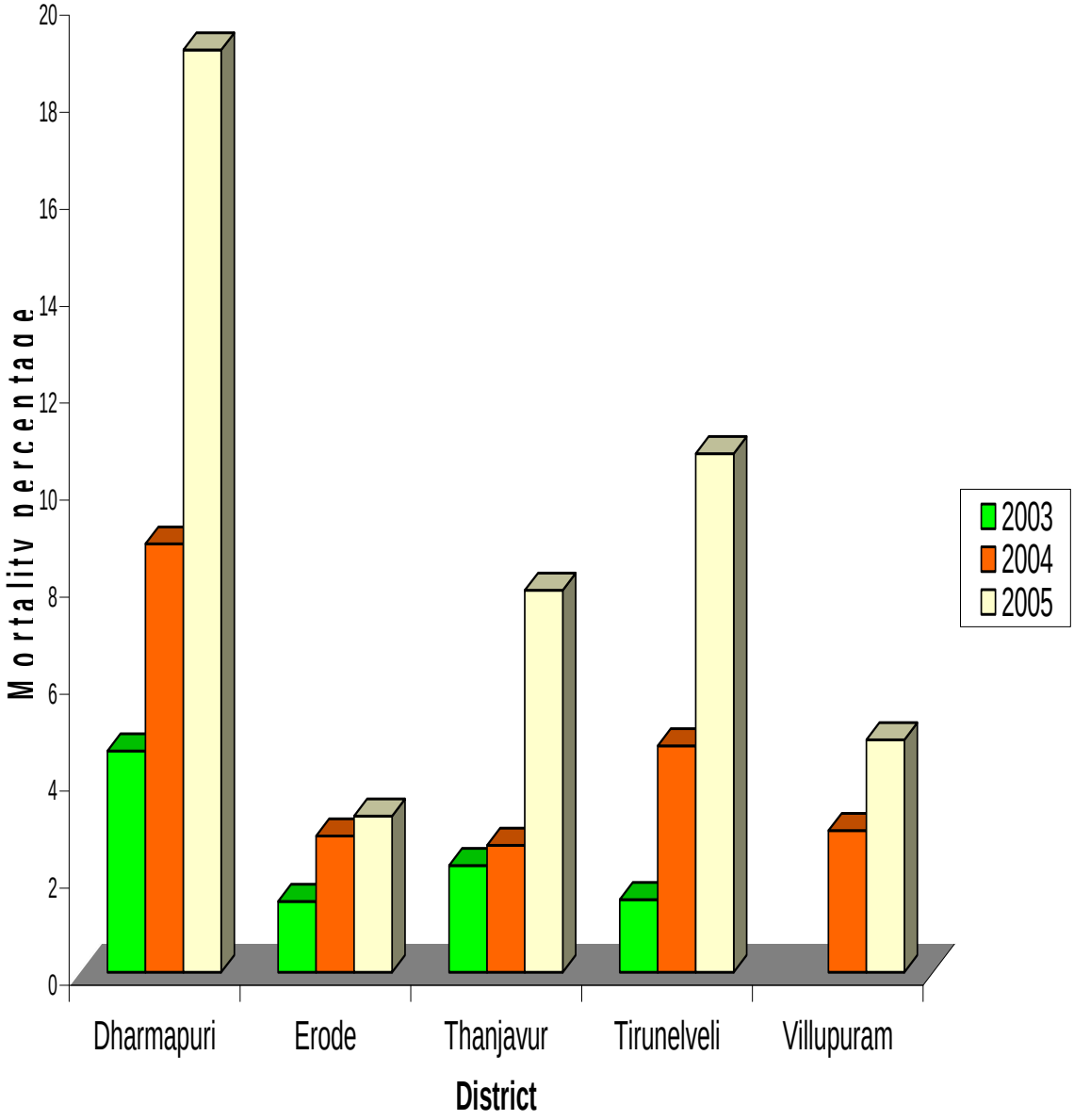


Table 1 : Details of mortality of cattle in selected districts of Tamil Nadu

District	No. of animals died	Seasonwise death of animals			Cause for death of animals			Age of the animal			Sex		Breed		Born / purchased		Value of animals died	
		Summer	Rainy	Winter	Natural	Disease	Accident	< 2 yrs	2.1- 5 yrs	> 5 yrs	Male	Female	Cross breed	Indigenous	Born	purchased	Total value (Rs.)	Average value of animal died
2003																		
Dharmapuri	147	63	41	43	30	92	25	44	54	49	18	129	112	35	63	84	906950	6169.73
Erode	28	14	3	11	7	21	0	13	12	3	7	21	4	24	17	11	122700	4382.14
Thanjavur	109	36	46	27	3	99	7	34	56	19	20	89	73	36	54	55	694000	6366.97
Tirunelvelli	91	47	31	13	0	91	0	31	44	16	14	77	78	13	38	53	458400	5037.36
Villupuram	39	28	7	4	6	32	1	3	24	12	2	37	16	23	22	17	369000	9461.54
Total	**414**	**188**	**128**	**98**	**46**	**335**	**33**	**125**	**190**	**99**	**61**	**353**	**283**	**131**	**194**	**220**	**2551050**	**6161.96**
2004																		
Dharmapuri	246	122	55	69	47	164	35	75	78	93	70	176	152	94	127	119	1269150	5159.15
Erode	77	33	22	22	23	52	2	26	39	12	13	64	23	54	43	34	481750	6256.49
Thanjavur	230	69	89	72	8	214	8	106	86	38	50	180	150	80	109	121	1246450	5419.35
Tirunelvelli	168	63	56	49	0	168	0	72	74	22	18	150	134	34	82	86	895900	5332.74
Villupuram	84	33	33	18	12	68	4	13	52	19	10	74	41	43	34	50	557700	6639.29
Total	**805**	**320**	**255**	**230**	**90**	**666**	**49**	**292**	**329**	**184**	**161**	**644**	**500**	**305**	**395**	**410**	**4450950**	**5529.13**
2005																		
Dharmapuri	391	121	117	153	40	305	46	107	130	154	59	332	304	87	182	209	2278750	5828.01
Erode	104	53	30	21	38	62	4	44	48	12	20	84	16	88	70	34	760900	7316.35
Thanjavur	258	60	81	117	21	225	12	126	86	46	38	220	178	80	118	140	1410450	5466.86
Tirunelvelli	265	104	62	99	0	265	0	160	99	6	64	201	211	54	136	129	1043450	3937.55
Villupuram	169	73	52	44	38	128	3	46	88	35	17	152	58	111	81	88	925805	5478.14
Total	**1187**	**411**	**342**	**434**	**137**	**985**	**65**	**483**	**451**	**253**	**198**	**989**	**767**	**420**	**587**	**600**	**6419355**	**5408.05**

Table 2
Estimated percentage of mortality in cattle in the selected districts of Tamil Nadu

District	Animals per 1000 House Hold	Total no. of deaths	Mortality (Per cent)	Over all mortality in state (Per cent)
2003				
Dharmapuri	9618	147	1.53	
Erode	5711	28	0.49	**1.30[a]**
Thanjavur	5822	109	1.87	
Tirunelveli	5523	91	1.65	
Villupuram	5056	39	0.77	
2004				
Dharmapuri	9716	246	2.53	
Erode	7464	77	1.03	
Thanjavur	6887	230	3.34	**2.09[b]**
Tirunelveli	5177	168	3.24	
Villupuram	9183	84	0.91	
2005				
Dharmapuri	10239	391	3.82	
Erode	10216	104	1.02	
Thanjavur	8752	258	2.95	**2.56[c]**
Tirunelveli	4906	265	5.40	
Villupuram	12259	169	1.38	

Values bearing different superscripts differ significantly ($P \leq 0.01$)

Table 3

Different factors involved in mortality in cattle

Factors	'Z' value		
	Year		
Season	**2003**	**2004**	**2005**
Summer vs Rainy	4.34**	3.39**	3.05**
Summer vs Winter	6.76**	5.32**	0.99 NS
Rainy vs Winter	2.35*	0.28 NS	4.04**
Causes of Death			
Natural vs Disease	28.23**	41.25**	49.90**
Natural vs Accident	1.54 NS	3.65**	5.33**
Disease vs Accident	31.10**	48.62**	60.79**
Age Group†			
Group 1 vs Group 2	4.71**	1.90 NS	1.34 NS
Group 1 vs Group 3	2.04*	5.96**	10.44**
Group 2 vs Group 3	6.82**	7.90**	9.05**
Sex			
Male vs Female	28.63**	30.09**	43.55**
Breed			
Cross breed vs Indigenous	11.36**	10.02**	14.89**

† Group1-age of animal less than or equal to 2 years, Group 2-age of animal more than 2 and less than or equal to 5 years, Group 3-more than 5 years.

NS-Not significant ($p > 0.05$),

* Significant ($p \leq 0.05$),

** Highly significant ($p \leq 0.01$).

Table 4 :Details of mortality of buffalo in selected districts of Tamil Nadu

District	No. of animals died	Seasonwise death of animals			Cause for death of animals			Age of the animal			Sex		Breed		Born / purchased		Value of animals died	
		Summer	Rainy	Winter	Natural	Disease	Accident	≤ 2 yrs	2.1- 5 yrs	> 5 yrs	Male	Female	Cross breed	Indigenous	Born	purchased	Total value (Rs.)	Avearge value of animal
2003																		
Dharmapuri	169	89	25	55	0	134	35	64	88	17	6	163	103	66	135	34	755860	4472.54
Erode	51	20	8	23	51	0	0	0	0	51	51	0	0	51	51	0	177900	3488.24
Thanjavur	7	4	2	1	7	0	0	4	3	0	7	0	7	0	0	7	35800	5114.29
Tirunelvelli	2	1	1	0	0	2	0	0	2	0	0	2	2	0	0	2	12500	6250.00
Villupuram	1	1	0	0	0	1	0	0	0	1	0	1	1	0	0	1	10000	10000.00
Total	**230**	**115**	**36**	**79**	**58**	**137**	**35**	**68**	**93**	**69**	**64**	**166**	**113**	**117**	**186**	**44**	**992060**	**4313.30**
2004																		
Dharmapuri	221	56	136	29	68	110	43	54	78	89	53	168	117	104	129	92	796850	3605.66
Erode	86	0	81	5	19	65	2	41	33	12	64	22	0	86	65	21	287700	3345.35
Thanjavur	15	6	5	4	0	15	0	8	7	0	2	13	14	1	1	14	119200	7946.67
Tirunelvelli	8	2	0	6	0	8	0	1	7	0	0	8	5	3	4	4	60000	7500.00
Villupuram	1	0	1	0	1	0	0	1	0	0	0	1	0	1	0	1	6000	6000.00
Total	**331**	**64**	**109**	**44**	**88**	**198**	**45**	**105**	**125**	**101**	**119**	**212**	**136**	**195**	**199**	**132**	**1269750**	**3836.10**
2005																		
Dharmapuri	276	90	113	73	68	157	51	98	85	93	62	214	134	142	194	82	1034450	3748.01
Erode	138	48	47	43	31	103	4	67	59	12	26	112	1	137	106	32	574250	4161.23
Thanjavur	21	3	9	9	0	21	0	16	5	0	0	21	21	0	0	21	171500	8166.67
Tirunelvelli	7	1	4	2	0	7	0	3	3	1	3	4	6	1	4	3	35800	5114.29
Villupuram	17	4	13	0	1	16	0	11	3	3	3	14	1	16	2	12	22500	1323.53
Total	**459**	**146**	**186**	**127**	**100**	**304**	**55**	**195**	**155**	**109**	**94**	**365**	**163**	**296**	**306**	**150**	**1838500**	**4005.45**

Table 5

Estimated percentage of mortality in buffalo in the selected districts of Tamil Nadu

District	Animals per 1000 House Hold	Total no. of deaths	Mortality (Per cent)	Over all mortality in state (Per cent)
2003				
Dharmapuri	3800	169	4.45	
Erode	3248	51	1.57	
Thanjavur	114	7	6.14	**2.87**[a]
Tirunelveli	796	2	0. 25	
Villupuram	49	1	2.04	
2004				
Dharmapuri	4924	221	4.49	
Erode	5161	86	1.67	**2.83**[a]
Thanjavur	365	15	4.11	
Tirunelveli	963	8	0.83	
Villupuram	295	1	0.34	
2005				
Dharmapuri	5132	276	5.38	
Erode	7479	138	1.85	**3.30**[a]
Thanjavur	464	21	4.52	
Tirunelveli	489	7	1.43	
Villupuram	350	17	4.85	

Values bearing same superscripts do not differ significantly (P > 0.05)

Table 6
Different factors involved in mortality in buffalo

Factors	'Z' value		
	Year		
Season	**2003**	**2004**	**2005**
Summer vs Rainy	7.84**	12.47*	2.75**
Summer vs Winter	3.40*	2.10**	1.37 NS
Rainy vs Winter	4.63**	14.18**	4.11**
Causes of Death			
Natural vs Disease	7.45**	8.63**	13.56**
Natural vs Accident	2.67**	4.17**	3.96**
Disease vs Accident	9.83**	12.34**	16.81**
Age Group†			
Group 1 vs Group 2	2.44**	1.63 NS	2.72*
Group 1 vs Group 3	0.10 NS	0.34 NS	6.03**
Group 2 vs Group 3	2.34**	1.97 NS	3.66**
Sex			
Male vs Female	9.51**	7.93**	17.85**
Breed			
Cross breed vs Indigenous	0.37 NS	4.59**	8.7**

† Group1-age of animal less than or equal to 2 years, Group 2-age of animal more than 2 and less than or equal to 5 years, Group 3-more than 5 years.
NS-Not significant ($p > 0.05$),
* Significant ($p \leq 0.05$),
** Highly significant ($p \leq 0.01$).

Table 7 :Details of mortality of sheep in selected districts of Tamil Nadu

District	No. of animals died	Seasonwise death of animals			Cause for death of animals			Age of the animal		Sex		Breed		Born / purchased		Value of animals died	
		Summer	Rainy	Winter	Natural	Disease	Accident	< 1 yr	> 1 yrs	Male	Female	Crossbred	Indigenous	Born	purchased	Total value (Rs.)	Average value of animal
2003																	
Dharmapuri	504	136	158	210	12	483	9	85	419	45	459	7	497	185	319	478883	950.16
Erode	584	87	258	239	15	565	4	30	554	18	566	0	584	214	370	291850	499.74
Tirunelvelli	143	71	6	66	0	143	0	72	71	68	75	0	143	104	39	61600	430.77
Villupuram	12	0	11	1	0	9	3	7	5	3	9	4	8	12	0	18100	1508.33
Total	**1243**	**294**	**433**	**516**	**27**	**1200**	**16**	**194**	**1049**	**134**	**1109**	**11**	**1232**	**515**	**728**	**850433**	**684.18**
2004																	
Dharmapuri	872	105	294	473	12	847	13	139	733	43	829	1	871	238	634	975480	1118.67
Erode	1261	269	453	539	45	1211	5	56	1205	54	1207	0	1261	849	412	879391	697.38
Tirunelvelli	133	58	15	60	0	133	0	8	125	91	42	0	133	99	34	139100	1045.86
Villupuram	45	5	23	17	1	41	3	27	18	9	36	2	43	44	1	139350	3096.67
Total	**2311**	**437**	**785**	**1089**	**58**	**2232**	**21**	**230**	**2081**	**197**	**2114**	**3**	**2308**	**1230**	**1081**	**2133321**	**923.12**
2005																	
Dharmapuri	1969	302	544	1123	18	1916	35	172	1797	238	1731	33	1936	495	1474	2374060	1205.72
Erode	1247	296	510	441	69	1168	10	91	1156	50	1197	0	1247	565	682	735870	590.11
Tirunelvelli	282	44	141	97	0	282	0	63	219	41	241	0	282	197	85	251100	890.43
Villupuram	204	109	36	59	16	186	2	72	132	28	176	14	190	167	37	178200	873.53
Total	**3702**	**751**	**1231**	**1720**	**103**	**3552**	**47**	**398**	**3304**	**357**	**3345**	**47**	**3655**	**1424**	**2278**	**3539230**	**956.03**

Table 8

Estimated percentage of mortality in sheep in the selected districts of Tamil Nadu

District	2Animals per 1000 House Hold	Total no. of deaths	Mortality (Per cent)	Over all mortality in state (Per cent)
2003				
Dharmapuri	7798	504	6.46	
Erode	2394	584	24.39	**10.37[a]**
Tirunelveli	1563	140	8.96	
Villupuram	197	11	5.57	
2004				
Dharmapuri	8735	877	10.04	
Erode	5440	1261	23.18	**12.00[b]**
Tirunelveli	2883	133	4.61	
Villupuram	996	34	3.41	
2005				
Dharmapuri	7567	1969	26.02	
Erode	10598	1247	11.77	**15.46[c]**
Tirunelveli	2794	282	10.09	
Villupuram	2238	116	5.18	

Values bearing different superscripts differ significantly ($P \leq 0.01$)

Table 9
Different factors involved in mortality in sheep

Factors	'Z' value		
	Year		
Season	**2003**	**2004**	**2005**
Summer vs Rainy	6.18**	11.61**	12.60**
Summer vs Winter	9.68**	21.38**	24.86**
Rainy vs Winter	3.43**	9.11**	11.61**
Causes of Death			
Natural vs Disease	142.32**	188.62**	221.26**
Natural vs Accident	1.69 ^{NS}	4.21**	5.23**
Disease vs Accident	156.40**	224.37**	259.23**
Age Group†			
Group 1 vs Group 2	47.24**	90.94**	109.02**
Sex			
Male vs Female	63.05**	100.98**	117.64**
Breed			
Cross breed vs Indigenous	261.48**	941.62**	338.75**

† Group1-age of animal less than or equal to 1years,Group 2-age of animal more than 1 year.
NS-Not significant ($p > 0.05$),
** Highly significant ($p \leq 0.01$).

Table 10 : Details of mortality of goat in selected districts of Tamil Nadu

District	No. of animals died	Seasonwise death of animals			Cause for death of animals			Age of the animal		Sex		Breed		Born / purchased		Value of animals died	
		Summer	Rainy	Winter	Natural	Disease	Accident	< 1 yr	> 1 yr.	Male	Female	Crossbred	Indigenous	Born	purchased	Total value (Rs.)	Average value of animal
2003																	
Dharmapuri	547	182	140	225	28	490	29	102	445	54	493	12	535	239	308	620413	1134.21
Erode	162	47	45	70	25	126	11	64	98	57	105	0	162	144	18	158650	979.32
Thanjavur	85	35	18	32	1	73	11	55	30	20	65	3	82	62	23	108450	1275.88
Tirunelvelli	30	14	6	10	0	30	0	13	17	13	17	9	21	22	8	19200	**640.00**
Total	**824**	**278**	**209**	**337**	**54**	**719**	**51**	**234**	**590**	**144**	**680**	**24**	**800**	**467**	**357**	**906713**	1100.38
2004																	
Dharmapuri	977	156	310	511	44	904	29	253	724	98	879	31	946	406	571	1012705	1036.55
Erode	360	149	105	106	68	275	17	168	192	103	257	1	359	317	43	333510	926.42
Thanjavur	185	35	89	61	2	165	18	136	49	41	144	5	180	139	46	217990	1178.32
Tirunelvelli	157	77	27	53	0	157	0	62	95	49	108	14	143	110	47	189350	1206.05
Villupuram	113	46	29	38	6	103	4	81	32	19	94	13	100	94	19	66200	585.84
Total	**1792**	**463**	**560**	**769**	**120**	**1604**	**68**	**700**	**1092**	**310**	**1482**	**64**	**1728**	**1066**	**726**	**1819755**	**1015.49**
2005																	
Dharmapuri	1866	228	713	925	63	1734	69	218	1648	181	1685	38	1828	518	1348	2318601	1242.55
Erode	601	194	183	224	171	416	14	341	260	165	436	0	601	518	83	600930	999.88
Thanjavur	663	88	156	419	134	476	53	364	299	145	518	65	598	345	318	686450	1035.37
Tirunelvelli	364	69	188	107	3	361	0	132	232	152	212	28	336	217	147	421100	1156.87
Villupuram	362	110	93	159	24	276	62	235	127	78	284	10	352	299	63	284850	786.88
Total	**3856**	**689**	**1333**	**1834**	**395**	**3263**	**198**	**1290**	**2566**	**721**	**3135**	**141**	**3715**	**1897**	**1959**	**4311931**	**1118.24**

Table 11
Estimated percentage of mortality in goat in the selected districts of Tamil Nadu

District	Animals per 1000 House Hold	Total no. of deaths	Mortality (Per cent)	Over all mortality in state (Per cent)
2003				
Dharmapuri	11985	547	4.56	
Erode	11088	162	1.46	**2.84**[a]
Thanjavur	3865	85	2.20	
Tirunelveli	2000	30	1.50	
2004				
Dharmapuri	11069	977	8.83	
Erode	12824	360	2.81	
Thanjavur	7067	185	2.62	**4.69**[b]
Tirunelveli	3364	157	4.67	
Villupuram	3872	113	2.92	
2005				
Dharmapuri	9812	1866	19.02	
Erode	18638	601	3.22	
Thanjavur	8416	663	7.88	**8.06**[c]
Tirunelveli	3402	364	10.70	
Villupuram	7550	362	4.79	

Values bearing different superscripts differ significantly ($P \leq 0.01$)

Table 12
Different factors involved in mortality in goat

Factors	'Z' value		
	Years		
Season	**2003**	**2004**	**2005**
Summer vs Rainy	3.74**	3.59**	16.47**
Summer vs Winter	3.01**	10.94**	29.30**
Rainy vs Winter	6.79**	7.28**	12.21**
Causes of Death			
Natural vs Disease	55.79**	86.73**	98.08**
Natural vs Accident	0.30 ^{NS}	4.55**	8.46**
Disease vs Accident	27.96**	100.48**	116.81**
Age Group†			
Group 1 vs Group 2	19.44**	13.42**	30.79**
Sex			
Male vs Female	34.77**	51.76**	70.31**
Breed			
Cross breed vs Indigenous	113.67**	149.78**	216.83**

† Group1-age of animal less or equal to 1years,Group 2-age of animal more than 1 years.
NS-Not significant ($p > 0.05$),
** Highly significant ($p \leq 0.01$).

CHAPTER - V

GOVERNMENT OF TAMIL NADU

DEPARTMENT OF ANIMAL HUSBANDRY

ESTIMATION OF MORTALITY RATE OF FALLEN ANIMALS

SCHEDULE - I

GENERAL INFORMATION ABOUT THE VILLAGE

Period of Survey From To

i)DISTRICT : ii)TALUK :

iii)BLOCK : iv)VILLAGE:

v)Date of Visit: vi) Season : Summer / Rainy / Winter

vii)Total No. of Households :

viii)Total Human Population (as per latest census) :

ix)Total Livestock Population (as per latest census) :

a) Cattle :
b) Buffaloe :
c) Sheeo :
d) Goat :
e) Pigs :
f) Poultry :
g) Others :

x) Any outbreak of disease of Livestock/Poultry during last 3 years:

Sl. No. (1)	Year (2)	Name of the Disease (3)	No. of Animals affected (4)	No. of Deaths (5)	Prophaylactive Vaccination made (6)

Signature of Enumerator Signature of Supervisor

GOVERNMENT OF TAMIL NADU
DEPARTMENT OF ANIMAL HUSBANDRY
Estimation of Mortality Rate of Fallen Animals
SCHEDULE – II
Period of Survey From To

District:									**Taluk:**						**Block:**						**Village:**

Sl. No.	Name of Householder	Father's Name of Householder	Size of Family			Stock. of Animals (Specify Purchase (P) or Born (B)						CATTLE - Death of Animals for the Past 3 Years															
			Adult	Young	Total	Cattle-Cross Bred	Cattle-Indigenious	Buffaloe	Sheep	Goat	Others	No. of Deaths	Year of Death	Cause of Death	Age of Deceased	Sex of Deceased	Breed of Deceased	Specify - Born (B) or Purchase (P)	Year of Birth/ Purchase	If Purchased Cost in Rs.	No. of calving/lactation of deceased	Ave.lactation lengthof disessed	Ave.milk yield per day of diseased	Feeding Practices (Stallfed or Grazed)	Specify Vaccinations given	Cost (or)Free specify Rate of Vaccination	Approximate value of animals at the time of Death
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

DEPARTMENT OF ANIMAL HUSBANDRY

Estimation of Mortality Rate of Fallen Animals

SCHEDULE - II

Period of Survey From To

District:										**Taluk:**							**Block:**									**Village:**				
BUFFALO - Death of Animals for the Past 3 Years																SHEEP - Death of Animals for the Past 3 Years													
No. of Deaths	Year of Death	Cause of Death	Age of Deceased	Sex of Deceased	Breed of Deceased	Specify - Born (B) or Purchase (P)	Year of Birth/Purchase	If Purchased Cost in Rs.	No. of calving/lactation of deceased	Ave.lactation lengthof disessed	Ave.milk yield per day of diseased	Feeding Practices(Stallfed or Grazed)	Specify Vaccinations given	Cost (or)Free specify Rate of Vaccination	Approximate value of animals at the time of Death	**Sl.no.of HH**	No. of Deaths	Year of Death	Cause of Death	Age of Deceased	Sex of Deceased	Breed of Deceased	Specify - Born (B) or Purchase (P)	Year of Birth/ Purchase	If Purchased Cost in Rs.	No.of youngones born to deceased	Feeding Practices (Stallfed or Grazed)	Specify Vaccinations given	Cost (or)Free specify Rate of Vaccination	Approximate value of animals at the timeof Death
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44		45	46	47	48	49	50	51	52	53	54	55	56	57	58

DEPARTMENT OF ANIMAL HUSBANDRY

Estimation of Mortality Rate of Fallen Animals

SCHEDULE - II

Period of Survey From To

District:										**Taluk:**								**Block:**						**Village:**			
GOAT- Death of Animals for the Past 3 Years														PIG- Death of Animals for the Past 3 Years													
No. of Deaths	Year /month of Death	Cause of Death	Age of Deceased	Sex of Deceased	Breed of Deceased	Specify - Born (B) or Purchase (P)	Year of Birth/ Purchase	If Purchased Cost in Rs.	No.of youngones born to deceased	Feeding Practices(Stallfed or Grazed)	Specify Vaccinations given	Cost (or)Free specify Rate of Vaccination	Approximate value of animals at the time of Death	No. of Deaths	Year /month of Death	Cause of Death	Age of Deceased	Sex of Deceased	Breed of Deceased	Specify - Born (B) or Purchase (P)	Year of Birth/ Purchase	If Purchased Cost in Rs.	No.of youngones born to deceased	Feeding Practices(Stallfed or Grazed)	Specify Vaccinations given	Cost (or)Free specify Rate of Vaccination	Approximate value of animals at the time of Death
59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86