

**The Analysis on the Status, Care and Management of Elephants
in Myanmar**

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ABSTRACT

Elephant Logging in Myanmar existed since the days of ancient kings. Historical documents of timber trade dates back to the Konboug dynasty in 1808. After nearly two hundred years later, elephants still remain the main power in the extraction of timber in Myanmar. World war II conflicts had greivous effect on Myanmar's domesticated elephants. However , in the Asian region, Myanmar holds the world's most government-owned elephants. Nearly 2800 elephants are owned by the Myanma Timber Enterprise (MTE). The demand for elephant power must remain steady and growing. A great deal of attention should be given more to both elephants and the staff, in order to minimize the death occurrence of the elephants, especially by the diseases and accidents; and improve the birth rates of elephants, as well as upgrading the standard and welfare of the elephants staff and families. Providing best veterinary care and replenishing medicines for the elephants are essential, to overcome the diseases. *Singoungs*, *Sinoks* and *Oozies* should be firm, kind and even-tempered, which qualities are understood and appreciated by the elephants. Hence, for the successful and sustainable logging operations, and maintaining elephants population, both the elephants and its staff are to be well-managed and cared for. The objectives of this paper are to conserve and maintain domesticated elephants in Myanmar, to promote health care and management to increase birth rates and minimize mortality rates, of elephants and also to provide social welfare programs for the families at the elephant camps.

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မြန်မာနိုင်ငံ ဆင်များထိန်းသိမ်းရေးနှင့်ရှောက်ခြင်းအပေါ် လေ့လာဆန်းစစ်ချက်

မျိုးမြင့် *

စာတမ်းအကျဉ်း

ရှေးမြန်မာမင်းများ ခေတ်ကတည်းက သစ်ထုတ်ခြင်းလုပ်ငန်းများဆောင်ရွက်ရာတွင် ဆင်ကိုအသုံးပြုခဲ့ကြပါသည်။ ၁၈ ရာစု၊ ကုန်းဘောင်ခေတ်တွင် သစ်ထုတ်ခြင်း၊ သစ်ရောင်း ဝယ်ခြင်း လုပ်ငန်းများ ဆောင်ရွက်ခဲ့ကြောင်း သမိုင်းမှတ်တမ်းများအရ သိရှိရပါသည်။ နှစ်(၂၀၀)ခန့်ကြာမြင့်ပြီးနောက် ယခုမျက်မှောက်ခေတ်ကာလတိုင် သစ်ထုတ်ခြင်းလုပ်ငန်းအတွက် ဆင်သည် အဓိကအခန်းကဏ္ဍမှ ဆက်လက်ပါဝင်လျက်ရှိပါသည်။ ဒုတိယကမ္ဘာစစ်ကြီးကာလတွင် သစ်ထုတ်လုပ်ငန်းရှိ ဆင်အများအပြား သေကြေပျက်စီးမှုများရှိခဲ့ပါသည်။ သို့သော်လည်း အာရှတိုက်တစ်ဝှမ်းတွင် မြန်မာနိုင်ငံသည် အစိုးရပိုင်ဆိုင် အများဆုံးကို ပိုင်ဆိုင်မှုရှိခြင်းမှာ ဂုဏ်ယူ ဖွယ်ရာဖြစ်ပါသည်။ မြန်မာ့သစ်လုပ်ငန်းအနေဖြင့် ယခုအခါ ဌာနပိုင်ဆိုင် (၂၈၀၀)ခန့်ကို ပိုင်ဆိုင် ထားလျက်ရှိပါသည်။ ရှေ့ဆက်၍ ဆင်အင်အားများကို ရေရှည်အသုံးပြုနေရဦးမည်ဖြစ်ပြီး ဆင်ဦးရေကြီးထွားတိုးတက်နေဖို့ လိုအပ်နေပါသည်။

သို့ဖြစ်ပါ၍ ဆင်သေဆုံးမှုလျော့နည်းရေး၊ ဆင်မွေးဖွားမှုမြှင့်တက်ရေးတို့အပြင် ဆင်ဝန်ထမ်းများနှင့် ၎င်းတို့၏မိသားစုများ လူနေမှုဘဝမြှင့်တင်ပေးဖို့လည်း လိုအပ်ပါသည်။ ရောဂါများမှကာကွယ်နိုင်ရန် ဆင်များအား အနီးကပ်ပြုစုကုသခြင်း၊ ဆေးဝါးများဖြည့်ဆည်း ပေးခြင်း တိုးမြှင့်ဆောင်ရွက်ပေးသင့်သလို၊ ဆင်များကို အနီးကပ်ပြုစုစောင့်ရှောက်ကြရသည့် ဆင်ခေါင်း၊ ဆင်အုပ်၊ ဦးစီး၊ ပဲ့ချိပ်တို့သည် ဆင်များအပေါ် ကြင်နာမှု၊ ခင်မင်တွယ်တာမှုဖြင့် ညင်သာစွာ ဆက်ဆံဆောင်ရွက်ဖို့လည်း လိုအပ်ပါသည်။ ဆင်များသည်လည်း မိမိ၏ ဆင်ဦးစီး၊ ပဲ့ချိပ်တို့၏ အထက်ပါကဲ့သို့ ညင်သာစွာဆက်ဆံမှုအပေါ် နားလည်ခံစားတတ်ကြ ပါသည်။ သို့ဖြစ်ရာ ဆင်ဖြင့်သစ်ထုတ်ခြင်းလုပ်ငန်းများ ရေရှည်တည်တံ့စွာနှင့် အောင်မြင်စွာ ဆောင်ရွက်နိုင်ရန်အလို့ငှာ ဆင်ဦးရေများတိုးပွားရန် ကောင်းမွန်စွာ ထိန်းသိမ်းစောင့်ရှောက်ရေး အပြင် ဆင်ဝန်ထမ်းမိသားစုများကိုလည်း ပံ့ပိုးကူညီပေးဖို့ လိုအပ်လျက်ရှိပါသည်။ သို့ဖြစ်ပါ၍ ယခုတင်ပြသည့်စာတမ်း၏ အဓိကရည်ရွယ်ချက်များမှာ ဌာနပိုင်ဆိုင်များအား ကာကွယ်ထိန်းသိမ်း စောင့်ရှောက်ရေး၊ ဆင်များ၏ ကျန်းမာရေးတိုးတက်ကောင်းမွန်လာစေရေး၊ မွေးဖွားမှုနှုန်းတိုးပြီး သေဆုံးမှုနှုန်းလျော့ပါးရေးနှင့် ဆင်ဝန်ထမ်းများနှင့် ၎င်းတို့၏မိသားစုများ လူနေထိုင်မှုဘဝများ မြှင့်တင်ပေးရေးတို့ဖြစ်ပါသည်။

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1. Introduction

Many tropical countries have been facing environmental crises directly or indirectly linked with losing their forest cover. Under the continuing process of forest degradation and deforestation in the tropics, one serious repercussion is seen in the habitat of natural flora and fauna. Experts have noted that the extinction rate of species has accelerated during last few decades, and more species are being driven to the brink of extinction due to this process.

Myanmar is also one of the countries in the tropics. Myanmar, with the total area of 676,577 km², has a wide range of topography, temperatures and rain falls. Because of its wide range of geophysical features, latitudes and climatic conditions, Myanmar is endowed with a diversity of flora and fauna, numerous ecosystems in sea, land and water bodies.

Myanmar, ratified the Convention on Biological Diversity (CBD) , in 1992. Hence, Myanmar is committed to conserve its biological diversity.

It is reported that, habitat degradation and loss of biodiversity are due to anthropogenic activities.

Whether in conservation of biodiversity or environmental issues, the domesticated and the wild elephants play a very important role.

1.1 Background history of elephants

The Word “**Elephant**” is derived from the ancient Greek word “**elephas**”, which simply means “**ivory**”. The elephant is the largest living land mammals in existence. Millions of years ago there were 352 members of elephant family which were spread over the large continents of Africa and Asia.



Figure.1 : A herd of African Elephants

Today, however, the elephant population has dwindled considerably over the years, and its habitat is now confined roughly to an area below the Sahara in the north, and Zambia in the south on the African sub – continent, while in Asia it still occupies the tropical forests of India, Sri Lanka, Bangladesh, Myanmar, Thailand, Laos, Cambodia, Malaysia, Borneo and Sumatra. Of the 352 members of original family, only two main species have survived the ravages of time and climatic changes that had taken place on earth. These are the African species known as *Loxodonta africana*, and

the Asiatic species known as *Elephas maximus*. The two main species are vastly different in many respects. The most prominent points of difference in the two main species are the shape and size of the ears; the formation of the spinal ridge; and above all, twin mounds on the forehead of Asian Elephants instead of the single dome on the African species.



Figure.2 : Shows an African Elephant

1.2 History of elephant domestication

The Earliest evidence of captive elephants found from the images on soapstone seals in the Indus valley (present day PAKISTAN), 4500 years ago, the Vedas, ancient HINDU writings (1500-1200 B.C) , mentioned tame elephants. The elephant-headed god “GANESHA” is being worshipped as the god of wisdom and remover of obstacles. For Buddhist, elephants, have special significance. White elephants were featured in many stories and revered for centuries in Myanmar and Thailand.



Figure.3 : shows an elephant used for sight seeing in India

Any white elephant captured in Thailand, belongs to the king. Elephant is a symbol of prestige, prosperity and power.

In Sri Lanka and India, elephants are being used in ceremonies and religious processions, coronations, parades, etc. Richly decorated and caparisoned elephant carries the reputed tooth of Buddha in Sri Lanka every year.

In the Mediterranean, King Ptolemy I of Egypt, began building an army of war elephants with 43 Asian elephant, captured at the battle of GAZA in 312 B.C.

In Asia, Indian Kingdom employed 1300-1600 war elephants in 1024 AD. By middle of 14th century, DELHI SULTANATE employed 3000 war elephants. In 1556-1605, Emperor AKBAR, built a stable of about 5000 war elephants, later, reported to have grown to the amount of 12000.



Figure.4 : A herd of Asian Elephants

In Myanmar, it is normally accepted that, captive elephants, were trained and put into service of men some 2000 years ago. Elephants were trained and used in battle in the days of Myanmar kings.



Historical depiction of elephant, dates back to the era of king Anawrahta, Bagan dynasty. In 1044 AD, used elephant corps, as the combat-arms-of-war, to conquer the rival kingdom of Bagan.

Figure.5 : An Asian elephant (left); an African elephant (right).

The elephant dance festival, is a traditional cultural highlight of Myanmar. It is celebrated on the eve of the full moon day of Thadingyut, at Kyaukse, 33 miles south of Mandalay. The whole town competes for, best dance performance and best richly and most highly decorated.



Two men inside the hollow costume imitate the movement of real elephant. A lead man coordinates the movement, assisted by a group of musicians, while the crowd roared in merriment.

Figure.6 : Elephant costume with two men inside

1.3 The majestic role of white elephant

The importance attached to the possession of a white elephant is traceable to the Buddhist religion.

In 1044 AD,

Figure.7 : A female white elephant (1958)



king Anawrahta, used white elephant in the promotion of Buddhism, who conquered king Manuha of Thaton, where he seized the sacred relics of Buddha. The sacred relics of Buddha and thirty sets of TIPITAKA were placed on 32 white elephants and carried to Bagan.

King Anawrahta, sent a mission to king Ceylon, with a white elephant as a gift.

King Bayinnaung invaded Thailand (then, SIAM), and captured white elephants.

In 1856, an English man named Ralph Fitch who visited the king's palace, reported king Bayinnaung as possessor of four white elephants. Sir James G.Scott (Shwe Yoe), in 1882, gave an eye –witness account of king Mindon's white elephant. On the 17th march in 1958, Maisu gave birth to a female white elephant, in the State Timber Board (STB) [now-MTE] camp in Indawgyi, near Hopin. During 2000 and 2002, three white elephants were captured in Rakhine State by MTE staff.

- **20th January-2000** - Captured male white elephant, (approx: age 10years) at Ahtenanya village tract, Rathedaung, Rakhine State.
- **28th January-2002** - Captured female white elephant (about age 26 years) at Kaing-Gyi creek, Maungtaw Township, Rakhine State.
- **18th July-2002** - Captured female white elephant (about age 5 years) at Kin-Creek, Maungtaw Township, Rakhine State.



Figure.8 : Shows three white elephants captured in 2000 and 2002 from Rakhine State

1.4 Domesticated elephant in Asia

Thirteen countries in Asia have wild elephants. But, most of the countries in Asia also have domesticated elephants. For example: Myanmar , Thailand, India, Lao PDR, Vietnam, Indonesian, Cambodia, Sri Lanka, Bangladesh, Nepal and Malaysia have both wild and domesticated elephants. The number of wild and domesticated elephants in some Asian countries was given in Table.1, against their human

population. It shows that the highest number of wild elephants is in India, and the highest number of domesticated elephants is in Myanmar.

Table.1 : Human population, wild and domesticated elephants in Asian

Sr No	Countries (Asia)	Wild	Domesticated	Human Population
1	Bangladesh	250	77	117787000
2	Cambodia	750	450	9968000
3	India	25000	3250	918570000
4	Indonesia	4250	570	194615000
	- Sumatra	3500	570	
	- Kalimantan	750		
5	Lao PDR	350	1225	4742000
6	Malaysia	2000	20	19695000
	- Peninsula	1350	20	19695000
	- Saba	650		
7	Myanmar	5000	6500	45555000
8	Nepal	60	70	21360000
9	Sri Lanka	1500	500	18125000
10	Thailand	1250	3900	58183000
11	Vietnam	450	225	72931000

Source – Gone Astray-



1.5 Objectives

The objectives of this paper are

- To conserve and maintain domesticated elephant population.
- To promote health, care and management of both MTE Elephants and welfare of its staff.
- To ameliorate birth rates and to minimize mortality rates of MTE Elephants.

2. Elephant logging in Myanmar

Elephant logging existed since the days of the ancient kings of Myanmar. Historical documents of timber trade dates back to the Konbaung Dynasty in 1808 A.D. when, Teak became very popular in western countries.

Sustainable management and conservation of forests of the country dates back to 1856. After the annexation of the country in 1886 and up to 1942, a large majority of Teak forests of Myanmar was worked under long-term leases by five big European firms, namely Bombay Burma Trading Corporation Ltd., Messrs. Steel Bros. Co.ltd., Messrs. Macgregor & Co.ltd., Messrs, Foucar Co.ltd., and T.D. Findlay and Sons Ltd. Annually over 380,000 hoppus tons of teak were extracted by using elephants and water buffaloes. Buffalo power was used only on flat terrain for short hauling distance and smaller logs with volume of less than one ton. Since then, elephant logging has



become indispensable:

In 1942, before the World War II, the total strength of elephants owned by the timber industry were about 10000 elephants. 6500 of these were full-grown Figure.10,11,12 : Elephant logging and hardwood between the ages of 5-18 years, engaged in transport of baggage and supplies; while the rest of some 1000 were calves-at-heel.



Figure.13 : Elephant logging

However, during the period of war from 1943-1945, many Timber elephants died of overwork and under-nourishment, while some were poached for valuable tusks. By the end of the war in 1945, only about 2500 full-grown elephants were available for timber extraction.

2.1 Elephants under the possession of MTE

The number of elephants existed under the possession of Myanmar Timber Enterprise during 1980-1981 to 1989-1990; 1990-1991 to 1999-2000; 2000-2001 to 2008-2009 are shown in Table.2, Table.3 and Table 4 respectively.

Table.2 : State-owned elephants during 1980-1990

Sr. No	Year	Full Grown	Trained Calves	Calves at Heel	Total
		(FG)	(TC)	(CaH)	
1	1980-1981	1244	981	314	2539
2	1981-1982	1266	1036	350	2652
3	1982-1983	1317	1033	405	2755
4	1983-1984	1331	1061	406	2798
5	1984-1985	1364	1045	423	2832
6	1985-1986	1393	1024	449	2871
7	1986-1987	1437	1036	434	2907
8	1987-1988	1502	1027	415	2944
9	1988-1989	1520	1038	401	2959
10	1989-1990	1537	986	395	2818

Table.2 shows that, within 10-years period (1980-1990) total number of full grown, trained calves, and calves-at-heel, have increased considerably. The total number at 1980 was 2539, and by the end of the decade, that is in 1990, total number rose to 2818. Increased by 279 (11%).



Figure.14 : State-owned Elephant during the period 1980-81 to 1989-90

Table.3 : State-owned elephants during 1990-1991 to 1999-2000

Sr.No	Year	Full Grown	Trained Calves	Calves At Heel	Total
		(FG)	(TC)	(CaH)	
1	1990-1991	1549	992	384	2925
2	1991-1992	1552	968	375	2895
3	1992-1993	1606	935	357	2898
4	1993-1994	1605	968	300	2873
5	1994-1995	1622	962	270	2854
6	1995-1996	1642	927	235	2804
7	1996-1997	1672	904	214	2790
8	1997-1998	1667	883	202	2752
9	1998-1999	1671	852	185	2708
10	1999-2000	1693	841	181	2715

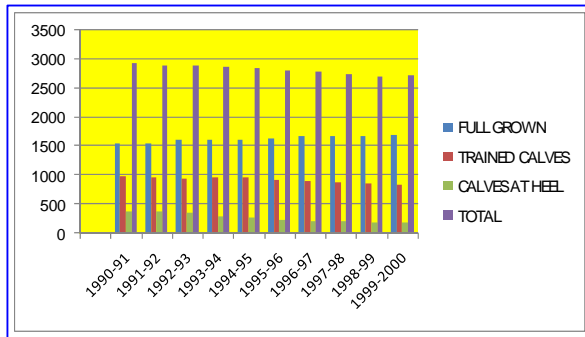


Figure.15 : State-owned Elephant during the period 1990 to 2000

In Table.3, it can be seen that, although full grown elephants increased by 144; both numbers of trained calves, and calves at heel have decreased by 151 and 203 respectively, during the period of 10 years (1990 to 2000), total number of elephant also declined by 7.2%.

Sl.No	Year	(FG)	(TC)	(CaH)	Total
1	2000-2001	1710	833	188	2731
2	2001-2002	1715	820	193	2728
3	2002-2003	1722	807	196	2725
4	2003-2004	1760	763	212	2735
5	2004-2005	1766	772	200	2738
6	2005-2006	1788	760	219	2767
7	2006-2007	1781	742	234	2757
8	2007-2008	1814	716	239	2769
9	2008-2009	1808	714	275	2797

In Table.4, it shows that, during this period the number of trained calves declined by (14.3)%, while full grown, and calves at heel grow by (5.7)% and (46.3)% respectively. Total number of elephants grow by (2.4)% only.

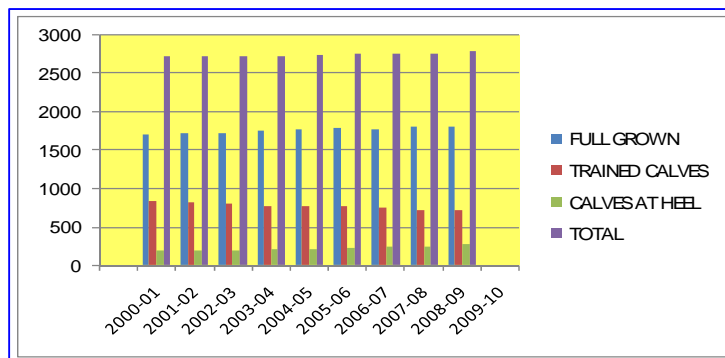


Figure.16 : State-owned Elephant during the period 2000 to 2009

2.2 Classification of state-owned elephants

Elephant are trained to work, by the experienced trainers as they reached the prescribed year. Therefore, based on the age, elephants are classified as follows:

- Up to 4 years - Calves-at-Heel (CaH)
- 4 to 18 years - Trained-calves (TC)
- 18 years and above - Full-grown (FG)

According to the haulage capacity of timber, full grown elephants are graded as follows ;

- 1st Class - stout & healthy, generally (age between 30-40 years), able to haul or drag log > 2 tons.
- 2nd Class - stout & healthy, generally (age between 25-30 and 45-50 years), able to haul log 1-2 tons.
- 3rd Class - Fit elephants, generally (age between 18-25 years and over 50 years), able to haul log < 1ton.



Figure.17 : Stout and healthy elephants

The retirement age is generally fixed at age 50, but younger ones and older ones of 50 years & above, which are deemed to be unfit and disabled are kept at separate sick camps, for regular treatment.

A record book is kept for, each and every elephants, since its birth to death, in which every detail of inspection, every

medical treatment are noted and recorded.

Altogether, there are 16 separate Department instructions regarding elephant logging & management, in addition, to the Extraction Manual, and Standing Orders, in which the care & management of elephants are explicitly mentioned.



Figure.18 : Mother elephant with her twin calves

2.3 Elephants gender

The number of male and female elephants during 1999-2000 to 2008-2009 is shown in Table.5.

Table.5 : List of male and female elephants during 1999-2000 to 2008-2009

Sr. No	Year	Full Grown (FG)		Trained Calves (TC)		Calves at Heel (CaH)		Total		Total (Both sex)
		M	F	M	F	M	F	M	F	
		1	1999-2000	671	1024	398	436	103	83	1172
2	2000-2001	689	1021	396	437	95	93	1180	1551	2731
3	2001-2002	703	1012	384	438	99	93	1186	1542	2728
4	2002-2003	703	1019	375	432	94	102	1172	1553	2725
5	2003-2004	727	1033	354	409	108	104	1189	1546	2735
6	2004-2005	727	1039	361	411	95	105	1183	1555	2738
7	2005-2006	733	1055	359	401	112	107	1204	1563	2767
8	2006-2007	744	1037	342	400	128	106	1214	1543	2757
9	2007-2008	762	1052	331	385	128	111	1221	1548	2769
10	2008-2009	760	1048	337	377	148	127	1245	1552	2797

Table.5 shows that, in full grown elephants, female are greater in numbers by (30%), in trained calves, female are also greater in numbers by (13)%, but in three classes combined females are greater by 307 numbers.

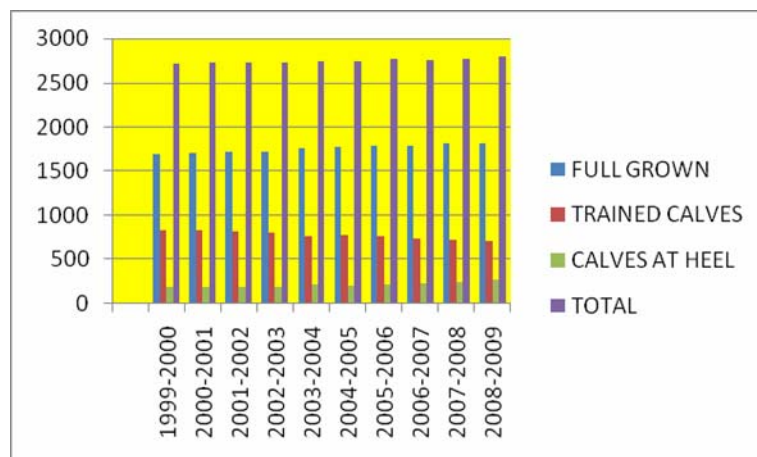


Figure.19 : Shows total population stays above 2700. While full grown stays around 1800. Trained calves stays around 700.

divisions in the year 2008-2009

MTE-owned elephants are scattered all over the country, under the management of Extraction Agencies, according to the need of logging operations. Table.6 shows the number of elephants in different states and divisions, in the year 2008-2009.

Table.6 : Elephant in States and Divisions (2008-2009)

Sr no	State & division	Full Grown (FG)		Trained Calves (TC)		Calves at Heel (CaH)		Grand total		
		M	F	M	F	M	F	M	F	Total
1	Kachin	18	28	6	11	4	7	28	46	74
2	Chin	23	33	9	13	6	4	38	50	88
3	Sagaing	194	307	130	158	59	50	383	515	898
4	Bago (w)	89	103	54	47	14	12	157	162	319
5	Bago (e)	76	115	40	43	12	16	128	174	302
6	Magwe	174	192	43	58	28	17	245	267	512
7	Mandalay	54	100	25	17	10	11	89	128	217
8	Shan (s)	7	13	5	1	1	1	13	15	28
9	Shan (n)	17	34	4	16	8	1	29	51	80
10	Rakhine	24	22	5	6	1	2	30	30	60
11	Ayerwaddy	53	62	12	5	1	2	66	69	135
12	Htamanthi	31	39	4	2	4	4	39	45	84
	Total	760	1048	337	377	148	127	1245	1552	2797

In Table.6, it can be seen, where the state-owned elephants are placed in states and divisions, according to the need of logging operations, Sagaing division has the largest herd, second is Magwe division.

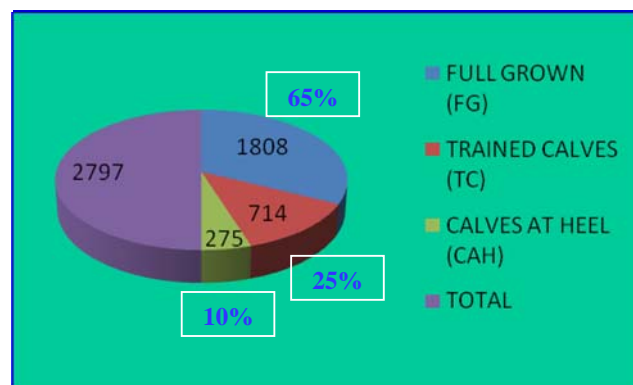


Figure.20 : Shows the present existing number of elephants.

2.5 The ratio of state-owned & hired elephant engaged in logging operations

Both MTE-owned and hired elephants are being used in timber logging operations. Elephants over 55 years of age, disabled and un-fits are not allowed to

work. Table.7, shows the number of MTE-owned and hired elephants working in logging operations, during 1999-2000 to 2008-2009.

Table.7 : State owned and hired elephant working in timber logging.

Sr.no	Year	Elephants deployed for Timber Harvesting (Logging)			Total	Remark
		Birth	Death	Loss		
1	1999-2000	1575	1360	2935		
2	2000-2001	1590	992	2582		
3	2001-2002	1595	1328	2923		
4	2002-2003	1602	1328	2930		
5	2003-2004	1640	1130	2770		
6	2004-2005	1646	1534	3180		
7	2005-2006	1668	1130	2798		
8	2006-2007	1658	947	2605		
9	2007-2008	1657	947	2604		
10	2008-2009	1651	947	2598		
	Average/Year	1464	1164	2792		

Table.7 shows the full grown elephants of MTE, stays quite constant above 1600 or around it. Hired elephants are getting lower.



Figure.21: Elephants are being offered a roll of tamarind pulp & salt, during inspection by the agency manager.

2.6 Births, Deaths and Losses of elephants

In the long history of timber logging and elephant management of MTE, many birth, deaths & losses have occurred during the past years. Table.8 shows the birth, death and loss of elephants during 1988-1989 to 2008-2009.

					Poaching	Death & Loss
1	1988-1989	90	103	5	-	108
2	1989-1990	118	126	54	-	180
3	1990-1991	110	109	13	14	136
4	1991-1992	80	120	23	12	155
5	1992-1993	71	95	18	13	126
6	1993-1994	73	110	8	5	123
7	1994-1995	58	81	6	5	92
8	1995-1996	64	111	14	6	131
9	1996-1997	54	92	5	8	105
10	1997-1998	61	102	1	2	105
11	1998-1999	37	85	13	3	101
12	1999-2000	59	69	1	1	71
13	2000-2001	70	73	1	1	75
14	2001-2002	56	62	5	-	67
15	2002-2003	52	65	-	-	65
16	2003-2004	61	66	3	-	69
17	2004-2005	55	80	3	-	83
18	2005-2006	73	79	3	1	83
19	2006-2007	63	85	1	-	86
20	2007-2008	74	67	1	-	68
21	2008-2009	108	91	-	1	92
	TOTAL	1487	1871	178	72	2121

Table.8 : Births, deaths and losses of elephant during 1988-1989 to 2008-2009

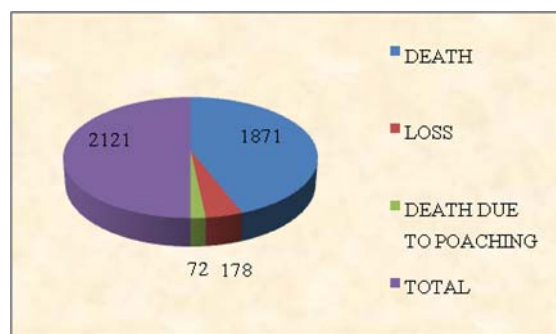


Figure.23 : Shows birth, death, loss and death due to poaching.

as follows;

Table.8 shows that, birth of elephants were greatest in 1989-1990, and lowest in 1998-1999. Death rate was also greatest in the year 1989-1990 and lowest in 2001-2002. Death due to poaching was considerably very high in 1990-1991 but gradually became less by one number in 2008-2009. Elephants are liable to be gone astray while grazing and assumed lost. Loss figure was highest in 1989-1990. We can clearly see that in 1989-1990 total death and loss was highest, but despite that, birth rate was quit high in that year

1998-1999. Death rate was also greatest in the year 1989-1990 and lowest in 2001-2002. Death due to poaching was considerably very high in 1990-1991 but gradually

Table.9 : Death of elephants

Sr.no	Year	Death of elephants									Total list of Elephants at the Beginning of the year	Mortality rate %
		Full Grown		Trained Calves		Calves at Heel		Total of both sex				
		(FG)		(TC)		(CaH)		M	F	Total		
		M	F	M	F	M	F	M	F	Total		
1	1999-2000	15	26	7	3	11	7	33	36	69	2708	2.5
2	2000-2001	13	26	9	7	8	10	30	43	73	2715	2.7
3	2001-2002	14	25	2	8	6	7	22	40	62	2731	2.3
4	2002-2003	20	15	13	4	10	3	43	22	65	2728	2.4
5	2003-2004	20	21	8	6	6	5	34	32	66	2725	2.5
6	2004-2005	24	25	10	5	9	7	43	37	80	2735	2.9
7	2005-2006	22	27	8	8	8	6	38	41	79	2737	2.9
8	2006-2007	19	37	7	5	6	11	32	53	85	2757	3.1
9	2007-2008	19	24	5	2	14	3	38	29	67	2769	2.4
10	2008-2009	33	26	7	5	8	12	48	43	91	2797	3.3
	Total	199	252	76	53	86	71	361	376	737		

Table.9 shows that, during the past 10-years, total of 737 elephants have died, of which 361 were male and 376 were female. Mostly full grown elephant have died, totally 451. Mortality rates have been hovering around 2.5 to 3.0 %, but in 2008-2009, mortality rate rose up to 3.3%, highest in the decade.



Figure.24 : A young calf, whose mother died after the birth, became very intimate with the *Oozie*.



Figure.25 :The young calf being fed milk by the staffs.

The comparison of death and birth rates during 1999-2000 to 2008-2009 is shown in Table.10.

Table.10 : Comparison of death and birth rates (1999-2000 to 2008-2009)

Sr. no	Year	Total list of Elephants at The beginning	Death of elephants				Birth			Birth Rate %
			Male	Female	Total	%	Male	Female	Total	
1	1999-2000	2708	33	36	69	2.5	32	29	59	2.2
2	2000-2001	2715	30	43	73	2.7	31	39	70	2.6
3	2001-2002	2731	22	40	62	2.3	27	29	56	2.1
4	2002-2003	2728	43	22	65	2.4	26	26	52	1.91
5	2003-2004	2725	31	35	66	2.5	29	32	61	2.24
6	2004-2005	2735	43	37	80	2.9	23	32	55	2
7	2005-2006	2737	38	41	79	2.9	41	32	73	2.7
8	2006-2007	2757	32	53	85	3.1	33	30	63	2.3
9	2007-2008	2769	38	29	67	2.4	41	33	74	2.7
10	2008-2009	2797	38	43	91	3.3	56	52	108	3.8
	Total		361	376	737		337	334	671	

Table.10 shows that, death was generally greater than birth figures. Except in 2007-2008 and 2008-2009, where birth rates are greater than the death rates.

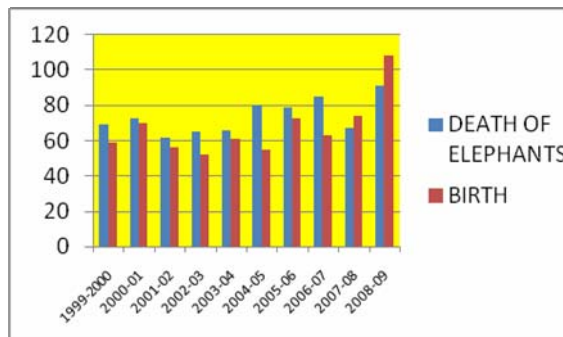


Figure.25 : Death toll the highest in 2008-2009.



2.9



Figure.26 : Mother elephant enjoying with her young calves.

attained f

To augment the shortage of timber elephants, and also to control conflict between the wild elephants and the people, MTE has been capturing elephants almost every year, by the approval of the Ministry of Forestry. At the same time, MTE owned

elephant have also been donated to other countries such as Sri Lanka, China as a gift or exchanges for other purposes. The number of elephants captured, transferred from the army and donated is shown in Table.11.

Table.11 : Number of elephants captured, transferred from the army and donated

Sr.no	Year	Captured elephants	Transferred from army posts	Donation & exchange	Remark
1	1982-1983	44	-	-	
2	1983-1984	35	-	-	
3	1984-1985	28	-	-	
4	1985-1986	28	-	-	
5	1986-1987	33	-	-	
6	1987-1988	39	-	-	
7	1988-1989	20	-	-	
8	1989-1990	29	-	-	
9	1990-1991	22	1	14	Holland / sale
10	1991-1992	23	4	-	
11	1992-1993	15	24	-	
12	1993-1994	13	9	2	Holland / sale
13	1994-1995	2	5	-	
14	1995-1996	1	8	-	
15	1996-1997	9	20	-	
16	1997-1998	2	2	2	Ygn Zoo
17	1998-1999	6	16	2	Ves Group
18	1999-2000	15	4	1	Yuzana
19	2000-2001	10	6	-	
20	2001-2002	9	-	-	
21	2002-2003	10	-	1	Yadanarbon Zoo
22	2003-2004	14	4	-	
23	2004-2005	29	-	2	Ygn Zoo (exchange)
24	2005-2006	35	4	2	Ygn Zoo (exchange)
25	2006-2007	6	2	-	
26	2007-2008	4	6	2	Sri Lanka, Donation
27	2008-2009	7	-	3	China exchange with Penguin
	TOTAL	488	115	31	

According to the table, elephant capture was highest in 1982-1983, but gradually became less.

Despite greatest care and management, by MTE, death of elephants have been occurring almost every year. Besides diseases and old age, and general debility, many deaths have occurred under very strange circumstances. The death of elephants under different circumstances is shown in Table.12.

Table.12 : Death of elephants under different circumstances

Sr.no	Year	Disease	Old Age	Snake bite	Accident	Poor Health	Still born	Tiger Attack	Lighting	Drowning	Poaching	Illegal Logging	Others	Total
1	1999-2000	24	10	8	14	8	3	-	-	1	1	-	-	69
2	2000-2001	28	11	3	19	8	3	-	-	-	1	-	-	73
3	2001-2002	20	11	4	18	6	2	-	-	-	-	-	-	61
4	2002-2003	30	8	5	14	3	2	1	-	1	-	1	-	65
5	2003-2004	24	20	1	4	3	1	-	-	-	-	-	13	66
6	2004-2005	42	4	7	18	4	4	-	1	-	1	1	-	82
7	2005-2006	27	11	2	18	13	4	-	1	2	-	2	-	80
8	2006-2007	31	14	8	16	10	2	-	-	-	-	1	-	82
9	2007-2008	21	9	5	16	7	1	-	-	-	-	-	4	63
10	2008-2009	39	20	2	17	7	3	-	-	-	1	2	-	91
	Total	286	118	45	154	69	25	1	2	4	4	7	17	732

Table.12 indicates that, during the past 10 years, deaths due to diseases was highest by 286. Second highest was caused by accident, which were 154 elephants. Old-age also played a higher roll in causing death by 118, and highest toll was 20 in 2003-2004 and 2008-2009. Deaths by snake bite was unusually high in 1999-2000, 2004-2005 and 2006-2007.



Figure.27 : Shows that, A dead Elephant is seen wedged between the stones.



Figure.28 : Dead elephant must be burnt thoroughly, and the grave site must be carefully, filled with earth.

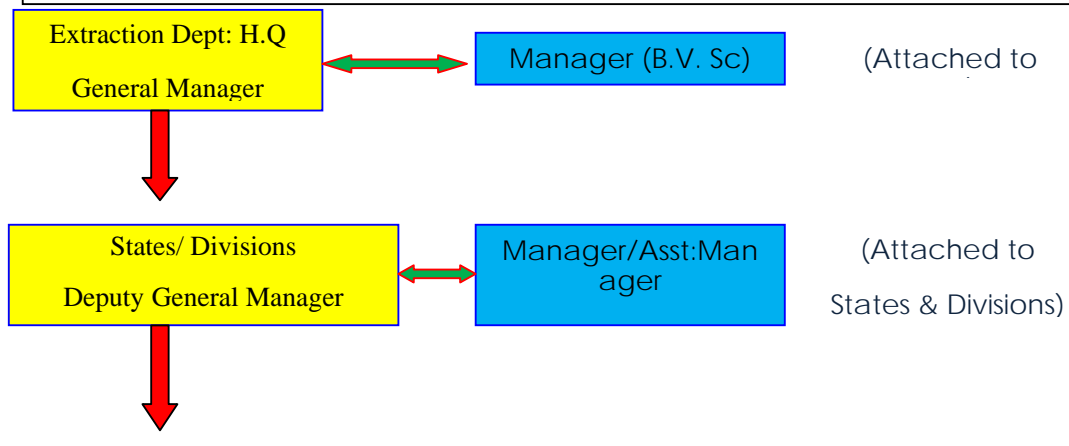




Figure.29 : Shows the organization chart for care and management of elephants.

The figure shows the intensive management of elephants by MTE staff. The chain in command produce a very effective impacts and results. This has been an ongoing procedures of MTE. It is quite evident, that, Manager, Assistant Manager, and Veterinarians are very important because they are men on the spot. By crisscross inspection, supervision and management, of elephants, MTE could surely increase and maintain the present number of elephants.

2.12 Expenditures of elephants management

Concerning health care and management procedures for elephants, the instructions are very explicit. For maintaining health conditions of elephants, they should be served salt mixed with tamarind pulp (without seeds) daily. Therefore, the respective agencies need to procure enough salt and tamarind, also pig's fat for smearing, shoulder, sides to ease the friction by dragging chains. These costs are unavoidable. The cost of these in 2008-2009 are shown in Table.13.

Table.13 : Ratio of salt, tamarind and pig's fat issued for elephants during 2008-2009

Sr no	State & Division	Full grown	Salt @	Tamarind @	Pig's fat @	Total kyats in (thousands)
		+ Trained calves	15 (viss)	30 (viss)	5 (viss)	
1	Kachin	63	945	1890	315	3092.5
2	Chin	78	1170	2340	390	3891.5
3	Sagaing	789	11835	23670	3945	39755.9
4	Bago (w)	293	4395	8790	1465	10202.1
5	Bago (e)	274	4110	8220	1370	15040.0
6	Magwe	467	7005	14010	2335	24256.5
7	Mandalay	196	2940	5880	980	6746.9
8	Shan (s)	26	390	780	130	1350.5
9	Shan (n)	71	1065	2130	355	4466.5
10	Rakhine	57	855	1710	285	2907.0
11	Ayerwaddy	132	1980	3960	660	6732.0
	Total	2446	36690	73380	12230	118441.4

According to the table : 13, Sagaing division has the largest number of elephants, hence, the need for salt, tamarind and pig's fat are highest.

The cost of health, care and management of the elephant included many high expenses, besides salt, tamarind and pig's fat. Many varieties and materials are needed every year and the cost are given in Table.14.

Table.14 : Expenditure for MTE elephants related works during 2008-2009

(in ,000)

1	Cost of medicines	-	16823.830	18.5%
2	Cost of paddy, grain, rice, powderd & milk, etc	-	14189.445	15.6%

3	Cost of short link chain (1/2", 5/8", 3/8")	-	15447.860	16.9%
4	Cost of equipment for elephant camps	-	7148.410	7.8%
5	Cost of training calves	-	15579.980	17.0%
6	Cost of forcing wild elephants away from the vicinity	-	15697.700	17.0%
7	Cost of materials for wild Elephant capturing party	-	4597.890	5.0%
8	Cost of Elephants transfer	-	510.700	0.6%
9	Cost of attention given for violent elephants	-	277.200	0.3%
10	'Thet-ke' and medicine for elephants staff	-	840.000	0.9%
	Total	-	91113.015	

Table.14 indicates the cost of medicines is very low by 18.5% of total expenditure, moreover, medicines for elephants staff were even lower. More expenditure should be allotted to obtain medicines for the elephants. Grand total of all expenditure, during 2008-2009 is Ks-209,554,415. Therefore by dividing by the total number of elephant 2797, will get the amount of Ks-74,921, for each elephant during the year. It means, that for each month the amount spent for each elephant is merely Ks-6243. It is quite evident, that more money should be spend on medicines and material for elephants.

2.13 Work done by MTE elephants during the past ten years

As mentioned above, elephants camps are situated over many states & divisions, according to the necessity of work load required. The elephants have done their show of work. The amount of teak & hardwoods that state-owned elephants have undertaken, during the past (10) years. (1999-2000 to 2008-2009), are shown in Table.15.

Table.15 : Work-done by MTE elephants (1999-2000 to 2008-2009)

State & Divisions	Numbers of Elephants	Stumping Work-done (Hoppus tons)		Remarks
		Teak	Hardwoods	
Kachin	28	13307	4564	
Chin	56	34231	44136	
Sagaing	360	273918	125075	
Bago (west)	126	48286	45375	
Bago (east)	149	43022	84515	
Magwe	282	96111	390553	
Mandalay	108	28740	116709	
Shan (north)	21	23022	6159	
Rakhine	31	9336	60668	
Ayeyarwaddy	50	5561	84567	
Total	1211	575534	962321	
		Total	1537855	

Table.15 shows that, during the past 10-year, 1211 elephants were engaged in the extraction of teak and hardwoods log, total 1,537,855 tons. The performance for each year was 153,785 tons/year. Hence, work-done performed by each elephant was 127 tons/year. Old and unfits are not included.



Figure.30 : Elephant dragging log in the compartment.



Figure.31 : Elephant dragging in depot.



Figure.32 : Elephants after bathing



Figure.33 : Elephants bathing in a creek

2.14 Working procedure of elephants camps

Working procedure for elephant camp

- Collect** - every day, early morning elephant is tracked and collected by its rider (*oozie*) where elephant was grazing.
- Bathe** - elephant is well bathed in the nearest stream to the camp.
- Harnessing** - elephant is harnessed correctly for dragging logs.
- Working** - during working hours, for easier skidding, rollers are put under the logs for easy dragging.



2.15 Work Figure.34 : Elephants being inspected by the agency manager.

Each camp generally consists of 6 elephants together with riders or Oozies, one helper and one headman.

Working elephants are *classified* into grades according to their dragging power.

- 1st class elephant >2 hoppus tons (3.6m³)
- 2nd class elephant -1-2 hoppus tons (1.8m³ -3.6m³)
- 3rd class elephant <1 hoppus tons (<1.8m³)



Figure.35 : Elephant dragging logs.

Working hour

- in cool water 8 hrs/day
- in hot water 5 hrs/day

Working Days

- 5 day a week

Working season

- From mid June to mid February with a short break of 2-3 weeks in October

Figure.36 : Elephant being harnessed, before sending off to work.



Average dragging or skidding distance

- about half mile (0.8km)

Working Capacity

- 100-180 hoppus tons (180.2m³-324.4m³) year for Teak.
- 180-240 hoppus tons (324.4m³-432.6m³) year for other species



Figure.37 : Elephants gears are kept under shade. Should be placed higher on the rack.

Work load of elephant according to age.

- Age 18-24-light dragging work
- Age 25-46-Full load
- Age 47-54-Working Capacity declines.
- Age 55-60-Light work.



3. So Figure.38 : A typical elephant gears rack.



Figure.39 : A typical elephant camp.

As stated above, all the elephants camps are placed at the respective ranges, in various reserves, where all the family members also reside, and camps are naturally , quite far away from villages and not very accessible. Hence, many social and welfares tasks were provided and carried out. Besides, health care, one of the most important social dealing is to provide education

for the children at the elephant camps. Extraction Agency even provide salaries for the teachers and providing temporary school at the camp. Some of such schools and teachers are listed in Table.16.

Table.16 : List of teachers and schools

Sr. No	State & Division	Agency	Camp Site	No. of School	No. of Teacher Employed
1	Kachin	Bamaw	We Ma	1	2
		Myitkyina	Zee Pin	1	1
2	Bago (West)	Zigon	Tha Bye Pin	1	1
		Zigon	Me Taw Khin	1	1
		Tharyawaddy	Tha Phan Pin	1	1
			Haing Shu	1	1
			Ye Ngan	1	1
			Ta Pay Lu	1	1
3	Bago (East)	Toungoo (South)	20 Mile	1	3
		Bago (North)	Yogyi Myaung	1	1
			Kyein Ni	1	1
			Yo Lay	1	1
			Ta We Chaung	1	1
		Sittoung Rafting	Hmaw Yaw Gyi	1	1
		Toungoo (North)	Non Myaung	1	3
4	Magwe	Min Bu	San Chaung	1	1
			Pan Ei	1	1
			Taung Po Gyi	1	1
		Taung Dwin Gyi	Wun Aung Gyi	1	3
			Ban Hon	1	2

5	Mandalay	Pyin Oo Lwin	Mogok	1	1
			Thitpok/Padauk/ ngok/Swe Daw myaung	3	3
6	Shan (North)	Momeik	Kyauk Htan Poe	1	1
7	Rakhine	Than Twe	Pyan Wa	1	1
			Yan Khaw	1	1
8	Ayerwaddy	Pathein (South)	Myitaya	2	2
			Chaung Tha	1	1
		Hen Tha Da	Tha Yet	1	1
Total				31	39

As in figure 38 (a, b & c), the schools are small and mostly with thatch roof and bamboo mats. Another aspect is, out of the 3000 elephant staffs, there are quite a large number of families existed, but actually students are small in number like 15, 20 or 30 at the most. Because of the nature of the scattered camps it is quite impossible to have a large number of students. But in fact, schools and teachers should be much more than the present number. Therefore, educational arrangement are needed to be strengthened



Figure.40 (a, b & c) : Teacher & students at the elephant camps school.



Figure.41 : Agency manager giving words of encouragement.



3.2 Elephants staff employed in



Figure.42 : Teacher and student receiving donations.

MTE.(2008-2009)

The veterinarians and elephants staff employed in 2008-2009 is given in Table.17.

Table.17 : Veterinarians and elephants staff employed (2008-2009)

Sr. no	Rank	Employed no	Educational level
1	Manager	2	B. V. Sc
2	Assistant manager	6	B. V. Sc
3	Deputy veterinarian	22	B. V. Sc
4	Deputy veterinarian	16	Diploma
5	Assistant veterinarian	3	Diploma
	Total	49	
6	Sin-ok	27	
7	Sin-gaung	194	
8	Oozie	2511	
9	Pejeik	308	
10	Black smith (3)	12	
	Black smith (4)	22	
	Total	3074	
11	Senior timber ranger	1	
	(wild elephant capture)		
12	Chaung-ok	3	
	(wild elephant capture)		
13	Chaung-gaung	3	
	(wild elephant capture)		
	Total	7	
	Grand total	3130	

Table.17 shows that, for 2797 of state-owned elephants, there are only 49 Veterinarians. It is by far a very small amount of employment. At the present situation, elephant camps are getting far, and the health care and management are becoming more and more difficult each year. Hence, it recommended to increase the Veterinarians by at least 20 persons, may be more is favourable.

3.3 Donation to elephants camps during 2008-2009

Extraction Department has been trying very hard to maintain the present status of elephant camps as well as up-grading the moral of elephants staff & families. More over, the most important thing is the upgrading the teaching facility to the children in the camps.

The donation of Extraction Department and private harvesting companies have helped in many aspects to Elephant camps and families.

The Table.18 shows the list of donation during 2008-2009, by the MTE and the private harvesting companies and individuals, engaged in timber harvesting.



Figure.43 : Agency manager, giving the clothes, blankets , etc to the elephant staffs.

Table.18 : List of donation (2008-2009)

No	Agency	Donated by	Commodities	Worth (Kyats)
1.	Myitkyina	Myat Hno Thu	Rice & essential rations	1800000/-
		MTE	- ditto -	800000/-
2.	Bahmo	Htoo/ Jade Land	Rice & school dress	900000/-
		Dagon Timber	Rice & other rations	202000/-
		MTE	School Stationary	200000/-
3.	Kalay	Pacific	Rice, Rations & blankets	814500/-
		U San Sha	Rice & rations	200000/-
4.	Kaw Lin	Myat Hno Thu / Tenway	Rice & medicines	8610000/-
		Htun Myat Aung		
5.	Katha (West)	MTE	Rice & cereal seeds	810000/-
6.	Katha (East)	AD/AE Contractors	Rations & seeds	420000/-
7.	Mawlaik (East)	Tin Win Htun/Asia World	Rice, stationary & medicines	3000000/-
		MTE	Stationary & medicines	400500/-
8.	Mawlaik (West)	Tin Win Tun	Rice & blankets	300000/-
9.	Shwe Bo	Shwe Moe Tha	Rice	300000/-
10.	Pyi	Dagon Timber/ Pacific	Rice, rations & stationary	1800000/-
		Tenway / Panthi	Rice, rations & stationary	
11.	Zigon	Pacific/ Kaung Myat/	Rice& rations	900000/-
		Asia Green		

12.	Gangaw	U Kyaw Tin, AD/AE Contractor	Rice, rations & stationary	8800000/-
13.	Pakkoku	U Kyaw Tin, AD/AE Contractor	Rice, rations & stationary	1000000/-
14.	Thayet	MTE	Materials for School	181000/-
15.	Minbu	Tokiwa	Pencils 72 dozens	
		MTE	Rice & stationary	460000/-
16.	Taung Dwin Gyi	MTE	Rice & rations	1200000/-
17.	Taungoo (South)	Htoo/ Dagon Timber/ Zarni Zaw/Ten Way/ Panthi/ Asia Green/ Kaung Myat	Rice, rations, medicines	1600000/-
18.	Bago (North)	Wood World FPJVC Win & Win NTC Wood Industry MTE	Rice & rations Rice & rations Rice & rations Rice & rations Rice & rations Rice & rations	450000/- 272000/- 290000/- 620000/- 120000/- 35000/-
19.	Pyinmana (North)	MTE	Torch Lights & medicines	100000/-
20.	Lashio	Ten Way MTE	Medicine, blankets, rations Ration	300000/- 25000/-
21.	Momeik	Momentum	School dress, blankets, longyis	950000/-
22.	Taunggyi	Sein Than Oo/ Soe Lwin/ CD/ Tin Myint Yee/ High Lander	Rice (100) bags, rations	2020000/-
	Hezada	MTE	Materials for School & Stationary	480000/-
	Pathein (South)	MTE	Materials for School & Stationary	480000/-
	Pathein (North)	MTE	Materials for School & Stationary	480000/-
			Total	40420000

Summary

Company Donation - 34768500 Kyats

MTE Donation - 5651500 Kyats

Total - 40420000 Kyats



A school at Shwe Gu

Figure.45 : Teacher, Students with agency manager

4. Discussion and Recommendation

4.1 Elephant Population

Table.19 shows the status and condition of the domesticated elephants engaged in timber harvesting.

Table.19 : The status of elephants before and after World War II and present day situation.

Period	State-owned				Private owned	wild
	Full Grown	Trained Calves	Calves at Heel	Total		
Before World War II	6500	2500	1000	1000	-	★ 15000
End of World War II	2500	(N/A)	(N/A)	2500	-	★ 6250
Present	1808	714	275	2797	★★ 2371	★★★ 5000
Source :				Total numbers of elephants in Myanmar. Approximately - > 10000.		
★ Burmese Timber Elephant						
★★ Registered at Forest Department						
★★★ Gone Astray						

According to the table, the population status of full-grown domesticated state-owned elephants have been diminished from 6500 in pre-war period, 2500 in post-war period, to 1808 in the present year. Similarly, both numbers of trained calves and calves-at-heel have the same diminishing result.

According to the table 2, 3 and 4, total numbers of elephant have been grown from 2539 in 1980-1981 to 2797 in the present year, grown by 258. However, considering the figure, the increased number is only 9 elephants/ per year, which is very small.

4.2 Mortality of elephant

One of the main reason the elephant population is becoming fewer, is due to the death of elephants that has been occurring every year. Besides old age, death of elephants come under different circumstances. A considerable variety of diseases, can directly attributed to the death of domesticated elephants, but which with proper care and treatment, can be greatly avoided.

According to the table 12, nearly 20 to 40 elephants are dying due to diseases every year, during the last decade. Then, second greatest number of death occurred during the last decade, were accidental deaths. Accidental deaths could take place by so many ways; such as; by falling into a burning charcoal-pit or gold mining-pit; or by stumbling over the ridge into a deep gully or by caught in a forest fire; or during dragging log, elephant can sustain injuries, which may sometime lead to death. Annual death toll caused by accidents were nearly 15-20 numbers. There is no doubt that, by proper handling and better management and supervision 30 to 40 elephants could be saved from dying by diseases and accidents.

4.3 Old age

Old and retiring elephants as well as those which are in poor health with general debility should also be treated and be given better veterinary care and sufficient medicine and supplement food. Death due to old age was highest by 20 in 2008-2009. Poor health is a threat also, causing average 4-10 deaths, annually. Hence, overall strategy and close supervision are urgently needed, which may also prevent the misuse of logging elephants.

4.4 Elephants expenditure

There are numerous items and details in the expenditure for elephants. In table 13, the cost for salt, tamarind pulp and pig's fat are kyats – 118,441,400 during 2008-2009. These expenses are being bear up every year by the MTE, and these items are very essential for health care of elephants. Table 14, also shows the various categories and their expenses in 2008-2009. But on the other hand, if we elaborate further, it can be easily summarized that cost of medicines is only 18.5% and supplement food (powdered milk, paddy, grain, etc) is only 15.6%. Therefore, a much larger amount of budget should be provided for the necessary medicines and supplement food. Subsequently, with larger amount of medicines, supplement foods, together with better veterinary care and supervision, there will surely be a definite improvement.

4.5 Need of qualified veterinarians

Veterinarians are not wholly responsible for health care and management of elephants, but the most responsible person or persons are agency manager and assistant manager for general management and supervision.

However, elephant camps leaders *Singoungs*, *Sin-oks*, and *Oozies*, *Pejeiks* have their share of responsibilities and duties also. Naturally, veterinary cares, treatments and medications are all done by the veterinarians.

According to table 17, there are at present 49 qualified veterinarians are employed for treating quite a large herd of 2797 elephants. Therefore, each veterinarian is supposed to look after 60 elephants, respectively. But, in recent years, as the timber harvesting compartments are getting deeper and far into the forest, the elephant camps are also needed to move to these forests. Therefore, with limited amount of veterinarians, they are facing difficulties in making inspection rounds, in time. Hence, in improving health care and management of elephants, the strength of veterinarians must also be increased to meet the demanding tasks. At this point, it is of most appropriate to mention that, recruitment of new blood of veterinarians is very difficult, because very few wants to join the MTE. Therefore, some arrangements should be made in order to be able to recruit new graduates of Veterinary Sciences, by offering attractive stipends and immediate appointment after graduation.

4.6 Capacity building and social welfare of elephants staff

Capacity build-up of elephants staff is most urgent. *Singaungs*, *Sin-oks*, *Oozies* and *Pejeiks* should be trained well in handling the elephants, because they must be kind and even-tempered. Elephants are frequently suffered from sore backs and feet, and most of such case being due to bad handling, lack of supervision and negligence. Therefore, awareness raising programs and on-job trainings are urgently needed.

Nevertheless, upgrading the camps, and camp-schools are equally important, because it give an indirect impact on the elephants staff, which may improve further their motivation. Donations of rice, clothes, blankets, mosquito nets, books and stationary are also a great help making life much easier for the elephants staff and families.

4.7 Recommendation

To maintain and increase the population of elephants of MTE, the following point are recommended:

1. To provide an adequate supply of medicines, materials and necessary equipments.

2. *Sin-goungs, Sin-okes, Oozies, Pejeiks* move closer attention and observations to the elephants.
3. To perform better management and supervision at all elephant camps.
4. To apply better veterinary care, by identifying early symptoms followed by preventive treatment.
5. To expend the strength of qualified veterinarians by recruiting new graduates, providing stipends and incentives.
6. To conduct on-job trainings for *Sin-goungs, Sin-oke, Oozies* and *Pejeiks* on their duties, responsibilities and tasks as well as care and management of elephants.
7. To upgrade the elephant camps, by providing primary education, social welfare and health care for the families.
8. Scientific research is needed on : diseases of the stomach and intestines, fever and infectious diseases, diseases of the heart, and filariasis, etc.

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