

ELEPHANT COOK BOOK

Prajna CHOWTA



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(aane mane)

हाथी परियोजना
भारत सरकार



PROJECT ELEPHANT
GOVT. OF INDIA



ANCF

ASIAN NATURE CONSERVATION FOUNDATION

ELEPHANT CODE BOOK

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CONTENTS

Foreword	vii
Acknowledgements	ix
Map (Distribution of wild Asian elephants)	xii
1. Introduction	
Situation of the species	1
Elephants in captivity	1
Chart 1 (Distribution of captive elephants in India)	2
Tradition	3
Economic factors	4
The aim of this book	6
2. Where to keep an elephant?	7
Four simple questions	7
Shade	8
Water	8
Soil	9
Space	10
Calm	11
Methods of restraint	11
Elephants out of control	12
3. Water and bath	14
Hygiene and cooling	14
Skin and brushes	15
Scrubbing	16
Oiling	17
Trust	17
4. Feed	19
Supplement ration	21
Chart 2 (Ration for free-ranging elephants)	22
Chart 3 (Ration for non-grazing elephants)	23
Chart 4 (Ration for zoo elephants in Europe)	24
Alternative rations in zoos	25
Exercise	25

Cooked or raw food	26
Food quality	27
Jaggery	27
Salt	28
Green fodder	29
Free-ranging elephants	31
Good and bad points of ration	32
5. Work and activities	34
History	34
Today	35
Timber dragging	36
Chart 5 (Maximum workload for elephants)	36
Chart 6 (Types of ropes used for elephants)	39
Harmful dragging method	40
Tourist rides	40
Circuses	43
Temples	45
Zoos	47
Space and facilities	49
Security	51
Breeding and mortality	53
6. Mahouts	56
Tradition and status	56
In Karnataka	58
Selection of mahouts	59
Handling an elephant	60
The use of the ankush	61
Responsibilities of the employer	62
Responsibilities of the mahout	64
Training of mahouts	65
Mahout Evaluation Form	68
7. Health care	69
Indications of good health	69
Physiological parameters	69
Estimation of height	70

Measurement of elephant	70
Estimation of body weight	70
Dentition of Asian elephant	71
Chart 7 (Age of appearance and replacement of molars)	71
Estimation of age	71
Chart 8 (Age and growth parameters)	72
Trimming of tusks	72
Musth	73
Basic health care	74
Service register of elephants	75
Vaccination	77
Specialised veterinary doctors	77
Symptoms of illness	78
Diseases of elephants	79
Anthrax	80
Chart 9 (Doses for vaccination against Anthrax)	80
Arthritis	81
Corneal opacity	81
Cutaneous filariasis	82
Decay of tusk (dental) pulp	82
Elephant pox	82
Foot rot	82
Gastric myiasis	83
Gastro-intestinal helminthiasis	83
Haemorrhagic septicaemia (HS)	83
Herpes (EEHV)	84
Impaction of colon	86
Louse infestation	86
Papillomas or warts	87
Poisoning	87
Sunburn	87
Surra	88
Tetanus	88
Tuberculosis (TB)	88
Reproduction	89
Pregnancy, delivery and calf care	90
Weaning and training of a calf	94

8. Laws	98
Protection of the elephant	98
Cruelty to elephants	102
Import/Export of elephants	103
Registration of elephants	104
In Kerala	105
Verbal commands	108
Glossary	110
Photographic Plates	
Plate 1: Hobbles and drag chain	115
Plate 2: Ghazbak and ankush	116
Plate 3: Dhoomchi and kati	117
Plate 4: Namda	118
Plate 5: Gaddi	119
Plate 6: Elephant harnesses	120
Plate 7: Details of gaddi	121
Plate 8: Measurement for the trimming of tusks	
Hemp rope with a loop, kitta and noose	122
Bibliography	123



भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS

FOREWORD

In the long history of elephants in captivity in India there have been several treatises on the care and management of the species. In the modern day a number of captive elephant 'manuals' have been produced and some more are currently under production. Where the Elephant Code Book by Prajna Chowta differs from most of the earlier works is the handy nature of volume as well as the succinct and focused way in which it presents a large amount of information that draws upon the personal practical experience of the author and a supporting team of renowned experts. All the management information presented is put into a historical context that explains in a simple and lucid style the justifications that underpin the judgments and recommendations in the book. The Elephant Code Book enunciates a simple yet comprehensive set of standards for the management of captive elephants that incorporates the best information from both India's traditional methods and approaches to elephant care as well as those derived from modern, scientific, humane elephant management systems.

The Elephant Code Book's underlying philosophy for evolving standards for captive elephant management rests on the uncompromising belief that elephants in captivity must be kept and managed under conditions that most closely replicate the conditions that elephants would experience in the wild. Hence, the four seminal questions that run throughout the guidance that the book articulates are:

- Is the location where the elephant is kept equivalent to its natural habitat in terms of climate, temperature, vegetation and water?

- Is the elephant free to search and select its own food?
- Is the elephant free to interact with, or avoid, other elephants?
- Are the conditions met for the elephants to breed naturally?

The actual condition of the 3000–4000 captive elephants in India dispersed among forest camps, zoos, temples, circuses and private owners throughout the country have not been systematically assessed. The extensive scientific survey of captive elephants in the major elephant bearing states of India conducted between 2005 and 2008 by two civil society groups, the Asian Nature Conservation Foundation (ANCF) and Compassion Unlimited Plus Action (CUPA), supported by Project Elephant (Government of India), highlighted through quantitative indicators the extent to which various facets of the management and healthcare conditions of captive elephants in India depart from ideal management conditions. The Elephant Code Book systematically and comprehensively addresses these shortfalls in captive elephant management in India. In an eminently readable and easily comprehensible style it lays out remedies, some that can be implemented immediately and others that involve more long-term behavioural changes within society as well as changes necessary in policies and laws.

A. N. Prasad
IGF & Director (Project Elephant)



जहाँ है हरियाली।
वहाँ है खुशहाली॥

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The idea of this book was first suggested by Surendra Varma, a field biologist at ANCF, who is passionately dedicated to the Asian elephant with a vast experience of research all over India, Myanmar and Vietnam. Varma managed to convince me that my experience with elephants and mahouts should be shared with others and he provided me with a mass of scientific references. Having myself come to elephant conservation via the indirect route of anthropology that led me to the study of tribal communities of mahouts and subsequently to the elephants themselves, I objected that I would not print anything that would not sustain the criticism of two eminent experts on the Asian elephant, both of whom I regard very highly:

— S. S. Bist, a high-profile Indian Forest Service officer who held the prestigious positions of Field Director of Buxa Tiger Reserve in West Bengal, Inspector General of Forests and Director of Project Elephant (Government of India), Principal Chief Conservator of Forests (Wildlife) and Chief Wildlife Warden (Government of West Bengal). A long-time supporter of the Indian tradition of taming elephants, S. S. Bist revived the 1920s' pioneering work by the legendary A. J. W. Milroy in his book *Management of Elephants in Captivity* (2002).

— Dr. Raman Sukumar, a leading scientist in the biology and ecology of the Asian elephant—author of three major books including the groundbreaking *The Asian Elephant, Ecology and Management* (1989) and numerous scholarly publications—who has introduced objective science-based policies into wildlife conservation and management. The recipient of various international awards and recognitions and a member of several national advisory bodies, Dr. Sukumar is presently Professor and Chair of the Centre for Ecological Sciences at the Indian Institute of Science and the founding trustee of the Asian Nature Conservation Foundation (ANCF).

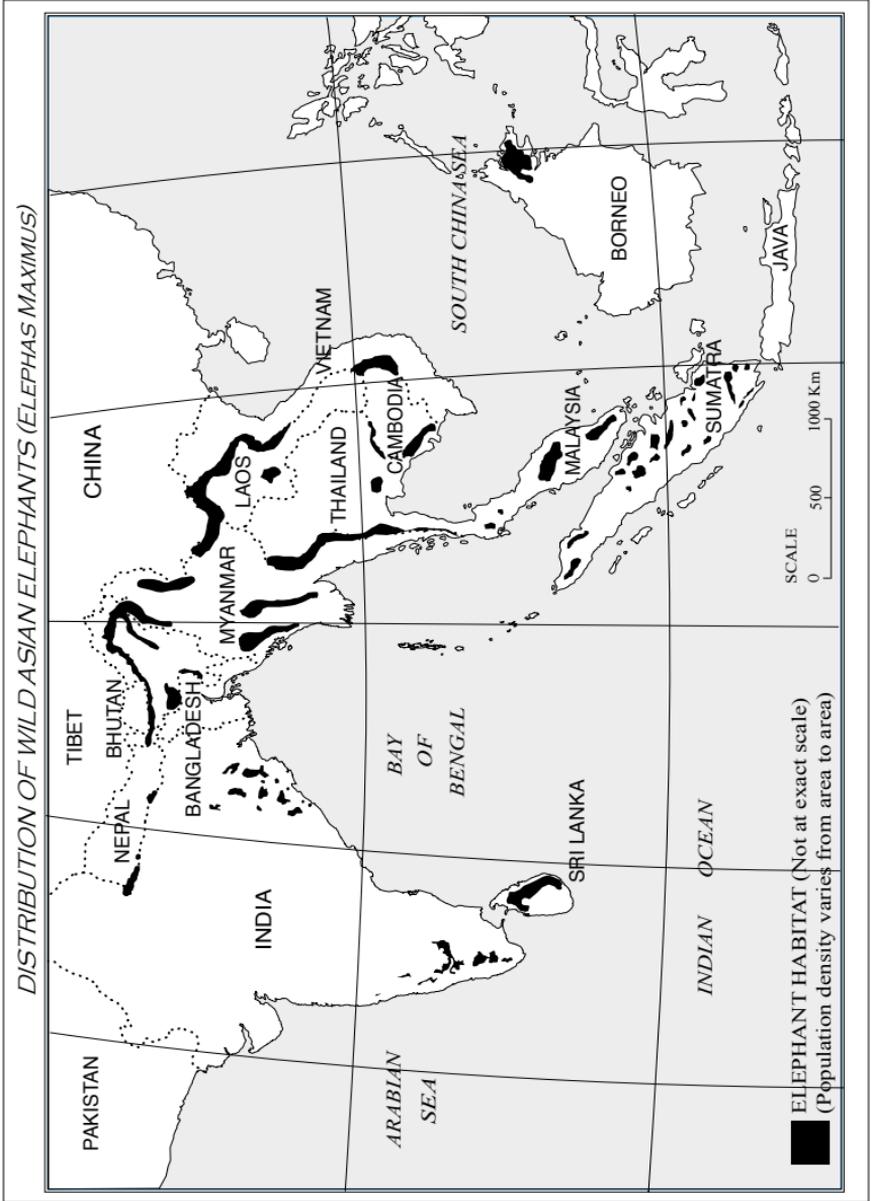
Miraculously, both S.S. Bist and Dr. Sukumar welcomed my first draft and patiently revised it. However, I also had to subject my experience in the health care of elephants to the scrutiny of a veterinary doctor and could not decide upon anyone else than Dr. B. C. Chittiappa, who has always generously shared his knowledge over the years. Deputed from the Animal Husbandry Department to the Karnataka Forest Department from 1985 to 2003, Dr. Chittiappa has treated the Department elephants and captured over one hundred problematic elephants. He is presently the veterinary officer at Bannerghatta Biological Park.

Philippe Gautier, my husband and director of five films on the Asian elephant, helped me with the editing and layout of this book, while Dr. Amrita Karnik and Arun Narayanan spontaneously accepted to proofread the text. Thomas Mathew, Executive Director, ANCF, patiently followed through the publishing of this book with the assistance of his colleague Sanjay Rattan.

I cannot miss the opportunity to reiterate here my gratitude to S. Parameswarappa, an IFS officer with an MSc in Natural Resources Management from Berkeley University. Among his teachers at the Forest Institute in Dehra Dun, he had the legendary pioneer of wildlife conservation, P. D. Stracey. S. Parameswarappa began his career during the last khedda days and occupied the position of Principal Chief Conservator of Forests of the Karnataka Forest Department from 1990 to 1995. Without his help and advice, it would not have been possible for me to enter the portals of the Forest Department and spend extensive amounts of time in the field among mahouts and elephants. Upon retirement, S. Parameswarappa agreed to become the president of the Aane Mane Foundation and joined M.P. Prakash, Dr. K.M. Kaveriappa and D.K. Chowta in supporting my endeavours. Finally, I wish to pay tribute to Parbati Barua, whom I visited in 1993, just after finishing my studies in London. She showed me a rare copy of the *Hastividya* and was the living proof that all this was possible for a woman.

Prajna Chowta, January 2010

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1. Introduction

Situation of the species. It is well known that the Asian elephant is at first a wild and formidable animal that lives freely in forest areas where it has no predator except man. But few people know that today, only about 40,000 elephants remain in Asia, including 28,000 in India (compared to about 500,000 in Africa). At the dawn of human civilisation, Asian elephants lived in a vast territory stretching from the Tigris and Euphrates Valleys in present day Syria and Iraq to the Yangtze-Kiang river in China (Daniel, 1998), and from the foothills of the Himalaya to the south of the Indian subcontinent and South-East Asia. They had also occupied the islands of Sri Lanka, Sumatra and Borneo that were accessible from the mainland as late as the last Ice Age, 18,000 years ago. This early range of 9 million km² has shrunk to less than 500,000 km² (Sukumar, 2003). Today, elephants are confined to small populations that cannot interact with each other anymore (see Distribution Map). This is why international experts have declared the Asian elephant (known to scientists as *Elephas maximus*) a highly endangered species and states have enacted laws for its protection.

There is no doubt that the decrease in the elephant population in the course of history is due to the occupation of land by humans and the killing and capture of millions of elephants. This fascinating animal, the result of more than 50 million years of natural evolution, a keystone of the ecological system, may disappear forever within a few decades if not protected. Its survival is in our hands, and its protection remains a challenge for humanity.

Elephants in captivity. It is also well known that the Asian elephant can be tamed and its strength and intelligence used for the service of man. India has a long history of capturing and training wild elephants. Seals of the Indus Valley civilization (2500–1500 B.C.) suggest the use

of tamed elephants in India at that time (Carrington, 1958), though the capture and taming of elephants has probably been practiced earlier in India. Between 2 and 4 million wild elephants have been captured since the beginning of elephant keeping and 30,000 to 50,000 were captured or killed between 1868 and 1980 (Sukumar, 1992, 1994).

Yet, very few people know that today, as many as 16,000 elephants are captive in Asia, and over 3300 in India alone. A 2008 estimate by the Government of India's Project Elephant gives the following figures:

Chart 1: Distribution of captive elephants in India

Geographical Distribution	Minimum	Maximum
South India	860	920
North East India	1903	1970
East India	209	240
North India	271	300
West India	79	92
Total	3322	3522

Highest Distribution	Minimum	Maximum
Assam	1253	1290
Kerala	612	635
Arunachal Pradesh	564	580

Agency Wise Distribution	Estimate
Forest Department	500
Zoos	82
Circuses	92
Private Owners and Temples	2650–2700

Source: Project Elephant, 2008

In India, the sight of elephants in inhabited areas is so common that many people think of them as a separate breed of 'domestic elephants'. This is a deep misconception. By 'domestic', one usually refers to animal species that have

been biologically modified by selective breeding over centuries by the agency of man and are now distinct from the wild species from which they originated (e.g. cats, dogs, horses, cows, sheep, pigs, goats, chicken, etc.). This does not apply to the elephants that can be seen in forest camps, zoos, temples, tourist spots, circuses and plantations or wandering in city lanes. In fact, it is more accurate to speak of 'captive' or 'tamed' elephants or more accurately of 'elephants in captivity', as most of them have been captured from the wild, and there is no biological difference between a wild and a captive elephant. The vast number of elephants in captivity is a cause of concern as they do not breed well and cannot maintain a population of their own, independently from the wild population. As much as man tried to breed elephants in ancient and modern times, it never worked well (see Zoos). Consequently, more and more elephants were captured from the wild until a few pioneers in wildlife conservation realised in the 1960s that the species was in danger of extinction (see *Elephant Gold*, by P. D. Stracey, 1963). Even in captivity, elephants remain a wild species. It is obvious that for them, captivity represents an immense compromise to living freely in the forest, and it does not take an expert eye to realise that the living and health conditions of many captive elephants are not viable.

Tradition. The custom of taming and keeping elephants in captivity has been practised in India for at least 4000 years. Elephants have been used in large numbers in wars, parades, religious ceremonies, for game hunting and the exploitation of timber. In times when elephants were widely used and represented great economic value, the methods of keeping and handling captive elephants were part of common knowledge in Indian society. Treatises on the upkeep and health care of elephants have been written in Sanskrit, Tamil, Assamese, Urdu, English and other languages, using the scientific knowledge that was available at the time. However, the use of elephants has decreased tre-

mendously today and the transmission of this knowledge is being progressively lost (see chapter on Mahouts). While in the past, this expertise was transmitted from generation to generation within communities of mahouts, today many elephants are left to the care of men who work based on practises quickly acquired on the job, without any proper training. In consequence, it often leads to mishandling. There is no doubt that this tradition needs to be reassessed and updated today.

Economic factors. The condition of captive elephants always depends cruelly on economic factors. At any time in history, the cost of purchase and maintenance of an elephant was always high and therefore, the quality of the upkeep was always a compromise between the expenses caused by the elephant (and its mahouts) and the income it could generate. When thousands of elephants were maintained at great expense by kings, in ancient armies, battles had to be won whatever the extent of casualties. In the time of timber extraction, each elephant had to drag its daily quota of timber so as to produce the maximum income for the company. Today, temple elephants are expected to 'bless' the largest number of devotees and receive the maximum of offerings, the same way as in tourist spots, it is made to carry as many visitors as possible and in circuses, it is expected to learn a number of tricks and perform in the maximum of shows to justify the expenses of its ration and the salary of its keepers. In all these cases, the living conditions of an elephant always comes second to its capacity to produce an income for its owner.

With captivity, the elephant has not only lost its freedom, it has also been caught in the economic system that rules human society, often beyond the dedication of the owners or the mahouts. This results in situations where elephants live under conditions that are inadequate to assure their basic health and survival. In some cases, captive elephants endure harsh treatment by inexperienced mahouts, or suffer from injuries, infections, insufficient or inadequate

nutrition, unclean or inappropriate living areas, isolation, overwork, stress, lack of veterinary care, accidents with motor vehicles, etc.

A survey of captive elephants and mahouts in various states of India, conducted between 2005 and 2008 (ANCF, CUPA, WSPA et al.) was pivotal in defining clear parameters for the welfare of elephants in captivity (Varma & Prasad, 2008). It revealed that the living conditions of many captive elephants are unsuitable and that the knowledge of a vast majority of mahouts is insufficient to cope with these problems. Today, when the notions of animal welfare and wildlife conservation are gaining ground in modern society, the condition of many captive elephants raises new concerns. Now that modern society, industries and armies do not need elephants, it is evident that they should not be used and abused anymore. After helping man for thousands of years, the elephant should be helped in its turn to live and prosper where it belongs.

The aim of this book is to provide in one handy volume the essential facts and information on the management of elephants in captivity, with the historical background that is necessary to understand the present situation. It also attempts to set minimum standards in the hope that the principles and methods articulated here will be adopted as a code of conduct in the management of captive elephants. Finally, it is motivated by the conviction that captive elephants should play a greater role in the conservation of the species as a whole.

This text is the result of 16 years spent in various elephant camps and amongst communities of mahouts in distant parts of India to study the methods of keeping and handling elephants, absorb the culture that has developed from this ancient tradition, and forge a personal experience of contact with elephants. It reviews the classical texts on the subject, most of which are out of print today, and refers to numerous scientific reports and publications that have considerably deepened our understanding of the elephant

in recent years. Moreover, this text was submitted to the scrutiny of several reputed specialists of the Asian elephant who kindly accepted to revise it.

The Elephant Code Book is designed as a reference tool for Forest Department officers, wildlife activists, private elephants owners, temple trustees, circus managers, zoo directors, veterinary doctors, traditional mahouts, elephant keepers and all those who can make a difference in the lives of captive elephants.

BIBLIOGRAPHY

- Barua P. & Bist S.S. (1996) *Cruelty to elephants - A legal and practical view*. Zoos' Print, Vol.XI, No.6.
- Biederman, Patricia W. (1994) *A giant step to safety*. Los Angeles Times, May 6, 1994.
- Bist S.S. & Barua P. (2000) *Elephant laws in India*. (Under prep.)
- Bist S.S. (2002) *Handbook of the Management of Elephants in Captivity*. Natraj Publishers, Dehra Dun.
- Bist S.S., Cheeran J.V., Choudhury S., Barua P. & Misra M.K. (2001) *The domesticated Asian elephant in India*, in *Giants on our hands*, Proceedings of the International Workshop on the Domesticated Asian Elephant, Bangkok, Thailand.
- Carrington R. (1958) *Elephants: A short account of their natural history, evolution and influence on mankind*. Chatto and Windus, London.
- Chandrasekharan K., Radhakrishnan K., Cheeran J.V., Muraleedharan Nair K.N. & Prabhakaran T. (1995) *Common Diseases of Asian Elephants In: A Week with Elephants*. Proceedings of the International seminar on the conservation of Asian Elephants (J.C. Daniel & H.S. Datye, eds.) BNHS, Bombay and Oxford University Press, New Delhi.
- Choudhury P. C. (1976) *Hastividyanava* (translated and edited) Publication Board, Gauhati, Assam.
- Clubb R. & Mason G. (2002) *A review of the welfare of zoo elephants in Europe: A report commissioned by the RSPCA*. Oxford, U. K. University of Oxford, Animal Behaviour Research Group, Department of Zoology.
- Daniel J.C. (1998) *The Asian Elephant, A Natural History*. Natraj Publishers, Dehra Dun.
- Dierenfeld E.S. (1994) *Nutrition and feeding*, pp. 69–70 in Mikota et al. (1994) *Medical Management of the Elephant*, West Bloomfield, Michigan, Indira Publishing House.
- Edgerton F. (1931) *The Elephant-Lore of the Hindus* (Matanga-Lila) New Haven, USA. (Reprinted by Motilal Banarsidass, Delhi, 1985.)
- Evans G.H. (1910) *Elephants and Their Diseases*, Rangoon.
- Ferrier A.J. (1947) *The Care and Management of Elephants in Burma*. London.
- Fowler M. E. & Mikota S. K. (2006) *Biology, Medicine and Surgery of Elephants*, Blackwell Publishing.
- Gadgil M. & Nair P.V. (1984) *Observations on the social behaviour of free ranging groups of tame Asiatic elephants (Elephas maximus Linn.)*, Proc. Ind. Acad. Sci. (Anim. Sci.) 93 (3): 225–233.
- Gale, Toke (1974) *Burmese Timber Elephant*, Trade Corporation,

Rangoon.

Galloway M. (1991) *Update on 1990 chaining survey*. Proceedings of the 12th International Elephant Workshop, Syracuse, NY.

Government of India. *The Wildlife Protection Act, 1972* (As amended in 1991) Natraj Publishers, Dehra Dun.

Government of India. *Recognition of Zoo Rules, 1992*.

Government of Kerala, *The Kerala Captive Elephants (Management and Maintenance) Rules, 2003*.

Gröning K. & Saller M. (1998) *Elephants: A Cultural and Natural History*. Cologne, Könemann.

Hatt J.M. Clauss M. (2006) *Feeding Asian and African elephants *Elephas maximus* and *Loxodonta africana* in captivity*. International Zoo Yearbook, 40(1):88–95.

Karnataka Forest Department (1976) *The Karnataka Forest Code*.

Hayward G., Latimer E., Richman L., Olson D. (2009) *Elephant Endotheliotropic Herpesvirus. Progress Report 3-2009*. International Elephant Foundation.

Kaufman G. and Martin J. (in press) Chapter 5. *Health as an indicator of well-being in captive elephants*. In: *An elephant in the room: the science and well being of elephants in captivity*. pp: 69–73.

Krishnamurthy V. *Care of pregnant cow elephants-Care of elephant calves*. In: Refresher course on health care and management of Asian elephants. (2003) College of veterinary and animal sciences, Mannuthy, Kerala.

Kurt F. & Hartl G. B. (1995) *Asian elephants (*Elephas Maximus*) in captivity – a challenge for zoo biological research*. Research and Captive Propagation. Finlander Verlag, Furth: 310–326.

Kurt F. & Garai M. (2007) *The Asian elephant in captivity—A field study*. Cambridge University Press, New Delhi.

Lair R.C. (1999) *Gone Astray – The Care and Management of the Asian Elephant in Domesticity*. Food and Agricultural Organization of the United Nations (FAO), Forestry Department, Rome, Italy, and Forestry Department Group, Regional Office for Asia and the Pacific (RAP)

Mathen G., *Feeding of captive elephants*. In: Refresher course on health care and management of Asian elephants (2003) College of Veterinary and Animal Sciences, Mannuthy, Kerala.

Mikota S.K. (1994) *Medical Management of the Elephant*. West Bloomfield, Michigan, Indira Publishing House.

Milroy A.J.W. (1922) *A short treatise on the management of elephants*.

Montali R.J., Richman L.K., Mikota S.K. et al. (2001) *Management Aspects of Herpesvirus Infections and Tuberculosis in Elephants. A Research Update on Elephants and Rhinos*; Proceedings of the International Elephant and Rhino Research Symposium, Vienna, June 7-11,

- 2001, 2001, pp. 87-95. Schuling Verlag, Vienna.
- Pfaff G. (1940) *Reports on the Investigation of the Diseases of Elephants*. Rangoon.
- Nicholls P. K. & Stanley M. A. *The Immunology of Animal Papillomaviruses, Veterinary Immunology and Immunopathology* 73 (2000) 101-127, University of Cambridge, UK.
- Rangarajan L. N. (1992) *The Arthashastra* (edited and translated) Penguin Books, New Delhi, India.
- Sahni K. C. (1998) *The Book of Indian Trees*, Bombay Natural History Society, Oxford University Press.
- Sanderson, G.P. (1879) *Thirteen years among the wild beasts of India*. W. H. Allan, London.
- Shetty B.V., Kaveriappa K.M. & Gopalakrishna Bhat K. (2002) *Plant resources of Western Ghats and lowlands of Dakshina Kannada and Udupi Districts*. Pilikula Nisarga Dhama Society, Moodushedde, Mangalore.
- Steel J. H. (1885) *A Manual of the Diseases of the Elephant and of his Management and Uses*.
- Shoshani J. & Tassy P. (1996) *The Proboscidea, Evolution and Palaeoecology of Elephants and Their Relatives*, Oxford University Press.
- Stracey P. D. (1963) *Elephant Gold*. Weidenfield and Nicholson, London.
- Sukumar R. (1989) *The Asian Elephant: Ecology and Management*, Cambridge University Press.
- Sukumar R. (1989) *Ecology of the Asian elephant in southern India I. Movement and habitat utilization patterns*. *Journal of Tropical Ecology*. 5: 1-18.
- Sukumar R. (2000) *Asian Elephant (Elephas maximus)*. In: Reading R.P. & Miller B. (eds). *Endangered animals: a reference guide to conflicting issues*. Greenwood Press, Westport, Connecticut, London, pp.34-39.
- Sukumar R., Krishnamurthy V., Wemmer C. & Rodden M. (1997) *Demography of captive Asian elephants (Elephas maximus) in southern India*. *Zoo Biology*, 16, 263-272.
- Sukumar R. (2003) *The Living Elephants, Evolutionary ecology, behavior and conservation*. Oxford University Press.
- Taylor V. J. & Poole T. B. (1998) *Captive Breeding and Infant Mortality among Asian Elephants. A comparison between twenty western zoos and three eastern elephant centres*. *Zoo Biology*, 17:311-322.
- Taylor V. J. & Poole T. B. (1999) *Can the Behavioural Needs of Asian Elephants be met in Captivity?* *Zoos' Print*, Vol. I-XIV, Nber 3-12.
- Varman K. S., Ramakrishnan U. & Sukumar R. (1995) *Direct and indirect methods of censusing elephants in forests: a comparison from Mudumalai Sanctuary*. In: *A Week with Elephants*. Proceedings of

the International seminar on the conservation of Asian Elephants (J. C. Daniel & H. S. Datye, editors) pp. 331–339. BNHS, Bombay and Oxford University Press, New Delhi.

Varma S. & Prasad D. (editors) (2008) *Welfare and Management of Elephants in Captivity. Proceeding of a Workshop on Welfare Parameters and their significance for Captive Elephants and their Mahouts*. Project Elephant (MoFE), CUPA, ANCF, Bangalore.

Veasey J. (2006) *Concepts in the care and welfare of captive elephants*. The Zoological Society of London, Int. Zoo YB. 40:63–79.

Williams J.H. (1953) *Elephant Bill*. Rupert Hart-Davis, London.

ELEPHANT CODE BOOK

As many as 16,000 Asian elephants—one third of the entire population—are captive. In India alone, about 3500 elephants live in various and often critical conditions of captivity, contradicting the contemporary notions of wildlife conservation and animal welfare.

The Elephant Code Book examines the current methods of elephant keeping and recalls the historical background that is necessary to understand the present situation. It reviews the classical texts on the subject as well as the relevant scientific literature in order to define the principles, methods and minimum standards to be adopted as a code of conduct in the management of elephants in captivity.

This text is the result of 16 years of personal experience in elephant camps and amongst mahouts in distant parts of India. Moreover, it was revised by several reputed specialists of the Asian elephant. The Elephant Code Book is intended as a handy reference tool for Forest Department officers, wildlife activists, private elephant owners, temple trustees, circus managers, zoo directors, veterinary doctors, traditional mahouts, elephant keepers and all those who can make a difference in the lives of captive elephants.

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