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# Medical Evaluation, Health Care and Management Protocols for Captive Elephants

in Riau, Sumatra, Indonesia





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WWF-Indonesia
AREAS (Asian Rhino and Elephant Action Strategy)
Tesso Nilo Programme

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# Captive Elephants

## in Riau, Sumatra, Indonesia

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## Penangkapan Gajah Liar: Pilihan Terakhir

**Penangkapan Gajah Asia di Sumatera seharusnya dipandang sebagai jalan keluar terakhir dan hanya dilakukan pada kawasan dimana habitat yang daya dukung alamnya tidak lagi memadai**

Apabila sama sekali tidak dapat dihindari, perawatan yang sangat serius dari setiap langkah pada proses penangkapan dan pelatihan pasca penangkapan akan sangat dibutuhkan :

1. Gajah-gajah dewasa lebih baik ditangkap dengan cara pembiusan kimia, baik berupa obat-obat sedatif narkotika yang kuat ataupun yang non narkotika. Oleh sebab itu, tim yang terlibat di dalam penangkapan sebaiknya didampingi oleh dokter hewan yang sudah ahli dan berpengalaman.
2. Dosis yang tepat serta penanganan medis yang sesuai sangatlah penting demi menghindari ketegangan/stres maupun kematian pada satwa.
3. Satwa yang sudah ditembak bius sebaiknya tidak dikejar atau diganggu karena hal itu akan menyebabkan penundaan pada periode induksi dan dapat menyebabkan *myopathy* atau bahkan kematian.
4. Sekalipun satwa-satwa tersebut masih didapati berdiri setelah penembakan dengan *xylazine*, yang menurut laporan merupakan bahan sedasi yang paling umum digunakan di Indonesia, kadangkala satwa-satwa tersebut bisa juga dalam posisi tersungkur atau pun pada posisi *sternal recumbancy* ( duduk dengan menyangga di dada). Posisi ini sangat berbahaya karena dapat mengganggu fungsi pernapasan yang bisa berakibat fatal. Gajah yang sudah terbius cenderung untuk mengistirahatkan tubuhnya pada tulang dadanya, gajah harus dibantu untuk mengambil posisi *lateral recumbency* dengan pertolongan gajah-gajah latih atau kalau tidak demikian zat anastesianya diganti dengan *Yohimbine* pada dosis tepat.
5. Luka yang membekas dibersihkan dengan *povidine iodine* untuk mencegah infeksi.

6. Antibiotik yang memiliki daya kerja lama, tetanus toksoid dan vitamin E perlu diberikan juga. Vitamin E diberikan guna mencegah terjadinya *myopathy* dan membantu menanggulangi ketegangan pada tubuh.
7. Pada saat berada dalam kondisi tersedasi berat, satwa sebaiknya tidak dipaksa untuk berjalan jauh. Pengangkutan dan penurunan dengan lori hanya baik bila satwa yang baru ditangkap tersebut ada dalam kondisi disedasi ringan dengan *xylazine* atau *haloperidol.*
8. Luka akibat rantai atau luka panas akibat tali hampir tak mungkin dihindari pada penangkapan gajah dewasa. Luka-luka akibat pergesekan dengan tali akan menimbulkan luka bakar hal ini dapat direduksi dengan menggunakan tali yang lebih lembut yang terbuat dari kapas atau *jute.* Tali tersebut diikatkan di beberapa bagian tubuh guna menghindari luka pada satu tempat tertentu saja. Pengikatan dengan cara seperti ini akan mendistribusikan tarikan dan mengurangi terjadinya luka-luka yang dalam.
9. Satwa sebaiknya didiikat di bawah tempat yang teduh dan tidak dibirakan dalam keadaan lapar atau haus yang bisa melemahkan kemampuan mereka menerima pelatihan. Pelepah batang pisang diberikan sedikt demi sedikit sebagai asupan makanan dan minumannya.
10. 3-4 hari kemudian gajah tangkapan diperbolehkan untuk digiring ke sumber air tentunya dengan diapit oleh gajah-gajah koonkies di kedua sisinya.
11. Luka yang masih belum membaik dibersihkan dan dirawat secara rutin dengan air obat yang disemprotkan melalui selang air. Antiseptik dan obat menangkal lalat harus dioleskan secara teratur juga.

## Pelatihan Gajah

**Teknik Pelatihan.**— Gajah-gajah Riau dilatih dengan cara ‘positif dan negatif’ atau lebih popular dengan istilah *the carrot and stick method* (metoda wortel dan tongkat). Bagi mereka yang baru pertama kali melihat, metoda ini kelihatan sedikit agak kejam tetapi bagi mereka yang sudah menyaksikan beberapa sesi seperti yang dilakukan di Assam, maka metoda ini boleh dikatakan cukup berhasil. Saya menyarankan supaya waktu pelatihan diperpanjang sedikit daripada harus memaksa gajah-gajah tersebut untuk cepat belajar.

**Perintah-perintah yang Diajarkan.**— Di dalam sistem kontak bebas ( gajah-gajah tangkapan dalam jumlah yang besar) diharapkan gajah-gajah tangkapan dilatih secara baik sehingga tidak akan ada banyak kesulitan dalam praktek pengelolaan dan administrasi pemeliharaan kesehatan setiap harinya. Namun disayangkan bahwa tingkat pelatihan bagi gajah di Minas Camp tidaklah memadai. Kemampuan untuk melakukan posisi *lateral recumbency* oleh gajah-gajah akan sangat memudahkan proses pemeriksaan kesehatan, pemberian obat-obatan dan pemeriksaan kaki karena posisi tersebut aman dan nyaman bagi satwa itu sendiri. Gajah-gajah hasil tangkapan di Riau perlu dilatih untuk melakukan perintah posisi *lateral recumbency*.

## Manajemen Gajah Tangkapan

**Memandikan dan Merawat.**— Kegiatan di air adalah aktivitas harian yang paling penting bagi gajah tangkapan. Jumlah air bersih untuk kebutuhan minum setiap harinya bisa mencapai 250-300 liter yang dapat diperoleh saat gajah diberi akses bebas ke sumber air misalnya dengan aktivitas mandi. Mandi dua kali sehari sangat ideal bagi gajah tetapi satu kali diantaranya wajib dilakukan dengan sesi perawatan dan pemeriksaan (*grooming*). *Scrubbing* atau menggosok wajib dikerjakan untuk membuang lapisan kulit mati dan memberikan sedikit pijatan di bagian tubuh akan membuat gajah senang. Aktivitas semacam ini akan menimbulkan keintiman antara gajah dan pawangnya sekaligus juga meningkatkan rasa percaya diri pada keduanya. Sesi *grooming* ini juga akan memberikan kesempatan pada pawang untuk mengecek jika ada duri atau abrasi pada kaki atau untuk merapikan kuku atau sol.

**Makanan.**— Kualitas rumput atau dedaunan di hutan Minas telah diperiksa dan diuji dan didapati bahwa secara kualitatif dan kuantitatif kualitasnya rendah. Untuk mengatasinya maka selain rerumputan dan dedauanan diberikan juga sebagai suplemen pelepah batang dan daun pisang. Sedangkan pada tiap musim penghujan tiap ekor gajah harus diberikan pakan rumput tambahan yang bermutu baik sebanyak 4-5 kilogram/hari karena pada musim tersebut biasanya rumput tumbuh lebih subur dan banyak. Jumlah ini dianggap cukup untuk gajah-gajah yang tidak dilibatkan bekerja. Sementara itu bagi gajah yang dilibatkan dalam kegiatan/operasi koonkie (menangkap gajah liar) dan gajah-gajah yang hamil tentu saja membutuhkan tambahan dari jumlah di atas. Pada musim kemarau, jumlah suplemen yang harus diberikan ditingkatkan sampai 20%.

**Air Minum.**— Tempat yang telah ditetapkan sebagai tempat pelatihan dinilai tidak cocok sebagai pusat pelatihan karena kawasan tersebut terletak di atas lading minyak di mana minyak mentah meresap ke sejumlah aliran anak sungai sehingga mencemari air bahkan sungai di dalam kompleks pelatihan itu sendiri. Pihak pengelola bertanggung jawab dalam menyediakan dan mencukupi kebutuha air bersih sepanjang musim kemarau dengan membangun reservoir permanen di dalam kawasan camp dan mengisinya dengan air bersih yang diperoleh dari berbagai sumber dengan tangki-tangki air. Reservoir tersebut harus dibersihkan dengan hati-hati setiap harinya.

**Higienitas.**— Kebersihan kandang di Pusat pelatihan Gajah Minas dari hasil pengamatan saya selama melakukan kujungan di sana adalah cukup baik. Bukti bahwa kandang (pilkhana) di Minas camp terawat dan bersih adalah rendahnya kasus penyakit kaki. Adapun hal yang perlu mendapatkan perhatian lebih adalah perawatan kuku di mana di camp ini hampir pada semua gajah mengalami deviasi bagian luar kuku. Perawatan kuku secara regular akan mengurangi resiko dari problem yang satu ini. Adapun penghalang utama adalah kurangnya gajah-gajah mendapatkan pelatihan untuk perawatan kaki.

**Perumahan.**— Gajah-gajah di Minas camp dilepas di hutan (dengan satu kaki tertambat atau dengan terikat rantai -tergantung pada tingkat pelatihan tiap gajah tersebut- dan ketajaman naluri kembali ke rumah) pada siang hari dan ditautkan pada tiang-tiang pada malam hari. Secara umum, tidak dibutuhkan perumahan tetapi pada kasus-kasus tertentu gajah-gajah yang sedang stress/tertekan membutuhkan suatu tempat yang lebih nyaman yaitu naungan yang beratap. Paling sedikit Minas camp membutuhkan 2 buah rumah (untuk 8 ekor gajah) yang mana rumah tersebut memiliki atap yang tinggi (15 kaki), dengan tiang-tiang kayu yang kokoh dan tanpa diding. Salah satu rumah hendaknya diberi lantai beton.

**Ikatan Gajah.**— Para pawang dapat mencoba teknik sederhana berikut ini yang efektif untuk mengurangi cedera akibat ikatan/tali temali, yaitu dengan cara mengganti ikatan pada kaki-kaki yang berbeda setiap hari. Misalnya : hari ini ikatan di kaki kiri belakang, besok ikatan dipindahkan ke kaki kanan depan, dst.

**Lanskap.**— Minas camp ini terlalu terbuka : pohon-pohon tunggal kurang banyak. Gajah-gajah yang tertangkap adalah gajah dewasa sekalipun sudah dilatih gajah-gajah tersebut masih liar dan mempertahankan insting alaminya, seperti menghindari sinar matahari dan tatapan langsung dengan manusia. Langkah-langkah yang perlu dilakukan adalah menanam pohon pelindung yang tumbuh cepat disekeliling camp. Keadaan ini gajah-gajah tersebut akan merasa hidup seperti di alam, membuat kawasan tersebut menjadi lebih teduh dan mengusahakan sedemikian rupa agar lebih terbuka untuk pengunjung/umum. Pepohonan akan bermanfaat banyak dan aman sebagai platform/tempat pada saat pengimobilisasian/pembiusan dan juga untuk menahan gajah yang melarikan diri saat mengalami *musth*.

**Reproduksi.**— Reproduksi dapat dipakai sebagai suatu tolok ukur/barometer kualitas kesehatan dan kesejahteraan. Kenyataan yang menunjuk bahwa tidak ada terjadi reproduksi di Minas camp yang dihuni gajah dewasa betina dan jantan di kawasan yang cukup luas ini memang memprihatinkan dan memastikan perlunya penyegaran terhadap praktek-praktek pengelolaan. Situasi dan kondisi yang dibuat menyerupai habitat asli biasanya membuat gajah-gajah Asia tangkapan lebih cepat untuk bereproduksi. Namun demikian, karena saat ini konservasi gajah mempertaruhkan banyak biaya, maka yang terutama sekali harus dilakukan adalah pemeliharaan kesehatan serta mempertahankannya hingga standar tertentu sebelum penggandaan jumlahnya melalui reproduksi alami.

**Jadwal Kerja Harian para Pawang.**—

1. Pada pagi hari melakukan pemeriksaan dengan detil selanjutnya melaporkannya kepada dokter hewan bila ada kejanggalan fisik dan tingkah laku. Pemeriksaan ini meliputi warna, konsistensi dan jumlah kotoran padat, urin, dsb.
2. Memandikan gajah secara cepat di sungai.
3. Bekerja sama dengan dokter hewan atau melakukan secara mandiri prosedur penanganan

kehewanan seperti membersihkan luka, melakukan penyuntikan, merapikan kuku, dsb.

4. Membawa gajah ke hutan lalu menambatkan atau mengikat salah satu kaki hanya di tempat di mana rumput segar ditemukan. Anda adalah orang yang paling harus bertanggung jawab apabila gajah yang anda pawangi didapati kurang makan.
5. Membersihkan semua kotoran dan sisa makanan dari pilkhana (kandang). Bila tempat latihan berdiri berlumpur, semprotkanlah debu atau abu.
6. Mendatangi gajah-gajah tersebut pada waktu siang untuk melihat apakah ada masalah dan untuk melihat apakah perlu pindah ke tempat kawasan rerumputan lainnya.
7. Membawa gajah pulang di sore hari. Memandikan sambil menyikat seluruh tubuh. Memeriksa kaki kalau-kalau terdapat duri atau benda asing lainnya.
8. Menambatkan gajah di tempatnya. Memberikan makanan suplemen dan rumput juga obat minum bila perlu.
9. Menyemprotkan disinfektan di lantai pilkhana sekali dalam 15 hari atau sesuai dengan yang dianjurkan dokter hewan setempat.

**Registrasi dan Pencatatan.**— Konferensi Internasional gajah tangkapan yang telah diselenggarakan di Thailand pada thn 2002 menetapkan bahwa semua gajah Asia (*Elephas maximus*) yang ditangkap harus ditandai dengan nomor registrasi unik yaitu dengan implantasi microchip dan akan disertai dengan sebuah buku registrasi nasional. Adapun usaha ini ditujukan untuk penangkapan dan perdagangan ilegal oleh pihak lain selain juga untuk memfasilitasi pencatatan tiap individual gajah. Karena tidak memiliki tanda identifikasi yang pasti, maka pelatihan milik pemerintah ini selalu saja harus berhadapan dengan berbagai spekulasi. Adalah sangat bijaksana dan tepat apabila pemerintah daerah Riau mau mengikuti kesepakatan dunia internasional ini. Karena hal itu akan memperbaiki citra Indonesia di mata global akan sikap dan komitmen Indonesia terhadap konservasi gajah baik in-situ maupun ex-situ. Penanaman microchip bukanlah akhir dari proses justru adalah sebuah awal. Buku layanan tiap individu gajah harus mulai dipersiapkan yang mencatat semua kejadian kehidupan di camp seperti tanggal penangkapan, daerah asal, data pengukuran badan pada saat ditangkap yang dikembangkan dan diperbarui secara tahunan, nama pawang, kejadian birahi, perkawinan, kehamilan dan tanggal kelahiran anak. Sementara untuk program pemeliharaan kesehatan harus dibuatkan sebuah catatan tersendiri.

## Kesehatan Gajah Tangkapan

Pemeliharaan kesehatan satwa ini harus dilakukan secara proaktif. Para dokter hewan yang ditugaskan tidak hanya menunggu laporan dari para pawang melainkan melakukan pegamatan langsung secara teratur. Suatu catatan tersendiri mengenai kesehatan dari tiap gajah harus dipersiapkan sedemikian rupa, suatu database/ bank data harus juga sudah mulai dikompilasi dan dibuatkan catatan khusus. Kemudian dari informasi yang soda terkumpul pada tahun

sebelumnya dibuatlah suatu kalender kegiatan untuk sepanjang tahun ini. Protokol pemeliharaan kesehatan ini akan menyelamatkan berbagai penyakit atau gangguan kesehatan yang sangat mungkin mengancam gajah-gajah tangkapan.

Seorang dokter hewan dengan seorang asisten dalam kondisi yang normal harus dapat melayani 100 ekor gajah  dalam suatu cam misalnya di Minas. Tetapi olehkarena gajah-gajah tangkapan baru selalu saja bertambah terus di Minas camp, maka mereka hanya mampu melayani 60-70 ekor saja. Dokter hewan yang melayani di Minas camp sebaiknya pada pagi hari melakukan kunjungan pada saat gajah-gajah masih berada di kandang guna mendapatkan gambaran yang luas. Tanda-tanda yang jelas pada kesehatan ataupun gangguan dapat diamati lebih dini sebelum gajah dilepas atau dibawa ke pelatihan maupun merumput.  Gajah bisa tidur sambil berdiri walaupun semua gajah yang sehat biasanya tidur dengan posisi berbaring sebanyak 3-4 jam pada larut malam.  Dokter hewan harus melihat apakah gajah tersebut berbaring atau tidak dari mengenali tanda atau bekas yang tertinggal di lantai. Jika gajah tidak dapat berbaring tidur selama 3-4 hari, maka itu sebuah indikasi adanya sakit pada sendi atau *impaksi*.

**Tanda-tanda Umum Kesehatan Gajah.**— Ada beberapa tanda khas yang mengindikasikan seekor gajah sehat. Kedekatan antara dokter hewan dan gajahnya akan membantu mengenali dari awal gejala gangguan kesehatannya:

1. Gajah yang sehat tidak bisa berdiam diri. Ia akan terus menggerak-gerakkan ekor dan gadingnya, mengepak-ngepakkan daun telinganya. Menyemprot punggungnya dengan debu, menggaruk-garuk tubuhnya dengan patahan ranting yang disanggah dengan kedua ujung gadingnya merupakan tigkah laku yang normal. Kepakan telinganya akan semakin sering ketika hari semakin hangat dan jaringan darahnya pada telinganya menjadi lebih menonjol.
2. Gajah yang sehat menggerak-gerakkan badan/kepalanya dari kiri ke kanan, menggaruk-garukkan salah satu kakinya ke kaki yang lain dan seringkali berdiri dengan tiga kakinya yang lain.
3. Matanya bersih dan cerah dengan sedikit atau tanpa berair.
4. Langit-langit, lidah dan lapisan sebelah dalam gadingnya berwarna merah mawar.
5. Kulitnya lembut, berkerut-kerut dan berwarna hitam setelah mandi.
6. Rambut-rambutnya berdiri kaku.
7. Terdapat butiran sisa yang lembab disekeliling kuku dan dapat dibuktikan dengan menaburkan debu/butiran halus di atasnya, maka dengan segera akan menggumpal dan lengket.
8. Secara umum kesan puas kuat terpancar.
9. Gajah yang sehat memiliki selera makan yang baik, bisa mengkonsumsi 150-250 kg serat dan 200-250 liter air setiap harinya.
10. Biasanya buang kotoran padatnya 15-20 kali sehari. (5-8 boli atau bongkahan per pengeluaran). Kotoran padatnya berwarna kecoklat-coklatan, berubah menjadi gelap setelah terkena sinar matahari dan udara, berair, berserat tetapi tidak begitu kasar. Warnanya bisa

bervariasi tergantung pada apa yang dimakan. Kotoran yang banyak serat menandakan gajahnya sudah berusia tua.

**11.** Gajah yang sehat mengeluarkan banyak urin yang berwarna kuning pucat. Baunya tidak sangit, agak bersifat basa alkali dan lebih berkristal dibanding dengan spesies lainnya.

**12.** Gajah yang sehat biasanya berbaring kalau tidur satu atau dua kali jauh di tengah malam tetapi tidak pernah di siang hari.

**13.** Anak gajah yang sehat di satu sisi seringkali tidur pada posisi datar setelah puas makan atau kapan saja di siang dan malam hari.

**14.** Gajah memiliki penglihatan yang buruk dan sangat mengandalkan indera penciumannya dan dapat menerima gelombang suara infrasonik.

**15.** Gajah merupakan spesies yang memiliki tingkah laku interaktif yang spesifik pada penglihatan atau penginderaan melalui penerimaan olfaktori atau auditori (pendengaran).

**Tanda-tanda Umum Ketidak Normalan.**— Dokter hewan sebaiknya mengamati satwa yang ditanganinya dengan teliti pada saat melakukan keliling pagi dan sebaiknya mencurigai setiap ketidaknormalan bila menemukan gejala-gejala berikut ini :

**1.** Gajah kelihatan lesu kurang responsif; ini merupakan gejala malas dan ketiadaan

**2.** Warna kulit keabu-abuan, lemas, kering dan kadangkala mengelupas.

**3.** Membran mucus/ lendir yang nampak dan warna lidah pucat, kotor, berwarna kekuningan.

**4.** Penampilan tubuh secara umum kering.

**5.** Daun telinga bagian bawah seringkali dingin.

**6.** Mata sayu, cekung ke dalam.

**7.** Kelihatan seperti sedang demam, nafsu makan berkurang, seringkali berbaring lalu tiba-tiba bangun berkali-kali.

**8.** Jumlah cairan urin berkurang dan berwarna gelap. Urin keluar sedikit-sedikit tetapi terus menerus.

**9.** Kotoran padat/tinja keras dan dilapisi lendir diduga terkena diare. *Submandibular oedema* adalah indikasi hipoproteinaemia. Geofagia (memakan tanah) merupakan indikasi defisiensi mineral.

**Abses.**— Abses/luka bekas alat bius dilaporkan sebagai penyebab yang paling umum pada gajah-gajah tangkapan baru di Riau. Hal ini dapat direduksi dengan menggunakan jarum suntik yang ukurannya tepat, konsentrat, (untuk mengurangi volume)namun di atas semuanya itu yang paling penting adalah meningkatkan kebersihan alat bius itu sendiri *(dart).* Sangat penting membersihkan luka dengan *povidon iodine* segera setelah mencabut alat bius dari tubuh gajah. Jangan sekali-kali menarik sekaligus semua bagian alat bius (*dart*) dari luka, tetapi dengan cara seperti mengeluarkan sekrup lalu melalui jarum yang suntikkan dua milimeter *Povidone iodine.* Selain itu penyuntikan *povidone iodine* juga pemberian antibiotik yang berdaya kerja lama serta racun anti tetanus juga sangat perlu.

**Pemeliharaan Gading.**— Gading yang bertambah panjang membuat gajah merasa tidak nyaman. Gading yang semakin panjang juga menambah beban di kepala dan menghambat gerakannya jika berada di dalam hutan. Pawang juga bisa cedera dan sudah sangat umum kasusnya bahwa gading menarik minat para pemburu. Oleh sebab itu secara periodik gading harus dipotong atau dirapikan. Hal ini merupakan tugas dari seorang dokter hewan. Perlakuan ini harus dilakukan dengan sangat hati-hati dan dengan pengetahuan yang benar tentang panjang dari lubang pulpa. Akan sulit menanganinya bila lubang tersebut terekspos. Orang-orang yang terlibat dalam pelaksanaan pemotongan dan perapian gading ini harus dilatih sedemikian rupa sehingga tidak menimbulkan stres pada gajah. Setiap gading yang dipotong harus ditimbang dan disimpan secara resmi. Pemerintah harus memusnahkan gading tersebut karena perdagangan gading adalah illegal baik di pasar internal maupun internasional seperti yang ditetapkan oleh CITES.

**Monitoring Kesehatan Staf.**—. TB (tuberculosis) merupakan penyakit utama yang mungkin menjangkiti para pawang dan orang-orang yang bekerja merawat gajah. Secara rutin setiap tahun para pawang harus diperiksa karena bisa saja mereka menjadi pembawa utama penyakit tersebut. Mereka juga diwajibkan untuk selalu meningkatkan kebersihan secara umum.

## Jadwal Kerja Dokter Hewan:

**Harian:**

1. Menginspeksi semua gajah di kandang, setiap gejala/tanda adanya indisposisi, apakah ada rumput yang diambil, tidur atau tidak, berapa kali melakukan posisi duduk dan penampakan tanda-tanda dini terjadinya birahi.
2. Mengawasi pemberian obat pada sesi pagi.
3. Hadir di jam pelatihan gajah, memberikan pertolongan pertama pada setiap abrasi.
4. Melaksanakan perlakuan khusus seperti pembedahan atau memotong gading jika diperlukan.
5. Mengawasi kebersihan kandang, peralatan makan, penyimpanan makanan, dsb.
6. Mengawasi pemberian obat pada sore hari.
7. Melakukan kunjungan mandadak saat jam makan.
8. Mengawasi aktivitas mandi, perawatan tubuh dan kaki.

**Tengah Tahunan:**

1. Vaksinasi HS dan tetanus. Tiap vaksinasi dilakukan sekali setahun antara satu vaksin dengan vaksin yg lainnya berselang 6 bulan.
2. Pemeriksaan tinja
3. Pemeriksaan protozoa dalam darah

**Tahunan:**

1. Pemeriksaan tuberkulosis
2. Melengkapi dan memperbarui catatan data pengukuran badan.
3. Memperbarui tiap-tiap catatan medis.
4. Menjalin kerjasama yang baik dengan Dinas Peternakan dalam rangka melaksanakan prosedur-prosedur diagnosa dan vaksinasi gajah.

## Camp Bagian Pengurusan Hewan menyediakan:

**Peralatan dan Perlengkapan:**

1. Perangkat bius untuk jarak jauh
2. Mesin sinar-X yang mudah dibawa
3. Mesin ultrasound yang mudah
4. Mikroskop
5. Pompa besrta selangnya
6. Peralatan bedah
7. Ember-ember dan cangkir
8. Tali
9. Kursi lipat dan meja
10. Perangkat pemeriksaan
11. *Glass slides and staining set*
12. Perangkat pemeriksaan kotoran
13. Peralatan suntik
14. Sarung tangan
15. Detektor logam
16. Alat-alat penghisap

**Peralatan Bedah:**

1. Pisau *Bard Parker*
2. Pisau Abses
3. Penjepit jaringan *Allis*
4. Penjepit arteri *Spencerwell*
5. Penahan jarum untuk luka berlubang yang dalam
6. Sekop *Volksman*
7. Kuret berlengan panjang
8. Jarum *Suturing* (Traumatic)
9. Retraktor penahan otot
10. Benang *suturing*
11. Penjepit peluru.

**Obat-obatan Rutin:**

1. Antihistamin
2. Kortikosteroid
3. Antibiotik (parenteral, oral and topical)
4. Anthelmintik ( melawan cacing bulat)
5. Antiseptik luka/kulit, salep oleh dan cairan yg disemprotkan (*sprays*)
6. Iodin tingtur, iodin povidon
7. Tembaga sulfat, Magnesium sulfat, Zinc sulfat, Merckuri Iodid Merah, Timbal Asetat, Iodum, Kalium iodid, dsb.
8. Formaldehid.
9. Analgesik lokal dan anastetik umum (Xylazin HCl, Ketamin HCl, Yohimbin HCl, Immobilon, Revivon, Doxapram, dsb.)
10. Cairan Intravenus (Saline normal, Saline dekstros, Dekstros 5%, 10%, 20%, 25%, larutan Ringer's laktat, larutan kalsium boro-glukona, larutan sodi-bi-karb, dsb.)
11. Berenil atau Nilberi (anti-hemoprotozoa)
12. Ivermektin oral dan parenteral.

# Executive Summary

## Capture of Wild Elephants: a Last Resort

**Capturing of Asian elephants in Sumatra should be seen as the very last option and should be done only in areas where there is no habitat left to support a viable population.** If absolutely unavoidable, great care needs to be exercised in every step of the capture process and the post-capture training programme:

1. Adult elephants are best captured by chemical immobilisation that involves use of highly potent narcotics or non-narcotic sedative drugs; therefore, the capture team should invariably be accompanied by a qualified and experienced veterinarian.
2. Appropriate dosing and proper medical management of the animal is essential to avoid undue stress or death of the animal.
3. The animal should not be chased or disturbed after being darted as this will delay the induction period and may lead to capture myopathy or even death.
4. Though elephants remain standing und47er xylazine sedation, which is reportedly being used in Indonesia, sometimes they may stumble down and assume sternal recumbancy (sit on chest). This position is very dangerous as it compromises the respiratory function and could be fatal. If a drugged elephant comes to rest on its chest bone, the animal has to be pushed to a lateral recumbent position using koonkies or the anaesthesia has to be reversed using an appropriate dose of Yohimbine.
5. The dart wound should be dressed with povidone iodine to prevent infection.
6. A long acting antibiotic, tetanus toxoid and vitamin E should be administered. Vitamin-E prevents capture myopathy and helps the animal overcome physical stress.
7. Animals should not be made to walk long distances in a highly sedated condition. Loading or unloading a fresh capture in a lorry can be best accomplished under mild sedation with xylazine or haloperidol.
8. Chain injury and rope burn of a fresh adult captive is inevitable. Burns can be reduced by using soft ropes like jute or cotton that may be tied in several places to avoid injury to a particular area. This will distribute the strain of the pulls and avoids deep injuries.

9. The animal should be tied under the shade of big trees and should not be starved or deprived from water completely in an attempt to weaken it into accepting training. Stem of a banana tree can be offered in pieces to supply both food and water.
10. After 3-4 days of incarceration, the freshly captured animal should be taken to water using two flank koonkies to bathe and drink. Taking the elephant to water should be a daily routine.
11. The wounds that develop should be dressed regularly using medicated water through a garden hose. Antiseptic and fly repellants must be applied regularly.

## Training of Captured Elephants

**Training Technique.**— Riau elephants are being trained using both positive and negative reinforcement, popularly called the carrot and stick method. The technique may appear little cruel for somebody who sees this for the first time but for someone who witnessed many such sessions in Assam, it seems to work well. I propose the training take a little longer rather than pushing the elephants too hard to learn quickly.

**Commands Learned.**— In the free contact system of keeping elephants (in large numbers) in captivity, it is desired that the elephants are properly trained so that there is no difficulty in the daily management practices and administration of healthcare. Unfortunately, it was found that the level of training of many elephants in the Minas camp was not adequate. The ability to commandeer a captive elephant into lateral recumbent position is essential for performing many activities like medical examination of the animal safely, administration of medicines and foot-care. Riau captive elephants should be trained to go into lateral recumbent position upon command.

## Management of Captured Elephants

**Bathing and grooming.**— Going to water may just be the most important event in a captive elephant's daily routine. The heavy demand of water (250-300 liters per day) for drinking can be fulfilled when the elephant has free access to clean water while going for a bath. Two daily baths would be ideal but at least one elaborate bathing and grooming session should be a compulsory event every day. Scrubbing should be compulsory as it removes dead skin and debris, massages the body and appears to make the elephant generally very happy. The procedure increases the intimacy between the elephant and its *pawang* and increases latter's confidence with his surge. The grooming session also gives the mahout an opportunity to check for any thorns or abrasions on the feet or even to trim an overgrown sole or nail.

**Food.**— The grass or browse quality in the Minas camp forest was examined and found to be quantitatively and qualitatively poor. It was found to be a good practice therefore, that food was supplemented with banana tree stems and leaves. In addition, four to five kilograms of a good

quality ration per animal per day should be added in the rainy season when the grass is abundant. This quantity should be enough for elephants that are not engaged in any kind of work. Elephants engaged in koonkie operations for dealing with wild elephants and pregnant females will require additional amounts. In the dry season, the food supplement should be increased for all elephants by 20 percent.

**Drinking Water.**— The site selected for the elephant training centre was improper as the area is over an oil field where crude natural oil oozes into numerous streams to pollute the water even at the small river in the camp. Management should provide clean wholesome drinking water during the dry season by constructing a concrete reservoir in the camp and filling it with clean water brought from elsewhere in water tankers. The reservoir should be meticulously cleaned everyday.

**Hygiene.**— The stable hygiene in the Minas Elephant Training Center during my visit period was reasonably good. The result of the pilkhana (stable) hygiene was reflected in the remarkably low incidence of foot diseases in the camp elephants of Minas. An apparent lack of nail trimming has led to outward deviation of nails in almost all the elephants, this should be addressed. Regular trimming of the tip of the excess nail will solve this problem. The main hindrance is lack of elephant training to accept foot care.

**Housing.**— The elephants are released in the forest (hobbled or with trail chains according to the level of training and homing instinct) for the day and tethered in their respective stalls for the night. In general, no housing is required for the elephants but occasions arise in such facilities where distressed animals need to be sheltered under roofs. At least two houses (for eight elephants) need to be constructed in Minas with high roofs (15 feet, with robust round wooden pillars) and without walls. One of the houses should have a concrete floor.

**Tethering elephants.**— Mahouts could follow a simple technique to reduce the chances of rope/chain burns by attaching the chain to a different leg each day.

**Landscape.**— The entire campsite in Minas is too exposed: it lacks a single living tree. Elephants here are captured adult and trained but still they are wild animals and retain many of their instincts, which include seeking cover from too much sun and human stares. Immediate measures need to be taken to plant quick-growing shady trees all around the site. This will give the elephants a near natural living atmosphere, cool down the area and make the centre more appealing to visitors. Trees will also provide a very useful and safe darting platform to immobilize and restrain any elephants that escapes during *musth*.

**Reproduction.**— Reproduction can be considered a barometer of good health and general well being. The fact that no reproduction takes place in an extensive facility with several adult bulls and cows like Minas is a cause of concern and warrants a fresh look into the managerial practices. Similar near natural conditions have resulted in captive breeding of Asian elephants elsewhere. However, since the upkeep of elephants is proving to be very expensive under the current

circumstances, care should be given to first get the health care and upkeep of elephants to a certain standards before attempting to increase the numbers through natural breeding.

**Daily work Schedule for Riau Pawangs.—**

1. Closely examine elephant in the early morning and report to the vet if any physical and behavioural abnormality is observed. Examination should include colour, consistency and volume of dung, urine, etc.
2. Give elephant a quick bath in the river.
3. Collaborate with veterinarian or self-administer veterinary procedures like dressing a wound, injections, trimming of nails, etc.
4. Take elephant to the forest and tether or hobble only where good grass is available. You will be accountable should your elephant be found to be underfed.
5. Remove all dung and leftover fodder from the pilkhana. If the standing place of the elephant is muddy, spray some dust or ash.
6. Visit your elephant at noon to see if it is entangled or in any kind of trouble and to change the area of grazing.
7. Bring the elephant back from the forest in the afternoon. Give a thorough bath by scrubbing the whole body. Examine the feet for any thorns or other foreign objects.
8. Tether the elephant at its usual place. Provide supplementary feed and fodder as necessary and administer oral medicine if any.
9. Spray disinfectants in the pilkhana floor once every 15 days or as suggested by the vet.

**Registration and record keeping.—** The International Conference on captive elephants held in Thailand in 2002 decided that all Asian elephants (*Elephas maximus*) in captive conditions should be given a unique registration number by implanting a microchip and a national studbook maintained. This would prevent illegal captures and trade by private owners and facilitate record keeping on individual elephants. Having no definite identification mark on elephants in the state-run elephant training camps opens avenues for speculation. It is important that the Riau authorities decide to follow the international agreement. That will improve Indonesia's image globally regarding the country's attitude and commitment towards conservation of elephants both in-situ and ex-situ. Microchipping is not the end of the process but the beginning. An individual service book must be maintained for each elephant where all its events of the camp life like date of capture, area of its origin, morphometric data at the time of capture with annual updates, name of the pawang, incidence of *musth*, mating, pregnancy and calving dates are all recorded. A separate register should be maintained for the healthcare programme.

## Healthcare of Captured Elephants

The approach to healthcare of elephants should be proactive. The vet should not wait for reports from the mahout but observe the animal on regular visits. A record of health-related information about every individual elephant should be maintained, a database compiled and annual reports

prepared. Then, based on the information gathered during previous years, a calendar of activities for the whole year should be prepared. This healthcare protocol will save many kinds of ailments to elephants in captivity.

A veterinarian with the assistance of a trained Para veterinarian should be able to take care of 100 elephants under normal conditions in a camp like Minas. But since freshly captured elephants continue to come into Minas, 60-70 elephants are likely to keep the vet fully occupied. The Minas camp vet should visit all the elephants at their pilkhana early every morning for an overview. Obvious signs of health and diseases can be noticed before the animals are released or taken out for training or grazing. Elephants can sleep standing, though all healthy elephants sleep lying down for about 3-4 hours late at night. The vet must see whether the elephant lay down from marks on the floor. If it fails to do so for 3-4 days, it could be indicative of a disease like joint pain or impaction.

**General signs of health in elephants.**— There are a few distinct signs that indicate a healthy elephant. Familiarity with them will help a veterinarian in detecting diseases:

1. A healthy elephant is never still. It continues to swing his trunk and tail and flaps its ears. Dusting the back with soil, scratching the body with a broken twig held by the tip of its trunk is a normal behaviour. It flaps its ears more frequently as the day warms and the blood vessels on the ear become more prominent.
2. A healthy elephant swings its body/head from side to side, rubs one leg with another and often stands on three legs, alternately resting one.
3. The eyes are clear and bright with little or no watering.
4. The palate, tongue and internal lining of the trunk are rosy pink.
5. The skin is soft, wrinkled and the colour black after a bath.
6. The bristles are firm to the touch.
7. A moist secretion exudes around the nails and can be observed by throwing some fine dust over them. It will stick.
8. There is a general impression of contentment.
9. A healthy elephant has a good appetite, consumes 150-250 kg of roughage and 200-250 liters of water daily.
10. It should defecate 15-20 times every day (5-8 boli per defecation). The dung is brownish, darkening on exposure to sunlight and air, juicy, fibrous but not very course. The colour may vary considerably according to the food eaten. More fibrous dung indicates old age, flattening of grinding surface of the molars, and/or damage of caecal microflora, which may be caused by oral antibiotic therapy.
11. The urine of a healthy elephant is copious with a faint yellow tinge. Odour is not unpleasant, slightly alkaline and more crystals than any other species.
12. A healthy elephant lies down to sleep once or twice late in the night but never in the day.
13. A healthy calf on the other hand, sleeps prostrate frequently after a hearty meal or whenever tired during the day and at night.

14. An elephant has poor eye sight and relies more on its sense of smell and can perceive infrasonic sound waves.
15. It exhibits species specific interactive behaviour on seeing or sensing through its strong olfactory or auditory receptions.

**General signs of indisposition.**— The vet should observe his animal carefully during the general round in the morning and should suspect some abnormality if he sees the following symptoms:

1. The animal looks listless; there is general languor and absence of incessant motion so characteristic of health.
2. The skin appears grayish in colour, hangs loosely and is dry and some times scaly.
3. The visible mucus membrane and the tongue appear pale, muddy, cyanotic or yellowish.
4. The trunk appears shriveled.
5. The lower flap of the ear is very often cold.
6. The eyes are dull, appear retracted and there are frequent abnormal discharges.
7. The animal appears out of condition and feverish, appetite reduced, and may lie down and get-up several times.
8. The urine volume may be reduced and dark coloured. Continuous dribbling of urine.
9. The dung looks hard and mucus coated or diarrhoea may be present. Submandibular oedema is indicative of hypoproteinaemia. Geophagia (eating of soil) is indicative of mineral deficiencies.

**Dart abscess.**— Dart abscesses are reportedly a common problem in freshly captured elephants in Riau. It can probably be reduced by using an appropriately sized needle, concentrated drug (to reduce volume), appropriate charges and above all, maintaining maximum hygiene of the dart. It is extremely important to dress the wound after removal of the dart immediately with Povidone iodine. Do not pull the whole dart from the wound, but unscrew the barrel from the embedded needle and push two milliliter of povidone iodine through the needle hole into the site. Administering an injection of a broad spectrum long acting antibiotic and tetanus toxoid should also be made compulsory for every freshly captured elephant.

**Tusk care and trimming.**— Overgrown tusks are a discomfort to the animal. They increase the load of the head and makes moving through the jungles difficult. The pawang can be accidentally injured and the animal is vulnerable to ivory hunters. It is very important to remember that ivory attracts poachers. Therefore, the periodic trimming of the tusks is an important task for the veterinarian. This has to be performed with good knowledge about the extension of the pulp cavity. If the pulp cavity is exposed during trimming, it will be difficult to manage.

Some people involved in elephant management might take advantage of the managerial need to trim the tusk too short and distress the elephant. Such tendencies must be curbed and all ivory obtained from periodical tusk trimming must be measured and weighed in presence of the

management and deposited in the official treasury. The government should then destroy the ivory as ivory trade is illegal both in the internal and international market as per provision of CITES.

**Staff health monitoring.—** Tuberculosis is a major problem in undernourished elephants. Pawangs should be tested annually as they may be the main carriers. They should also maintain daily general hygiene.

## Work schedule for veterinarian:

**Daily:**

1. In spection of all the elephants in their pilkhana, any sign of indisposition, whether grass was taken, slept or not, stool quantity and appearance and bull for early signs of musth.
2. Supervision of dressing or administration of medicines, morning session.
3. Attending training of elephants, extending first aid to any abrasions.
4. Rendering special treatment like surgery or tusk trimming when necessary.
5. Supervision of cleanliness of the pilkhana, feeding utensils, feed store, etc.
6. Supervision of dressing or administration of medicines, afternoon session.
7. Surprise visit at feeding time.
8. Supervision of the bathing, grooming and foot care.

**Half-yearly:**

1. Vaccination of elephants against HS and Tetanus. Each vaccine annually, schedule each six months apart.
2. Fecal examination and mass deworming.
3. Blood smear staining and examination for protozoa.

**Annually:**

1. Screening for Tuberculosis.
2. Morphometry and updating of records.
3. Maintenance of individual medical records.
4. Keeping good liaison with the livestock department for getting help in diagnostic procedures and vaccination of elephants.

## Camp level veterinary supplies:

**Equipment and accessories:**

1. Long range tranquillizing equipment with accessories
2. Portable X-ray machine
3. Portable Ultrasound machine
4. Compound microscope

5. Dressing pump with hose
6. Surgical instrument kit
7. Buckets and mugs
8. Ropes
9. Folded chair and camp table
10. Post-mortem kit
11. Glass slides and staining set
12. Fecal examination kit
13. Syringes
14. Hand gloves
15. Metal detector
16. Suction apparatus

**Surgical instrument kit:**

1. Bard Parker knife
2. Abscess knife
3. Allis tissue forceps
4. Spencerwell's artrery forceps
5. Deep cavity needle holder
6. Volksman scoop
7. Long handle curette
8. Suturing needles (Traumatic )
9. Self retaining muscle retractors
10. Black Braided silk suturing thread
11. Bullet forceps.

**Regular medicinal supplies:**

1. Antihistamines
2. Corticosteroids
3. Antibiotics (parenteral, oral and topical)
4. Anthelmintics ( against roundworms and flukes)
5. Skin/wound antiseptics, ointments and sprays
6. Tincture of iodine, Povidone iodine
7. Copper sulphate, Magnesium sulphante, Zinc sulphante, Red iodide of mercury, Lead acetate, Iodum, Potassium iodide, etc.
8. Formaldehyde
9. Local analgesic and general anaesthetics (Xylazine HCl, Ketamine HCl, Yohimbine HCl, Immobilon, Revivon, Doxapram, etc.)
10. Intravenous fluids (Normal Saline, Dextrose Saline, Dextrose 5%, 10%, 20%, 25%, Ringer's lactate Solution, Calcium boro-gluconate solution, Sodi-bi-carb solution, etc.)
11. Berenil or Nilbery (anti-haemoprotozoan)
12. Oral and parenteral Ivermectin.

# Mission

The undersigned studied the management practices and healthcare procedures being followed in the Minas center for one month (12.06.2004 - 09.07.2004) to suggest possible measures that could be adopted to improve the healthcare, management and welfare activities of the elephants in the camp. The assignment was accepted at the behest of A. Christy Williams, Coordinator, Asian Rhino and Elephant Action Strategy (AREAS), WWF-International, and Nazir Foead, Director of Species Program, WWF Indonesia. Dr. Wisnu Wardana, Veterinary Consultant, Bukittinggi Zoo was an associated member in the endeavor and Zulfira Warta of WWF-Pekanbaru was the coordinator of the program and local supervisor. Christy Williams and Michael Stuewe reviewed earlier versions of this manuscript.

Due consent was sought from John Kennedie, the provincial chief of KSDA, to start the work and it must be mentioned that excellent cooperation was obtained from the staff and mahouts of the camp during all my visits. We appreciate his concern for the welfare of the camp elephants and hope that appropriate measures will be initiated in keeping with recommendations made in the present document.

Captive elephant culture in Indonesia is still in a state of infancy. We studied the Minas Elephant Training Center in such a perspective and offered my studied suggestions here keeping ground realities in mind. The concept is clearly to provide some vital guidelines for improved care and management of captive elephants. Besides Minas, study trips to APP Elephant Park, Sebanga Duri Elephant Conservation Centre and Pekanbaru Ulin Zoo were also undertaken to explore possibilities for improvement in the management and healthcare programme of these captive elephant facilities.

Use of koonkies (trained elephants) to deter crop raiding wild elephant is a relatively new concept and there have been encouraging results from a few experimental forays in Assam. In Indonesia, four camp elephants are being experimentally used for this purpose in the Tesso Nilo anti-depredation camp of WWF-Indonesia. This field camp was visited twice for the health check-up of the four koonkie elephants placed there. Mahouts were given tips on koonkie operations for

deterring the crop-raiding elephants. Excellent feedback was received from the mahouts during the interactions and it is hoped that the Tesso-Nilo experience will provide invaluable insight and knowledge to human-elephant conflict mitigation endeavours.

My visit to Indonesia as an "Elephant Healthcare Consultant" had the objective of improving the health care of captive elephants in Riau Province, Indonesia, and to act as an advisor on the productive use of captive elephants as "koonkies" for mitigating human-elephant conflict. The decided term of reference of the visit was as under:

1. Develop protocols for regular elephant healthcare checkups in Riau Province, Sumatra.
2. Conduct local training of vets and elephant handlers in diagnosing and treating common ailments and other medical conditions in elephants with an emphasis on elephants in the flying squad.
3. Help improve the health conditions of elephants in Minas elephant camp.
4. Assist in the field implementation of human elephant conflict mitigation.
5. Develop a plan for a model elephant camp.

The entire WWF-Pekanbaru team was very supportive of my work and took excellent care of me during my stay. Zulfira Warta coordinated my visits and worked in a very accommodative way. Dr. Wisnu Wardana was a very good co-worker, and assisted in all my health care procedures efficiently. It was because of Dr. Wishnu that my communications with all the people including Dr. Rini (Minas) and all the pawangs (mahouts) and managers were possible.

We tried to medically examine all the elephants in Minas, and also demonstrated the procedures to local vets. Improper training of some of the elephants made thorough examinations difficult. Fecal samples of all the elephants were examined and were found to be highly infected. They all were dewormed with appropriate medicines that were brought from India. Since the livestock population of Pekanbaru (Riau Provicne) is very low, it is extremely difficult to get veterinary medicines locally. We left some stock with the vet for future use.

Diagnostic equipment had to be borrowed from the livestock department, which was quite useful. The staff at the livestock department was very cooperative and expressed their willingness to offer all possible help to the Minas vet. Many senior officers from the department, including the chief of the province, participated in a one-day workshop held in the WWF office to learn about various management and healthcare procedures in elephants that we

*Discussing elephant healthcare issues at the WWF Indonesia office*

presented. Blood smears were collected and sent to Dr. Wisnu's laboratory for examination of blood protozoa. Susan Mikota reported that about 50 percent of the elephants of Sebanga-Duri were infected with blood parasites in her study. It is difficult to examine blood smear slides in the field. On the next visit, we should be prepared with good laboratory equipment to administer all the tests in the field. All samples that we collected were negative for parasitic ova.

I arranged film shows and presentations for the pawangs at Minas and the flying squad to suggest better management practices. Tips on koonkie operation in chasing crop-raiding elephants were shared. Improving rope-work for more saddle stability and to give a better holding for the second rider was demonstrated.

# Human-Elephant Conflict Mitigation

The exploding human populations in Asian countries exert tremendous pressure on elephant habitats. Habitat loss and fragmentations, the loss of quality forests required for this mega herbivore species has resulted in disturbed elephant populations in almost all countries, so much so that the very existence of the species is now endangered. Vast tracts of elephant habitat have been transformed into agricultural land and human settlements without considering the elephant herds that use these areas in their annual migration in search of food and water. This gives rise to the inevitable: conflict with human interests.

It is ironic that elephants are considered pests in their own backyard. They are annihilated by poison, electrocution or simply gunned down. Such measures have dramatically reduced Asian elephant population in all its range countries. In the beginning of the 20th century, Thailand, with some 90 percent of the land under forest cover, could harbour an estimated 300,000 wild and captive elephants. A hundred years later, the human population soared to 63 million, a six fold rise from 8 million, the forest cover was decimated to 20 percent of its former area. The wild elephant population plunged to a mere 2,000 (Mecir, 2004).

In the once densely forested Indonesian island of Sumatra, the primary forests have dwindled to less than 20 percent. When hardworking Javan farmers were encouraged to migrate, they slashed and burned virgin forests nurtured to clear land for crops. Multinationals stepped in and palm oil plantations completely changed the landscape. Big herds of elephants were squeezed to isolated corners. In Riau Province, huge paper industries with an annual production of 4 million tons of paper pulp milked the forests dry. Worse still, the paper giants' Acacia plantations turned into an invasive species and spread like wild fire. Elephants cannot eat Acacia and they were compelled to look elsewhere for their food source: elephants devoured and wiped out nearly 2.5 million acres of cropland – nearly USD 6 million in damage between 1993 and 1995. A year later, 12 elephants were found dead due to poison.

In Assam, India's elephant homeland, elephants are fast losing their ground due to unabated immigration of people form neighbouring countries like Bangladesh, Nepal and India's own heartland

states. At Borak valley in the southern plains of the Borail hill range, a herd of 350 wild elephants were completely wiped out in 15 years thanks mostly to the influx of people and tea plantations that cleared the natural forests. The complete absorbtion of Balipara reserved forest for human settlement on the North Bank of the Brahmaputra River has rendered some 400 wild elephants homeless. Now they are everywhere: inside villages eating on plantain trees, raiding crops during harvest seasons and, inevitably, getting killed in retaliation. In the south-western district of Goalpara, wild elephants were unheard of only 15 years ago but the massive destruction of forests in the adjoining Garo hills in Meghalaya has pushed elephants downwards into the area, now a human-elephant conflict zone. A related event is connected to the forest disappearing: after two days of incessant rain in October 2004, five hundred villagers and their homes were washed away in the Garo hills, an incident that never happened before. The forests serve an important function not only as elephant habitat but also as catchment for rivers. More and more wild herds are becoming problematic. Some of them are addicted to the country liquor brewed in the villages. They have become habitual crop raiders after developing a taste for the sweet cash crops grown in farms that sprang up in their corridors.

These are examples of the predicament that Asian elephants face everywhere. Though respecting the sanctity of elephant territory is clearly the answer, that is no longer possible in its entirety in the current situation. In the human-elephant conflict, elephants could be the losers. Thankfully, accountable governments and concerned people are thinking seriously about mitigating this conflict to ensure the survival of this flagship species, an indicator of a green earth. Depending on factors like the strength and behaviour of the herd, topography of the area and resources available, short term anti-depredation measures are being adopted in different countries. They include:

1. Power fencing
2. Elephant trenches
3. Changing cropping pattern
4. Villagers education not to brew country liquor
5. Rural electrification and lighting farm boundaries
6. Using chilli cakes
7. Using fire-crackers and beating of drums
8. Deploying koonkie squads

Out of these, encouraging results have been observed in the deployment of koonkies in Assam during recent years. In Rani-Garbhanga Reserve, just two koonkies were effective to keep a 70-strong herd of wild elephants at bay in 2002 and 2003. They were effective in Narengi Army Camp too and The WWF-India has now deployed 15 koonkies in the worst-affected Sonitpur district of northern Assam on an experimental basis. The results have been encouraging so far. For the provinces like Assam in India with more than 1200 unemployed captive elephant population, this has the additional benefit of providing alternative employment opportunity.

In Indonesia a number of factors like human settlements, forest fires, legal and illegal logging, timber estates, plantations, agricultural expansion, shifting cultivation, oil exploration and road building have caused extensive degradation and fragmentation of the island's elephant habitat ( Hutadjulu and Janis, 2002). The resultant human-elephant conflict that assumed menacing proportions in the eighties was handled by the Indonesian government by three main activities:

1. Population management (*Tata Liman*). This involved translocations of elephants from degraded habitat to a more suitable habitat.
2. Elephant empowerment (*Bina Liman*). This involves habitat improvement, fencing, community education and training troublesome elephants to participate in human activities.
3. Elephant utilisation (*Guna Liman*). This means using domesticated elephants for forestry, agriculture and recreation activities.

The first capture of wild elephant in Indonesia as a part of this programme took place in 1986 with the help of Thai mahouts and koonkies. A total of 362 elephants were being maintained (Dec 2000) in six Elephant Training Centers (ETCs), a big dip into already scarce state resources. Since the fiscal year 1997/1998, between 50 and 55 percent of the annual national budget (APBN) for elephant conservation was allocated for operating Elephant Training Centers. These elephants were removed from the wild for the protection of plantations. Unspecified numbers died in the process of capture and training. No healthcare and management protocol for the camp elephants have been developed.

The culture of elephant utilisation was nonexistent in Indonesia. The plan of Elephant utilisation (*Guna Liman*) has practically remained a non-starter. With almost zero procreation record in the camp elephants, which can be used as a barometer of wellbeing, the ETCs will be regarded as death camps by future generations. Such large scale captures should be a last resort, not an alternative to respecting the elephant's territorial authority.

WWF-Indonesia has engaged four trained camp elephants in Tesso-Nilo to mitigate human-elephant conflict on an experimental basis. Detailed studies on this experiment have been presented in Chapter 7.

# Capture Of Wild Elephants – Only A Last Resort

**Capturing of Asian elephants in Sumatra should be seen as the very last option and should be done only in areas where there is no habitat left to support a viable population.**

The following section is written as a guide for the humane treatment of unavoidable captures through proper protocols and guidelines. In the old days, only young calves of below seven years (Six feet in shoulder height) were captured from the wild to restock the depleted working elephant populations because they could be easily trained. Adult elephants are very difficult to break-in, they stubbornly resist any attempt to learn, which results in longer training, severe physical and psychological stress, injuries, infections and a high incidence of death. In the Indonesian perspective, elephants are captured to remove crop-raiding elephants from the fields as they provoke farmers to resort to revenge killings. Restocking captive populations is clearly not the agenda. Great care needs to be exercised in every step of the capture process and the post-capture training programme:

1. Adult elephants are best captured by chemical immobilisation that uses highly potent narcotics or non-narcotic sedative drugs. The capture team should be accompanied by a qualified and experienced veterinarian.
2. Appropriate dosing and proper medical management of the animal is essential to avoid undue stress or death of the animal.
3. The animal should not be chased or disturbed after being darted as this will delay the induction period and may lead to capture myopathy and death.
4. Though elephants remain standing under xylazine sedation, which is reportedly being used in Indonesia, sometimes they may stumble down and assume sternal recumbancy (sit on chest). This position is very dangerous as it compromises the respiratory function and may end fatally. If a drugged elephant comes to rest on its chest bone, the animal has to be pushed to a lateral recumbent position using koonkies or the anaesthesia has to be reversed using an appropriate dose of Yohimbine.
5. The dart wound should be dressed with povidone iodine to prevent infection.
6. A long acting antibiotic, tetanus toxoid and vitamin E should be administered. Vitamin-E prevents capture myopathy and helps the animal overcome physical stress.

7. Animals should not be made to walk long distances in a highly sedated condition. Loading or unloading a fresh capture in a lorry can be best accomplished under mild sedation with xylazine or haloperidol.
8. Chain injury and rope burn of a fresh adult captive is inevitable. Burns can be reduced by using soft ropes like jute or cotton that can be tied in several places to distribute the strain of the pulls and avoid deep injuries.
9. The animal should be tied under the shade of big trees and should not be starved or deprived from water completely in an attempt to weaken it into accepting training. It can be fed stems of banana trees for food and water.
10. After 3-4 days of incarceration, the freshly captured animal should be taken to water using two flank koonkies to bathe and drink. Taking the elephant to water should be a daily routine.
11. Wounds should be dressed regularly using medicated water through a garden hose. Antiseptic and fly repellants must be applied regularly.

# Training of Captured Elephants

In the free contact system of keeping a large number of elephants in captivity, it is desirable that the animals are properly trained so that daily management practices and administration of healthcare runs smoothly. Unfortunately, it was found that the level of training of many elephants in the Minas camp was not adequate.

It is not possible to take every elephant to the restraining chute every time you want to handle it, so the animal should be trained to accept handling by an outsider, including the vet. A sitting posture or sternal recumbency (*Duduk*) is sometimes not entirely safe. The Minas elephants do not release both hind limbs onto the ground and keep one knee up in this position. That means they can stand quickly and attack the vet. Ideally, elephants should drop both knees onto the ground while assuming the *Duduk* position. Then they will need more time to stand and the handlers would be safer. Currently, none of the Riau elephants can be made to lie down to a lateral recumbent position, except Mutiara who was brought from the Bukittiggi Zoo and was trained elsewhere. The ability to commandeer a captive elephant into lateral recumbent position is essential for performing many activities like safe medical examination of the animal, administration of medicines and foot-care.

Foot diseases are the commonest ailments of captive elephants and routine examination of the foot is a must to avoid complications. As an example, captive Minas elephant Anwar was limping with his right foreleg, kept the leg lifted off ground. On examination, a swelling on the ground (solar) surface of the foot was noticed, which could be a solar abscess due to a thorn. The swelling could not be examined as the elephant could not be made to lie down.

*Removing a thorn from an elephant's foot in Sebanga*

Anaesthetizing him for examination or if necessary surgical drainage was considered, but had to be abandoned as he would stand on the limb placing weight on the solar surface to balance himself under xylazine sedation that would preclude access to the abscess. In western elephant facilities, the elephants are trained to offer the foot on a stool when commanded for pedicure or just for a routine foot care. In Minas facility, at least a lateral recumbency would partially solve this problem.

I have witnessed the morning training sessions in Minas. During my visit, five fresh captures were undergoing training: Sunshine, Membot, Unyil, Mele and Momon. I keenly observed the proceedings and found that a both positive and negative reinforcement popularly, the carrot and stick method, to train the elephants. The technique appeared to be quite all right to a person like me who witnessed many such training sessions in Assam, but may appear little cruel for somebody who sees this for the first time. In Assam, during the days of elephant capture (*mahals*), elephants were trained as early as four years as no adult animal was allowed to be captured. Now that capture of wild elephant is banned in India, we train only the easily tractable captive born calveswhen they are about 4–years-old. In Minas, they train adult or sub-adult animals from the wild that are difficulty to break in. However, since the purpose of training here is not to perform any highly skillful activity, they can be little more patient. In general, I propose to let the training take a little longer rather than pushing the elephants too hard to learn quickly.

The elephant must be trained to adopt a proper sit down or sternal recumbent (*duduk*) posture with all the knees (actually two elbows in front and the two stifle joints in the rear limbs) touching the ground and the lie down or lateral recumbent posture (*Tidur*) as these are very important for the daily handling of the elephant by the vet and also for routine foot care procedures. To train the lie down (*Tidur*) posture, the elephant should be made to sit down (*Duduk*) first in shallow river waters (3-4 feet) and gradually coaxed to lie down by pulling sideways holding the ear while gently stroking the downside of chest behind the elbow near the axilla region. This is generally taught at bathing time and does not take more than five days.

The respective mahouts should make their elephants practice all tricks everyday lest they forget. New tricks will keep the elephants stimulated and keep the boredom of camp life at bay. We should refrain from forcing elephants to adopt absurd postures or perform painful activities. The elephant's anatomy and organisation of limb bones means that they are not suited for sporting activities and forcing them to do so amounts to cruelty.

# Elephant Management Protocol

The Minas Elephant Training Center is about 40 km north-west of the city of Pekanbaru, capital of the Province of Riau, Indonesia. The original training centre was located in Sebanga. A majority of elephants were transferred to the present site at Minas for administrative and managerial reasons in 1998. In Sebanga, the local people almost destroyed the adjacent forest and settled in the camp area. Forests were converted to palm oil and rubber plantations and there was a scarcity of forages and grazing area for the elephants. Moreover, the water there was also found to be in excess of the permissible limits of iron, lead and chromium (Micota and Hammatt, 2000). The oil company CALTEX very generously constructed the physical facilities, including the approach road, for the present Minas Elephant Training Centre. A skeleton camp with nine elephants is still being maintained in Sebanga at present.

When the Dutch colonised the island of Sumatra about 350 years ago, the culture of captive elephants disappeared along with the royal wealth that paid for the upkeep of elephant stables. Until two decades ago, an estimated 2,800-4,800 wild elephants lived in the dense evergreen forests of Sumatra (Blouch and Simbolon, 1985) but things started changing rapidly after large scale transmigration of farming people from Java. The farmers cleared large forest areas, making larger numbers of wild elephants became visible. The wild elephants found themselves in agricultural fields, palm oil cultivations or deep inside villages, giving rise to conflict situations. People started considering elephants as pests. The Indonesian government's solution was capturing crop-raiding elephants on a large scale and putting them in Elephant Training Centers. Since the captive elephant culture was non-existent, they hired Thai mahouts and koonkies to capture and train elephants in Sumatra. The first elephant was captured in 1986. By 1995, 570 elephants had been captured and put into camps (Lair, 1996.). These elephants were kept in six ETCs: Lhokseumawe (Aceh), Holiday Resort (North Sumatra), Sebokor (South Sumatra), Sebanga (Riau), Way Kambus (Lumpung) and Seblat (Bengkulu). The Sebanga camp in Riau was later shifted to its present site at Minas.

The present wave of elephant culture in Indonesia is still in its infancy when compared to other Asian countries who have had experience with elephant husbandry for over 3,500 years. Elephant

management and healthcare is still in an early stage and needs help to mature into a self-sustaining culture. Animals in captivity may some time become critical for the survival of the species as predecessors of future generations as habitat is lost and free ranging elephant populations continue to decline throughout Asia.

**However, Capturing of Asian elephants in Sumatra should be seen as the very last option and should be done only in areas where there is no habitat left to support a viable population.**

## Bathing and grooming

*A Mahout grooms his elephant while bathing in Assam*

Going to water may just be the most important event in a captive elephant's daily routine. The heavy demand of water (250-300 liters per day) for drinking can be fulfilled when the elephant has free access to clean water while going for the bath. Two daily baths would be ideal but at least one elaborate bathing and grooming session should be a compulsory event every day. An initial bath in the morning would be a first chance to drink and cool down. After the animal is brought back from grazing, it should be taken to the river, commandeered to a sit or, better still, assume a lateral recumbent position while the mahout (*pawang*) washes and scrubs it thoroughly. In Assam, we use an over-baked brick, which is porous and blackish, to scrub the elephants. In south India, mahouts use a dissected coconut for this purpose. Riau mahouts could use a brush of their choice. Scrubbing has to be compulsory as it removes dead skin and debris, massages the body and makes the elephant very happy. The procedure increases the intimacy between elephant and pawing. It also increases the latter's confidence with his surge. The grooming session gives the mahout an opportunity to check for any thorns or abrasions on the feet or to trim an overgrown sole or nail.

## Feeding elephants at Minas

The grass or browse quality in the camp forest was examined and baring a few patches, it was found to be quantitatively and qualitatively poor. A good practice is supplementing fodder requirement with banana tree stems and leaves brought from outside in lorries and given to the elephants in the afternoon. This practice should be continued.

Considering the low quality of the fodder, grain feeding to the camp elephants are also practiced but the feed quality was found to be very poor and the de-oiled rice polish that is being given was found to be full of paddy husks which is useless as feed. If the total quantity is low, the feed should be of good quality and contain high protein. Depending upon the availability in the local market and price, some pulses or soybean mixed with high quality rice polish or wheat bran and molasses (raw *gula*) should be given. Four to five kilograms of a good quality ration per animal per day should be adequate in the rainy season when the grass is abundant. This quantity should be enough for elephants not engaged in any work. Elephants engaged in koonkie operations for dealing with wild elephants and pregnant females will require additional amounts. In the dry season, the amount should be increased for all elephants by 20 percent.

According to Dr. Wisnu, the soil in this part of the country is generally deficient in various essential macro and micro minerals. So naturally, the vegetation growing in this soil will also be deficient in mineral contents. This could be one very important reason why the Minas elephant are not reproducing. Therefore, a mineral mixture used for other livestock should be a regular part of their ration. Just 30-40 gram of the mineral mixture daily will effect wonderful improvements in the health conditions of the elephants.

## Drinking water at Minas

The selection of site for the elephant training centre was improper. The area is over an oil field and crude natural oil oozes through numerous streams, polluting the small river in the camp too. I visited the camp in the dry summer season and probably witnessed the worst water quality in the year. There was a thin layer of oil over the water, which was barely at knee-deep level. The elephants did not show any eagerness to drink or much merriness when brought to the river, which is in contrast to their usual behaviour. The water quality will probably improve as the rainy season sets in but the management should provide clean wholesome water for drinking during the dry season by constructing a concrete reservoir in the camp and filling it with clean water brought from elsewhere in water tankers. The reservoir should be cleaned meticulously everyday.

**Camp hygiene:** The stable hygiene in the Minas Elephant Training Center during my visit period was reasonably good. In all my afternoon visits, I always found the dung boli and left-over grass and banana leaves cleared from the place where elephants are tethered for the night. The places were swept well, and the waste materials including the dung boli were burnt. Few wheelbarrows would ease this job. The result of the *pilkhana* (stable) hygiene was reflected in the remarkably low incidence of foot diseases in the camp elephants of Minas. Besides a slight brittle in the fourth digital nail in the right forelimb of Mutiara, which was due to the desiccation, no other elephants had any foot or nail diseases. While not a result of hygienic procedures, the apparent lack of nail trimming has led to outward deviation of nails in almost all the elephants. Regular trimming of the tip of the excess nail will solve this problem. But, as mentioned before, the elephants' lack of training to accept foot care is a great hindrance.

**Housing of elephants in Minas:** The elephants are released in the forest (hobbled or with trail chains, according to the level of training and homing instinct) for the day and tethered in their respective stalls at night. No housing is required for the elephants in general but occasions arise when distressed animals need to be sheltered under roofs. For instance, orphaned or rescued calves, and old and critically ill animals need protection from the blazing sun and heavy tropical downpours. Again, elephants with nasty wounds have a tendency to load their wounds with the soil and need to be kept in concrete floors to avoid contamination of the wound to effect an early healing. Considering this points, at least two houses (for eight elephants) need to be constructed in Minas with high roofs (15 feet, with robust round wooden pillars) and without walls. One of the houses should have a concrete floor.

Sometimes male elephants at the periodical *musth* need to be restrained for long periods. It is hazardous to approach them during those days, which affects floor hygiene and causes foot sores that heal with a lot of difficulty. With concrete flooring, this problem can be avoided.

**Tethering elephants:** By the simple technique of changing the chaining leg alternately, mahouts could reduce the chances of rope/chain burns For example, on all even dates in the calendar, use the right leg for chaining and the left on all the odd days. Some western zoos follow this technique and we have adopted this in the Assam State Zoo and found it to be easy and effective.

**Landscape plantation:** The entire campsite in Minas is too exposed because of lack of a single living tree. Elephants here are captured adult and trained, but still they are wild animals and retain many of their wild instincts that include seeking cover from too much of human contact and the hot sun. Immediate measures need to be taken to plant quick growing shady trees all around the site. This will give the elephants a near natural living atmosphere, cool down the area and make the centre more appealing to visitors. Trees have other managerial advantages in an extensive elephant facility. For instance, when a bull runs amok, breaking his chain in the height of a *musth* episode, the trees can provide a very useful and safe darting platform to immobilize and restrain him.

**Reproduction of camp elephants in Minas:** Reproduction is an integral instinct of all living creature and not just an auxiliary function. It can be considered a barometer of good health and general well being. The fact that no reproduction takes place in an extensive facility like Minas that has several adult bulls and cows is a cause of concern and warrants a fresh look into the managerial practices. Similar near natural conditions have resulted in captive breeding of Asian elephants elsewhere. In north-Bengal, excessive captive births in the duty elephants have created problems. We may not seek them to reproduce and can prevent captive breeding accordingly; but the lack of a single natural incidence of reproduction in so many elephants of mixed sex population reflects their poor physical and psychological health and unfriendly keeping conditions.

General zoo guidelines maintain that elephants are kept in as natural ecological conditions as possible, which means that the environment must be provided to ensure species specific behaviour patterns in choice of food, social interactions, forming family units, dominant hierarchy

and successful rearing of offspring. The living environment should be enriched to reduce the frequency of abnormal behaviour and the ability to cope with the changed environment in a more normal way. Because of the highly social nature of elephants, living in the company of conspecifics is the primary source of enrichment. Elephants kept in near natural conditions convey more understanding of the species and its requirements to the visitor and insight into the necessity to protect the species.

The measures necessary to fulfill this objective includes improving food, including mineral rations, allowance of social interactions and avoiding over subduing by physical tortures. However, since the upkeep of elephants is proving to be very expensive under the current circumstances, care should be given to first get the health care and upkeep of elephants to a certain standards before attempting to increase the numbers through natural breeding. Breeding in captivity should not be an excuse for removing elephants from their natural habitat.

**Restraining chute:** It is good that the Minas facility has a metallic restraining chute for handling of new untrained, non-cooperative or dangerous elephants and administering medical needs. The structure was found little lanky and can be reinforced with some wooden poles for strength and stability. It is necessary to fill the earth at the base. In its present condition, rain water will accumulate at the base of the chute and make it difficult to keep clean. A molded plastic table is needed near the chute to keep veterinary tools and medicines when animals are being treated.

**Mahout (Pawang, elephant handler) quality:** Elephants are enormously strong creatures and they are very intelligent. Therefore, elephant management is very different from the management of other farm animals. The role of the pawang is vital in maintaining the physical and mental well-being of an elephant. He should understand the basic requirement of the animal, be compassionate in handling, try to communicate effectively (verbally and physically) and keep his animal clean and well groomed. He should be physically fit, agile and athletic and maintain personal hygiene to avoid zoonotic (diseases that spread from human to animals and vice-versa) diseases spreading. Periodic screening of the pawangs against tuberculosis is essential as the disease often spreads to elephants. They should sincerely cooperate with veterinarians, report to them about any alterations in the feeding behaviour and changes in the colour and consistency of voidings (stool and urine) and administer oral medicines punctually. The pawangs should have a daily work schedule and there should be strict supervision on their activities and attitude towards their elephants. Handling animals as big and strong as elephants could give a pawang a sense of pride and could itself be a motivation for his work.

The Minas pawangs are young and agile but many of them are very new in the trade and lack experience. This is to be kept in mind when assessing their performance as is the fact that they are from a land that has had no recent elephant culture. It is important that they are introduced to an elephant culture by motivation and encouragement. They should be encouraged to develop an emotional bond with their charge and if possible should be sent to other countries like India (Assam) to see and learn from experienced mahouts. Introducing an annual “Best Pawang of the

Camp" award could increase their involvement, which should be judged by their work attitude round the year.

## Daily work Schedule for Riau Pawangs:

1. Closely examine elephant in the early morning and report to the vet if any physical and behavioural abnormality is observed. Examination should include colour, consistency and volume of dung, urine, etc.
2. Give elephant a quick bath in the river.
3. Collaborate with veterinarian or self-administer veterinary procedures like dressing a wound, injections, trimming of nails, etc.
4. Take elephant to the forest and tether or hobble only where good grass is available. You will be accountable should your elephant be found to be underfed.
5. Remove all dung and leftover fodder from the pilkhana. If the standing place of the elephant is muddy, spray some dust or ash.
6. Visit your elephant at noon to see if it is entangled or in any kind of trouble and to change the area of grazing.
7. Bring the elephant back from the forest in the afternoon. Give a thorough bath by scrubbing the whole body. Examine the feet for any thorns or other foreign objects.
8. Tether the elephant at its usual place. Provide supplementary feed and fodder as necessary and administer oral medicine if any.
9. Spray disinfectants in the pilkhana floor once every 15 days or as suggested by the vet.

## Registration and record keeping

The International Conference on Captive Elephants held in Thailand in 2002 decided that all Asian elephants in captive conditions should be given a unique registration number by implanting a microchip and a national studbook maintained. This was deemed necessary to prevent illegal captures and trade by private owners and to facilitate record keeping on individual elephants. Though private ownership is not commonly prevalent in Indonesia, no definite identification mark on elephants in the state-run elephant training camps leaves room for speculation. Elephants with the same or similar names may create problems in various ways. It is important that the Riau authorities decide to follow the international agreement. That will improve Indonesia's global image regarding the country's attitude and commitment towards conservation of elephants both in-situ and ex-situ.

The necessity of microchipping captive elephants in Riau was mentioned to John Kennedie, the chief of KSDA, and he readily agreed to my proposal and suggested that I examine the microchips used in fish for elephant use. I had the opportunity to visit the "Arowana" (CV Sumatera Aquaprima) fish farm owned by Anuar Salmah and found that they use microchips that can be used in

elephants. He readily gave us 80 microchips (AVID MUSICC chip Identification system, USA) and a reader that can read the chip from a distance of six centimeter. We decided to implant them on the elephants but since time was short, only 11 elephants were finished before I had to leave. Dr Wisnu and Dr Rini were given hands-on training so they could complete implanting the rest of the elephants at the camp.

Most countries place the microchip the middle of the elephant's neck at the cranial end behind the left ear. For the implantation site, the prominent middle auricular artery and vein that goes together towards the neck should be followed. The chip is implanted about two inches towards the neck from the level of the vessels. The experience of implanting microchips in this location for over 1,000 elephants was found to be safe and effective so the same was done for the Riau elephants too.

Microchipping is not the end of the process but the beginning. An individual service book must be maintained for each elephant where all events of the camp life like date of capture, area of its origin, morphometric data at the time of capture with annual updates, name of the pawang, incidence of *musth*, mating, pregnancy and calving dates are all recorded. A separate register should be maintained for the healthcare programme.

*Implanting a microchip in an elephant at Minas*

**Carrying capacity of Minas:** From my observation of factors like the availability of grassland, hygiene, etc. Minas is barely good enough for 50 elephants, which means that it is already more than full. Further overloading the camp with freshly captured elephants will cause a breakdown in hygiene and acute food scarcity. If new elephants are to be accommodated, similar number of elephants will have to be posted out, perhaps for a flying squad in conflict areas following the Tesso Nilo pattern.

# Elephant Health Care Protocol

Administering healthcare needs to a gigantic creature like an elephant is a specialised task. Mere knowledge of anatomy, physiology or behaviour of the animal is not enough to be a successful elephant veterinarian. One needs to have a special compassion for the animal. The enormous size and frequently unpredictable temperament of elephants makes the job really challenging. It is difficult for any person to objectively evaluate the health condition of an animal: it is still more difficult to do so for elephants. The latter usually do not show symptoms of disease until it is very advanced. The clues that something is wrong comes from obvious symptoms like refusal of feed or water, or changes in the colour or consistency of urine and dung. Reports from the mahout are heavily depended upon, but given his level of education in Asian countries, we cannot expect him to keenly observe and report the early signs of diseases. A lot of dedication is required on the part of the vet to familiarise themselves with the body language of an animal. In my studied opinion, elephants are the most expressive veterinary subjects compared to any other animal.

The approach to healthcare of elephants should be proactive. The vet should not wait for reports from the mahout but go to the animal regularly and make observations. A record of all health-related information of an individual elephant should be prepared for an annual report that will eventually make up a database. Then, based on the information gathered from the previous years, a calendar of activities for the whole year should be prepared. Such a healthcare protocol will save many kinds elephants in captivity from many ailments.

To the best of my knowledge, not a single veterinary school anywhere in the world offers any special course on elephant healthcare, and so a veterinarian has to learn from senior colleagues who gained their knowledge from long years of experience. It is extremely important for elephant vets to remain connected with experienced people around the world.

**Veterinarian elephant ratio:** Under normal conditions, a veterinarian with the assistance of a trained para veterinarian should be able to take care of 100 elephants in a camp like Minas. Since freshly captured elephants continue to come into Minas, 60-70 elephants are likely to keep the vet fully occupied. The new arrivals will have a lot of wounds that need daily cleaning and

dressing. Moreover, handling of individual elephants takes much longer because the training level of the elephants is low.

## Frequency of visits

*Stool examination of flying squad elephants.*

In normal conditions it is enough if the vet visits his elephants twice weekly. But since the Minas camp luckily has a resident vet, she should visit all the elephants at their pilkhana early in the morning everyday for an overview. Obvious signs of health and diseases can be noticed before the animals are released or taken out for training or grazing. Though elephants can sleep standing, all healthy elephants sleep lying down for about 3-4 hours late in the night so the vet must check for marks on the floor. If an elephant does not sleep lying for 3-4 days, diseases like joint pain or impaction should be suspected.

## Signs of health in elephants

There are a few distinct signs that indicate a healthy elephant. Familiarity with them will help a veterinarian in detecting diseases:

1. A healthy elephant is never still. It continues to swing his trunk and tail and flaps its ears. Dusting the back with soil, scratching the body with a broken twig held by the tip of its trunk is a normal behaviour. It flaps its ears more frequently as the day warms and the blood vessels on the ear become more prominent.
2. A healthy elephant swings its body/head from side to side, rubs one leg with another and often stands on three legs, alternately resting one.
3. The eyes are clear and bright with little or no watering.
4. The palate, tongue and internal lining of the trunk are rosy pink.
5. The skin is soft, wrinkled and the colour black after a bath.
6. The bristles are firm to the touch.
7. A moist secretion exudes around the nails and can be observed by throwing some fine dust over them. It will stick.
8. There is a general impression of contentment.
9. A healthy elephant has a good appetite, consumes 150-250 kg of roughage and 200-250 liters of water daily.
10. It should defecate 15-20 times every day (5-8 boli per defecation). The dung is brownish,

darkening on exposure to sunlight and air, juicy, fibrous but not very course. The colour may vary considerably according to the food eaten. More fibrous dung indicates old age, flattening of grinding surface of the molars, and/or damage of caecal microflora, which may be caused by oral antibiotic therapy.

11. The urine of a healthy elephant is copious with a faint yellow tinge. Odour is not unpleasant, slightly alkaline and more crystals than any other species.
12. A healthy elephant lies down to sleep once or twice late in the night but never in the day.
13. A healthy calf on the other hand, sleeps prostrate frequently after a hearty meal or whenever tired during the day and at night.
14. An elephant has poor eye sight and relies more on its sense of smell and can perceive infrasonic sound waves.
15. It exhibits species specific interactive behaviour on seeing or sensing through its strong olfactory or auditory receptions.

*Physical measurement of elephants*

## Some physiological values in Asian elephants

It helps to know the physiological parameters in the species to detect deviations that may indicate disease from clinical or laboratory investigations. This also aids in the diagnosis of the condition or at least to know the direction of internal changes taking place so as to render at least symptomatic treatments till a confirming diagnosis is made after detailed clinico-pathological examination.

| PARAMETER | MEAN VALUE |
|---|---|
| Rectal temperature | 96.6 degree F. /36.9 degree C |
| Respiratory rate | 4-6/ Min |
| Heart rate | 25-35/Min |
| Haemoglobin (g/dl) | 12-14 |
| Total leucocyte count | 15,000/ml |
| Lymphocyte | 7000-8000/ml (40-60%) |
| Neutrophils | 6000-7000/ml (22-50%) |
| Monocyte | 2000-2500/ml (1-3%) |
| Basophils | 50-100/ml (0.3-2%) |
| Eosinophils | 400-600/ml (6-15%) |
| Total RBC count | 3,000000/ml |
| Blood Urea Nitrogen | 10-13mg/dl |

| | |
|---|---|
| Creatinine | 1.2-1.6mg/dl |
| Serum calcium | 9-12mg/dl |
| Phosphorus | 4.5-5.5mg/dl |
| Iron | 50-70mg/dl |
| Total Protein | 8-11mg/dl |
| Glucose | 80-90mg/dl |

## General signs of indisposition

The vet should observe the animal carefully during general rounds in the morning and should suspect some abnormality if the following symptoms are present: The animal looks listless; there is general languor and absence of incessant motion so characteristic of health. The skin appears grayish in colour, hangs loosely and is dry and some times scaly. The visible mucus membrane and the tongue appear pale, muddy, cyanotic or yellowish. The trunk appears shriveled. The lower flap of the ear is very often cold. The eyes are dull, appear retracted and there are frequent abnormal discharges. The animal appears out of condition and feverish, appetite reduced, and may lie down and get-up several times. The urine volume may be reduced and dark coloured. Continuous dribbling of urine. The dung looks hard and mucus coated or diarrhoea may be present. Submandibular oedema is indicative of hypoproteinaemia. Geophagia (eating of soil) is indicative of mineral deficiencies.

## Probable diseases:

Most diseases reported in Asian elephants can be classified as Infectious, Nutritional and Traumatic.

**Infectious:** Important infectious diseases encountered can be classified as :

**1. Helminthic:** A thorough fecal examination conducted in Minas and Tesso Nilo elephants revealed heavy incidences of gastro-intestinal helminthiasis. Twenty (41.67 percent) elephant shad only nematodes and 11 (22.91 percent) elephants had only paramphistome flukes. Five (10.42 percent) of 48 elephants had mixed infestation with both flukes and nematodes. In summary, 36 (75 percent) of elephants were infested. Three (75 percent) out of four elephants were infested with round worms in Tesso Nilo. None of the elephants in Tesso Nilo had fluke infestations.

The deworming registrar revealed that the elephants were dewormed with Ivermectin during the month of February, 2004. This can be considered as an indication that the area is highly infested with parasites. A fortnightly treatment of the pilkhana with disinfectant and proper disposal and burning of dung should be strictly followed. The vet must examine fecal samples of all the elephants once every six months and deworm the infected animals with appropriate drug/dosing

and also ensure the administration of the medications. The most prominent signs of helminthic infestation are anaemia, loss of appetite, indigestion, diarrhoea, geophagia and submandibular oedema.

**2. Haemoprotozoan**: There is high incidence of haemoprotozoan diseases particularly Trypanosoma and Babesia in Sumatran cattle and horses and therefore it is probable that elephants will be infected. Anaplasmosis has been reported from Sumatran elephants. Mikota (April, 2000) reported 50 percent incidence of haemoprotozoan diseases in the elephants of Sebanga-Duri camp. The diseases are transmitted by insect vectors and run a chronic and wasting form. Therefore it is essential that peripheral blood smear stained and examined for the protozoa at least once every six months. If any animal shows mild fever and chronic wasting condition, staining blood for the haemoprotozoan infection should be a part of the disease investigation protocol. Berenil and Nilbery are effective medicines for haemoprotozoan diseases.

**3. Bacterial:** There are many bacterial diseases that affect elephants. Besides external wound infections, the most important bacterial diseases of elephants are Anthrax, Black leg (Clostridial), Tetanus, Tuberculosis, Pasteurellosis, Salmonellosis and E.Coli. Annual vaccination of all the elephants against Pasteurellosis (H.S) and Tetanus is essential. While making a schedule, one vaccine can be scheduled on the sixth month, for example, H.S in January and Tetanus in July. Anthrax has never been reported in Riau Province and the last anthrax case in Indonesia was recorded 20 years ago in a place nearly 600 km away. Therefore, elephants of Minas need not be administered with Anthrax vaccine.

Salmonellosis and collibacillosis are generally problems in young calves, particularly those raised on artificial feeding. It causes severe diarrhoea, loss of appetite, dehydration and death. Proper hygiene of the feeding bottle or pail is necessary. Smaller amounts of milk (2 liters) should be prepared at one time and no leftover milk should be fed later. Treatment should include gut-active broad-spectrum antibiotic, astringent and rehydration. Antibiotic sensitivity tests should be performed immediately and if necessary, the antibiotic changed accordingly. After recovery, Vitamin-B complex and lactobacillus capsules should be given to restore their appetite.

Tuberculosis is a major problem in undernourished elephants. Pawangs should be tested annually as they may be the main carriers. An Intradermal tuberculin test should be performed once annually to identify the suspects. Administer 0.1 cc of bovine purified protein derivative tuberculin containing 5000 tuberculin units in the caudal fold or behind the ear. Evaluate by palpation at 24, 48 and 72 hours. Any evidence of swelling or induration (hard to touch swelling) should be considered as suspect. Suspect animals should be subjected to a Comparative Cervical Test within 10 days or after 60 days of the initial test. Additional diagnostic procedures include biopsy of the test site, culture of the tracheal wash, sputum or nasal discharge and ELISA test.

Positive animals should be isolated and treatment should be rendered with Isoniazide and Streptomycin sulphate. Three months of medication are required.

Tetanus is fatal to elephants. There will be rigidity of muscles, inability to swallow and the prolapse of the nictitating membrane. Early treatment with hyper immune serum, magnesium sulphate (muscle relaxant) and penicillin can save the animal. Penicillin is the drug of choice for Anthax. Sulfademidine is the drug of choice for Haemorrhagic Septicaemia. Haemorrhagic Septicaemia is diagnosed with confirmation on examination of peripheral blood smears with bipolar bacilli.

**4. Viral:** Several viral diseases have been reported in elephants. Encephalomyocarditis, Elephant pox, Herpes virus, Foot and Mouth Disease, Rabies and Rinderpest are known to affect elephants. The elephants of Minas are not particularly vulnerable to these diseases since their location is isolated. FMD is reportedly absent in Indonesia and does not require a vaccination.

Besides the above mentioned specific infectious diseases, elephants suffer from bacterial pneumonia, urinary and genital tract infections, mycoplasma infection, mastitis and fungal infections, trauma, abscess, impaction, etc.

Foot diseases are common problems of captive elephants, but it was interesting that the incidence of foot disorders were almost nil except in Mutiara where a brittle nail of the fourth digit due to dryness. But all elephants had long nails that caused outward bulging of the toenails due to the pressure on the ground. This has probably happened because the elephants were not trained for foot or lateral recumbency. Pawangs must be made to understand the importance of foot trimming and the absolute necessity to train their elephants to lie down fully.

**Rope burns:** Newly captured elephants frequently suffer from nasty rope burns that get infected and infested with maggots. Rope burns are best treated as follows:

1. Removal of the offending rope which is then tied in other areas of the elephant's body or leg.
2. Flush the wound lavishly with medicated water (1 percent acriflavin is good) through a garden hose twice daily.
3. Spray some antiseptic lotion with fly repellant quality after flushing regularly, twice daily (Topicure Herbal Spray by Natural Remedies, Bangalore, India is very good for such wounds).
4. Lincomycin IM is a good antibiotic for skin wounds. Additionally, Vit-C, Placentrex are useful for early healing.

**Dart abscess:** Dart abscesses are reportedly a common problem of freshly captured elephants. The incidence can probably be reduced by using appropriate sized needle, concentrated drug (to reduce volume), appropriate charges and above all, maintaining maximum hygiene of the dart. The possibility of dart abscesses cannot be completely eliminated, as the dart will carry infections from the skin of the animal to its tissues. Therefore, it is extremely important to dress the dart wound immediately with Povidone iodine after removal of the dart. Do not pull the whole dart from the wound, but unscrew the barrel from the embedded needle and push two milliliter of

povidone iodine through the needle hole into the site. Administering an injection of a broad spectrum long acting antibiotic and tetanus toxoid should also be made compulsory for a freshly captured elephant.

Because of the thick and elastic nature of the skin, abscesses in elephants tend to spread beneath the skin and through the muscles rather than rupturing and draining the contents out like other animals. Therefore when swelling at the dart site become obvious, it is better to ripen the abscess and soften the skin over the area by application of blistering agent (Red ointment - hydrargyri iodum rubrum) and subsequently drain the content by opening. After draining out the contents and irrigating the cavity with antiseptic solution, soak out all the fluid and apply seton of a sterile gauge dipped in 2.5 percent tincture of iodine and pack the cavity overnight. This is important for breaking the pyogenic membrane. Povidone iodine cannot replace tincture of iodine in breaking the pyogenic membrane. Abscesses not drained in time may lead to severe cellulites, fistular tract and even lead to fatal septicaemia.

Tincture of iodine should not be repeatedly used on the subsequent days of dressing as it burns down the budding capillaries (granulation tissue). Povidone iodine, 1 percent acriflavin or even hypertonic salt solution can be used alternately for dressing. The mouth of the wound should not be broadened as the elephants load the wound with soil.

The vet has to look to various other areas to administer his preventive health Care programme including:

**Quarantine:** All new arrivals to the camp should be quarantined for a period of one month. It is understood that a strict quarantine of the newly captured elephants is not possible, as you need to use koonkie elephants to attend to his needs including removal to the river for bath and training. It should be at least ensured that other elephants are vaccinated and the new member vaccinated and dewormed on arrival.

**Diet inspection and review:** Quite often, the diet is unbalanced and inadequate. This affects the health and well-being of the elephants, and frequently becomes the cause of medical problems. In Minas, the grass and browse quality was not satisfactory during my visit period. As it was the dry season in Indonesia, the grass will definitely improve in the monsoon. Allowing good quality grain ration should compensate for the deficiency on roughage. Poor quality ration will cause gastrointestinal disorders or even food poisoning. The vet will have to formulate the diet ration considering the availability of grass and also inspect its quality. It should also be observed by surprise visits whether the mahouts are giving the prescribed food or not. I have observed that some elephants are given their feed on the bare ground, which is highly objectionable because of the likelihood of contamination. It should be given in a container.

**Tusk care and trimming:** Overgrown tusks are uncomfortable to the animal. They increase the load of the head, cause impediments in movements through the jungle, accidentally injure the

pawang and make the elephant vulnerable to ivory hunters. Therefore periodic trimming of the tusks is an important task of the vet. This has to be performed with good knowledge about the extension of the pulp cavity. If the pulp cavity is exposed during trimming, there will be profuse haemorrhage, pulp infection and may even end fatally. Control the animal properly and if necessary sedate him. There are two systems for determination of the extent of the pulp cavity:

*Trimming tusks is a routine healthcare procedure*

1. Measure the circumference of the tusk at its origin. The same is the extent of the pulp from the base. That is the circumference at the origin of the tusk is the same as the extent of the pulp tissues. Retain two inches as margin of safety and you can cut the tusk just distal to the line.
2. Measure the distance between the medial canthus of the eye and the base of the tusk. This is the pulp length and you can cut the tusk distal to that.

For cutting the tusks, an electric saw is useful but you can use a wire saw or a hacksaw. Some water should be poured on, to prevent overheating of the area during the cutting. The sharp edges should be smoothened using a rasp or phial. Temperamental elephants are known to have cooled down after the trimming of tusk. This is an important job for an elephant vet of Indonesia as all the male elephants are tuskers.

It is very important to remember is ivory attracts poachers and even people involved in elephant management might take advantage of the managerial need to trim the tusk and make it too short, thereby distressing the elephant. This tendency must be curbed and all ivory obtained from periodical tusk trimming must be measured and weighed in the presence of the management and deposited in the official treasury. The government should then destroy the ivory as ivory trade is illegal both in the internal and international market according to CITES.

**Staff health monitoring:** All staff working in close proximity with the elephants should be subjected to tuberculin testing annually. It should also be observed that they maintain general hygiene in their daily life.

**Camp hygiene:** Maintenance of the pilkhana, feed store, restraining chute and training ground hygiene is very important. The vet should see to proper cleanliness, which will ultimately reflect on the health of the elephants under his charge.

**Rearing of orphan calves:** Successful rearing of orphan elephant calves needs good knowledge of the special physical and emotional needs of the animal. If it is an unweaned baby, milk to the tune of about 10 percent of the body weight is needed daily. Diluted cow milk can be given but may lead to diarrhea due to high fat content. Instead, infant milk formula (Lactogen-2) in proper dilution has been found very suitable. The total amount can be divided into 8-10 feedings and given at every two-hour intervals. Milk feedings should be given from 5 AM till 8 PM. If the calf wants more at night, electrolyte water should be given. Calcium, Phosphorus, iron, Vit-A, B-complex, C and E are to be supplemented.

Elephants are extremely social animals and do not like to stay alone. The young calf seeks company and the caretaker should not leave him alone. Two people should engage with one calf so that they can attend it alternately. As it grows, a foster mother should be found from among the older females in the camp who will teach it socialization skills. This early exposure is necessary for the calf to pick-up the necessary microflora by eating the stool of adult animals, else it will have digestive problems and be sickly.

## Work schedule for veterinarian:

**Daily:**

1. Inspection of all the elephants in their pilkhana, any sign of indisposition, whether grass was taken, slept or not, stool quantity and appearance and bull for early signs of musth.
2. Supervision of dressing or administration of medicines, morning session.
3. Attending training of elephants, extending first aid to any abrasions.
4. Rendering special treatment like surgery or tusk trimming when necessary.
5. Supervision of cleanliness of the pilkhana, feeding utensils, feed store, etc.
6. Supervision of dressing or administration of medicines, afternoon session.
7. Surprise visit at feeding time.
8. Supervision of the bathing, grooming and foot care.

**Half-yearly:**

1. Vaccination of elephants against HS and Tetanus. Each vaccine annually, schedule each six months apart.
2. Fecal examination and mass deworming.
3. Blood smear staining and examination for protozoa.

**Annually:**

1. Screening for Tuberculosis.
2. Morphometry and updating of records.
3. Maintenance of individual medical records.
4. Keeping good liaison with the livestock department for getting help in diagnostic procedures and vaccination of elephants.

## Camp level veterinary supplies:

**Equipment and accessories:**

1. Long range tranquillizing equipment with accessories
2. Portable X-ray machine
3. Portable Ultrasound machine
4. Compound microscope
5. Dressing pump with hose
6. Surgical instrument kit
7. Buckets and mugs
8. Ropes
9. Folded chair and camp table
10. Post-mortem kit
11. Glass slides and staining set
12. Fecal examination kit
13. Syringes
14. Hand gloves
15. Metal detector
16. Suction apparatus

**Surgical instrument kit:**

1. Bard Parker knife
2. Abscess knife
3. Allis tissue forceps
4. Spencerwell's artrery forceps
5. Deep cavity needle holder
6. Volksman scoop
7. Long handle curette
8. Suturing needles (Traumatic )
9. Self retaining muscle retractors
10. Black Braided silk suturing thread
11. Bullet forceps.

**Regular medicinal supplies:**

1. Antihistamines
2. Corticosteroids
3. Antibiotics (parenteral, oral and topical)
4. Anthelmintics ( against roundworms and flukes)
5. Skin/wound antiseptics, ointments and sprays
6. Tincture of iodine, Povidone iodine
7. Copper sulphate, Magnesium sulphante, Zinc sulphante, Red iodide of mercury, Lead acetate, Iodum, Potassium iodide, etc.

8. Formaldehyde
9. Local analgesic and general anaesthetics (Xylazine HCl, Ketamine HCl, Yohimbine HCl, Immobilon, Revivon, Doxapram, etc.)
10. Intravenous fluids (Normal Saline, Dextrose Saline, Dextrose 5%, 10%, 20%, 25%, Ringer's lactate Solution, Calcium boro-gluconate solution, Sodi-bi-carb solution, etc.)
11. Berenil or Nilbery (anti-haemoprotozoan)
12. Oral and parenteral Ivermectin.

# Tesso Nilo Anti-depredation Elephant Camp

A detailed morphometry and medical data of the four camp elephants of Tesso Nilo: Indro, Rehman, Lisa and Riau, was collected and is available with the authors. Overall, all the elephants were in excellent health conditions despite having moderate degrees of worm infestations (three out of four). Blood samples were collected for haematology, biochemistry and to study blood smear for haemoprotozoa.

A survey of the grazing fields of the elephants revealed a good number of grasses and shrub species in abundance, which is preferred by the elephants. There was no need to give any supplemental food to the elephants as such, however it was suggested that at least some palatable feed (like pulses with molasses and salt) once daily be given to the elephants after they return from the grazing ground. Just two kilograms per animal per day would suffice in the present condition. This is required as an incentive for them to return to the camp if they become lose by chance some day. Moreover, this practice of feeding tasty food to the elephants by the mahouts improves their relationship and also makes administration of oral medicine easier. However, it is important that when elephants are used for koonkie operations, they may not have sufficient time to graze and on such occasions, 5-6 kg of the soaked ration is to be allowed to each elephant. Mineral mixture should be given regularly.

The water quality in the nearby river was found to be good. The river is just 10-15 minutes walking distance for the elephants from the camp. The depth of the water was enough for the elephants to bath properly even in the dry season. It was suggested that the elephants are bathed by properly scrubbing at least once daily. Foot care should also be taken at the time of the bath.

The biggest problem was the unavailability of a vet nearby. It is suggested that an experienced vet visits the elephants once a month to administer vaccines and deworm them according to the protocol suggested for the Minas elephants. The senior mahout was taught how to administer injections intramuscularly when very serious condition demands but only as suggested by a vet.

Proper record keeping is extremely essential so it was good to note that an individual file for each of elephant was maintained. An individual service book as suggested for the elephants of Minas should be created and maintained properly too. There should be separate medical registrars.

The rope work and fitting of saddletree was examined. They are using plastic ropes both in the neck as well as in the girth as jute ropes are not available. The practice of covering of the plastic rope with fire hose to avoid rope burn injuries is well thought out. Their use of jute sacks on the back for the back rider during koonkie operations is comfortable for both rider and elephant. A piece of rope tied on both sides of the girth rope on the back turning it from below the tail was demonstrated as used in Assam. To avoid injuries to the soft tissues below the tail, a bent metal pipe is used in Assam which is called a *Domsi.* The rope below the tail is passed through this tube. This rope will give stability to the saddle and give a hold to the rider on the back.

## Suggestions for koonkie operation

Certain working tips were suggested to the mahouts for chasing away crop raiding wild elephants.

1. Always properly fit the saddle, etc.
2. Always carry fire crackers, a loud speaker, a torch light, drinking water and knife.
3. Always carry a spear. During koonkie operations in the deep forest, the second rider should carry the spear as the mahout has to clear his way by cutting the hanging branches or creepers. In the open, the mahout should carry the spear as he will have to face any challenges that might come on rare occasions.
4. Never split from the group. Elephants and mahouts derive courage from each other and are likely to be more effective and safe when operating in a group.
5. Do not go too close to the wild elephants.
6. Do not walk into swamps.
7. Always try to maintain high ground.
8. Always be brave! Never lose heart. Elephants get their courage from yours.
9. Examine your elephant for any injury or abrasions after each return and render first aid. Give supplementary food.

The plantation companies and the local community occupy prime elephant land in the area for palm oil, rubber or Acacia-eucalyptus plantations. The adjacent proposed Tesso Nilo National Park has been subjected to massive illegal logging and on my first visit, I biked deep inside the forest (11 km, surveying about 50 sq km) to study the forest quality and found not a single tree of the original forest in the entire area. Everything was invaded by acacia. Elephants do not feed on acacia and this has compelled wild herds to raid palm oil plantations.

On my second visit, when a herd was seen in the area, I found them foraging on the alpinia fodder that has grown secondarily under the old (6-7years) acacia plantations. On the other side of the road some good fodder was still intact and it was clear that the elephants visit the area in search of food. Elephants do not forage in a confined area and instinctively move on to avoid

overgrazing of a certain area. This is what we call as sustainable use of the forests by its natural inhabitants. Their dung and the broken twigs add to the biomass and improve the forest quality. Elephants need enormous amounts of grass and therefore, cannot live in a badly degraded forest. Keeping these in mind, there is a necessity of educating the community to avoid further damage of the forest. The WWF flying squad of koonkies alone can not deter the wild herds from damaging the crop fields. The matter should also be taken up with plantation and paper pulp companies as they have a heavy responsibility in triggering human-elephant conflict. WWF should organise local vigilance committees with participation from plantation and paper pulp companies. After a thorough study of elephant movement routes, other proven mitigation methods should be used wherever possible such as:

1. Elephant trench.
2. Solar powered electric fencing.
3. Solar powered street lights in the elephant's cross-over routes.
4. Roadside fires in strategic points.
5. Use of firecrackers, loudspeakers and beating of drums.
6. Burning of chilly cakes

The entire obligation or responsibility of crop protection should not be taken by WWF alone as it will be difficult to sustain this in the long run. People must help elephants to help themselves.

## A word on deployment of elephants

The deployment of elephants has many short- and long-term benefits.

1. The captive elephants can effectively minimise the man-elephant conflict and when that happens, the demand/reason for capturing more wild elephants will drop.
2. The elephant training centres are already crowded. Their vegetation cannot support the resident elephants. When they are posted out, they can get better food and fodder because of fewer numbers of elephants in one place.
3. The elephants earn their livelihood instead of being parasites on the state.
4. There is a long-term benefit. The people around the posting sites get to see the elephants and their effectiveness up close. They will also feel that the mammoth animal is a friendly and noble creature and not a hostile beast. The elephant is a known crowd puller and people will start seeing them in a better light. The people's general apathy will be replaced by strong public opinion in favour of elephant conservation. The government will also be pressurised to act according to the public sentiment. Only a strong public opinion can save the elephant, not any government action alone.

# Asia Pulp & Paper Elephant Facility

The APP elephant park was started in 1989 to relieve pressure on the state-owned Elephant Conservation Center at nearby Sebanga-Duri. The elephants with the paper giant are still owned by the state. The animals were deep inside the grazing forests during our visit to the park and we could not make a physical assessment of their health status. However, a mahout present in the camp has reported that all the elephants are apparently healthy and have no physical or behavioural problems.

The facility has two well constructed elephant houses for tethering eight elephants. Strong round wooden pillars, 120 cm in circumference and 550 cm in height, has been used. The floor space for each elephant is 400 cm X 500 cm, with a mild incline backwards and a good wide drain on the rear. The roof is of galvanised iron sheets and the height of the houses at the top is nearly 600 cm. There is a row of pillars (four in one row) separating each cubicle and a strong wooden plank (12 cm X 5 cm) has been bolted on both sides of the pillars. The houses are robust, the floor concrete. There is a concrete water tank of about 5,000 liter capacity near the elephant houses for drinking water that hasn't been used for quite sometime.

There are a lot of trees surrounding the area and since the elephant houses are on a height, it catches cool breezes.

The elephants graze together in the forest and have ample opportunities to socialise. There is a football ground adjacent to the houses which are used by the elephants to playing football. The facility looked quite impressive. The list of the elephants (four male and four female) are given in the annexure-1.

Here again, despite the mixed sex group of elephants living together for over 20 years, no reproduction has taken place. This can be an indicator of some intrinsic problems and need to be thoroughly investigated.

# Sebanga Duri Elephant Conservation Camp

The Sebanga-Duri Elephant Conservation Camp was established in Riau province of East Sumatra in 1988. This centre housed more than 50 elephants till 1998 till the camp had to be partially shifted to Minas because the local people almost destroyed the adjacent forest and settled in the camp area. Forest land was converted to palm oil and rubber plantations and there was a scarcity of forages and grazing area for the elephants. Presently a skeleton camp is being maintained with nine elephants.

Because of the large scale transformation of land and moving of earth in the adjacent areas, the camp area appeared swampy and unsuitable for elephants and people. However, there was a lot of swamp grasslands that looked good for the elephants but may be a source of parasitic infestations. They are presently deworming the elephants with Manil. Except one female, Epi, all other elephants were average to good in health. Epi's health condition was very poor.

The mahouts and the camp administration appeared to have lost their enthusiasm probably because of the shifting. They all looked very resigned. The camp may be retained for now, but needs to imbibe some new spirit. The camp elephants should be attended by a vet once monthly. The animals need foot care as some of the elephants were found with overgrown sole and nails.

The water in the ponds of the camp was muddy and unfit for consumption by the elephants. Probably fishing in the ponds by local people was responsible for damaging the water quality; Mikota (2000) also reported very high levels (toxic) of lead, cadmium and iron in the water of Sebanga.

# Pekanbaru Ulin Zoo

Four elephants are being kept in the Pekanbaru Ulin Zoo as exhibits and to offer joyrides to visitors. The list of the elephants is available on request. It is a privately owned zoo that purchased two elephants from the KSDA. The remaining still belong to KSDA. Since the elephants were already out for grazing, we could examine one female elephant. Her condition was average and it was clear that she was underfed and undernourished. The owner admitted that there is food scarcity due to the dry season and reported that the elephants are regularly dewormed by a vet who periodically visits the zoo. He stated that the elephants have no physical or behavioral problems as of now.

We advised him to immediately improve the feeding ration of the elephants by including good quality grains and arrange fodder from elsewhere during the scarcity period. Using captive elephants for joy ride should be encouraged in a country like Indonesia because this will help create awareness and love for the animal.

We also suggested the owner to visit Bukittinggi Zoo where Dr Wishnu works to see the good elephant management practices.

# Model For An Elephant Camp With Fifty Elephants

## Selection of camp site:

1. The site of the camp should be as close to natural elephant habitat as possible. This will help avoid the stress of transporting newly captured elephants. Moreover, the climate and vegetation will be similar which will help quick acclimatisation of the elephants.
2. The camp site must have a perennial and clean unpolluted water source like a river. The water level should be examined in the dry season and water quality needs to be tested not only for contamination but also for the level of various heavy metals like lead, selenium, aluminum and fluoride etc.
3. The camp should be connected with a motorable road, but should not be near a public road.
4. There should not be any village nearby with livestock population to avoid spread of infectious diseases to the elephants from the domestic livestock population.
   There should be a minimum of 150 hectares of land with forages per elephant to be stationed in the camp. The forest should be rich in natural bamboo, wild banana, alpinia and such other vegetation that the elephants forage upon. The camp land should be well protected by law against conversion attempts.
5. Only a sufficiently big area with natural vegetation can sustain the grazing by 50 elephants. The forest will have to be managed professionally to avoid degradation. Mahouts should be asked to rotate grazing to avoid over-grazing a particular area.
6. For cultivation of grass to be supplied during the dry season, a level land (10 hectares) should be available with the camp.
7. A township should be available at least within 10 kms from the camp headquarter with school, hospital, shopping complex and recreation center.
8. Electricity supply.

## Physical facilities required:

1. The tethering site (pilkhana) should be well drained and have a lot of shady trees. Elephants

tethering poles (wooden) should be fixed; if elephants are constantly tethered into trees, the tree will die because of bark damage.

2. An elephant shelter house for housing old, sick and pregnant elephants is required. Robust elephant houses constructed in APP can be followed as model. The facility has two well constructed elephant houses for tethering eight elephants. Strong round wooden pillars, 120 cm in circumference and 550 cm in height has been used. The floor space for each elephant is 400 cm X 500 cm, has a mild incline backwards and a good wide drain on the rear. The roof is of galvanized iron sheet and the height of the houses at the top is nearly 600 cm. There is a row of pillars (four in one row) separating each cubicle and a strong wooden plank (12cm X 5cm) has been bolted on both sides of the plank. The houses are robust, floor is concrete. There is a concrete water tank of about 5,000 liter capacity for providing drinking water for the elephants near the houses. One small walled house is required for housing rescued, orphaned or abandoned infants.
3. Elephant health centre equipped with doctors chamber, clinical laboratory, running water, desk-top computer, drug storage, library, surgical kit, and remote injection equipment, dressing hose, baby calf feeding bottle etc.
4. Managers Office with all facilities.
5. Community kitchen and dining hall cum recreation center.
6. Feed store.
7. Barrack for bachelor mahouts.
8. Staff quarters for the manager, veterinarian and senior mahouts and office staff.
9. Sanitary system and supply of clean water.
10. Tractor with trailer for fodder cultivation, supply of fodder, banana stem etc.
11. Staff bus/school bus.
12. One pool vehicle for the manager and the vet.
13. Five wheel-barrows for carrying feed and five for cleaning pilkhanas.
14. Elephant restraint chute.
15. Elephant training facilities.

## Staff requirement:

1. Manager - 1 (one)
2. Veterinarian - 1 (one)
3. Veterinary assistant - 1 (one)
4. Mahouts - one for every elephant plus one extra against every five. The senior most and most experienced mahout should be designated as head mahout.
5. Drivers - 3 (Three)
6. Helper of bus driver - 1 (one)
7. Staff cook and assistant - 2 (two)
8. Office assistant - 1 (one)

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