Gajah

Securing the Future for Elephants in India

The report of the

Elephant Task Force

Ministry of Environment and Forests

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जहाँ है हरियाली ।
वहाँ है खुशहाली ॥

Acknowledgements

Over the few months of its existence, the Elephant Task Force has accumulated many debts. On behalf of the Task Force I am especially appreciative of the Hon'ble Minister of State for Environment and Forests, Shri Jairam Ramesh for having given me and my distinguished colleagues this task. He has been supportive and helpful at all times.

It is also a pleasure to place on record the sterling work of Mr. A.N. Parsad, Director, Project Elephant and a distinguished and highly experienced officer of the Indian Forest Service. He not only went out of the way to facilitate our tasks but also made several valuable suggestions. His office and staff were also helpful in every way and deserve our thanks.

It has been a privilege and honor for me to work with the members of the Task Force all whom have contributed with zeal, zest and energy. It is not commonplace to find such a spectrum of talents and a wealth of experience as it has been on the Task Force. It is especially positive that there was a sense of team spirit at all times. I record my debt of gratitude to each and all the members.

The Principal Chief Conservators of Forests and Chief Wildlife Wardens of the 18 Elephant Range states, their colleagues and staff were also helpful. A special word of thanks to those who found time to join us in our deliberations, or responded to queries. The Task Force owes special thanks to the Forest Departments of Karnataka, Orissa, Kerala and Assam for their hospitality. The temple of Guruvayoor and the Mysore Zoo were most helpful in our field visits. We thank the managements and also the staff for their briefings and cooperation.

Public hearings were organized at the Centre for Ecological Sciences, Bengaluru, the Kerala Forest Research Institute, Peechi, and by the State Forest Departments in Guwahati and in Bhubaneshwar. A hearing for the Northern Region was held at the Ministry of Environment and Forests, Delhi. All help given is deeply appreciated.

The communities of elephant conservation and captive elephant care in India may be small but are diverse, some times vocal and always vibrant. It is a matter of satisfaction that the Task Force received as many as 121 written submissions, some very detailed and meticulous. The Hearings were marked by extensive, open debate and often yielded very valuable insights and suggestions that (we hope) inform the tone and tenor of this Report.

Several individuals, scientists and foresters, students and scholars, Mahouts and farmers, Panchayat representatives and cultivators, elephant lovers and vets, as well as members of a host of voluntary citizens' groups informally contributed through sustained conversations, by e mail, in phone and more so in person. These diverse voices are evidence enough of how many people will for sheer feeling for the cause stay with the issues raised here long after this Report has been submitted. We are grateful to them all, most so to those we met on field visits. We have tried in some small way to suggest platforms where their energy can contribute not only to dialogue but to ways to generate working approaches to the problems faced by the subject of our Report, the elephant.

The Wildlife Trust of India provided a base for meetings of the editorial team. Several members of the staff contributed in myriad ways to enabling this report to be put together. In particular, I would be failing in my duty if I do not thank by name those whose help was invaluable. Sandeep Kumar Tiwari has been a constant presence with his boundless energy. John Kunjukunju, Sheren Shreshtha, and last but

by no means the least, Nisha Kumar who put in a lot of work on production. A special word of thanks also goes to the energy and creative talents of the communications team of Sharada Annamaraju, Sapna Yadav and Namrata Anand.

In conclusion, it might be added that the Task Force was charged with the task of assessing and formulating an overview of how India ought to better care for its elephants, wild and captive.

While we have tried to be synoptic and positive, we are aware of our shortcomings given the constraints of time. The usual disclaimers apply. The Task Force and its members accept responsibility for any errors of fact or interpretation. We trust that even in error we may have helped if in a small way.

Mahesh Rangarajan
Delhi, Saturday 28 August 2010.

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Executive Summary

Securing a future for the elephant in India, its continued survival in the wild and its humane care in captivity constitute a major challenge.

They call for drawing on the best in our communities of knowledge and governance.

The Task Force is crystal clear on one point. India *can* secure the future for Gajah and its forest home.

It will be a challenge but one we possess the ability to surmount, provided we have the will, demonstrate the wisdom and deploy the means necessary.

It is not immediate extinction as much as attrition of living spaces and the tense conditions of the human-elephant encounter on the ground that require redress.

As a long lived and sociable animal familiar to all of us since childhood, elephants may seem to require little help. But the shrinking of habitat and the selective killing off of tuskers in key populations by ivory poachers are cause for grave concern.

Elephants in captivity are close to our hearts but there are times standards fall short of the humane treatment and welfare they are surely entitled to. Their care givers, Mahouts and veterinary doctors too need recognition and better amenities.

Project Elephant has, since 1992, done much commendable work. But its successes notwithstanding, it needs more than an accretion of resources.

Elephant habitats are under immense pressure. Rapid economic expansion and development pressures require far more attention to land use plans from an ecological perspective. New knowledge needs to be brought to bear in population and habitat assessment.

Above all, systems of mitigation to alleviate human-elephant conflict need to re-energise and be made much more accountable.

To accomplish this requires administrative overhaul and better machinery. The Task Force strongly favours new institutions and mechanisms to achieve these wider objectives.

We need a new **National Elephant Conservation Authority (NECA)** on the lines of the structure for tiger conservation. Nestled with it will be a new **Consortium of Elephant Research and Estimation (CERE)** who will develop and apply the best methods for enumeration. Transparency of methods and results will uphold standards and inculcate a scientific temper.

Along with similar changes at the state level, there will be a new category of **Elephant Landscapes**. These, ten in number will include the existing and proposed 32 Elephant Reserves.

While no new reserves are proposed, there will be a consolidation of the existing reserves. Over 40 per cent of the Elephant Reserves is not under Protected Area or government forest.

The Task Force favours **Ecologically Sensitive Area status** under the Environment Protection Act to regulate activity that may be ecologically negative.

Elephant Corridors that link critical populations had already been identified prior to the Task Force by scientists, administrators and reputed voluntary organizations. We have now ranked the Elephant Corridors according to priority and feasibility for action. Our main emphasis is on innovative methods to secure habitats beyond the Protected Areas. These could include Community or Conservation Reserves, Ecosystem Services payments and conservation easements. Protected Area expansion can also be considered but so too can other measures. These will forge partnerships and reinforce alliances for conservation at ground level.

It is vital to stress that elephant conservation is about combining quality science with humane administration. A mobile mega herbivore, *Elephas maximus* is often in sharp indirect or direct conflict with our own patterns

of land use. While securing viable habitats, there has to be accommodation in other zones, to enable wildlife and people to be compatible.

The increased financial outlay of Rs. **600 crore over the 12th Five Year Plan** period has sound logic to back it up. A third of the allocation will be to secure vital habitats that serve as links between populations that may be cut off. Rather than land acquisition which is often conflict prone, we propose a range of other instruments from conservation easements to Community Reserves.

Similarly, human-elephant conflict requires urgent redress, and not only for making good loss of crops or homes. It requires preventive measures that can be monitored, verified and held accountable. **One sixth of resources asked for are earmarked for conflict issues.**

The Task Force favours a permanent and continuing mission in high conflict zones, with innovative methods to alleviate tragic loss of life of both humans and animals. **Conflict Management Task Forces** can commence work in known zones of high conflict. These will include experienced foresters, scientists, wildlife vets, and social scientists.

Elephant human conflict is a wider phenomenon than these foci of high conflict. **Mandatory *taluka*-level hearings** at different times in the sowing and harvesting season in all conflict areas can bring together affected citizens, officials and elected representatives.

Given the Elephant Reserves cover 65,000 square kilometres and that this is a vital input into larger land use planning, the proposed outlay is necessary and justifiable. The Task Force appreciates need for transparency. 50 Crores is for research, monitoring and study vital for sound policy.

It has suggested specific ways to bring elected representatives and those with domain knowledge in close and continuing contact with local citizens through appropriate forum. **Elephant Reserve Committees** will enable redress, consultation and transparency.

Bringing science, administration and applied social science together is the key. Protection in the wild with conflict management to help both humans

and elephants will demand Herculean effort. So will upgrading care of elephants in captivity, with **Citizens Elephant Welfare Committees**.

Assuring Gajah a future for tomorrow will require resources today, whether living space or funds, the application of the best of technical and scientific knowledge or the fashioning of responses that makes partners of citizens who live in proximity with the species.

But it is an effort well worth the making. Beyond the specific gains of ecological security, the *in situ* conservation of elephants will undoubtedly bring, it is time for a paradigm shift for conservation in India.

The elephant-oriented efforts, both preservation and conflict resolution, can act a bridge between those who value ecosystems and others who work for betterment of the less privileged. By putting the programmes outlined in this report, India can blend sound science with citizen participation, sensible planning to avert environmentally destructive practice with retaining critical habitats intact.

The outlay includes smaller allocations for outreach. India's children and youth especially those near elephant landscapes are a vital force for the future. **Gajah Centres and an elephant awareness campaign** can bring civil society actors to fore. A place in our hearts is vital for the future of our country's largest (if often gentle) inhabitant.

An **International Elephant Congress** of the fifty elephant range states and an **Asian partnership for Gajah** will see India play a positive role for scientific and ecological cooperation.

But the immediate initiative will be to **re-energise the protection machinery with a recruitment drive giving local youth, especially the Scheduled Tribes preference.** To assess how conservation proceeds, the new consortium for enumeration and research also needs to get off the ground. A well equipped forest staff, with the best and most transparent scientific assessment system for numbers and habitats are vital elements of conservation. They need urgent action.

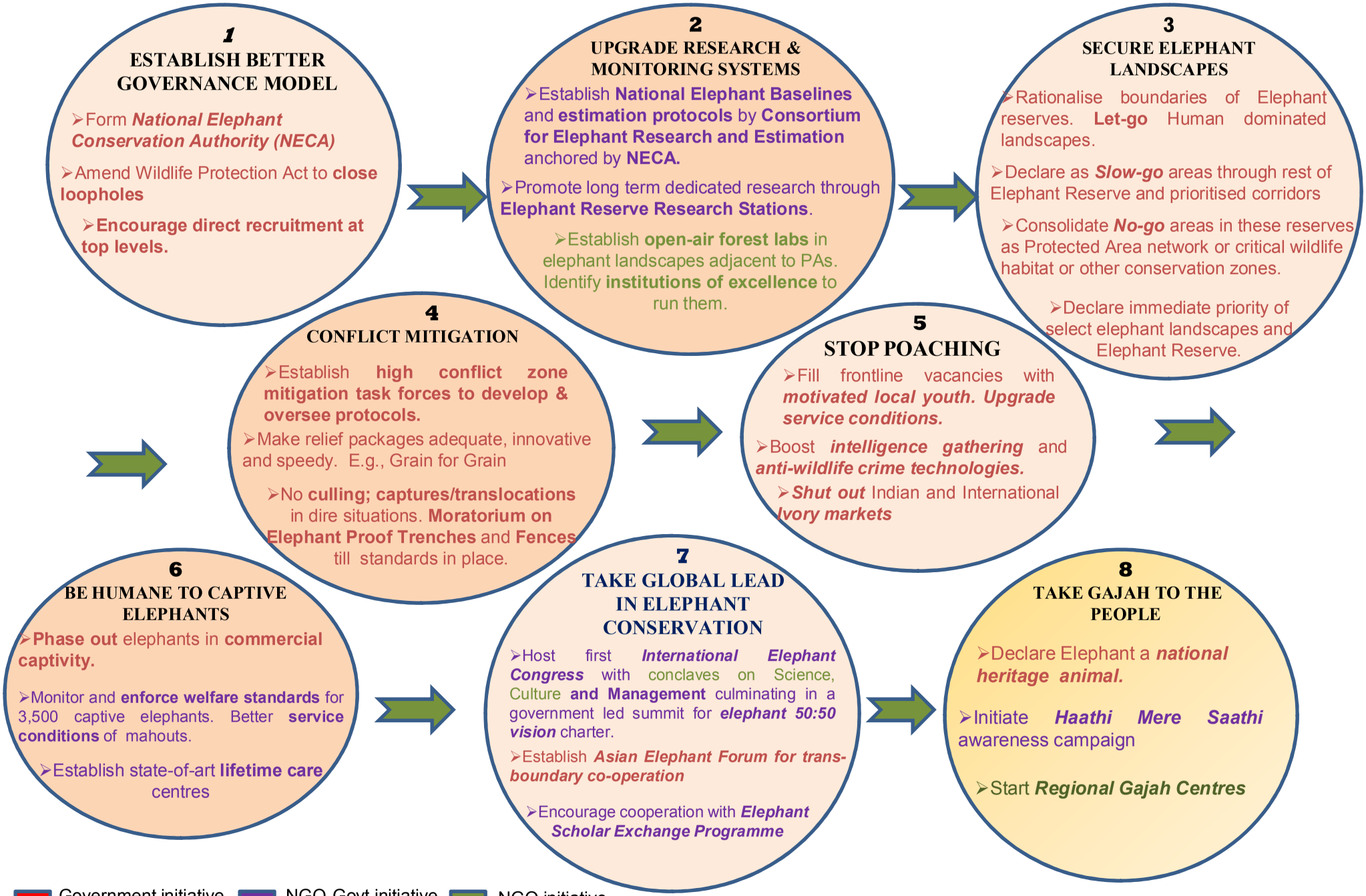
Gajah is a symbol of a search for better compact with nature, our land and our common natural heritage. The rest of Asia and the world look upon us to rise to take a lead.

So declaring it the **National Heritage Animal** will give it due place as emblem of ecological sensitivity. It will also mark recognition for its centrality in our plural cultures, traditions and oral lore.

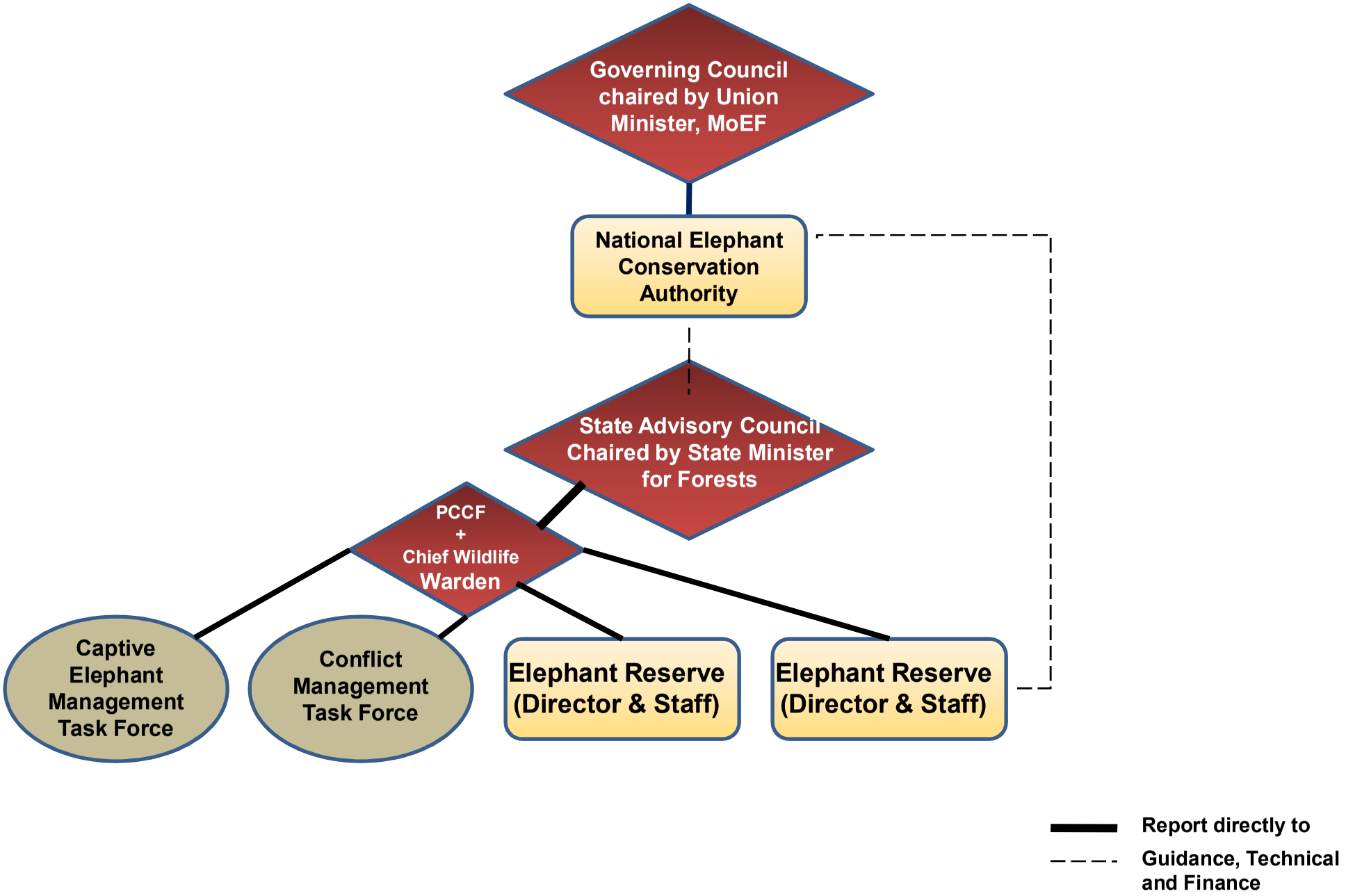
Someswara wrote almost eight centuries ago, it is the realm with many elephants in its forests that will be truly most secure.

India cannot fail Gajah. The latter's survival and ecological security is linked to our very own.

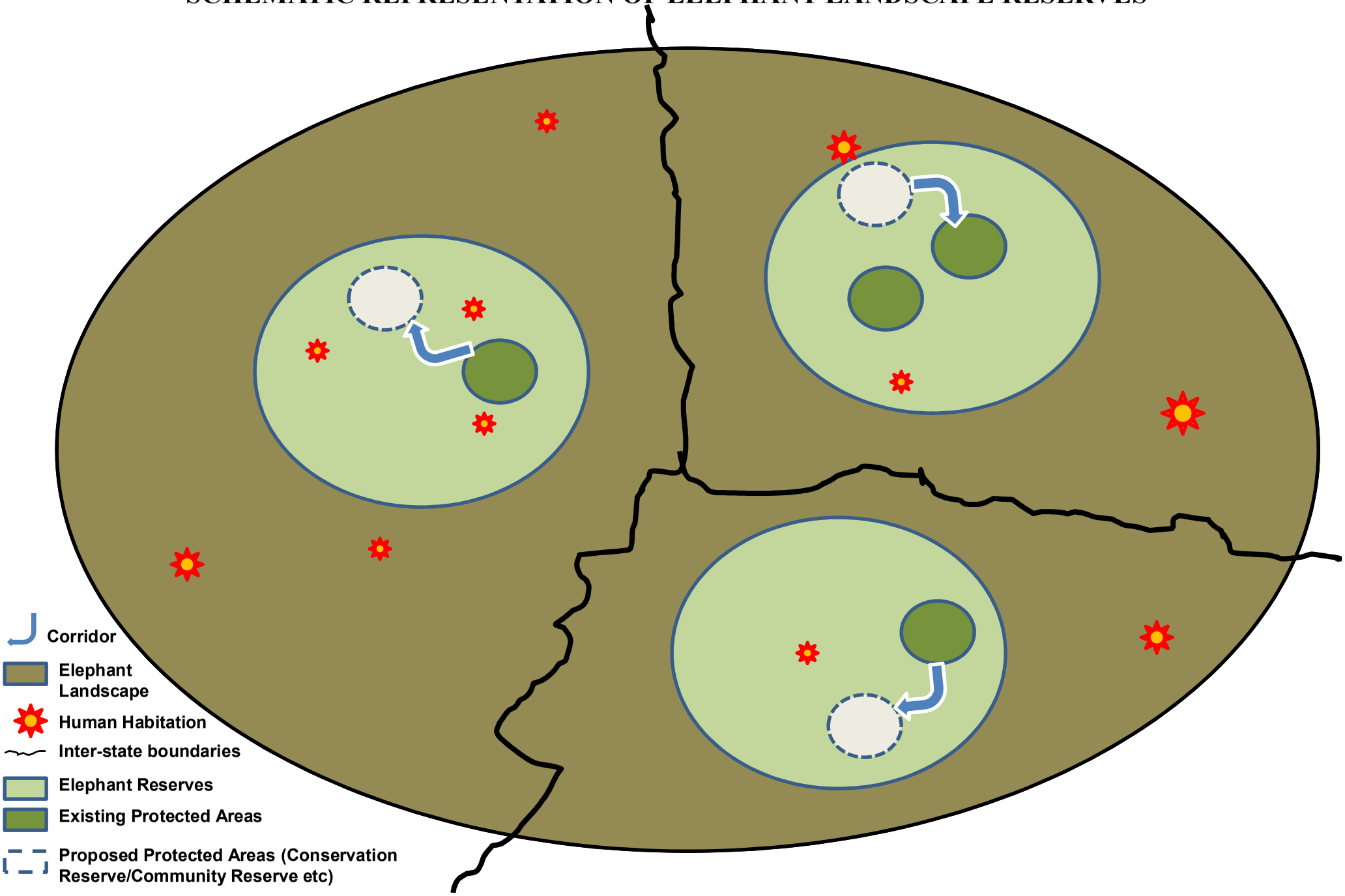
MAJOR RECOMMENDATIONS OF THE ELEPHANT TASK FORCE



PROPOSED STRUCTURE OF ELEPHANT CONSERVATION AT UNION AND STATE LEVEL



SCHEMATIC REPRESENTATION OF ELEPHANT LANDSCAPE RESERVES



CHAPTER 1

Introduction

Securing the challenge of conserving elephants in the wild and of ensuring humane care in captivity is symbolic of the wider dilemma of living in harmony with nature in India. No animal better symbolizes our cultures and few have such major presence across diverse ecosystems as this flagship species. But there is more to securing the future of the elephant than knowledge of its biology.

The ecological and behavioral characteristics of elephants in the wild are the necessary starting point but the challenge of conservation begins within our broader social milieu. As our country's economic base expands, the challenges for *in situ* conservation in general and of large vertebrates in particular will be more, not less intense. But the challenge is both societal and scientific.

An India with elephants living securely in the wild, and in humane conditions if in captivity, is still within reach. Such a goal if attained not in full measure but very substantially can have wider resonances. It is also of importance beyond our own borders. Possibly as many as six of every ten wild Asian elephants live in India.

As for its future, there are grounds for both hope and concern. The most recent estimate of the wild population of elephants in India is over 26,000 elephants. While population estimates may be revised as more rigorous techniques are developed, what they do show is that the elephant does not confront crisis of the sort the tiger has faced in the recent past. Its visibility and presence across diverse ecosystems is probably greater than that of the magnificent big cat.

India is also home to 3500 captive elephants, with ancient traditions of captive care. Even as science unlocks secrets of their lives in the wild, new knowledge informs us about their complex social relationships.

Forest reservation helped halt agricultural expansion. Protected Areas provided refuges. Sustained measures have brought the levels of poaching for ivory under control. The respect, tolerance and fellow feeling accorded to these huge neighbors by most people have helped its survival.

But there is no reason for complacence. Poaching of male elephants for tusks has declined but there are well-researched populations showing that the after-effects are all too real, with the males being too few and sex ratios heavily skewed towards females. Large developmental and infrastructural projects when not planned or located with adequate care are fragmenting habitat, while other local pressures degrade them.

Elephants cannot survive simply through strict protection of a few parks and sanctuaries. A sole focus exclusively on Protected Areas, vital as they are, is inadequate for the long term conservation of this keystone species. Habitats outside reserves may often be crucial especially if they are corridors or links between large tracts of habitat.

Yet, we cannot overlook how economic, social and cultural demands will take priority outside the boundaries of parks and sanctuaries. Any interventions in such areas have to proceed on a different set of premises, involving local stake-holders. Participation and incentives, planning and conflict management not merely exclusion will be critical.

Even more so securing elephants and their habitats and containing conflict with people has the potential to give conservation in India a new direction. It is no mean task and the odds are immense.

But we *can* succeed. Indeed we must: failure is too high a price to pay. Success requires that policies be better informed with sound science. Landscapes vital to viable populations of elephants have to remain intact. Careful land use planning can minimize the irretrievable loss or fragmenting of habitat.

Gajah and Prajah

The survival of the elephant depends even more on taking its cause to the people. *Gajah* (the elephant) and *Praja* (the people) have to go together. Losing sight of either dimension will harm both.

The elephant is more than a symbol of our cultures. It is an animal that has fascinated the best of our poets, writers and singers across the ages. Its sociability and intelligence are proverbial.

Elephas maximus is a keystone species in the Asian tropical forest. It can act as an umbrella or flagship for conserving biodiversity. *Gajah* can help save critical parts of the land mass that will be functional ecosystems representative of Asia's biomes. And also serve as a living library for science, store of genetic wealth and place where we can continue to learn how nature works.

But elephants and people are often in conflict. Asia's largest vertebrate, requires living space, food and water, and the search for these often conflicts with human aspirations and needs.

Wild populations can only survive if the landscapes they live in remain intact. This was not as much an issue in the past centuries but demographic growth, the expansion of agriculture and the growth of industry and infrastructure have fragmented habitats.

Human–elephant conflict is also a matter calling for serious attention and action. Every year over 400 people lose their lives to elephants, and these are mostly cultivators or labourers. In turn, more than half of the 100 elephants killed each year are in defense of crops.

The stress, suffering and loss are all too real. It is tragic for elephants as well as humans are both victims in the conflict. Both are victims of victims.

Crop compensation and *ex-gratia* payment for the loss of human life (in a very small way) are important facets of elephant conservation in India. But the issue requires much more sustained and knowledge based programmes that alleviate distress, but also address underlying factors that exacerbate conflict. The best of our country's skills in science and humane governance have to be brought to bear on this issue.

A Future for Gajah

The future of wild elephants rests centrally on how best India secures their habitats. Population and habitat management have to take account of sound ecological principles. But the tactics can vary. The local textures of land use, society and culture across vary greatly across India's elephant habitats. The ecological and social diversity is easy to take note of but difficult to appreciate in coming up with a response. Elephants in India are distributed across four large regions, each with several sub-populations from small herds in isolated forest patches to several thousand elephants within large interconnected landscapes.

The complex contours of the elephant conservation scenario were recognized by a previous Task Force two decades ago and built into the founding principles of Project Elephant in 1992. Since then, Project Elephant has had significant achievements. The 65,000 square kilometers in the 32 existing and proposed Elephant Reserves include Protected Areas and forests as well as zones of human use and habitation.

From the outset, the objective was to consolidate preservation in the parks and sanctuaries. But since these form less than 30 per cent of the Elephant Reserves, it is land-use planning that has been the major challenge in the rest of the landscapes.

Despite significant achievements, there have been shortcomings. The goals were spelt out but the means to get there were lacking, and not merely in a narrow financial sense. Coordinated interventions for land-use planning outside Protected Areas or to secure corridors required a far wider range of instruments of intervention. Further, the mitigation of conflict in a transparent manner and science based planning of reserves needed substantial strengthening.

Finally, Project Elephant's efforts to improve the welfare, status and standards of captive elephants and their care-givers even when assisted by active civil society groups needed more focus.

Above all, the efforts lacked sharp focus and attention at the highest level of government. The fragmentation and degradation of habitat is a serious issue and cannot be addressed without major overhaul both of administrative machinery and of official policies. Timely action can avert crises, and effective governance make people partners in protection.

A Mission Renewed

There is, to put it simply a need for a renewed sense of purpose. India can and should take the lead in protecting Asia's elephants.

In doing so, it needs to take Gajah back to the people. Far more than any wild animal it is a species that children and adults alike are familiar with. But this goodwill has hardly been harnessed with a wider message of conservation and awareness of animal sensibilities, or of our lore and cultures. The elephant needs pride of place in our national life and it also needs to be

restored not just in its beleaguered habitats but in the hearts and minds of our people.

The Elephant Task Force has made several specific recommendations. These extend over different facets of governance and research, the securing of landscapes and mitigation of conflict, anti poaching and ivory trade measures and compassionate and humane care for captive animals.

But to secure the future for Gajah, the key is in our perceptions as much as in policies and programmes. Declaring it the National Heritage Animal will recognize its dual identity as our symbol of ecology and of culture. Taking Gajah back to the people through a host of outreach programmes, most of all in and around its habitats, will bring on board children and young people who will share their lives with this remarkable animal in the 21st century. Finally, India ought to take the global lead in Elephant Conservation, with an International Elephant Congress and broader cooperation with Asian neighbors.

Any such efforts at the popular or global level will eventually be tested on the ground. The Task Force is convinced that India can give Gajah a secure future. An India without elephants is unacceptable. But an India with elephants requires sustainable approaches that work on the ground.

The best of our science and our democratic institutions have to mesh together and solve real life problems and crises. A future for Gajah depends on how solidly we can rise to the challenge of the hour.

CHAPTER 2

Establishing a better governance model

Project Elephant was launched by the Government of India in the year 1992 as a Centrally Sponsored Scheme of the Ministry of Environment and Forests (MoEF). It was intended to provide financial and technical support to the elephant range states of India for the protection of elephants, their habitat and corridors and address issues of human-animal conflict. It also sought to promote welfare of captive elephants. Administratively, it formed one division of the Wildlife Wing of the MoEF.

The main stated objective of Project Elephant is to ensure long-term conservation of viable populations of the Asian elephant (*Elephas maximus*) and its natural habitats in India.

Against this overall prime objective, the immediate goals of the Project Elephant scheme are:

- Ecological restoration of existing natural habitats and migratory routes or movement paths of elephants.
- Development of scientific and planned management programmes for conservation of elephant habitats and of viable populations of wild Asian elephants in India.
- Promotion of measures for mitigation of human elephant conflict in crucial habitats and moderating pressures of human and livestock activities in crucial elephant habitats.
- Strengthening of measures for protection of wild elephants from poachers and unnatural causes of death.
- Research on elephant management related issues.
- Public education and awareness programmes.
- Eco-development.
- Veterinary care.

- Technical and administrative assistance to states in fulfilment of the above.
- Facilitate, enable and encourage research on elephants, their ecology, behaviour, habitats and elephant-human relations in the wider sense.

While the MoEF oversees and guides the project, it is the concerned state governments which implement programmes.

The **strategy** being adopted for this is two fold:

- A Steering Committee for Project Elephant has been constituted which includes representatives of the government as well as non-government wildlife experts and scientists. Besides, the Chief Wildlife Wardens of the 12 elephant range states, and the heads of four premier institutions, namely the Wildlife Institute of India (WII), Zoological Survey of India (ZSI), Botanical Survey of India (BSI) and Indian Veterinary Research Institute(IVRI) are permanent invitees to the meetings of the Steering Committee. The committee advises the centre on project related issues.

- The central government, through a centrally sponsored scheme, arranges for and provides financial, technical and scientific assistance to the states having free ranging populations of wild elephants, on approved items of work that directly or indirectly contribute to ensuring the long-term survival of identified viable populations of elephants in their natural habitats.

In spite of the project working for almost 18 years and the fact that the measures and programmes taken up for the conservation the elephant have shown some encouraging signs, Project Elephant itself has not been able to grow and take a leadership role in elephant conservation in the country. Although the current population estimates of elephants in India generally show an upward trend, the selective elimination of the males has resulted in a skewed sex ratio in some parts of the country threatening the viability of elephant populations. Human-elephant conflict is on the

rise and is currently at an all time high, but financial allocations to deal with the problem have not increased proportionally.

It is therefore felt that the organisational framework under which Project Elephant works be given a re-look and be revamped so as to give more teeth and financial strength to Project Elephant.

***What should the institutional framework of Project Elephant be*?**

There were three possibilities that the Task Force considered. The first was to convert Project Elephant into a statutory body like the National Tiger Conservation Authority (NTCA). The second was for it to take the shape of a society like the Wildlife Institute of India (WII), with autonomous functioning. The third was to let things be structural i.e., let Project Elephant be a Directorate within the Ministry and strengthen it.

To consider the first option, i.e., to bring it on line with NTCA, Project Elephant has to be declared a **statutory authority** through an amendment of the Wildlife (Protection) Act with administrative powers and legal backing to ensure elephant conservation.

While debating this, it was kept it mind that it was important to remember that the NTCA manages Tiger Reserves which are completely within the Protected Area Network and hence the management of a Tiger Reserve is easier as it allows for better coordination between the Union government and the state governments.

Elephants, being long ranging animals, render the concept of Elephant Reserves (ER) much beyond the boundaries of a PA. Only about 27 percent of the area of ER is legally protected under the PA network. Almost 30 percent of the ER is outside the purview and control of the MoEF and State Forest Departments. In such a scenario, unlike Project Tiger, the conservation of elephants requires better coordination and support of other ministries and a much higher financial support.

Besides, in the current Centre-State relationship where the state wishes to work in a more autonomous and independent style, the directives and

suggestions from a central statutory body is taken as impinging upon their right of managing the local biodiversity in an independent manner.

Hence, for better coordination between MoEF and various other ministries, financial stability and autonomous functioning, it was suggested that Project Elephant be registered as a ***Society*** chaired by the Hon'ble Minister of Environment and Forests.

While this gives autonomy to the running of the National Elephant Conservation Authority (NECA) and will bring in additional funds from outside the government system, a major drawback for this was that members felt that this would render Project Elephant ineffective in Centre-State dialogues. While this could work in case of research institutions such as the WII, it would be a serious impediment to the governance of elephant related issues.

Additionally it was felt that sticking to *status quo* would also be a retrogressive step and non reformatory in nature when the challenges facing the elephant are immediate and enormous in nature.

Recommendations

It is thus recommended by the Task Force that Project Elephant be converted into a statutory agency on the lines of NTCA and the relevant amendments in the Wildlife (Protection) Act be carried out for such a change to be made. The Task Force further recommends that this new body be called the (NECA).

The following structure is recommended for the newly constituted NECA at state and central levels:

Governance at Union and State levels

The Task Force recommends that the NECA be governed by a Governing Council which includes representatives of the government as well as non-government wildlife experts, scientists and other conservation scholars.

The Chief Wildlife Wardens of the elephant range states, representatives from four eminent national and four regional conservation NGOs, eminent academicians from ecology, social science, economics and land use planning will also be co-opted. Two elected representatives (MPs from the Lok Sabha) should also be part of such a council. Adequate care should be taken to ensure that members of Scheduled Castes and Tribes and women are provided due representation within the above categories. The Governing Council may have not more than 15 members. The Minister of Environment and Forests will chair the council.

In order to facilitate coordination, it will help that the Secretary, NTCA, Secretary, Central Zoo Authority (CZA) and the head of the Wildlife Crime Control Bureau can be special invitees to the Governing Council of the NECA. Further, the Secretary, NECA should be a special invitee on the National Board for Wildlife (NBWL).

It is also recommended to have state level councils to formulate state level policies and coordinate efforts. The council can be chaired by the Forest Minister of the state and the member secretary can be the Chief Wildlife Warden, Principal Chief Conservator of Forests (PCCF level) or Head of Forest Force (HOFF) could also be an invitee. Eminent elephant conservationists, respected academics and NGOs must form part of the society at all levels. The same guidelines for NECA should apply at the state level.

Administrative structure at the Union level

It is recognised that the new structure must be greatly strengthened at the Centre and a one-person operation not be allowed to continue. It is recommended that an 11 member secretariat be set up, consisting of:

a. The Director: The Inspector General Forests (IGF) is to be upgraded to Additional Principal Chief Conservator of Forests (PCCF) level. An eminent conservationist can also be considered for this post. This post can be called Member Secretary/Director NECA.
b. Regional Joint Director four (one for each region) members.
c. Research Officer/Scientist "C" (or other appropriate level) one post.
d) Researchers (Junior Research Fellow Conservation, Senior Research

Fellow veterinarian) two members.

e) Account Officer post one.
f) Data Operator post one.
g) Secretary post one.

Governance at the state level

This should be similar to the proposed module at the Union level.

Elephant Reserves:

Elephant Reserves should be the basic management unit for elephant conservation in the country. The Task Force recommends that the limits of an Elephant Reserve should lie within state boundaries. If inter state reserves exist, these boundaries need to be aligned.

A list of 32 Elephant Reserves to be continued with, are given as Appendix III. The Task Force recognizes that within Elephant Reserves, there are areas designated as, National Parks, Wildlife Sanctuaries or other protected area categories. These should be continued with. If state governments feel that other critical elephant habitats and corridors exist that should come under the PA network, then community and conservation reserves should be considered. These categories of PA may be considered and can be more inclusive while fulfilling conservation objectives. The entire Elephant Reserve should also be brought under Ecologically Sensitive Areas (ESA) under the Environment Protection Act (EPA). The categorization of different parts of the reserve under the expandable ESA should be done under the aegis of the Reserve Management Committee overseen by NECA. Activities that are proposed to be checked or permitted under very strict ecological safety standards pertain to infrastructure, mining and large scale development. Local livelihood activities such as, but not limited to, cultivation, herding, fishing outside the PA's may continue subject to existing norms. The Task Force is convinced that local people resident in the reserve area should be partners and allies for conservation and not be treated as adversaries. The idea of the proposal for ESA status is cognizant of the continuing presence

of large numbers of residents in the non PA sections of the Elephant Reserve areas.

The Task Force recognizes that the boundaries of certain reserves may need to be rationalized as they were not drawn on scientific and ecological principles that form the foundation of the conservation of elephants and associated biodiversity of the wild. For instance, Jamshedpur falls within the current boundaries of an Elephant Reserve. It is recommended that an Expert Committee be formed under the aegis of NECA who will rationalize the ER boundaries after baseline information of elephant numbers and distribution is made available under the new protocols.

It is recognized that states normally appoint a Director for each Elephant Reserve and this should be continued with.

In addition an Operational Reserve Level Management Committee should be set up chaired by the Director of the Reserve. A nominee of the District Commissioner, Local peoples' elected representatives (MLAs, Zila Parishad, Gram Panchayat and Gram Sabha), local conservationists, NGOs and officers in charge of line departments such as railways, block development authority and block veterinary officer should be members. This committee will be advisory in nature for operational matters in the ER. It will hold public hearings at least twice a year for redressal of grievances. The roles and responsibilities of the members of the Management Committee shall be clearly defined.

Under the aegis of the Reserve Level Management Committee, each Reserve Director should be tasked with developing and implementing a clear five year Management Plan with goals and objectives. The plan should also have activities spelt out for those at the following levels of management. DCF and Range Officer levels (for territorial divisions and PAs); Director/Manager level for private undertakings where relevant, and field biologists/scientific organization for research and monitoring. The Action Plan should have performance indicators to measure progress at each level of management to judge the effectiveness of elephant conservation in the reserve. The sanction of budgets should be on the basis

of annual work plans within the overall five year management plan for each Elephant Reserve.

The NECA should conduct independent evaluations at the end of five years for each ER. This will be mandatory. Such evaluation can also be considered for midterm assessment. The evaluators should not have conflict of interest that hinders objective evaluation. A conflict of interest may consist if a person.

(1) has business or financial interest in a third party dealing with state forest department/elephant reserve/territorial division.
(2) Individually receives non monetary gifts/hospitality from state forest departments, Elephant Reserves, contractors associated with higher agencies unless these are made available as part of official work.
(3) Is dependent on research or conservation activity within said state.

Elephant Landscapes:

Contiguous reserves in adjacent states that form part of a unified landscape e.g., Nilgiri-Eastern Ghats shall be declared as newly created Elephant Landscapes (EL). The new Elephant Landscapes that are recommended are as follows:

1. Kaziranga-Karbi Anglong-Intanki
2. Kameng-Sonitpur
3. East Central
4. North Western
5. Brahmagiri-Nilgiri-Eastern Ghats
6. Eastern South Bank
7. North Bengal-Greater Manas
8. Meghalaya
9. Anamalai-Nelliampathy-High Range
10. Periyar-Agasthyamalai

Of these ten Elephant Landscapes the Task Force recommends that the first five be taken up on priority basis and re dedicated to the nation at the earliest. The next five should follow in due course. The landscapes are sound ecological and conceptual entities but need to be put into effect and practice. They are founded on principles of elephant habitat contiguity and have distinct populations with occasional genetic exchange.

The landscapes need to follow a three-tier conservation mode if they are to be successful at a holistic level. The PAs within the landscapes need the best level of protection by government agencies to ensure maintenance of their ecological integrity and the viability of elephant populations. In these, the Protected Areas need a more strict level of protection and conservation. In contrast the areas that lie outside the ER of the landscape need more cooperative models of conservation such as community-based conservation, community forests, public-private partnership or ecosystem payment services. At a larger level, the EL's may well include one or more ER's. The larger landscape areas beyond the ER limits will require government to be a facilitator and coordinator of activities that may be beneficial or harmful to elephants. This will involve cooperation with undertakings such as railways and highways, local bodies such as panchayats, government departments such as agriculture and animal husbandry and private landowners.

These landscapes should be coordinated by a Regional Joint Director at four regional levels (southern, central, eastern and north-eastern and northern), who will coordinate with directors of all ER's in the region and be based at NECA head quarters.

The Governing Council of NECA will commission Perspective Plans for each EL. As distinct from the five year Management Plan, the Perspective Plan shall be for a period of 50 years. It will integrate ecological information with land use planning to provide an overview of emerging threats and opportunities for biodiversity conservation in general and elephants in particular. The Perspective Plans will incorporate the widest level of public consultation at the local and district levels. It shall be the

task of NECA and the ER leadership to align the Management Plans with the general direction of the Perspective Plan.

The Perspective Plans as well as Management Plans should be public documents with open access except for operational details that may compromise anti poaching work.

Changes in Recruitment Rules and Norms

The Member Secretary, NECA should be an open recruitment post and chosen through national level selection. It will be open to Indian Forest Service officers with requisite experience. Government may consider whether prior experience in NECA or the Elephant Reserves should be a qualification. The government should also consider recruiting non IFS and non-governmental personnel with requisite conservation experience in the NECA. This is especially necessary at the level of the new post of Regional CCFs who will assist the Secretary of NECA. The same may be considered for Directors of each Elephant Reserve.

The Regional Joint Directors of NECA will have a very critical role. These posts may be open to Indian Forest Service officers and also to biologists and/or social scientists with requisite experience. Within the forest department, middle level officers should also be eligible to apply for these posts through selection. A five year short service commission equivalent especially but not only for research personnel, in executive posts in ER's should be created.

Framing a policy for elephant conservation

The Task Force recommends that the Government of India frames a policy on elephant conservation in India based on this report.

Financial outlay

One of the major constraints in implementing various conservation measures with ER's and human-elephant conflict (HEC) mitigation has been lack of funds.

In the 8th Five Year Plan the allocation was only 23 crores which increased to 81.99 crores in the 11th Five-Year Plan.

A comparative table of the 11th Five Year Plan and the recommended one for the 12th Five Year Plan is as follows:

S.No	**Name of activities**	**Fund allocation (in INR crores)**	**Fund allocation recommended for 12th Five Year Plan (in INR crores)**
1	Elephant protection(anti-poaching and anti-smuggling)	15.00	50.00
2	Habitat protection	15.00	50.00
3	Corridor securement	-	200.00
4	HEC mitigation and eliciting public co-operation	41.00	100.00
5	Monitoring and research	08.00	50.00
6	Captive elephant management and welfare	-	25.00

7	Training and capacity building of frontline staff	-	30.00
8	Wildlife health monitoring and veterinary support	-	10.00
9	Awareness building and campaigns	-	25.00
10	Legal support	-	5.00
11	Global lead in elephant conservation	-	5.00
12	Salary and establishment (NECA	02.99	10.00
	TOTAL	**81.99**	**600.00**

The financial outlay should be increased to at least **600** crores in the 12th Five Year Plan.

CHAPTER 3

Upgrading Research and Monitoring Systems

There is a need for more robust and better systems of enumeration of not just the populations of elephants but also of the changing composition of these populations across age and gender. Further, by drawing on the best scientific expertise in a more transparent and open manner, it will be possible to supplement larger enumerations with intensive studies in key select sites. As in the case of the tiger, integration of landscape level information is also vital for conservation policy and for a more holistic idea of elephants in the context of their habitats. Equally crucial, such systems of research and monitoring will gain enormously by specifically-designed initiatives to promote research across the wider gamut of issues that affect elephants. Hence, this chapter begins with a review of and suggestions for the enumeration system. It then sets out mechanisms to accomplish these objectives and also spells out how best to facilitate, encourage and enable research.

Background and Review

Traditional methods for elephant population monitoring have mostly tended to focus on population size based on total counts or estimation from dung density. These prevailing methods have significantly contributed to our understanding of elephant numbers. They have often incorporated and furthered modern scientific methods.

But there are limitations that need to be addressed. It is only by addressing these issues that the systems of enumeration and research can give more accurate and better-informed results.

Elephant Estimation: Background and Limitations

The prevailing system of monitoring of Asian elephant populations in India focuses on population size, sex ratio and population structure (in

calves, juveniles, sub-adults and adults categories). However, little thought has been given to estimation of numbers and associated sampling-based variation or on the power of any estimate to detect demographic changes in elephant populations (such as increases and declines). In spite of this perturbing fact, estimates for monitoring elephants are made mainly to know the total number of elephants (population size). The first-ever attempt to estimate the elephant population in India was done in the forests of United Province (now Uttar Pradesh) by F.W. Champion during the year 1929. Subsequently, in 1966-67 further such attempts were made by the Uttar Pradesh Forest Department with repeat estimates undertaken in the years 1976 and 1978. All these estimates were based on the 'Direct Total Count' arrived at by averaging figures of three counts taken at an interval of 10 days at the level of the forest beat.

During 1977 to 1985, the Asian Elephant Specialist Group (AESG), International Union for the Conservation of Nature/Species Survival Commission (IUCN/SSC), came into being to investigate Asian elephant status and distribution throughout its range. The four Task Forces of AESG did an assessment and reported the population of elephants in India based on informed knowledge and guesses along with a few estimates that were carried out at various representative sites following different efficient and cost-effective methods. Realizing the inappropriateness of various estimates and their limitations in certain habitats a workshop was organized in December 1991 at the Mudumalai Wildlife Sanctuary to evaluate the applications of 'direct' as well as 'indirect' methods. These marked a major advance on previous methods.

With the launch of Project Elephant in 1992, population estimates of elephants were made at intervals of five years following different methods such as total count, total count by tracking, registration count, water hole count, sample count, transect count and dung count, varying from site to site. Based on these estimates elephant population in the country were reported at being around 25604 in 1993, 25877 in 1997, 26413 in 2002, and 27694 in 2007-08. These estimates comprising population information of 15 years suggest an increase. But the information generated does not help

deduce any reliable inference in detecting population changes at any level. Considering the elephant's long lifespan and the threat to tuskers posed by poachers, total numbers may be inadequate as index of how populations are faring in the wild. It is equally essential to know the male:female ratios and the age structure of populations.

Project Elephant also revised the elephant estimation methodology in all 11 Ranges and 32 Reserves in 2005. Necessary guidelines for enumeration were also notified to all elephant range states. The fresh objectives set for monitoring through enumeration are: to learn about trends in population and structure of elephants residing in ERs; to set up accurate baselines for ERs in general and Monitoring of Illegal Killing of Elephants (MIKE) sites in particular; to gain information about the status of males (especially tuskers) in the ERs and to provide exposure to the field staff regarding sampling techniques useful for enumeration and monitoring of elephants.

The revised guidelines emphasized undertaking synchronized estimates together by the adjoining ERs with contiguous elephant habitats. Based on this, the Synchronised Elephant Census (SEC) was conducted across various states in India in 2005 and is also presently underway in 2010. The SEC uses three main methods to obtain population sizes and related information: block count, line transect dung count, and waterhole count (Anonymous, 2010). The block count is also referred to as 'direct count' and the dung count as 'indirect count'. The waterhole count is primarily used to generate population structure to scan and categorize individuals in various sex and size classes. Stratification of sampled area may be made in terms of high, medium and low elephant density, or through vegetation types. The sample area selected for elephant estimation through direct count has been 30% (enhanced to 50% in 2010 estimate) in all categories. A separate guideline for computing dung-decay rate has also been circulated among the elephant range States.

Besides technical aspects of the methods, the guidelines also cover aspects such as estimation period, training of enumerators, and data analysis, involving organizations/experts and fund allocation to the respective States.

Review of the Current Methods and Status

The elephant is a large-bodied animal whose presence in forests, according to some experts and managers earlier, can be detected easily by sightings. This may be partly true for some open savannah habitats but do not hold true in most forest situations. Detection probability and spatial scale (sampling unit or area) are two major sources of variability in any population monitoring program and therefore these concerns need to be addressed to improve the program design. The three main methods – total count, block sampling count and dung count on transects for estimating elephants across all the ERs of India, implemented since 2005, need a critical evaluation on scientific grounds so that most appropriate/alternate method(s) can be drawn within feasible logistical and budgetary limits. There is also a misconception that data collected by two or three methods can be statistically rationalized and converted into one estimate for arriving at an elephant population.

Total count

The total count is a method where it is assumed that the entire area or estimation unit has been searched for elephants and that every single individual within the area has been individually seen and counted without errors, duplicates, or omissions. However, even if the entire area is surveyed, it is very unlikely that all elephants are detected and seen within the survey area. As the area becomes larger, denser in vegetation, more difficult in terrain, and poorer in light conditions, the observer's ability to detect elephants may vary substantially within and across landscapes. Cumulatively, this variation in the ability to detect them might create substantial bias when all data are pooled together for total estimation. Besides sampling and observer-related variations, the unknown error related to detection is a major drawback for any statistical analysis even with several repeat counts.

Block sample count

The total count and the block sample count are not very different on the technical design. However, here instead of entire zone, small sample zones are surveyed with an assumption that if 15% area is sampled it may be expected to contain 15% of the elephants occurring in the entire zone. On the contrary, elephant distributions are far from uniform in the sampled zones and the process of selection of sample blocks becomes a critical issue if bias is to be avoided. Additionally, the longer the time taken to do the estimation, the greater are the chances of double counting. Elimination of double counts by selecting a few individuals for registration and identification does not work well and leaves lots of scope for biases. Also, the issues of detection and variation identified in the total count method remain in the block sample count method as well.

In conclusion, both the above methods selected for elephant estimations are statistically weak and therefore are not entirely reliable. In the field, a forest beat is the smallest administrative unit, the boundary of which is considered to be discernible by the field staff. The beat may vary in size from 2 to 40 km^2; mean size is around 19 km^2 on countrywide basis. In total counts, searching elephants in such large forested and highly uneven terrain conditions in a day is difficult and the assumption that none are missed out is unrealistic. Even in a block sample in an area as small as 5 km^2 the possibility of missing elephants cannot be ruled out. The methods also suffer from other associated problems such as identifying marked space boundary and chances of double counting due to uneven distribution of elephants.

Line transect dung count (indirect)

In line transect sampling the observers progress on straight line transects and record sighting objects ***viz.*** elephants in direct method or dung in indirect method. The indirect method of population monitoring of elephants through dung surveys may be used in two ways. First, the number of dung piles per unit effort (area surveyed or kilometres walked) may be taken as an index of elephant abundance or relative abundance.

The second option is to translate the dung data into elephant numbers, for which two other key parameters need to be estimated – the dung decay rate and per day defecation rate of elephants.

The former method of generating a dung encounter based index of abundance is good enough to know changes in elephant population and habitat use. For many purposes, it is not required that one should know the actual number of elephants to correlate them with habitat and other anthropogenic or ecological factors. An estimate of number of dung piles, the relative distribution of dung piles and changes in dung pile encounter rate index over several seasonal comparison periods can provide a lot of information for detecting changes and taking necessary management decision to manage the area. As this method is easy, rapid and can be executed by moderately trained staff, it may be suitably applied across large landscapes for monitoring purposes.

In contrast, translating the dung data into elephant numbers has several pitfalls in assumptions and variability in estimation of dung density, dung decay rates or disappearance rate, and the defecation rate of wild elephants. The 'steady state' assumption, i.e. that the number of dung piles produced by the elephants per day is equal to number that disappears per day is an untested hypothesis and can vary on seasonal context. The other variables can be estimated and corrected with several controlled experimentations on large dung samples in different *in situ* habitats and substantial hours of systematic direct observation on defecation behaviour of wild elephants. The Project Elephant dung enumeration guidelines (2005) lay emphasis on conducting such experiments for almost 105 days on at least 120 dung piles on several stratified strata for the estimation of decay rates. However, this practically never happens in the field and also cannot be done without involvement of qualified biologists or trained personnel working under supervision of the former and an understanding of various statistical models and assumptions on the pattern of decay. Seasonal, geographical, and observer effects also need to be factored in. Categorizing the dung-pile, for example into a category where a dung-pile has totally disappeared or is unlikely to be seen is subjective and observer-biased. Projecting defecation rates (16.33 piles/day) and decay rate

(0.0097) from single source study conducted at Anamalai or Mudumalai cannot be applied for the whole country. Guidelines to either generate reliable defecation rate data or compilations of prior data from wild elephants have been scarce. In conclusion, the method of dung data collection for converting dung density estimates into elephant numbers over large landscape has a very large potential for error and biases and hence is not a reliable approach. It is also limited in scope and has limited ability to detect changes through short-term time-series monitoring.

Currently Project Elephant coordinates a countrywide elephant census once in five years and from 2005 each reserve conducts its own estimation.

Estimation, Research and Monitoring: Recommendations

1. Establish National Elephant Baselines and estimation protocols by a Consortium of Elephant Research and Estimation (CERE) anchored by the National Elephant Conservation Authority

A properly designed elephant monitoring program based on reliable and robust methods has much wider applicability for detecting changes in elephant population status and trends over time and space. This should be coordinated by a Consortium of Elephant Research and Estimation (CERE).

This is recommended to be a consortium of people and organizations with the requisite scientific skills and capabilities. Important among them are scientists (including individuals of scientific eminence who are independent research scholars), statisticians, government research institutions, universities, and non- government organizations engaged in scientific research and conservation. There should be regional nodal scientific agencies identified to coordinate monitoring and estimation of elephants at the regional level. The CERE which will be nestled within the NECA will facilitate and coordinate the working of the regional nodal agencies.

Note on Methods:

Occupancy, abundance index, density and demography of elephants across the ranges could be key parameters for correlating them with habitat and anthropogenic and ecological variables to draw meaningful conclusions important for conservation and management. There is a need to move from simply monitoring elephants in a synchronised effort over two days towards a monitoring system that is more technically robust and inclusive.

Selecting and defining the objectives at design stage is a critical task that also needs periodical improvements through consultations with several institutions, scientists and field managers. The process of implementation cannot be equally intensive at all spatial scales, as cost and availability of qualified trained manpower to collect information are the limiting factors. The range occupied by elephants is estimated to be around 110,000 km^2 of land composed of Protected Areas, Reserved and other categories of forests, plantations, agriculture, and non-forest areas. Over this extensive range, monitoring efforts are to be undertaken by building on the capacity of the network of forest field staff and watchers for field support along with wildlife biologists and research institutions for technical support and training. Forest field staff and watchers are often poorly educated and cannot be expected to adopt and implement collection of complex data that may be required for the enumeration. There is a need therefore for an integrated program that includes field staff with wildlife biologists to achieve various monitoring objectives.

Here, we propose an improved three-tier approach based on recent advances in scientific methods for elephant population monitoring and landscape assessment. This will involve a combination of extensive surveys for elephant distribution and abundance index based on dung encounter and more intensive surveys in select sites for robust estimation of elephant densities and demographic parameters using line-transect surveys and/or mark-recapture estimation. These surveys will be carried out intensively in the first year of implementation to establish a national baseline for elephants.

Tier 1: Dung surveys for elephant occupancy and encounter rate

The objectives of the Tier 1 sampling are to gather and share baseline data on elephant distribution (occupancy approach) and index of abundance (dung-based encounter rates). This will enable documenting elephant distribution over the large landscape level and the trends in abundance index over multi-year periods. Occupancy estimation may be carried out using techniques prescribed by Mackenzie *et al*. (2002). By gathering accompanying habitat information, the influence of these on elephant distribution may be explored. Re-using line transects in subsequent surveys can reduce variation in encountered estimates and thus can improve the resolution. An additional benefit of this sampling is that it will help identify and delineate areas of high-occupancy and density for intensive sampling for Tier 2.

Implementation: It is envisaged to have three sampling periods in the first year to be undertaken during three major seasons: dry season and summer (February to May), south-west monsoon (June to September), north-east monsoon and winter (October to January) to map elephant distribution depending on seasonal context. The above variations are necessary as wet and dry seasons vary in different regions. Trained Forest Department field staff may apply this method with support from scientists for planning sampling effort, data collection and compilation, and final analysis and synthesis of results. Frontline forest staff are critical observers of elephants and their observations need to be included in studies. We recommend adoption of a citizens' science model to scientifically-validate such observations. The Tier 1 method implementation is envisaged to begin with the submission of the final report of this task force. The effort will be repeated once in four years. In intervening years, the same method may be applied during one season (dry season) for trend monitoring purposes.

Tier 2: Intensive survey for density estimation and demography

The objectives of this Tier are to:

1) Obtain more intensive, robust, and precise estimates of elephant density in select sites using line transect surveys or mark-recapture estimation techniques.

2) Obtain reliable data on population structure (age-sex classification), group sizes, and demography (birth/death rates) of Asian elephant populations in select sites.

These investigations are intensive, science-based and modern in approach and will focus on sites that are selected based on medium to high densities of elephants as determined by Tier 1 surveys or reliable prior information. Line transect surveys will be carried out for direct sightings of elephants and herds using an appropriate sampling design by regular surveys along marked lines (Buckland *et al.* 1993). Mark-recapture estimation may follow well-established methods (Krebs 1999) as implemented in recent field studies of elephants in India (Williams 2002 and Goswami *et al.* 2007). For demographic monitoring, age-sex classification of individuals detected during line transects surveys as well as supplementary observations at sites of congregation or movement such as waterholes, corridors, and grasslands may be used.

Implementation: The Tier 2 efforts will be carried out by qualified biologists with support and training of local Forest Department staff. The effort needs to be carried out in all three seasons in the selected sites in the first year. Sampling design (e.g., stratified by habitat) and effort may be worked out as appropriate for each site and will involve regular surveys replicated within seasons. Based on the experience from the first year surveys, the sampling protocol may be refined for long-term monitoring to be carried out at least once in four years.

A registration count based on elephant identification through morphological characteristics (photo files) can give a known population size over few months of intensive sampling of key selected sites. Mark-recapture of individuals through photo IDs, marked radio-collar elephants or genotyping of non-invasive DNA samples are the effective ways of monitoring key population and developing detection function to correct two-phase adaptive model (Conroy *et al.* 2008).

Tier 3: Characterization of elephant landscape complexes – integration of remotely-sensed and thematic data in GIS

The objectives of Tier 3 are the creation of standardized database using remotely-sensed land use information, elephant distribution, habitats, spatio-temporal use and socio-economic information and querying them for elephant conservation and management. This effort will focus identifying key elephant conservation areas, rationalizing elephant range boundaries, and taking measures for other linking areas through preventive, restorative, regulatory, and mitigation processes.

Implementation: This effort shall require identifying qualified institutions and the Elephant Authority for developing this database repository, its periodical updating and sharing information with all stakeholders.

Primary analysis of the data is to be done by the regional nodal agency and a national level synthesis of the regional analysis is to be done by CERE. Final reports will be put up on NECA websites and will be open-access. Data once analysed will also be put up on the NECA website and will be open-access to bonafide applicants verified by CERE. Safeguards need to be put in place to prevent misuse such as targeting individual elephants for illegal killing.

2. Promote long term dedicated research through elephant reserve research stations

Every elephant landscape is to have a NECA-run Elephant Reserve Research Station within the Protected Area to promote research and monitoring within the Reserve on a long-term and continuous basis. Research officers (both ecological and veterinary) should be posted at such stations and must be given enough promotional avenues for continued motivation. It shall be their task to facilitate and assist in every way, bonafide research by established scholars and research students from India and elsewhere. Applicants should be screened by CERE. While conservation, behavioral and ecological research with management implications continue to be a priority, basic research should also be

encouraged in keeping with the spirit of scientific temper. The field stations should provide accommodation and research support including field level laboratories and libraries within the field station. Researchers who avail of these facilities should share their research publications with the Reserve and with CERE.

3. Establish open-air forest laboratories in Reserved Forests adjacent to Protected Areas in elephant landscapes and identify institutions of excellence to run it

Each elephant landscape is recommended to set aside and facilitate an independent open-air research facility on the lines of Barro Colorado and other such experiments. These open-air forest laboratories are not to be run by the government but by bonafide research institutions and agencies under a Memorandum of Understanding with the Forest Department for a period of 25 years. These sites are recommended to be not less than 25 km^2 and are to be situated in government reserve or protected forests adjacent to the Protected Areas in the elephant landscapes. Such sites can be used for vital research and long term monitoring such as management of invasive species, experiments in hydrology with surface water bodies and ground water, soil sciences, experiments with the spectrum of living taxa, effect of forest fires on habitat. The multiple dimensions of human-wildlife and forest interactions such as grazing, lopping, collection of non-wood produce, artificial regeneration, selective extraction and the socio-cultural dimensions of human-ecosystem interactions can also be studied at such sites.

4. Institute Gajah fellowships and studentships to post-graduate, doctoral and post-doctoral students

It is recommended that NECA sets up a panel of scholars to screen and select applications for one post- doctoral, three doctoral and six post-graduate fellowships and studentships with emoluments as per UGCA norms. The academic disciplines that qualify can include natural and social sciences, humanities and arts, provided it focuses on elephant ecology, conservation, behavior or its interactions with human beings in its widest sense.

5. Information transparency

The Task Force strongly recommends transparency vis-à-vis enumeration results and data. As has been the case with the open-access data post the Tiger Task Force, it is recommended that information be shared via the NECA website. Further measures in this direction may also be considered. While caution has to be exercised to ensure that the disclosure of location of tuskers does not help poaching, protocols developed in other elephant range countries can be studied and other information shared. It is to be stressed that such sharing among researchers, scholars and citizens is vital to the process of improving our knowledge base on the species.

CHAPTER 4

Securing Elephant Landscapes

Asian elephants once ranged over a vast area from the Tigris and Euphrates in West Asia to South East Asia (Olivier, 1978). However, the present distribution of the elephant is limited to Nepal, Bhutan, Bangladesh, India, Sri Lanka, Myanmar, China, Thailand, Malaysia, Indonesia, Cambodia, Laos, and Vietnam (Santiapillai, 1987). Though the number of Asian elephants in the wild is estimated to be about 44000 - 56000, it is threatened because of habitat loss, shrinkage and degradation of its distribution range. Fragmentation of available habitats has further confined most of the populations to smaller habitat islands. Developmental programs in and around areas of elephant habitat and encroachment of the habitat lead to loss of traditional movement paths of elephants. All these have contributed to increased human - elephant conflict, which often leads to loss of both human and elephant lives as well as property.

The historical range of elephants in India has shrunk confining the elephants presently into distinct geographical zones (Jerdon, 1874; Ali, 1927; Daniel, 1980). The Indian sub-continent has an estimated population of about 27000-29000, which is about 50% of the Asian elephant population. Elephants in Andaman and Nicobar islands are considered to be feral, as they are the descendants of the captive elephants used in timber felling operations. Most of these are presently enclosed in the ten Elephant Landscapes (proposed by this Task Force) spread over 110,000 km^2 in four regions northeast, east-central, northwest and south India (Bist, 2002).

Perhaps more than any other mega-vertebrates, elephants can only have a secure future if landscapes containing viable populations are managed in a holistic and ecologically sound manner. The long term survival of these

populations rests on consolidating habitats and maintaining the integrity of corridors. The latter are as vital as the former. Given its size and longevity the elephant will find strictly protected habitats indispensable for survival. At the same time corridors are vital to enable the maintenance of genetic diversity. Bereft of critical corridors, the populations of elephants in strictly protected habitats will be isolated and much more vulnerable even in the medium term.

a) Of the ten landscapes, this task force has prioritized five major elephant landscapes for initiating a more integrated and comprehensive strategy for conservation. These are the Brahmagiri-Nilgiri-Eastern Ghats landscape, East-Central landscape, North-Western landscape, Kameng-Sonitpur landscape and the Kaziranga-Karbi Anglong-Intanki landscapes. The other existing five Elephant Landscapes (erstwhile ranges) can be taken up in due course. All numbers are subject to revision once more robust methods of estimation are taken up but present census estimates are cited below as per the record.

1. North-Western Landscape

The North Western elephant population in India was once continuously distributed over parts of erstwhile Uttar Pradesh from Katerniaghat Wildlife Sanctuary to the Yamuna river (Singh, 1978). Currently the elephant occupies about 10,000 km^2 forests in the outer Himalaya and the Shivalik Hill ranges and parts of Terai and Bhabar tracts. The steep Himalayas and the Shivaliks bound this elephant range to the north and the fertile Terai to the south. About six sub-populations are known to occur over this landscape: Katerniaghat Wildlife Division, in and around Dudhwa Tiger Reserve, between Sharada river and Haldwani Town, Haldwani and Khoh river, Khoh and Ganga rivers and between River Ganga and Yamuna (Javed, 1996). The break around the Khoh river and Ganga is still crossed by bull elephants.

The elephant habitat in the North West has six Protected Areas *viz* Rajaji National Park, Corbett Tiger Reserve that includes the Sona Nadi Wildlife Sanctuary, and Dudhwa Tiger Reserve that includes the Kishanpur Wildlife Sanctuary and Katerniaghat Wildlife Division. Recently a few

elephants were reported to visit Suhelwa Wildlife Sanctaury east of Katernighat Wildlife Division from Bardia National Park. The altitude varies from 200-1000m.

The growing human population and their encroachment of the elephant habitat has not only fragmented the habitat but has also led to degradation of the available habitat. Dependence on the forest for fuel, timber, livestock grazing and conversion of natural forest into monoculture plantation of tea, eucalypts, have severely degraded the habitat and exotics like *Lantana* and *Parthenium* have taken root. The impact of "Gujjar" settlements on the habitat is multifarious (Dabadghao and Shankaranarayan, 1973; Johnsingh *et al*., 1990; Johnsingh and Joshua, 1994).

Two Elephant Reserves are located in this landscape (the Shivalik Elephant Reserve in Uttarakhand and the Uttar Pradesh Elephant Reserve in Uttar Pradesh. Twelve corridors have been identified in this elephant range.

2. North Bengal-Greater Manas landscape

There are about 300-350 elephants in the Dooars of Northern West Bengal, spread across the districts of Darjeeling, Jalpaiguri and Cooch Behar, comprising nine Forest Divisions, viz. Kurseong, Wildlife-I, Baikunthapur, Kalimpong, Wildlife-II, Jalpaiguri, Cooch Behar, Buxa Tiger Reserve (West) and Buxa Tiger Reserve (East). Although this number is only a little above 1% of the total elephant population of India, an extraordinarily high human-elephant conflict, characterizes this region.

Northern West Bengal has a forest area of 3051 km^2 or about 24% of the total geographical area of forests of the state. However, the elephant habitat is confined to about 2200 km^2 in three distinct geographical zones, viz. (a) The terai stretch between the Mechi River and the Teesta River, comprising of the forest areas of the Kurseong Division and the Mahananda Wildlife Sanctuary, (b) The western Dooars stretch between the Teesta and Torsa rivers comprising Apalchand range of Baikunthapur Division, Jalpaiguri, Kalimpong and Cooch Behar Forest Divisions,

Jaldapara Wildlife Sanctuary, Chapramari Wildlife Sanctuary and Gorumara National Park and (c) The eastern Dooars stretch between Torsa and Sankosh river that adjoins Assam and Bhutan and comprises the forests of Cooch Behar Forest Division and Buxa Tiger Reserve (Barua and Bist 1995).

Both, the terai and the western Dooars are patchy (human habitation and tea gardens interspersed with forests) through which regular elephant movement occurs. The future of over 85-100 elephants between the Teesta and Torsa rivers is uncertain, mainly due to fragmentation of forest areas in Baikunthapur, Kalimpong, Jalpaiguri and Cooch Behar Forest Division. The elephants are compelled to move through tea gardens, villages and agricultural field resulting in increased conflicts. It is also important to protect the elephant corridor between Mahananda Wildlife Sanctuary and Baikunthapur Forest Division along the Teesta River by relocating the illegal human settlements (Nayabasti) along this corridor. There is also need to re-establish the corridor between North Diana forest and Rheti forest which serves as a link path for herds in the Tonda and Titi forests (Tiwari, 2005).

This Northern West Bengal population is connected to the Greater Manas population through the Buxa-Ripu elephant corridor linking Buxa Tiger Reserve to Manas Tiger Reserve. Due to large-scale encroachment and tree felling in Kochugaon Forest Division and other areas of Kokrajhar and Bongaigaon districts, elephant movement between Buxa Tiger Reserve (northern West Bengal) and Manas National Park (Assam) has been severely affected.

3. Kameng-Sonitpur Landscape

In eastern Assam, the range covers part of the floodplains of Brahmaputra and Lohit river.

In 1970, due to clearing of a strip of about 20 km in the Dibang valley of Arunachal Pradesh for cultivation and habitation, the elephant population

of this and the Eastern South Bank Landscape became separated from each other.

The elephant habitats of the north bank are under severe biotic pressure resulting in degradation and fragmentation. Between 1991 and 1998, more than 1500 km2 of forest area has come under human encroachment in the north bank (Talukdar and Barman, 2003). The Sonitpur district of Assam has been the worst affected and between 1994 and 1999, it lost 86.75 km2 (1.7%) of forest area and more recently between 1999 and 2001, it lost 145.44 km2 (2.86%) of forest area (Srivastava *et al.*, 2002). Thus 229.64 km2 of moist deciduous forest and 2.55 km2 of semi-evergreen forest have been lost between 1994 and 2001. The Gohpur Reserved Forest (133 km2) in the Sonitpur district is now totally encroached with no sign of the forest. Due to degradation and shrinkage of habitat in Sonai Rupai Wildlife Sanctuary, Charduar Reserved Forest and Balipara Reserved Forest, elephants have started visiting Arimura Chapori (adjacent to the Brahmaputra River, near Tezpur) since the past 15 years. Elephants from Sonai Rupai Wildlife Sanctuary and Charduar Reserved Forest visit Arimura Chapori either via Gabharu-Dipota-Becheria or via Dhendai and Dhulepachung Tea Estate while from Balipara Reserved Forest to Arimura Chapori they come via Addabari and Harichuri Tea Estate. Elephants take shelter in Arimura Chapori (a small patch of forest) during the day and raid crops at night. Urgent remedial measures need to be taken to improve the habitats of Sonai Rupai Wildlife Sanctuary, Charduar Reserved Forest and Balipara Reserved Forest to restrict the movement of elephants to Arimura Chapori to reduce human-elephant conflict (Tiwari *et al*, 2005). Movement of elephants has also been affected between Pakke Tiger Reserve and Papum Reserved Forest in Arunachal Pradesh due to human encroachment and agricultural activities. Elephants mainly use river-beds to move between these two areas. Seijosa nullah and a small plantation area near Longka Nullah serve as a movement path between the two habitats due to the complete clearing of forest in Nauduar Reserved Forest in Assam. The hydro-electric project in Lower Subansiri has also adversely and seriously affected the elephant movement in the area.

There are two Elephant Reserves in this Landscape, Kameng ER in Arunachal Pradesh and Sonitpur ER in Assam.

4. Eastern South Bank Landscape

Elephants on the South Bank of Brahmaputra occupying about 4500 km^2 of forests are divided into eastern, central and western populations. The eastern population spreads over Lower Dibang Valley, Lohit, Changlang and Tirap in Arunachal Pradesh, Tinsukia, Dibrugarh, Sibsagar, Jorhat and Golaghat in Assam and Mon, Tuensang, Mokokchung and Wokha in Nagaland. The population lost the contiguity with the North Bank in the seventies and the central area of South Bank in the eighties (Choudhury, 1995, 1999). The landscape is highly fragmented and dominated by tea plantations.

The separation from the south bank-central areas was due to large scale felling and encroachment in Dayang Reserved Forest, Nambor (South Block) Reserved Forest, Diphu Reserved Forest and Rengma Reserved Forest, totalling about 990 km^2 of forest area (Choudhury, 1999). This range has been fragmented at many places, the most notable being the area along the Dhansiri River (Dayang Reserved Forest, Nambor South Reserved Forest, Rengma Reserved Forest and Diphu Reserved Forest) thereby severely hindering the movement of elephants between this part of Assam and Nagaland. Till the 1980's elephant movement was reported between Rengma Reserved Forest (Assam) and Baghty Valley (Nagaland) between Sungkha and Lishuya village. Similarly elephant movement from Desoi Reserved Forest and Meleng Reserved Forest (Assam) to adjacent elephant habitat in Nagaland has been badly hindered by habitat degradation in Assam and Nagaland. As a result of large-scale destruction of forest cover in Golaghat district in the last two decades, elephants move to National Highway-37 in search of food from the trucks and buses passing on the highway. This area had dense forest cover till the mid 1980s. At present, about 40% of the northern part of Nambor Reserved Forest has been encroached (Talukdar and Burman, 2003).

Elephants from Digboi and Doom Dooma Forest Divisions move to forest areas of Changlang district of Arunachal Pradesh near Buridihing. A part of the elephant population of the Changlang district is continuous with that of Myanmar through a corridor in Namdhapa National Park. However, all the other probable migration routes through Tirap and Changlang district of Arunachal Pradesh and Mon and Tuensang district of Nagaland are no longer available due to heavy poaching by a section of the Konyak and the Wancho Nagas and clearance for jhum (Choudhury, 1999). Movement between Upper Dihing East and West block and Doom Dooma takes place mainly through tea gardens and agricultural land. Movement of elephants between Lakhipathar Reserved Forest (Digboi FD) and Takawani Reserved Forest (Doom Dooma FD) used to occur through Langkasi and Anandbari tea gardens. But due to encroachment and the expansion of settlements on both sides of the Tinsukia-Digboi highway (NH37) for many years now, elephants are only using the corridor area for crop raiding and the connectivity is totally broken. The elephant movement between Upper Dihing East and West block (Golai corridor) mainly passes through private land and has been severely obstructed due to purchase of land by Oil India, agriculture activities and human settlements.

5. Kaziranga-Karbi Anglong-Intanki Landscape

The central range of the south bank of the Brahmaputra is one of the most important habitats for the elephant in north-eastern India and extends from Kaziranga National Park across the Karbi plateau into Nagaland and includes parts of the central Brahmaputra plains and the basin of the Diyung River to the foot of the Meghalaya plateau in Assam and Meghalaya. This population has become separated from the south bank-western population due to expansion of Guwahati city (capital of Assam), clearing of forest, 'jhum' cultivation and settlements along the National Highway 40 (Shillong-Guwahati) in the Rhi-Bhoi district of Meghalaya.

The elephants from the eastern Karbi plateau move down regularly to the plains of Kaziranga National Park at the beginning of winter, ascending once again at the advent of the floods (Choudhury, 1999). Movement between these two forests takes place mainly through tea gardens and

cultivated lands. Heavy traffic on National Highway 37 passing through the corridor is one of the major barriers for animal movement, especially during the rains. There is occasional movement between this population and the south bank-western area population through Nongkhyllem Reserved Forest and the degraded habitat of Rhi-Bhoi district (through Nongwah Mawphar village area established in 1999).

This landscape covers the forests of Golaghat FD , Eastern Assam Wildlife Division, Karbi Anglong East FD and part of Nagaon FD and Nagaon south FD within Golaghat, Nagaon and Karbi Anglong districts. Dhansiri-Lungding Elephant Reserve encompasses part of the forests of Karbi Anglong Autonomous district , NC Hills Autonomous District and parts of Nagaon district extending over the forests under Karbi Anglong West, Hamren, Nagaon and Nagaon south Forest Divisions.

Elephants also inhabit Dhansiri and Daldali Reserved Forests in Karbi Anglong and Intanki sanctuary in Kohima in an area of about 1050 km^2. Elephants regularly move between Dhansiri and Intanki across the inter-state boundary. Inside Assam, they move between Dhansiri and Daldali and adjacent forests.

6. Meghalaya Landscape

The elephant population, south of the Brahmputra (in the western section) is seen in parts of Assam and most of Meghalaya through the foot of Meghalaya plateau covering the Garo and Khasi Hills (c. 6850 km^2). It covers Kamrup and Goalpara districts in Assam, and Ri-Bhoi, West Khasi Hills. East Garo Hills, West Garo Hills and South Garo Hills in Meghalaya. The seasonal range of this population also extends to areas of Bangladesh. A small population of elephants is distributed in Barail-Jaintia Hills along the southern faces of the Barail Range of Assam and Jaintia Hills of Meghalaya.

This area also includes the Garo Hills Elephant Reserve spread over 3500 km^2 and supports approximately 1700 elephants. However, developmental activities and clearing of forest for 'jhumming' or swidden

(shifting cultivation) has resulted in degradation and fragmentation of habitat. The problem is more complex due to the fact that most of the forest area is under community or local control. Less than 10% land is under the control of Forest Department and the rest is community owned forest. Due to large deposits of coal and limestone in Garo Hills, many of the elephant habitats are in danger. Coal and limestone mining in Darengiri area has led to fragmentation of the habitat and hindered the movement of elephants between Angratoli Reserved Forest and Emangre Reserved Forest. A big cement and limestone mining operation was planned near Siju Wildlife Sanctuary, which could have threatened the movement of elephants between Balphakram National Park and Nokrek National Park. This was prevented by the Supreme Court of India in response to a Public Interest Litigation (PIL) filed by a conservation organization. Human settlements, the new North-Eastern Hill University campus, fishery ponds, the 2nd police battalion camp, heavy traffic on the Guwahati-Tura road and agricultural activities has threatened and almost blocked the elephant movement between West Garo Hills and Nokrek National Park (Tiwari *et al,* 2005). There was a proposal for uranium mining in Balphakram National Park that was recently rejected by MoEF in May 2010.

7. East-Central Landscape

The elephant habitats in central India extend over 17,000 km^2 in the states of Orissa, Jharkhand and southern parts of West Bengal. Biogeographically, this region falls in the Chota Nagpur plateau in the North of the Eastern Ghats (Rodgers and Panwar, 1988). A major portion of the forests in Jharkhand, southern West Bengal and north-western portions of Orissa are deciduous. The elephant habitats in Chota Nagpur are in Palamau, Singhbhum and Dalbhum forest. On the north of Mahanadi river, elephants are distributed in Baripada, Karanjia, Keonjhar, Bamra, Rairakhol, Angul, Dhenkenal, Athamalik and Athgarh Forest Divisions. Boudh, Nayagarh, Phulbani, Baliguda, Kalahandi, Raygada, Parilakhmundi and Ghumsur North Forest Divisions in Orissa form the elephant habitat in the area. Singh (1989), Datye (1995), Nigam (2002), Swain and Patnaik (2002), Sar and Lahiri Choudhury (2002) and Singh *et al.* (2002) have surveyed the elephants of the area.

Orissa has about 57% of the elephant habitat in Central India extending over an area of 10,000 km^2. Nearly 53% of the elephant habitat falls within eleven Protected Areas *viz* Simlipal Tiger Reserve and Hadgarh, Kuldiha, Satposia Gorge, Baisipali, Chandaka-Dampara, Kotgarh and Badarma. Nine Elephant Reserves have been notified or are planned in this landscape.

Chowdhury, 2006 identifies four zones of larger habitats in Orissa and two in Jharkhand. The first, with Similipal Tiger Reserve (2770 km^2) and Kuldiha (116 km^2) and Hadgarh (191 km^2) Wildlife Sanctuaries, has an area of 3200 km^2 with an estimated population of about 491 (Prusty and Singh, 1994). The zone along with the adjacent forests of Noto and Gadashi could be an ideal habitat for long-term conservation of elephants. The Satkosia-Baisipalli zone, situated in the central Orissa, has Satkosia Gorge Wildlife Sanctuary (795.5 km^2) on the north of Mahanadi river and Baisipalli (168.3 km^2) Wildlife Sanctuary on the south of Mahanadi. This with the adjacent 800 km^2 Reserved Forests could form a larger landscape of about 1760 km^2 (Chowdhury, 2006).

The south Keonjhar plateau, with about 2600 km^2 is spread over Deogan, Ghatgan and Telkoi Ranges of Keonjhar Forest Division and Kamkhya and West Ranges of Dhenkenal Division. Madanpur-Rampur-Kotgarh-Chandrapur zone in the Eastern Ghats Ranges has about 8000 km^2, of which about 80% are fragmented due to shifting cultivation.

The elephant habitats in Jharkhand is about 6000 km^2 in extent, which forms about 28% of the forests in the state and hold about 600-700 elephants. The Palamau and Dalma Wildlife Sanctuaries form about one third of the elephant habitat. Mines of Iron, Manganese and Copper are the major threats (Singh and Chowdhury, 1999).

The Palamau Tiger Reserve extends over an area of about 1250 km^2 area harbour an estimated 180 elephants (DS Srivastava, pers. comm.). The second zone of Dingbhum-Dalbhum-Bonai include Saranda, Kolhan and

Porahat Forest Divisions.This is contiguous with Joda and Koira Ranges of Bonai Division of Orissa (2900 km^2) on the south and Dalma wildlife sanctuary (193 km^2) of Jharkhand on the north. The management problems in this zone are pollution and habitat degradation due to iron-ore mining, illegal forest felling, fragmentation of habitat, and tribal/community hunts. Mines are a major issue. This is especially so in the rich sal forest of Saranda, a prime habitat that can be secured with careful regulation to protect intact habitat from being fragmented by mines.

Shifting cultivation occurs in the Bonai Forest Division, Orissa. The canal layout of the Subarnarekha Multipurpose Project poses a barrier to the movement of elephants from Porahat in Singhbhum Forests to Dalma WLS.

In addition, there are five other populations in Orissa and three in Jharkhand. The Bamra Hills has two Protected Areas *viz.* Khalasuni (116 km^2) and Badarma (304 km^2). This constitutes an Elephant Reserve of an area of 427 km^2; Kapilas, and Chandaka-Dampara Wildlife Sanctuary populations. The Lakhari Valley Wildlife Sanctuary has is spread over an area of 185 km^2 and Mahendragiri over 130 km^2. Eastern Ghats extending from south of Mahanadi river up to Mahendragiri forms the elephant habitat in the southern region. Recent observations show that there are wide-ranging movements by these populations and there are not isolated as believed earlier. The three populations in Jharkhand are 1) Hazaribagh, Chatra and Gaya, 2) Ranchi and Gumla and 3) Rom-Musabani forests.

The elephant habitat in Midnapore, Bankura and Purulia districts in southern part of West Bengal are considered as range extensions from adjoining Dalma Wildlife Sanctuary of Jharkhand. The area is predominantly of tropical moist deciduous forests interspersed with dry deciduous forests. About large number of elephants are believed to move annually to West Bengal during paddy season from September to February. There is also a resident population in the region (Chowdhury *et al.*, 1997). The area is mostly under agriculture with no Protected Areas. Mayurjharna Elephant Reserve with an area of 414 km^2 has been recently declared. Problem in south Bengal is probably due to the regeneration of

sal (*Shorea robusta*) forests as a result of community conservation programmes. The sal forests provide cover to elephants but no food and as a result crop raiding and the associated problems by the once migratory population is very common.

The Central Indian habitat of elephant is one of the most fragmented and degraded because of encroachment, shifting cultivation and mining activities. The Northern part of Orissa has the highest number of mines of Iron, Manganese and Chromate. The southern part has about 9% of the total forest area under shifting cultivation.

8. Brahmagiri- Nilgiri –Eastern Ghat Landscape

The Brahmagiri – Nilgiris – Eastern Ghats population extends from Brahmagiri Hills to the south through the Nilgiri Hills and east through the Eastern Ghats in the states of Karnataka, Tamil Nadu and Kerala with a splinter group in Andhra Pradesh distributed over 12000 km^2 of habitats. A number of the Protected Areas including Bandipur, Nagarhole, Mudumalai, Wyanad, Biligirirangan Swamy Temple, Kaveri and Brahmagiri fall within the area. In this vast habitat the connectivity between Nagarahole Tiger Reserve and Brahmagiri Wildlife Sanctuary is broken by the presence of coffee estates. Elephants from Nagarahole Tiger Reserve move to Brahmagiri Wildlife Sanctuary via Tholpatty Range (Wyanad Wildlife Sanctuary) and Thirunelli corridor (A.J.T.Johnsingh and R. Raghunath pers.comm.).

The diversity in the vegetation ranging from the dry thorn forest to the montane shola grasslands make it one of the best elephant reserves in the country with a demographically and genetically viable population. This is the largest population of elephants in the country and possibly in Asia.

The large extent of the habitat with diverse vegetation types and a number of cash crop cultivated areas and human settlements within make it also one of the most complex regions in terms of conservation challenges. Maintenance of habitat continuity through the existing corridors or through consolidation of habitat minimizing or mitigating the ill effects of

human-elephant interaction and control of poaching, control of fire and other degradation factors would help maintaining the integrity of habitat.

Nilambur – Silent Valley – Coimbatore elephant population is connected to the Nilgiris through the high altitude mountainous portions of Silent Valley and Mukurthi National Parks. The most important connectivity here, known as Mukurthy-Mudumalai corridor included the forests of the Naduvattam Range (Nilgiri South Forest Division) and Gudalur Forest Range (Gudalur Forest Division). Increasing firewood need from Gudalur township is a grave threat to this connectivity. The extension of the Mudumalai Tiger Reserve could be considered. It is also distributed within the forests of Nilambur South and North Divisions, Mannarkad Division and Silent Valley National Park. The vegetation types include evergreen, semi-evergreen, moist deciduous, dry deciduous, dry thorn scrub and shola forests and grasslands. Though a large stretch of forest is found in the area, a portion is subjected to forestry operations, cash crop cultivation and pressures from the surrounding human habitations. There are a few constrictions through which the elephants move either throughout the year or in certain seasons. Maintenance of these corridors through appropriate measures, relocations of selected private holdings and stringent protection measures would ensure long-term survival of this population.

Elephants, about seven, appeared in Andhra Pradesh in 1984 and established in the dry deciduous forests of Koundinya Wildlife Sanctuary. A second herd of 22 joined the first in 1986 (Syam Prasad and Reddy, 2002). The population occupies an area of about 356 km^2 and is currently believed to be extending their range.

9. Anamalai – Nelliampathy – High Range Landscape

This elephant population is one of the best conserved with about 4500 km^2 of diverse habitat (Easa *et al.,* 1990). This is a human-dominated elephant landscape as the number of people including Scheduled Tribes living in this landscape could be close to 50,000. The elephant landscape is spread across Tamil Nadu and Kerala. Anamalai Tiger Reserve and the Palani

Hills form the Tamil Nadu part of the habitat. Parambikulam Tiger Reserve, Chinnar, Thattekad, Peechi and Chimmoni Wildlife Sanctuaries, Eravikulam, Anamudi shola, Mathikettan shola, Pambadum shola National Parks, and the Reserved Forests of Chalakudy, Nemmara, Vazhachal, Malayattur, Munnar and Mankulam Forest Divisions from Kerala part of the elephant habitat. The vegetation types range from the dry thorn scrub forest to the high altitude shola grasslands with evergreen and moist deciduous forests equally dominating. The recent land allotment by government (Anayirangal) and the explosion of tourism facilities are major threats to the elephant habitat.

10. Periyar-Agasthyamalai Landscape

Periyar – Srivilliputhur population is spread over Kerala and a small portion of Tamil Nadu. Periyar Tiger Reserve with adjoining Ranni, Konni, Achankovil, Punalur and parts of Thenmala Forest Divisions form the elephant habitats in Kerala part where as portions of Theni, Madurai, and Tirunelveli Forest Divisions and Meghamala Wildlife Sanctuary and Srivilliputhur Grizzled Squirrel Wildlife Sanctuary form the habitat on the Tamil Nadu side. The vast stretch of evergreen forests is the uniqueness of the area. The dry deciduous forest along the eastern slopes of this landscape is also crucial for the longterm conservation of elephant. There are extensive plantations of tea and eucalyptus especially in southern part.

This is probably one of the compact elephant habitats in the south without many human habitations.

Agasthyamalai hills is the southern most elephant population in the country and consists of Kalakkad – Mundanthurai Tiger Reserve (KMTR), Neyyar, Peppara and Shendurney Wildlife Sanctuaries and Reserved Forests of Thiruvananthapuram Forest Divisions. It is crucial to establish a connectivity with the Periyar population along the suggested Kottavasal corridor. Other suggestions for the Periyar-KMTR landscape are the acquisition of defunct estates in the heart of the elephant habitat, establishment of Kulathupuzha Conservation Reserve and Megamalai Wildlife Sanctuary and strengthening protection.

b) Securing Corridors

Long-term conservation of elephants can be ensured only by maintaining viable population within viable habitats which could be maintained by linking the fragmented habitats by protecting and strengthening the existing corridors.

Working with a team of elephant researchers, forest officials, Project Elephant Directorate and the NGOs, the Wildlife Trust of India along with the Asian Nature Conservation Foundation has identified 88 elephant corridors in India and published a report entitled *Right of Passage: elephant corridors of India* (Menon *et al*, 2005). These are the minimum number of elephant corridor is existing in the country. These corridors have been prioritized into those of high ecological priority and feasibility (Priority 1) and those of medium to low feasibility or ecological priority (Priority II). A list of these is given as Appendix IV.

Hurdles in the protection of corridors

a) One of the most important hurdles in protection of these identified corridors is that they do not have any legal protection under India's Wildlife (Protection) Act or the Environment (Protection) Act.

b) Lack of sound land use policies in elephant habitats has resulted in fragmentation of habitat or escalation of elephant-human conflict. This is especially so as many of the corridors fall in private land and human used (road and rail) areas.

c) Lack of awareness among stakeholders about the existence and importance of the linkages has also resulted in loss and degradation of the corridors, especially in areas where rail and roads passes through. This leads to human settlement and various developmental activities coming on either side of road/rail tracks.

d) Lack of fund to secure the corridor by either land purchase/ voluntary relocation of people or through community intervention. The total grant for this under XI Five Year Plan in Project Elephant is only about Rs. 15 crores which is insufficient considering real estate costs in India, In addition NGOs such as the Wildlife Trust of

India have put in additional resources to secure corridors but this is far from adequate to satisfy the national need.

Recommendations to secure corridors

1. All the elephant corridors listed in *Right of Passage: elephant corridors of India* publication and thereby agreed to by Project Elephant and state governments should be notified as state elephant corridors by respective State Governments and declared as ecologically sensitive areas.
2. The corridors should be legally protected under various laws appropriate for the state and the local context, such as for e.g.
    a. Community or Conservation Reserve
    b. Declaring the corridor as high priority Ecologically Sensitive Area under EPA with maximum regulation of ecologically destructive activity .
    c. Declaring corridor land as RF or PF under Indian Forest Act.
    d. Community forests under the Forest Rights Act.
    e. Increase boundary of existing Protected Area and make corridor part of the existing PA.

    About 35% of the corridors are touching a Protected Area, 9% are within PAs, 7% have a PA on either side and 30% are close to PAs indicating that if the corridors are safeguarded, a larger chunk of habitat in fringe areas can be made available to the elephants. This also indicates that almost 45% of the corridors could be directly included as part of the PA.
3. Land use policies in elephant habitats especially corridors must be made clear to prevent further fragmentation of habitat or escalation of elephant-human conflict. The policies should be pragmatic enough to allow the corridors to be protected. It is very important for managers to enforce them strictly and with authority.

4. Any land diversion in identified an Elephant corridor irrespective of its size could come to Forest Advisory Committee (FAC) in Delhi and not to the regional offices of the MoEF. This is important as can be seen in the case of Gola corridor where land was unwisely given to the Indo-Tibetan Border Police (ITBP) without understanding the critical nature of the area.
5. In case of widening of roads in corridors or conversion of narrow gauge to broad gauge should only be allowed if they agree to pass through overpass/underpass in corridors area to prevent obstruction to elephant movements.
6. Encroachment in corridors and elephant reserves have to be made punishable and fine imposed. Minimum fine of Rs 10 lakhs and imprisonment of not less than two years should be impose and has to be incorporated in WLPA. This is a major problem in most elephant areas.
7. It is also important to demarcate and inform people about the importance of the corridor area and discourage them from carrying out any activities detrimental to the wildlife movement. For this signages should be erected in all the identified corridors. The signages will also help the local authorities to plan developmental activities in an ecologically sensitive manner. Uniform signages have been developed by the Project Elephant and the Wildlife Trust of India which may be used for the purpose.
8. Awareness programs targeting the villagers living both within and around the periphery of the corridor should be carried out through schools and community organizations. Developing a comprehensive education program that is targeted towards local students and the community at large, and the provision of information in the school curriculum that would expose the students to the issues that concern elephant conservation and enable them to understand the complexity of the problem would be of value.
9. State level consultative meetings should be organized to discuss the various issues concerning elephant conservation including corridors. This would facilitate better coordination of activities between

Government and non government organizations working on these issues. Project Elephant should provide financial support to organise these meetings.

10. Many of the managers of Elephant Reserves and/or elephant corridors have very poor understanding of the corridor in their area and need of protecting them. Hence, the Management Plan of Forest Divisions/PA should also include the corridors existing in the area and clearly outline the conservation plan to secure them to maintain continuity and uniformity of conservation efforts even when the managers change.
11. State Forest Department and Project Elephant should make efforts to protect corridor land, voluntary relocation of people or securing with support from local community. Local non government agencies should be made part of the process to make the process transparent and to facilitate the securing process. Acquisition should be a last option.
12. Local residents should be involved in corridor conservation by providing them incentives for maintaining their lands as corridors and should be included in the management committees of Elephant Reserve of that area.
13. In North East India, especially Meghalaya where most of the land is under community control, it is important to sensitize the local community about the need of securing the corridor and benefits. The community setting aside land for conservation should be adequately compensated. Measures to strengthen the economic condition of people in these corridor areas should also be strongly implemented. Special technical and financial assistance to the councils is also important.
14. Developmental activities in elephant habitat should be thoroughly discussed involving various stake holders to prevent further fragmentation and degradation.
15. Regulation of night traffic on road/rail lines passing through corridor would also protect the corridors.

16. Elephant corridors that facilitate multi mega species (tiger, leopard, rhino, and gaur) movement should be given high priority and efforts should be made to jointly secure these corridors along with NTCA. This could also be included in the Conservation Plans of Tiger Reserves.

17. Securing and protection of corridors should be made part of the management plan of the adjacent PA to facilitate securing and management of almost 50% of the identified corridors that lie on the periphery of PAs.

18. One of the important factors determining the functionality of the corridor is its usage by elephants and other wild animals. It is important that the corridors are regularly monitored to assess its usage as well as to plan conservation measures required to strengthen the corridor. This will also help in assessing the biotic pressure on the linkage and planning corrective measures. Monitoring of corridors should be included in management plans of adjacent PA's if existing. This is also important to keep an eye on change of land-use/developmental activities in the corridor area.

19. Use of ecological corridors is a dynamic process and in a changing landscape, elephants adapt to the changes and alter their movement path to cope with the biotic pressure on existing corridors. As such it is important to regularly survey, groundtruth and monitor the new paths along with the existing ones to manage them and prevent straying in human areas.

20. One of the stumbling blocks in securing and protecting the corridors is the lack of financial resources with the state forest department and Project Elephant to purchase land. The total outlay in XI Five Year Plan of Project Elephant is only 15 crores. It is suggested that this should be increased to at least 200 crores for the XII Five Year Plan and more provision be made in the last two years of the current plan.

21. Fund from other sources like CAMPA, could be utilized for purchasing corridor land and this may be given as a priority suggestion to the states by MoEF.

c) Infrastructure and development projects in elephant landscapes

Degradation, fragmentation and shrinkage of forest cover to accommodate the increasing human population largely characterised by various developmental activities have severely threatened Indian wildlife. Long ranging species such as Asian Elephant and Tiger, that require a large landscape to fulfill their ecological needs have been the most affected ones. Hydroelectric and irrigation projects, roads, railway lines and mining have severely depleted and fragmented the elephant habitat. Other developmental activities affecting elephant conservation is death of elephants due to electrocution by high tension electric wires. All this has increased the interface between elephants and humans resulting in increase of human elephant conflict and isolation of many elephant populations into isolated herds. It is to be stressed that non-developmental activities such as agriculture, grazing, firewood collection have all contributed to the general degradation of habitat. However, developmental activities have been large scale, very visible and also theoretically more easily addressable as they are perpetrated to a large extent by government agencies or those that are regulated by the government. It is for such areas of development that have been addressed in this section.

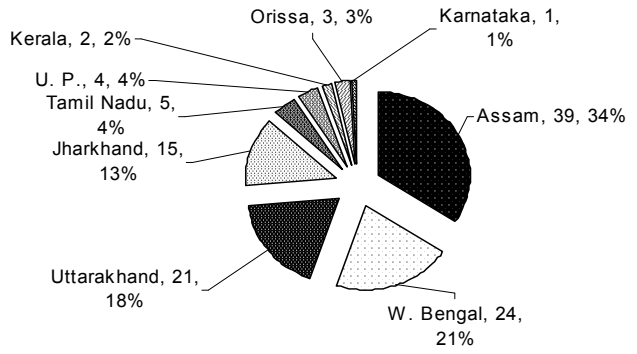
1. Effect of rail and road on elephant habitat

The physical presence of the roads and railway lines in the habitat creates new habitat edges, alters the hydrological dynamics and create a barrier to the movement of elephants and other animals, leads to habitat fragmentation and loss, apart from death due to train and vehicular hits. Rail and an increase in road traffic operates in a synergetic way across several landscapes and causes not only an overall loss and isolation of wildlife habitat, but also splits up the landscape in a literal sense. Various developmental activities also come up on either side of the highways and railroads thereby further fragmenting the habitat and increasing biotic pressures.

a. Railway lines

In India, a large number of endangered wild animals including elephants (*Elephas maximus*), tigers (*Panthera tigris*), leopards (*Panthera pardus*), Rhinoceros (*Rhinoceros unicornis*) and gaur (*Bos gaurus*) are being killed annually by train hit. Since 1987, the country has lost 150 elephants due to train hits. These include 36% cases recorded from Assam , 26% in West Bengal, 14% in Uttarakhand, 10% in Jharkhand, 6% in Tamil Nadu, 03% in Uttar Pradesh, 03% in Kerala and 2% in Orissa. In an emerging economy like India, where expansion of railways and roadways is inevitable, such accidents pose an additional threat to elephant populations especially in the wake of already existent threat like large scale habitat degradation, loss of habitat quality, fragmentation, and conflict with humans.

Fig. 1 Elephant mortality due to train hit in India (1987-2007)



Various factors contribute to elephant mortality by train hits. These include ecological (food, water, shelter, vegetation and movement of elephants), physical factors (steep embankments and turning), technical (speed of train, frequency and time, unmanaged disposal of the edible waste and garbage) and lack of awareness of among drivers, passengers and planners. A general lack of coordination between the railways and the forest department is the reason for lack of any sustained mitigation measure.

In the state of Uttarakhand unlike other states, problems of elephant mortality due to train hits occur mainly in Rajaji National Park (RNP). Since 1987 till date RNP alone has lost 20 elephants due to train hits, which

is about 18 % of the total recorded elephant mortality in the Park. Until the year 2001, elephant mortalities in Uttarakhand were high, almost similar to that in Assam. Considering the magnitude of the problem in Rajaji National Park, the Wildlife Trust of India conducted a scientific study and later followed up with implementation of mitigation measures in collaboration with the Forest Department and Railways between 2002 and 2007 to try and reduce the rate of mortality due to such reasons.

A study (Menon *et al.* 2003), revealed that elephant were crossing the railway track in search of water and agricultural farmland. In addition, steep embankments, sharp turnings, unmanaged disposal of edible waste and garbage along the track by the train caterers and passengers, increased speed of trains and higher frequency of trains contributed to the cause. Most of the accidents (80%) happened in summer between January and June by night bound trains.

The mitigation measures jointly implemented in close association with the Forest Department and Railways included workshops to sensitize train drivers, fixing signage along the railway tracks to keep them reminded and installation of hoardings at railway stations to create awareness among the train passengers about the hazards of unmanaged garbage disposal in the forest areas. The steep embankments were leveled down, vegetations along the sharp turnings were cleared to improve visibility, water bodies on the southern side of the track were improved to reduce frequent elephant movements and non-biodegradable and edible wastes were regularly removed from the Park. Joint night patrolling was conducted to alert train drivers. These joint efforts have been successful in preventing elephant death due to train hits in RNP. These initiatives have resulted in bringing elephant mortality due to train hits in RNP to zero.

***Recommendations*:**

1) Intensive survey of the accident prone areas to identify possible factors responsible for elephant death due to train hits and plan site specific short and long term mitigation measures.

2) Co-ordination committees may be formed involving Railway, Forests Department and local conservation organizations working on this issue at both the central and division levels within a state to ensure a coordinated approach to the problem.

3) Engagement of elephant trackers round the year to receive information regarding presence of elephant herds within five kilometers of the track length. Preference be given to motivated local youth especially STs and Other Traditional Forest Dwellers. Special alertness to be maintained during cropping seasons.

4) Support research to develop sensors that could be deployed on either side of the track in accident prone areas to emit warning signals (sound/light) on approach of heavy bodied animals.

5) Railway should reduce speed of train passing through forest or high accident prone area. This has been done in certain critical areas (eg Rajaji National Park, Karbi Anglong in Assam) and has to be followed in other areas.

6) Locomotive drivers, cabin crew, guards, passengers and caterers to be sensitized on this issue and made aware of the measures to be taken to avert such accidents. The caterers should be strictly asked not to dispose food waste and garbages in the forest area that attracts animals on railway track.

7) Signages to be fixed at accident prone areas along the railway track to alert Loco Pilots.

8) Expansion of railways through elephant habitats to be brought under FCA. In each such case Environment Impact Assessment (EIA) should include assessment on elephant movement by qualified biologists with expertise. Necessary amendment could also be considered in Forest (Conservation) Act, 1980. Environment (Protection) Act, with a provision that any new investment of value INR 100 million and above on forest lands already authorized for

non-forest uses will be subject to clearance again by the Ministry with compulsory EIA.

9) Railway projects should be brought under the purview of EIA.

10) In case where railway track passes through corridors, attempt to be made to form overpasses/underpass in critical bottleneck area. However, during construction, most of the materials should be prefabricated elsewhere so that the construction process does not affect animal movement. No construction to be allowed between 6 Pm and 6 AM.

2) Roads

With the increasing spatial demands of the road network to support development and economic growth of the country, many of them passing through forest, has severely affected wildlife habitat and survival of various species, especially nomadic species like elephants. Major ecological effects of roads are habitat loss and fragmentation, disturbance of the physical, chemical and biological environment resulting in alteration of habitat suitability of various species, mortality of animals by moving vehicle, disruption of connectivity and movement barrier. In India, a large number of animals are killed every year, especially during the monsoons.

Expansion of highways is the thrust of the government to develop infrastructure and connectivity. The surface transport ministry has set a daily target of 20 km of all weather roads to be constructed. The plan also includes expansion and widening of the existing roads (four and six lanes).

The following recommendations are given to ameliorate possible - human-animal conflict.

***Recommendations*:**

a) Environmental Impact Assessments (EIA) to be carried out with rigor and endorsed by independent bodies. Also, independent bodies with scientists to monitor Environmental Management Plans by user agencies. EIAs need to incorporate insights on biodiversity especially habitat connectivity and animal movement.
b) New Developments to be brought under FCA if not already in place. Even for widening of existing road, FCA has to be obtained.
c) NHAI to be sensitized of the issues and a joint coordination committee to be put into place headed by Secretary MoEF.
d) In case where roads passes through corridors, attempt to be made to form overpasses/underpass in critical bottleneck area. However, during construction, most of the materials should be prefabricated elsewhere so that the construction process does not affect animal movement. No construction to be allowed between 6 pm and 6 am.
e) Night traffic should be regulated in areas where a road passes through important wildlife area and pressure horns prohibited. This must be applied at a landscape level and not at a PA level as it has been noticed that by restricting in one area the pressure is merely transmitted to the neighbouring PA (eg. Bandipur vs Wayanad).
f) The Task force has to work with NHAI/State Highway and railways to remove encroachment along roads/railway track. There is already a standing order of Supreme Court in this regard where it held the NHAI responsible for removing encroachment along NH22 and this could be used as precedent to remove encroachment in other areas.

3) Mining

This is another important factor affecting elephant conservation in the country. Mining activities cause a range of environmental consequences that can be severe and irreversible. Mining operations and the process of constructing new mining infrastructure often results in large-scale alteration of the environment at landscape and ecosystem levels. The

clearing of forest is one of the most significant impacts of mining on biodiversity. Loss of forest cover occurs not only in the mined area but also in areas affected by associated activities such as dumping of overburden, deposition of tailings, development of infrastructure for transport and service corridors (railway lines, roads, pipelines, conveyers) and surface facilities (offices, workshops, vehicle parks, storage depots and warehouses). The excavation of the substrate materials and creation of the mine voids also alter the soil profile, hydrology, topography, and nutrient status of the substrate. These secondary factors have the potential to result in deleterious effects on the local biodiversity. At the landscape level, environmental impacts occur generally in the form of alteration of land form features and fragmentation of biological habitats that may cause isolation of populations of floral and faunal species.

Mining, especially open cast mining has dealt a severe blow to elephant conservation in the country, especially in Central India where most of elephant areas in Singhbhum (Jharkhand), Keonjhar, Mayurbhanj, Dhenkanal, Angul and Phulbani (Orissa) have been severely fragmented leading to increased HEC and movement of elephants to adjoining states of Chhattisgarh and West Bengal. Between 1996 and 2000, the growth of open cast mining was 7.6% compared to 0.7% for underground mining. Total forest land diverted for mining between 1980 and 2005 in India is about 95002.6 hectares.

There are seven main statutory Acts that regulate environmental impacts from mining activity as given below:

a. Mines and Mineral (Development and Regulations) Act, 1957
b. The Water (Prevention and Control of Pollution) Act, 1974
c. The Air (Prevention and Control of Pollution) Act, 1981
d. The Environment (Protection) Act, 1986
e. The Wildlife (Protection) Act, 1972, and
f. The Forest (Conservation) Act, 1980
g. The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights Act), 2006

Of these, the Forest Conservation Act 1980 clearly stipulates that mining including underground mining is a non-forestry activity. Therefore, enough provisions have been made in this Act either to minimize or compensate the adverse impact on environment when the forest land is to be diverted for non-forest purpose. Some clause of the law which are particularly related to diversion of forest land for mining purpose includes:

a. In case of open cast and underground methods, the mining process generates solid waste materials like over burden by removing the top soil of forest land which if not properly disposed can create immense damage to the landscape. The Act has made it mandatory for the mining companies to submit *"a mining plan (indicating the solid waste management and post-mining land use plan for reclamation of forest land) along with the proposal submitted for granting lease. The mining plan should be duly approved by Indian Bureau of Mines, Nagpur"*.

b. To determine whether diversion of forest land to non-forest use is in the overall public interests or not, the Act makes it essential that *"a cost benefit analysis should be enclosed in all the proposals involving diversion of forest land of more than 20 hectares in plains and more than 5 hectares in hills"*.

c. The Act also lists the parameters for assessing the cost and benefits accruing due to diversion of forest land. While taking into account the environmental losses due to diversion of forest land, the Act specifies that "as a thumb rule, the environmental value of one hectare of fully stocked (density 1.0) forest would be taken as Rs. 126.74 lakhs to accrue over a period of 50 years. The value will reduce with the decrease in the density of forest".

d. In order to compensate for the loss of forest land due to diversion, compensatory afforestation (CA) is one of the most important conditions stipulated in the Act while approving proposals for diversion of forest land for non-forest uses. The Act says that *"it is mandatory to submit a comprehensive scheme for compensatory afforestation along with the proposal for diversion of forest land. The scheme will include the details of nonforest/degraded forest area identified for compensatory*

afforestation, year-wise phased forestry operations, details of the species to be planted and the cost structure of various operations".

e. This is based on asset replacement approach, where compensatory afforestation is required to be done over an equivalent area of non-forest land. The cost of land and afforesation will be borne by the mining agency and the Forest Department will manage the newly planted area. Such area will subsequently be transferred to the ownership of the State Forest Department and declared as Reserved/Protected Forests. When non-forest lands are not available, the Act states that compensatory afforestation may be carried out over the degraded forest twice in extent to the area being diverted.

f. Ensure full and complete compliance is necessary with the rerspect to the Forest Rights Act (2006) especially in all cases relating to mining. This is especially important with respect to froest dependence of the sections of the people covered by the Act. These very forests may in some cases also be vital corridor or habitat for elephants. Community rights and not merely indiviudla need to be fully recognized.

The gaps

a. Despite the existence of so many rules and regulations under which mining industry operates in India, mining is still contributing considerably towards the dwindling forest cover and poses a hurdle to animal movement. This is due to the fact that due consideration is not given to its ecological and social impact.

b. In most cases, EIA is done overlooking the impact of the project on migration of animals and the ecological sensitivity of the area just to facilitate the setting up of the project. This has also been compounded by the fact that there is no licensing of Consultants to keep an eye on the quality, integrity and veracity of claims made in the EIAs, and no liability on the consultant.

c. There is also noticeable gap in the availability of time series data and area wise data on the extent of land/forest degraded in various mine intensive and eco sensitive areas, for assessing the impact and for implementation of the mitigatory measures.

d. Lack of landuse planning, especially in forest areas has compounded the problem and forest is considered as the easiest resource available for industrial, infrastructure or human settlement.

***Recommendations*:**

a. To make it mandatory for the user agency to consult NECA for undertaking developmental activities in Elephant Reserves.
b. Mining leases in Elephant Reserves should be reviewed and if necessary stopped. In areas that are not Elephant Reserves but used by Elephants leases should be viewed with caution.
c. State governments need to have regional groups/ expert committees to have local agreements to secure elephant movement areas and judiciously plan developmental activities in Elephant Reserve in due consultation with NECA.
d. Mining permits may need to be reviewed and new ones subject to stricter EIA norms in all Elephant Reserves. Mining may be listed as impermissible in "No Go" areas like PAs and other critical wildlife habitat in the Elephant Reserves and as strictly under supervision in "Slow Go" zones in the Reserves under ESA provisions of the EPA.
e. Small mines and quarries less than five hectares do not come under the purview of Mines and Mineral development act and this should be amended to bring them under relevant acts. This is important as at many places, large areas are being mined by group of companies with small individual mining areas. These break up and fragment habitat and their negative impact on water, soild and vegetation adversely affects elephants and other wildlife and the ecosystem as a whole. Care at the time of clearance can avoid unnecessary habitat and forest fragmentation.
f. Time series data on the extent of land and forest degraded in various mine intensive area is essential to assess the impact on elephant habitat and data should be collected on set parameters to assess forest degradation and fragmentation.
g. In addition to funds for compensatory afforestation, Net Present Value of the forest land diverted for non-forestry used shall also be recovered from the user agencies and used for conservation of elephant habitat.

h. An independent system of concurring, monitoring and evaluation shall be involved to ensure effective and proper use of funds available under compensatory afforestation, CAMPA. This could be done by forming a committee with members of forest department, mining, wildlife scientists and Govt/non-government agencies working in the area.
i. Quarterly review on conditions laid down during clearance must be done and status report must be submitted.
j. Powers under EPA must be delegated to the local forest official level.
k. Mine closure plans, which are mostly in place, must mandatorily address the ecological requirements of the area and strictly implemented. This should not be just filling of pits but restoring the habitat with suitable local species.
l. While permissions are accorded for mining in a area, due consideration should be kept that once the single block is exhausted and mining started in second block, the first mining block should be properly filled and plantation undertaken with indigenous species before permission accorded for mining the third block. This should be made mandatory in all mining areas.
m. EIA/EMPs must not be mine centric but must be made at a landscape level.
n. Clearance under the FRA (2006) is mandatory, with explicit consent of the Gram Sabhas before any forest diversion.

4) **High tension power lines.**

Electrocution is one of the most common causes of elephant deaths in India. This is due to two important reasons:

a) high tension electric lines passing through forest area: The electricity poles supporting the wires are placed far apart, causing the wires to hang low. At times elephant passing under the wire accidently touches it and gets electrocuted.

b) At times, the high tension wires are illegally tapped by villagers from the nearby electric poles of and used as barrier to prevent crop raiding by elephants or even for poaching as seen in recent days in Orissa, North Bengal, Karnataka and many other states.

Recommendations

a. When such high voltage wires are installed, the authorities should be careful about the 'sag' that occurs between the poles. In areas where elephants are found, they should maintain the height at such levels that the animals are unable to reach them even with their trunks stretched.

b. It should be made mandatory for Power Grid Corporation, NTPC, etc which frequently requires forest land for laying high tension wire to take permission from NECA for laying high voltage lines in Elephant Reserve.

c. When electric lines are laid along a 'right of way' within a protected area, there are funds allocated to clear the vegetation along the line to prevent electrocution of animals during monsoons. However, these funds remain unused or even misused, leaving wildlife susceptible to accidents. This has to be regulated.

d. In case of death of elephants by electrocution due to high voltage wire, adequate compensation should be taken from Power Grid Corporation, NTPC.

e. Landowner of agricultural land where a elephant dies of electrocution should be prosecuted.

f. The Power Grid Company should come with an award scheme for person who informs them of sagging of power lines and poles to prevent accidents- both for human and wildlife.

g. Options must be explored of using insulated wires within elephant reserves, of auto-power trip solutions that work in case the wire is 'grounded'.

h. A more realistic approach must be taken while approving low tension wires through forest and wildlife habitat especially Tiger and Elephant Reserves.

CHAPTER 5

Mitigating Human Elephant Conflict

The Background

The Task Force defines human-elephant conflict (HEC) as the adverse impact people and elephants have on each other. Conflict of this nature entails suffering for both humans and elephants that are in such situations. The intensity and scope of the conflict is a major challenge for conservation as much as for humane governance.

The levels of conflict are high in many parts of the elephant's range but are very serious or quite high in states like West Bengal, Assam, Orissa, Jharkhand and Chhattisgarh. More than half the expenditure incurred by Project Elephant under the 10th Five Year Plan is for HEC mitigation. Another 15 to 20 per cent is spent on *ex- gratia* and compensation for loss of property or crops. Thus more than two of every three rupees spent on elephant conservation deals directly or indirectly with human-elephant conflict.

Equally important are the retaliatory killing of elephants by people. Elephants are probably the only species that come into such serious conflict with people when their habitat is destroyed or degraded. Severe, widespread HEC is index of failure to protect forest cover or reverse their fragmentation and degradation. On an average nearly 400 people are killed annually by elephants and about 100 elephants are killed by people in retaliation.

Elephants annually damage 0.8 to 1 million hectares of (Bist, 2002). Assuming that an average family holds one or two hectares, then HEC affects at least 500,000 families. The figure could be twice as high if the size of the land holdings were smaller. Losses can be a very significant burden for the individual cultivator, particularly if holdings are small or marginal.

Effective mitigation of conflict is therefore imperative for successful elephant conservation. Thus far, our plural cultures and the high tolerance levels of rural people have enabled elephants to persist in many areas. But individual families of small holders or labourers cannot be expected to shoulder the burden of conflict forever on their own.

The reality is that HEC has increased in its intensity and spread over the last two decades. The effective mitigation of conflict is thus imperative for elephant conservation. Past policies and processes, therefore, require critical review and urgent as well as medium and long term action.

The changing behaviour and ecology of elephants in the context of landscapes forms one dimension of the strategy. Highly context specific responses that fully allow participation of affected people is the other aspect. Only such an integrated approach can defuse tense situations, giving both elephants and people a fair deal.

Premises

The premises that can guide the way for site specific strategies need to be spelt out.

Firstly, all areas where conflict is an issue, need to implement a programme to understand the nature (types) and spatio-temporal patterns of conflict, as a prerequisite to implementing conflict resolution methods. NECA has to closely monitor and analyse such records and processes. These include field inspection to record the exact location via coordinates, time, extent of damage, and estimation of cost, name of farm/farmer/property, retaliatory measures or guarding measures in place.

At present, considerable conflict mitigation is applied to landscapes in a non-specific manner based on the individual experiences or recommendations from research studies or more subjective knowledge from other landscapes.

Secondly, conflict mitigation evolved in the above fashion (site-specific, based on research) needs to be implemented with the involvement of local stakeholders and the affected people.

Third, it is essential to effect a change in the approach of Forest Department (FD) personnel. FD staff involved in conflict resolution need procedures to prioritise areas and types of conflict resolution chosen. This should emerge from research and monitoring and be clearly articulated in management plans. For instance, the location of barriers such as fencing should be done based on intensity of threat or extent of damage as recorded empirically and not based on administrative convenience or subjective judgement.

Analysis of problems

Policy makers have treated mostly symptoms of the problem (habitat loss), not the problem itself. These changes have major implications for social structures of elephants, ranging behaviour and ecological requirements.

There are a host of key issues. The loss of a significant part of or of whole home ranges or their severe degradation of renders the affected elephants "displaced" as their social structure and hierarchies do not allow them to move freely into the remaining habitat. Such displaced elephants cause serious HEC problems locally or in other areas when they disperse out of the original habitat patch.

For instance mining in Orissa's forests can displace elephants which cause problems in adjacent areas or even across the border into other states. Though elephant home ranges can range from 250 sqkm^2 and to 600 sqkm^2, conservation focuses often on small habitat patches. This is the case with the wildlife sanctuaries of Dalma, Jharkhand and Chandka, Orissa. Elephants disperse and wander well outside the sanctuary and cause severe HEC problems. Dalma Wildlife Sanctuary which is approximately 200 sqkm^2 but has an elephant population that impacts (through HEC) an area that is in excess of 3000 km^2.

Elephant behaviour and ecology has to be at the core of any coherent strategy or policy. Females live in strongly bonded social groups called clans (Douglas-Hamilton, 1978; Moss, 1983; Vidya and Sukumar, 1998; Desai, 1995). Clans have well established home ranges that have been established over multiple generations. Different clans within a population have well established social hierarchies. Home ranges and social hierarchies therefore govern movement and habitat use by clans. When habitat loss, degradation or fragmentation takes place it directly affects only those elephants within whose home range it occurs. Due to their well defined social hierarchies and spacing behaviour the affected clans cannot move into the remaining habitat as they are likely to be pushed out by the resident clans. Therefore clans cannot adjust to significant loss, fragmentation or degradation of habitat within their individual home range even though the overall habitat patch is large. Habitat loss in one area and habitat improvement in another do not balance each other or reduce HEC, the affected clan will continue to raid unless they are directly addressed.

Elephants are habitat generalists and live in diverse habitat types ranging from semi-arid habitat to wet evergreen forests so quality does not refer to vegetation type but of the levels of degradation. Elephant clans have well defined and specific movement paths and a population with several clans could thus have multiple movement paths or migration routes. Breaking of any such path/route will result in the affected clans coming into conflict with the people in these modified landscapes. These are traditionally used routes of the elephants and various reasons of social and geographic reasons may prevent them from using other routes even if the habitat was available. Elephants require large home ranges to meet their ecological needs, ranging in size from – 180 to 600 sqkm^2 for female clans (Baskaran, *et al*. 1995; Williams *et al*. 2002).

This necessitates a landscape-level approach to elephant conservation while adequately addressing the HEC situations in high human-density areas.

Landscape management of HEC

The interface area and the perimeter length have implications at the landscape and at the village level. Poor structure at either of these levels could result in increased HEC and in increased problems to resolving it. They need to be addressed at both levels.

Interface area between human use areas and elephant habitat: Hard or clear boundaries are those that are *distinct boundaries* between human use and elephant habitat areas. Such boundaries are not easily negotiable by elephants. Conflict along such boundaries is also generally low unless there has been large-scale displacement of elephants. Distinct boundaries lend themselves to the erection of elephant proof barriers, reduce the manpower required to guard the boundary and reduce the costs as they greatly diminish the length of the interface area. Hard boundaries are mostly seen in Reserved Forests and Protected Areas that have been well demarcated.

The most common interface is however *a diffuse boundary* where the boundary is not clear. This is typical of areas with high level of encroachment (as in parts of Assam and parts of central India). Diffuse boundaries are the norm where swidden cultivation (or slash and burn agriculture) is practiced (as is the case of parts of North East India). Diffuse boundaries create problems for HEC mitigation measures involving barriers or fixed deterrents as there is no clear boundary at which to implement the barrier. They create a mosaic of human use areas and elephant habitats ensuring that elephants constantly encounter human use areas and thus increase the probability of conflict. As boundaries are not clear HEC is generally very severe.

Both interface types are relevant. Even at the individual village level, interface may be a hard or diffuse boundary. In such areas the only strategy is to stop random habitat conversion and aim for consolidation and rationalisation of elephant landscapes and reserves.

Implications of different ownership/jurisdiction on HEC management: In terms of addressing the interface area a key point for HEC management is an understanding of the owners and stakeholders in non-forest department managed forest land along the perimeter of PAs and Reserved Forests. These lands could be Revenue Forests (under the management of the Revenue Department), community or District Council forests (under the management of the relevant communities and district councils) or they could be privately held forests. There are two key points that need consideration; first these forests may serve as elephant habitat and an ideal HEC mitigation strategy would require that these be treated as elephant habitat. Excluding them would result in habitat loss and further escalation of HEC. Another result would be barrier cutting off elephant habitat and passing through the forest. The second issue relates to including them as elephant habitat through negotiated agreements with the owners.

Tea, coffee and rubber plantations offer food and shelter to elephants and also contain small forest patches where they find shelter. Estates can act as corridors where essential and these can be maintained by negotiation with the owners. Cordoning off huge areas of estates, especially of water sources from elephants is standard practice. It is inadvisable.

The Forest Departments may consider necessary mandate and authority to implement HEC mitigation measures in these extended areas. The ownership and management of these areas outside the RF/PA would continue to rest with the concerned departments and any changes in the status of land have to be assessed with special attention being paid to its need as an elephant habitat.

Understanding Crop Raiding

Why do elephants raid crops or what are the different types of crop raiding?

Crop raiding is both opportunistic and obligate in elephants. It is important to understand the differences between these types of raiding as HEC mitigation measures depend on the type of raiding and its intensity.

a. Opportunistic raiding: If given the opportunity (unprotected/poorly protected crops and little or no human disturbance), elephants will raid crops when they encounter them as they see crops as food. This type of crop raiding is common in all agricultural areas in and around elephant habitat. This is the most easily managed type of HEC. Proper guarding techniques or even minor barriers are sufficient to stop such crop raiding. Some opportunistic raiding elephants may get habituated to existing crop protection methods and take to raiding routinely, recognizing a rich source of food. Stopping such elephants has no adverse impact on their well being.

b. Obligate raiding: When habitat loss, fragmentation or degradation severely reduces the size or quality of the habitat within a home range, the affected elephants (clans or bulls) will raid crops out of necessity. As they cannot get enough resources from their home range they resort to crop raiding for sustenance. When clans which have lost a significant part of their home range are stopped from crop raiding they may eventually die out. Lack of resources would result in starvation, reduced fecundity and calf survival which eventually would lead to the extinction of the affected clan. There is a clear need for further study on the impacts of stopping such clans from raiding and to take a more holistic approach on dealing with obligate crop raiders.

c. Dispersing herds: When the home range or social organization is severely disrupted, an entire clan or often a part of the clan will break off and disperse in hope of finding a new and more suitable area. Males also disperse but this is a natural part of the social behaviour. However males, like clans, may disperse out of the normal elephant range when conditions become extremely poor. The primary reason for such dispersals is severe disturbance in the original range and it is a clear indicator of serious problems in the natal area. Such dispersals cause serious HEC problems for two reasons. First there is generally no suitable habitat outside existing elephant range and the probability of finding suitable habitat

patches is very low (given the low forest cover). As such these elephants become totally dependent on crops for their survival.

Second, people living in the newly colonized areas are unaware of how to deal with HEC. The absence of familiarity with such large animals makes them vulnerable. The inability to minimise risk (on either side) has tragic consequences, leading to loss of human life as in parts of Andhra Pradesh, Maharashtra and Chhattisgarh.

In any landscape or even a specific site, one or more or all types of HEC mentioned above can exist. Each needs a separate mitigation tool or a combination of tools. Only a proper assessment of the types of HEC situation prevailing would allow the proper selection of the right tools to successfully deal with HEC.

Perimeter length

In addition to the type of interface, the length of the interface area (perimeter length of human use area or elephant habitat) also has a strong bearing on the intensity of the problem and its management. Convoluted boundaries with lengthy perimeters will increase the costs of applying HEC mitigation measures, increase chances of conflict and also the probability of elephants encountering the boundary. Shorter perimeters due to better shape of the enclosed area will reduce the cost of protecting the perimeter as well as minimise the number of affected elephants. Disproportionately long perimeter would also increase the area that is exposed to degradation and disturbance from humans. This can be addressed by the reserve boundary rationalisation as suggested by the Task Force as an immediate management step.

HEC Management

HEC mitigation needs a comprehensive approach that uses multiple tools to stop creation of new problems and minimise or resolve existing problems. Since the conflict is with a very large mammal with needs of a landscape mosaic to sustain it, this issue cannot be comprehensively settled in one step. The objective would be to set in motion a HEC

mitigation strategy that will eventually lead to resolving most of the problems in the long term. HEC mitigation needs to follow a three step process which involves:

a. Actions that halt or prevent the creation of new HEC situations or the escalation of existing ones.
b. Actions to contain minimize or resolve existing problems.
c. Actions that deal with any residual or unavoidable HEC problems.

HEC Management Tools

Stopping the causative factor of HEC

The first step would be to develop regulatory mechanisms that stop habitat loss, fragmentation and degradation that initiate and escalate HEC. Given the current trend vis-à-vis the use of forest lands for development this becomes critical to HEC mitigation. While these were broadly identified here, they are taken up in detail in the landscapes chapter.

Stopping or regulating habitat loss requires cross sectoral linkages between the FD and other departments and long term land use planning. These have to take habitat and ecological requirements of elephants into account.

There is an urgent need to ensure elephant specific Environmental Impact Assessment (EIAs). All infrastructure/development projects that require conversion of elephant habitat would require an elephant specific EIA that stops poorly planned or damaging development. However, where development is justified it identifies and recommends suitable actions (including HEC mitigation and conservation related actions) to avoid, minimize and mitigate the adverse impact of the proposed development. And most importantly, based on a pre and post project implementation assessment the EIA would establish the HEC and conservation costs that the developing agency (government or private) would be responsible for paying.

Habitat protection is a continuing challenge and needs readdress. This can be facilitated by

a. monitoring habitats using satellite images of reasonable resolution biannually to identify habitat loss due to encroachments (vulnerable areas and corridors would be targeted first).
b. Direct monitoring on the ground at the beat level by having monthly (with a focus on vulnerable areas).
c. Clear demarcation of forest lands using boundary stones, fences or trenches. Revenue forests acting as elephant habitat should also be similarly demarcated. This should be done at the earliest in vulnerable areas.
d. Resolving the ambiguous status (ownership/jurisdiction) of any forest land that constitutes elephant habitat (especially where it is large and forms a significant or important part of the elephant habitat).
e. Where habitat has been lost due to violation of the various forest laws there is a need to enforce law so as to recover the lost habitat.

Containing HEC and resolving problems

It is a major challenge to work out how to stop elephants from entering human use areas. The guarding of crops is the single biggest contributor to stopping/containing HEC. Any sound framework has to take into account the need for sustained human interventions to augment the capacity to address the issues at the local level. These will have to include:

a. Capacity building by identifying the successful tools used in guarding across the country, build awareness among communities about these methods.
b. Support for guarding by encouraging it and by subsidizing tools needed to make it more effective (trip wire alarms, fire crackers, MGNREGS support)
c. Incorporate guarding as a support tool when applying other protection measures like electric fences, elephant proof trenches, anti-depredation squads.

Field Level Issues

Field level issues in conflict mitigation are the next weak spot in HEC control efforts. There are areas where multiple methods (electric fences, elephant proof trenches and anti-depredation squads) have been used over time. Despite sound planning, there has been a general pattern of failure.

Tools or methods chosen to contain conflict are often inappropriate. Such poor identification of the most appropriate HEC mitigation tool or use of even inadequate methods is a major lacuna.

Lack of monitoring to ensure effective implementation and facilitate adaptive management approaches is equally serious. This is true of major mitigation tools like electric fences and elephant proof trenches, translocation/capture of elephants or habitat enrichment efforts. Neither is there an assessment of their impact nor is the expenditure accounted for.

The lack of community participation is another major cause for failure of HEC mitigation efforts. The primary reason for failure is because of stakeholder needs not being taken into consideration and for implementing measures without the consultation of the affected people and seeking their full co-operation/participation in implementing the mitigation methods.

In the case of compensation/relief for crop and property damage, corruption resulting in poor evaluation of claims, delays in evaluation and compensation payment, and inadequate compensation amounts aggravates the animosity towards the system and consequent retaliation on elephants.

The public audits of HEC mitigation efforts are therefore essential to maintain fuller accountability and ensure greater transparency.

Gaps in knowledge

There are major gaps adequate, quality information, the key ones being:

a. Data on elephant behavioural ecology in different habitat types, long-term ranging behaviour, responses to changes in habitat (structure, quality, interface areas) and to HEC mitigation efforts in lacking or very limited.
b. Critical evaluation of past conflict mitigation and conservation efforts for different types of HEC situations is lacking.
c. Encourage innovative approaches to conflict mitigation and resolution. Traditional approaches such as chasing, erection of barriers, or removal of so-called problem elephants have proved inadequate. It is worth exploring a range of options: insurance (of property and crop), community-based fencing, and government support for crop guarding, and in general, movement to a framework that incorporates prevention and risk-reduction rather than compensation and reaction.

Recommendations for Mitigating Conflict

Given the seriousness of human-elephant conflict and its extreme gravity in certain areas, there should be a continuing programme for containing and defusing such conflict.

1. The Task Force recommends constitution of **Conflict Management Task Forces in identified areas.** These will be funded by the NECA and will be a permanent / long term programme to mitigate and significantly reduce conflict on a continuing basis. The task forces will include on a mandatory basis a biologist with elephant expertise in the region, an animal welfare specialist, a wildlife veterinarian, an expert of rural socio-economic issues/social scientist, elected representatives from the community, the Regional CCF and representative of the Revenue/Civil Dept. The Territorial Wing of the FD will be fully associated with the process. **NECA will finally identify the area for constitution of such task force in consultation with the respective state or states. However , the task force recommends constitution in areas such as** Sonitpur (Assam) , Rani, Hassan(Karnataka), Keonjhar / Sundargarh (Orissa) Tirupattur (Tamil Nadu) , Sariakela/ Kharsawan

(Jharkhand), Majuli (Assam), Rom-Musabari (Jarkhand), Raigarh/Jashpur (Chhattisgarh) and southern West Bengal.

2. Transparency of information is vital to build public confidence and also enable continuous evaluation of policies and programmes. It is recommended that data pertaining to claims for loss of life, crops or property, elephants killed/captured in retaliation, be put up in public domain.

3. The option of Culling elephants (killing of herds or whole groups of elephants as a technique of population management) is ruled out as a policy instrument as it is ethically unacceptable in the Indian context.

4. The second option of **killing in self defence** or in extreme conditions is not ruled out in rare cases. However, the identification of such animals should be done carefully and their removal carefully supervised and after observing due protocols. At present, the Chief Wildlife Warden is empowered under Section 11 of the WLPA to take such remedial extreme action. The section specifies how killing is a last option and capture or tranquilizing or translocation are preferable. The Task Force re-iterates its observation in letter and spirit. All such cases where the Chief Wildlife Warden takes such action are to be reported by him/her to the NECA.

5. **Removal via capture** of elephants is also a strategy to mitigate conflict. But caveats are in order. All removal requires careful consideration and should be done only under the assessment and monitoring by a consortium of research institutes, individuals, other stakeholders and government departments with the requisite capacity.

6. **Translocation of elephant populations** are to be considered subject to strict conditions. It will work best if done for whole herds or family groups but whether in such cases or with the individual bull's viability of the approach should be carefully examined. Such translocated animals must be compulsorily monitored through the best means possible (such as telemetry) in order to ensure that they do not cause conflict elsewhere, and in order that the Forest Department can re-

capture them in such eventuality. Translocation entails certain problems even as it offers some scope for containment of conflict under certain conditions.

7. **Short drives** which basically focus on driving elephants deeper into the forest or away from a particular village are often employed in high conflict areas. These often serve little purpose as elephants return or just move on to the next village where they cause problems. This approach can be used to placate people in a crisis situation but it cannot be used as routine HEC mitigation measure in any area as the real need in such areas is more lasting solutions.

8. **Anti depredation teams are crucial for drives.** Anti-depredation squads/drive teams are essential for containing elephants in high conflict areas. The limitation of this method is that it does not solve anything and generally only helps in moving the problem from one village to another. As a stop gap measure to overcome immediate problems caused by public outrage to HEC this is a solution. But the time gained needs to be used to develop better and more lasting solutions. Such teams will always be necessary to deal with crisis situation, however they cannot be a permanent or a regular solution in any area as the scale of the problem calls for a more lasting and better solution.

9. **Reproductive control of elephant populations** in unviable situations needs serious and sustained scientific research. NECA can facilitate such research under the auspices of Consortium for Elephant Research and Estimation.

10. **Barriers to elephant movement** are an important tool to contain damage, but they require careful planning, good execution and good maintenance. In the absence of these, barriers may have little or no positive impact. Barriers are used primarily to keep elephants out of human use areas. Their effectiveness depends entirely on how suitable a particular barrier is to the local conditions (intensity of HEC and type of HEC, and field conditions for applying the barrier). Quality of

construction and maintenance are also the keys to success or failure of barriers.

There is a need to evaluate past efforts in terms of costs, quality of application and the effectiveness (factors that contributed to success or failure). There is also a need to develop best practices manual whose guidelines must be mandatory for erection of any barrier.

Fences and Trenches can only work only as a part of a larger landscape level planned intervention.

A moratorium on EPT is suggested and expensive electric fences without involving the community for maintenance to be discouraged. This could be reviewed by the Conflict Management Task Forces.

Considering the persistent and common grievance in some areas that officials are not easily accessible to cultivators and other villagers affected by elephant and other wildlife crop damage, it is recommended that **public hearings be held at least twice a year, at the start of the *kharif* and *rabi* sowing seasons (depending on locality), at taluka level**. These could be chaired by the local MLA and mandatorily require presence of not only the Wildlife Wing and Territorial Wing staff but also the revenue and civil authority.

These public consultations at taluka level are a must particularly in high conflict areas. These should include the local Deputy Conservator of Forests (both the Protected Area PA DCF and the Territorial DCFs), other departments should include police, agriculture, horticulture, veterinary, the private agency that has put up mitigation measures (electric fence) should also be present, affected farmers should be present. EDC members and office bearers may be invited. Journalists (both local and state newspapers) including their association office bearers should also be invited.

Such hearings serve two objectives: preparation and review on a regular basis at a field level.

First, coming before the main sowing season, they must serve as **assessments of preparedness** on the part of farmers, forest departments, revenue officials, and NGOs to deal with conflict. This will help identify steps to prevent conflict, how to follow up and how to implement plans for both.

Second, at the conclusion of the harvest (or ahead of the next sowing) season, these hearings serve as **means of review** to help identify successful efforts, means of overcoming challenges and even fix accountability for failures both on the part of farmers and government officials in the implementation of conflict management plans.

11. **Practical means of valuing farmer investment in crop protection:** The extent and severity of crop losses has led to deep resentment due to the burden on cultivators. In conflicts with elephants, farming communities suffer their greatest costs, *not only in terms of material losses*, but also additional investments like wages and infrastructure, which are required to cultivate in contexts where elephants pose high risk to cultivation. At present, these high costs are not factored into any valuation of losses that farmers bear.

    Hence, payments for the **work of crop protection may be considered under the auspices of the MENREES.** This will alleviate distress and reduce the burden on cultivators both in cash and labour terms. This is a serious matter in areas hard hit by crop raiding elephants and the farming community looks to the government and the wider society for assistance. The matter should be taken up on priority basis with the Rural Development Ministry.

12. **Crop Compensations and Insurance:** The Task Force considered in detail procedures that will alleviate distress among those worst affected by human elephant conflict and arrived at the basis of norms to be observed in such case Compensation for crop damage should be available if and only if other methods (barriers) have failed despite

being properly applied (by the government, community or the owner). Effective crop protection measures should be the priority. Only where they fail despite sincere implementation should compensation be paid.

In agricultural areas that lie adjacent to or within the elephant's range, the priority must instead be to increase effective protection to farmlands by implementing barriers that are non lethal to elephants. It is important to explore means of creating these barriers that go beyond the efforts of forest departments alone. Novel business models such as ones that provide 'crop protection as a service', involve community-led collective action, or private-public partnerships must be encouraged to provide a diversity of crop protection options for varied contexts.

Technical considerations are important in the design of barriers. We equally need robust, sustainable institutional arrangements to oversee the creation and maintenance of barriers. In most instances today, it is impossible to answer the simple question as to whom does a fence or a trench created to prevent crop loss belong? As long as the ownership of the asset itself is unclear, its survival and effectiveness remain bleak. In every instance a barrier is implemented, there needs to be clear written agreements between the Forest Department or other 'investors' and the local communities about their roles and responsibilities in the creation and maintenance of the barriers. At local levels, such institutional mechanisms are perhaps most practical at the level of G*ram Panchayats* or where relevant G*ram Sabhas*.

Once barriers have been created, and maintenance agreements for these barriers have been reached with local communities, insurance must become the standard means of off setting further crop losses to elephants. Schemes such as the recently revised Modified National Agricultural Insurance Scheme must be adapted for this purpose, and implemented in collaboration with entities such as the Agricultural Insurance Company of India. There are serious policy hurdles due to the problems in recognising **wild animal damage as being subject to insurance cover**. For the present, all crop loss amounts require re-evaluation, and substantial upward revisions as per the state, region and crop. **The PSU insurance companies should be approached by**

NECA/MOEF to take up and cover a few such sites on a pilot basis. These can be made the basis for extension to all high conflict zones. Premiums in such cases must ideally be shared between farmers and Forest Departments, and payouts of insurance (which can go partly to offset farmer's losses, and partly to repair barriers) would be contingent upon efforts to maintain barriers. In the absence of barriers, or where no maintenance agreements exist, relief must be implemented strictly as a transitional means, pending the institution of more long term measures to reduce crop loss.

There may be a structured approach to crop compensation to ensure social justice. The maximum amount payable to an individual (family) should be based on some predetermined percentage of what the minimum wages (government rate in that area) a person would earn in a year. The upper limit for relief can be 80 percent to 100 percent of the minimum annual wages or the actual loss (including labour and input costs) whichever is lower. Ideally, relief should be paid partially in grain and partially in cash for two reasons; first people generally keep enough grain to support the family and then sell the rest of the harvest for money.

For people Below Poverty Line (BPL), Scheduled Tribes and Scheduled Castes and anyone holding less than two acres of agricultural land relief as above should be given in cash or grain for grain.

For those holding land above two acres but below five acres 50 percent to 75 percent based on resources available, should be given as relief (grain for grain or cash).

For those with land holding greater than five acres, 25 percent of the actual damage or a predetermined maximum amount allowable (whichever is lower) should be paid. If the Forest Department will be the relief dispensing authority, it will have limited ability to verify landholding by a relief claimant. This requires mechanism for coordination with the Revenue Department.

There will be a need to determine different classifications for different

regions in India, taking into account land productivity. This is necessary given land yields and crop values vary across the country and also are dependent on irrigation and the number of crops in a year.

Verification is critical to any compensation scheme as this method is open to misuse. In our bid to accelerate the process we should not subject the scheme to abuse. A transparent verification scheme involving the forest departmental personnel and members of the village HEC committee should assess the extent of damage and recommend compensation. Assessment of damage should follow standard assessment guidelines (to be developed).

Transparency maintained by posting the lists of claims and assessments on a monthly basis in the Forest Department office.

Compensation claims should be cleared every month. This is to ensure that the claimants are not harassed or squeezed for money as this is the major problem identified by the people and a major cause for frustration and anger among the affected people.

The role of the MLA, elected members of rural local bodies, the District Collectorate and forest officials in hearings will help redress grievances. Coordination of Revenue and Forest Departments is vital.

13. **Loss of human life or grave injury** due to elephants in conflict situations is deeply tragic and any immediate and medium term steps to reduce it are urgent and necessary. **Ex gratia relief for loss of human life should not to be less than three lakh rupees.**

For injury the full hospital bill including transport, costs (lodge and board) for a family member to be at the hospital and post discharge treatment and medication should be paid for. Loss of pay (or wages in the case of daily wage earners) for the duration of the treatment should be compensated. Where the injuries permanently disable or seriously impair the person's ability to work normally he should be given a structured compensation package similar to that done by life insurance companies. Full disability in taking up his normal work should be compensated at the same rate as that of loss of life (i.e. Rs. three lakhs).

Timely payment of existing compensation amounts is vital so too is the plugging of 'leakages' in the process.
NECA assisted by the Conflict Management Task Forces should initiate a thorough review of the compensation systems.

13. **Innovative schemes are already under way for mitigating losses and require facilitation and assistance.** Schemes such as Grain for Grain, cooperative fencing by farmers, community maintained barriers, highly trained watchers with scientific guidance to reduce casualties in plantations are all well known. NGO government partnerships, initiatives by farmers' cooperative or self help groups or District or Autonomous Councils are instances to be assisted with funding and technical help. These require study and careful up-scaling. Government should facilitate, assist, encourage and support such attempts. NECA may consider extending such support while assisting such help by other government agencies.

CHAPTER 6

Anti poaching, Trade and International Ivory Issues

Background

The Asian Elephant in India is threatened by various factors of which illegal poaching of male elephants for ivory trade is the most critical. Although, population censuses of elephants in India show an upward trend, the selective elimination of the males has resulted in a skewed sex ratio in several parts of the country threatening the viability of such populations. It has been estimated that the country has only about 1200 tuskers of breeding age in an overall population of about 25000-27000 Asian elephants (Sukumar in litt) and although this requires more science to correctly establish, the fact that there is a problem in the sex ratio in certain areas cannot be denied.

Through the 1970s and 1980s poaching saw an upsurge and by the 1990s, poaching had peaked. 1996-98 saw a tremendous escalation in poaching with at least 253 elephants poached in India in that three-year period. The actual figure could be as high as two times this, if undetected carcasses are taken into consideration

Issues faced by the department when curbing poaching

Although there has been considerable control exercised by the forest department in controlling poaching in the early part of the last decade or so, such efforts must not slacken. This is due to the cataclysmic effects that poaching can have on a population of otherwise long-lived and slow maturing species such as the elephant. Many of the arguments on why poaching can be devastating for elephant populations in India that are even otherwise under tremendous pressures from habitat loss and conflict are given under the arguments against the illegal trade.

To control poaching the two critical elements are the frontline forest staff

and intelligence gathering. No one can protect a targeted species in the forest better than well trained, well motivated, young forest staff who intensively patrol the forest. The best way to equip such forest guards is by having a good intelligence network that feeds information in to them. This is far more efficient than arming them with sophisticated weaponry although in case of specific instances, where the poachers are similarly armed, this may also be thought of. If the forest staff are under trained in such combat, the use of select paramilitary in such instances may also be considered. It is critical that such force be used only against heavily armed poaching gangs or armed insurgents and not used indiscriminately against local villagers.

In doing so the certain issues confront us. One is that in general, the Forest Department is becoming better staffed at the apex and not down the line.

There is over 50 percent vacancy in many Wildlife Divisions of the country. There is a severe shortage at the lower levels (watchers, guards and foresters).

Even though, often, all middle-senior officer level positions are filled what is required are frontline staff with motivation and drive at the lower levels.

One of the most crucial posts is that of the Range Forest Officer (RFO). These positions are largely vacant. Wherever RFO positions are filled they are mostly staff on the verge of retirement or else those who consider this as punishment posting.

There are instances such as in Kerala and Gujarat (Gir) where the RFOs are mosly young and able to do extended spells of field work in tough terrain and difficult weather.

Then again there is a great burden on protecting species and habitat that is put on anti poaching watchers and other temporary staff who in many cases work for decades without employment security or benefits. Even forest staff at the lower levels are vulnerable to poor benefits and little or no training. They are essentially silviculturists and foresters who are not equipped mentally or physically to combat professional poachers. This

results in loss of life and limb for the staff as well as poaching of, among other species, elephants.

The forest staff at lower levels are often bloated in terms of numbers but are unskilled to do an anti poaching job. In other areas, even the numbers are too few. They are also ill-motivated in many places and through acts of omission can allow poaching to continue unhindered. It is important to point out at this juncture that in many places, the lower level forest staff are actually the key protectors of the system and face tremendous odds in their battle to save elephants in particular and nature as a whole.

Pressure of the opening of the international ivory trade

The ivory trade is a centuries old business worldwide. Several arguments have been made to legitimise the ivory trade as being good for elephants, good for resolving human-elephant conflicts, good for development of human range states, and good for preserving tradition. However, no rationale, whether ecological, economic and ethical can justify the international ivory trade.

Trade in ivory figurines continues nationally in many African and Asian countries adding to the volume of ivory currently in global trade. No estimates are available on total volumes of such trade and there are varying reports on the decline of this industry in Japan, and the concurrent rise of demand in China. What could be said with certainty is that a large volume of ivory continues to be traded around the world.

One of the foremost explanations advocated in favour of ivory trade is that it could be used sustainably to financially support elephant conservation and manage overpopulation of elephants. But the important question remains – is it ecologically sustainable for elephant and their habitat and is it an economically sustainable activity? The third dimension to the issue is that despite its sustainability whether ethics permit such an activity or not.

(A) <u>Ecological Perspective</u>: This could be summarised as follows:

Ivory is a slowly renewing, finite resource extracted from endangered species.

The ivory trade depends on the availability of raw material. In the recent past, legal trade has only been proposed for the ivory of the African savannah elephant (*Loxodonta Africana*). The recently described African forest elephant (*Loxodonta cyclotis*) and the Asian elephant are both more endangered that *L.africana* and both will necessarily be threatened (the degree of threat being debatable) by an increase in trade in look-alike ivory. The ivory from both these species (known as hard ivory) is preferred by the largest global consumer of ivory, Japan.

In India, poaching is threatening elephant populations by skewing sex ratios. To give on example, the former Chair of the Asian elephant specialist group had then estimated that the number of tuskers of breeding age in an overall population of 25000 – 27000 Asian elephants in India is just 1200 (Menon. *al*, 1997).

Under the current situation, application of the precautionary approach would render illegitimate any international trade that has the potential to further threaten such endangered populations.

Elephant biology does not support a traditional demand-supply model

"Elephants are not beetles" was part of the title of a seminal paper by Poole and Thomsen 1989 that was, in part responsible for the ivory trade ban at the CITES CoP in Lausanne. And indeed they are not, elephants are slow growing, slow breeding, long-lived, and socially complex animals that are strongly sexually dimorphic. None of these life-history traits support a traditional demand-supply model that allows the elephant to be a "sustainable" source of ivory for a growing or even steady demand from the Far East. In 1989, Poole and Thomsen argued that given that female reproduction takes place between the ages of 10 and 20 (Moss, 1989), and

male reproduction between 25 and 30 (Poole 1989) and given the particular pattern of off-take of the ivory trade, the exploitation of elephant populations has been biologically unsustainable since 1950. They calculated at the time that even an off-take of up to 4% would drive the species to extinction and that even if the trade were banned, it respite for some of these elephant populations, courtesy of a complete ban on international ivory trade, lasted only nine and a half years.

Also, in *Elephas*, only the males are tusked, whereas in *Loxodonta*, both sexes have tusks, the weight of the male tusk reaching six times that of the female (Parker 1979). In both cases, therefore, older males are the targets of poachers. This selective hunting of large tuskers effects the population in a number of ways. One of these ways is the effect on reproductive rates, as recent studies (Poole, 1989) demonstrate that females prefer males with longer tusks, possibly due to the fact that longer tusks indicate lower parasite levels and therefore healthier mates. An off-take that involves the healthier and fitter males of a population also reverses the "selection of the fittest" theory and therefore can be thought of as unnatural selection (Parker, 1979). In Asia, hunting for male elephants leads to highly skewed sex ration, such as the 1:100 (male: female) ration observed in some parks in southern India (Ramakrishnan,*et.al*,1990), anything beyond 1:5 is a cause for worry (Menon, 2002).

These features of mega herbivore biology make the elephant an extremely unsuitable candidate to be a supplier of raw material for commercial trade. If ecological sustainability requires ecological systems to remain functional despite an off-take, it is difficult to achieve this in a species with such biological characteristics.

No-consumptive utilization has a better chance of sustainability

The economics of creating large and utilizing the elephant wealth of a nation in a non-consumptive way through tourism, as demonstrated by countries like Kenya, can generate benefits in a far more sustainable manner than following a consumptive utilization model. Consider, for example, the amount of money that can be raised, the employment versus

handout possibilities for elephant, which can contribute to the nation's economy throughout its lifetime. Elephant parks also provide the country with biodiversity catchments, water catchments and climatic moderators.

The total economic value of elephants can be calculated as the sum of direct use, indirect use and non-use values. Geach (2002) has studied the economic value of elephants to the Eastern Cape region direct use values are equal to the non-consumptive use or tourism-related revenues to ecological and ecosystem services provided by elephants, including their contributions to maintaining biological diversity. He also lists among non-use values the donations that come from non-elephant range countries or organizations based in such countries due purely to global concerns for the species. This study, from a part of Africa where consumptive utilization is the nationally accepted model, does not even compute the value of this form of use as a direct value of elephants since "availability of (and demand for) elephant products such as meat, hides and ivory are low.

Watts (1997) provides a pithy analysis of the tourism versus trade debate. The Zimbabwean government ivory stockpile was valued in the 1997 proposal to the CITES CoP in Harare at US$ 3.5 million. Watts compares this to the Department of National Parks and Wildlife Managements annual budget, estimated at US$ 12 million. She calculates that ivory sales would support the department only for a maximum of 15 weeks. It must be remembered, however, that the ivory in question was stockpiled over seven years. Zimbabwe's estimate of annual earnings from the ivory trade, were it to be legalized, was at that stage US$ 500000, while the government earned more than US$ 1 million given its estimated life span and the services it could render the wildlife tourism industry. Most of these observations point to non-consumptive utilization models, such as tourism, to provide a more economically (and ecologically) sustainable use of elephants that the ivory trade.

A shift in demand will render the ivory trade unsustainable in the long run.

What about traditional consumers of ivory? Do they need the ivory? It is known that nearly three quarters of all ivory that reaches Japan is used for making signature seals or *hankos*. *Hankos* were traditionally made of wood and stone; the use of ivory is a more recent phenomenon, dating back not more than 200 years. Societies in their evolution drop certain traditions regularly and this non-essential use of elephant teeth is already considered old fashioned in the Far East. Many young Japanese and Chinese prefer to sign rather than use the seal and, for those who do not, a number of ivory alternatives are available.

In a detailed study of ivory markets in Japan, Sakamoto (1999) reports that the volume of domestic sales by 59 members of the ivory importers association fell from 181.3 tons in 1989 to 82.5 tons in 1990 to 69.9 tons in 1991. Similarly an analysis of the fiscal-year transactions for 1996 and 1997 show that 64% of respondents felt wholesaler had decreased for the period, while 80% of wholesalers interviewed reported a decline in volume transacted between wholesalers and retailers. Supporting this fact, the most recent study of the Japanese markets by Martin and Stiles (2003) documents that " largest decrease in the ivory industry has been in the quantity of tusks used. From 1980 to 1985, Japanese used about 300 tonnes on average per year. In the late 1990s and in 2000 and 2001 the average had dropped to around 10-15 tonnes annually, a decline of at least 95%. By early 2002 the Japanese ivory dealers had come to terms with this low supply of tusks and had accepted that they could survive on a constant supply of 15 tonnes a year."

All this clearly indicates a downward spiral in one of the most important markets for ivory, which may somewhat explain why nearly 178.8 tonnes of ivory remained stock-piled with 200 traders in Japan in November 1996 (Menon, 2002). 53 Despite the fact that 52.6% of the population of Osaka city surveyed said that they preferred ivory for *jitsuin*, or official name seals, there is a general tendency for younger consumers to use other means of signing documents, such as by pen and ink, or using artificial

hankos. Ivory *hankos* are neither an essential commodity nor do they embody Japanese culture, which used non-ivory *hankos* long before ivory became fashionable. The current persistence by the Japanese government in importing soft ivory from African savannah elephants, which is not preferred at all by the ivory carvers or users (Menon and Sakamoto, 1998), is more a statement of defiance to international pressure than a response to genuine national demand.

Enforcement issues

As long as the ivory trade continues, it will continue to put pressure on some elephant populations, thereby increasing the threats to their survival and the cost of their protection.

Given the cultural preference of the Japanese for hard ivory or *indo-khiba* and *togata* (traditionally believed to be ivory that is produced by African forest elephants an Asian elephants, respectively) over soft ivory or *shiromono* (ivory that is produced by African savannah elephants) and the difficulty faced by enforcement agencies in telling the two apart, the legalization of soft ivory consignments would result in an enforcement nightmare. It is clearly documented in several of our earlier reports (Menon et.al 1997) that shivromono, *indo-khiba* and *togata* are three different commodities as viewed by the Japanese trader. If vast quantities of soft ivory from savannah or southern African elephants were to flood the market, they would not lower the demand for hard ivory from western African and Asian elephants. This trade perception has also been clearly documented in two Japanese studies. Sakamoto surveyed wholesalers and retailers and found that 100% of wholesalers and 75% of retailers could distinguish (using traditional visual means that are yet untested by modern science) between different forms of ivory. Nishihara records Recently, in Santiago, Chile, at the 12th CITES CoP, a Japanese ivory dealer said to me, "We need the hard ivory that comes from forest elephants, not the soft ivory from southern Africa's savanna elephants, to make our products."

Legal importation of soft ivory does not drive down the price of the preferred hard ivory, also stimulating a market for the contraband forest elephant product.

Studies have shown through a series of investigations in Japan that the demand for hard ivory far exceeds that of soft ivory, even if the latter is legal and the former illegal. In fact illegal ivory has always surpassed legal ivory trade in volume. In the late 1980s it was estimated that as much as 90% of the 1000-odd tons of ivory that entered the global market was illegal. This puts an enormous economic burden on elephant range states to protect elephants from the activities of poachers. India's Project Elephant, for example, has an annual budget of US$320,000 for anti-poaching and anti-depredation in India during 2003-2004 (Kumar & Menon, 2006).

(B) <u>Ethical Perspective</u>:

To the two concepts of ecological and economic sustainability, it is important to add a third dimension, that of ethics. It has been shown in the above discussion that both ecological and economic reasoning are at best debatable and probably unsustainable. All this should also be woven into an ethical fabric where discerning societies and nations of humankind must examine the ethics of revenue generation from killing "near-persons" such as elephants.

The raw material for the ivory trade comes largely from living, sentient beings.

Whether endangered or not, ivory comes from highly intelligent, social animals that are affected by death and are bound by close familial ties. This is demonstrated by a plethora of elephant studies (Varner, 2003).

While some of the ivory that enters trade comes from natural mortality, the amount is far overshadowed by that which is obtained from unnatural mortality. In Asia this is largely from poaching. Records from India – the country that best documents the poaching of Asian elephants – show that 36.4% of total elephant mortality in a five year span from 1997 to 2001 was

natural, while 63.6% represented unnatural deaths. Unnatural deaths include poaching, conflict-related deaths and electrocution. Poaching alone constituted 37.4% of all deaths, marginally more than natural deaths. In Africa, culling is an added means of procuring ivory.

Whether through poaching or culling, ivory sourced from non-natural mortalities originates from the killing of sentient individuals. In a recent paper on elephant person-hood and memory, Varner concludes that elephants are "near-persons" based on biographical consciousness, Machiavellian intelligence and encephalization quotients among other traits. He argues that although "person" is normally considered synonymous with human beings, that "among ethicists, the descriptive component usually refers to certain cognitive capacities which may or may not be unique to human such as rationality, self-consciousness, or moral agency". This scientific yet philosophical rationale goes beyond religious, spiritual and nationalistic callings, which also have their own place in the debate. Douglas Chadwick states the ethical reasoning very simply:

"If a continuum exists between us and such beings in terms of anatomy, physiology, social behaviour and intelligence, it follows that there should be some continuum of moral standards "(Chadwick, 1999).

Such moral standards would most certainly abhor the conversion of a living elephant into its utilitarian parts. "From a utilization perspective, an elephant is worth the sum of its ivory, its hide, its mountain of meat and few other parts such as feet and tail hairs" (Price, 1997). This reasoning would thus not support trade in the parts of a species that so closely resembles our own selves.

There is a strong ethical, religious and spiritual basis in many Asian countries that renders the ivory trade illegitimate.

In some Asian countries where elephants are worshipped or revered, killing elephants for trading in their parts is considered unethical. Even in most countries where ivory trade is prevalent there are long standing beliefs that ivory that is traded comes from dead elephant graveyards and does not require the killing of elephants. An investigator once

documented a Japanese ivory carver of more than 40 years – upon realizing that elephants were shot at to gain ivory – worshipping a broken tusk with an accidental bullet embedded in it, by placing it on an altar meant for ancestor worship.

A recent collection brought together a collection of Asian philosophers, leaders and conservationists who argue from all corners of the continent that ethical prerogatives are important in determining elephant management. In this collection of essays, the late Prince Sadruddin Agha Khan, a leader of the Shia Ismaili Muslim community of West Asia pondered, " What is the human perversity that condones the killing of animals merely to decorate our persons or surroundings with their remnants? We are aghast when so called 'backward' societies indulge in practices like human head-hunting for trophies. By what strange logic can we, the, justify the killing of magnificent animals merely for their tusks, horns or skins?"

Collectively, the preceding arguments lead us to the conclusion that a sustainable ivory trade is an unattainable abstract: a chimera. India has most definitely framed its policies keeping ethics, morality and a certain spiritual aspiration of the people in mind, and sheer economics is not the only guiding principle of species conservation in the country. In India, the species do not always have to pay to survive. True to its belief, India have always strongly stood for the precautionary principles at CITES, and seen that flagship species like the elephants are not treated as mere commodities.

Each country has its own laws and regulations on the local sale and possession of tusks or ivory articles. Most African countries permit local trade in ivory, as do several Asian countries. India is one of the few elephant range countries to impose a total ban on all internal trade in ivory.

The trade in Indian ivory was banned, by the government of India in 1986. Though the trade was banned, traders continued to import African ivory, and carve them for re-export. In 1991, India banned the import, export,

carving and sale of African ivory as well. The Convention on International trade in Endangered Species of Fauna and Flora (CITES) banned the trade in Asian ivory internationally in 1976 and then in African ivory in 1989. However the issue keeps coming up at successive CoPs.

Recommendations

The poaching of elephants and the trade of ivory has to be plugged by direct enforcement initiatives as well as policy and judicial interventions. The trade at ground level has to be checked by strengthening the anti-poaching and anti-smuggling initiatives through various coordinated activities involving enforcement agencies, government and non-government agencies.

1. **Anti – poaching:**

a. Most elephant areas that are not Project Tiger Reserves as well are understaffed or staffed with over aged personnel. It is strongly recommended to fill all vacant posts with new recruitments on a priority basis.

b. At least 50% be reserved for existing daily wagers who have been working for several years, round the year for the departments such as trackers, anti poaching squads, anti depredation squads.

c. Front line forest staff to be well equipped, not just with basic needs, but also with modern equipments and trained in use and application of modern techniques of patrolling and communications.

d. State Anti-poaching squad should also be properly trained in recording evidences of poaching and wildlife crime to strengthen the case in court and better conviction.

e. Young and dynamic staff to be employed in high profile and poaching prone areas to curb poaching incidences.

f. Forest Department personnel should coordinate with paramilitary forces along the international borders. This can be considered in insurgent affected areas, where considered practical, prudent and necessary.

g. Regular information gathering along with regular surveillance of known traders, who have been accused in previous wildlife goods seizure cases. Local villagers / Scheduled Tribes and Other Traditional Forest Dwellers / to be employed and incentives given for successful information leading to seizures and the similar action.

h. Spreading awareness amongst the residents of high elephant conflict areas and assisting them to prevent HEC and retaliatory killing of elephants. At times, this is also used by some to instigate villagers to assist in killing elephants.

i. Each division should maintain data of elephant mortality and trade that has to be regularly updated and analyzed at state as well as Union level. The data should be shared with enforcement agencies at regular interval on a regional basis so that important poaching areas could be identified and kept vigil on.

j. As a motivation measures, the anti-poaching squad should be properly insured so that incases of any eventualities, assistance reaches their family at the earliest. Provision should also be kept to employ on member of the families in case of causality. Staff in insurgent areas should be provided be added incentives.

k. Inter-state coordination to be strengthened and joint patrolling of transition areas could be planned.

l. Anti-poaching plans for Elephant Reserves be made mandatory as part of the annual plan of operations

m. Health service of staff should be done. This should include temporary watchers.

n. 1000 rupees hardship allowance should be given to daily watchers. Ration should be provided to all field posted watchers.

o. All foresters, forest guards and temporary watchers should be covered under the 15 rupees annual premium *life insurance cover* in the Post office schemes. This will give their families some sustenance in case of any tragedy. The cover is of Rs 1 lakh. They should also have access *to health services* in all facilities upto a ceiling of 2 lakh rupees as is the case of police constables.

p. Young, new recruits at the lower level should serve a minimum of five years in wildlife divisions after which they can be given posting at their selected divisions.

2. **Anti – Smuggling measures (most of these to be taken up through the WCCB and appropriate state mechanisms)**

   a. Enforcement agencies like police and customs to be sensitized and trained in wildlife crime prevention especially around sensitive areas. Incorporate forest, wildlife conservation and wildlife crime prevention training as an important aspect of induction training program as well as in service training program.

   b. Develop information sharing mechanism and regular interactions between forest department, police, customs and non governmental agencies working on this issue through the Wildlife Crime Bureau.

   c. Database for wildlife crime and criminals for different zones at local levels, states levels and international levels to be prepared and database should be made available to all concerned and shared on regular basis. This could also be used in strategic planning for curbing wildlife trade in the country.

   d. To keep a proper tab on the inventory of ivory items seized and to destroy them on regular basis as and when possible to avoid smuggling and theft of goods.

   e. Regular vigil for wildlife items and ivory in high end shops and five star hotels.

3. **Sensitization of judiciary**:

   a. Judiciary to be sensitized on wildlife crime, *modus operandi* and national and international wildlife crime scenario and any project from government or non-government agencies to do this needs support.

   b. Fast track Special Courts dealing with wildlife crime needs to be set up. Budget provisions for the states to finance fast track courts may be made available in the centrally sponsored schemes in this and other schemes.

4. **Policy interventions including CITES**

a) India keeps to its well stated stance of being against any international resumption of the ivory trade and actively lobby and ally with governmental and non-governmental agencies to achieve this end.

b) Project Elephant does not have a dedicated record of all mortality of elephants in the country including poaching except the figures provided by the state forest department. Such a database be set up such that the data could be used to support India's opposition to lifting of ban in ivory trade in CITES and other forums. If such databases exist with non governmental organisations, ways of achieving a tie up with such bodies be explored.

c) The full fledged CITES Unit that has been created in the MOEF should be strengthened. It should deal with CITES issues on a daily basis and work on CITES should not be only at the time of meetings but between COPS as well.

CHAPTER 7

Compassionate care for captive elephants

The Task Force affirms that elephants are integral to cultures, religions and livelihoods in many parts of India. India has a long tradition of elephant keeping and handling. In recent times, the quality of care and management of captive elephants has been inadequate. Consequently, there is substantial room for improvement of their condition in captivity.

In the long run, the Task Force favors the complete phasing out of elephants from commercial captivity. However, for the present, it aims to bring the upkeep to the highest standards through a synthesis of the finest traditions of elephant care including Mahout practice and of modern scientific knowledge and practices accompanied by better regulation and monitoring.

Background: Elephants in Indian traditions

The Global Elephant Charter www.elephantvoices.org signed by eminent field biologists, scientists, conservationists, and scholars of elephant-human relations states that, "Science and traditional wisdom provide ample knowledge to identify and protect the interests of elephants. This Charter is an expression of that knowledge. It recognizes that elephants exhibit remarkable physical vigour, unusual social complexity and significant cognitive abilities. Furthermore, it acknowledges that elephants are complex, self-aware individuals, possessing distinct histories, personalities and interests, and that they are capable of physical and mental suffering."

The estimated numbers of captive elephants in the country can be put at 3400 to 3600, with 1903 to 1970 for Northeast India, 860 to 920 for southern India, 271 to 300 for northern India, 209 to 240 for eastern India, 79 to 92 for western India and 78 for the Andaman and Nicobar islands. There are elephants in

most states of India. These numbers have not been validated in the last 10 years.

Elephants categorized for easy identification by the management types they belong to. These include:

Government

a. **Forest Camp** elephants belonging to the state governments.
b. **Zoo** elephants belonging to the state governments or municipal authorities.
c. **Forest Corporation** owned elephants in Andaman islands.
d. **Government owned temple elephants** e.g., in Guruvayoor, Kerala, Pollachi of Tamil Nadu, Tirupathi, Andhra Pradesh and Nanjangud, Karnataka under purview of the Department of Hindu Religious and Charitable Endowments (HR & CE).

Private

a. **Circus** elephants belonging to commercial companies.
b. **Tourist** elephants belonging to tourist operators e.g., in Jaipur.
c. **Elephants used for alms** by wandering mendicants, rides e.g., in Punjab, Jaipur, Mumbai, Goa, Delhi, Poona etc., which are clearly identifiable in specific groups.
d. Elephants in **religious trusts/ institutions** like "*muths*", temples, churches and mosques.
e. Elephants used in **festivals** belonging to private individuals, religious institutions and private agencies.

Though elephants – both wild and captive – have been give the status of Schedule I animal under the Wildlife (Protection) Act, 1972 (WLPA), the usage of these animals has gone unchecked. The result is that the legal status of elephants in captivity falls somewhere in between the Wildlife Act and the Prevention of Cruelty to Animal Act 1960, (PCA) which gives rise to tremendous abuse and misuse.

Norms to inform humane care of elephants

Elephants, whether wild or captive, are an integral part of our national heritage. Sovereign ownership of natural resources and wildlife wealth should not exclude elephants in captivity. Conservation policies that may diminish the status of the captive elephant should effectively integrate them into India's wildlife protection laws. This is especially important given that the vast majority of captive elephants today were born in the wild and subsequently taken into captivity. There has indeed been regulation of capture to ensure that captures do not deplete wild populations. Such regulation needs to be more effective.

The objective here is to move towards this goal by addressing real anomalies on the ground, especially with respect to legal provisions, the systems of monitoring, standards of care and upkeep and finally, by addressing the service conditions of the Mahouts. The Task Force has taken into account the differing, strongly held, often conflicting views on what direction should be imparted to the policy on captive elephants. It fully recognizes the role of captive elephants in various living cultures and traditions. In keeping with the best in these very cultures, it cannot compromise on the welfare, health, safety and up keep of these animals. It also seeks to prevent illegal capture. At present, mortality and health standards of captive elephants are often unsatisfactory.

Veterinarians, biologists, welfare personnel, caregivers and other elements in civil society can assist in effectively monitoring and supporting better standards for captive elephant care.

There are often serious lacunae in the basic welfare systems for captive elephants in most management regimes. Deviation from an elephant's ecological and biological needs for commercial reasons and poor husbandry can adversely affect its welfare and health. Hence, future strategies should

include the phasing out of elephants from private agencies, individuals and institutions. The Task Force recommends WLPA amendments to support this central philosophy by

(a) The strict implementation and enforcement of the existing WLPA Provisions;
(b) Amendment of the WLPA by deletions and additions and
(c) Total ban on acquisitions of elephants in lawful or unlawful possession by agencies, institutions or individuals from the wild

From ownership to custodianship:

Further changes in the WLPA

A one-time amnesty for elephant guardianships is proposed for all owners and guardians possessing elephants. The enactment of legal amendment & to regularize the ownership of captive elephants in 2003 (extended to 2004) by the Declaration of Wildlife Stock Rules 2003 had serious shortcomings since most owners did not register their animals. All ownerships of therefore, need to be declared and registered once more after fresh amendment.

Amendment of **Section 2 (16) (b) of the WLPA:** The definition of 'capturing' trapping by means of pits, separation from herd, snaring with the intention to acquire should apply to the acquisition of calves and elephant from the wild for trade and sale and any act which causes pain, suffering, stress, fear or any kind of discomfort to the captive elephants, should be included in the definition.

Amendment of Section 39: This should include elephants in the definition of Government property, including those in lawful possession of individuals and institutions.

Amendment of Section 42: The term "Ownership Certificates" in Section 42 may be substituted by the term "Guardianship Certificates" since wild

animals are the property of the Government and not individuals or group of individuals. Hence elephants, as wildlife, cannot be "owned."

Amendment by Addition: To provide for cancellation clause for custodians who do not have adequate facilities and consequently *a)* Permanently rehabilitate the elephant to a lifetime rescue or care center and b). award compensation as per government norms.

Amendment of Section 43 (2): Transport of elephants need to be reported in advance and the Chief Wildlife Wardens (CWLW) should ensure that captive elephants be **barred from entry into inappropriate geographical locations** for instance extreme heat or extreme cold and their presence in urban and municipal areas be subject to restrictions in the interest of public safety and welfare.

Sonpur Mela, Bihar is the hub of captive elephant trade in India. It is recommended to discourage the presence of elephants there with a view to curb trade of elephants.

Amendment of Section 40 by deleting sub-section (2): Since all Schedule I and II animals are protected under Section 40 (2A), Section 40 (2) allows the transfer of elephants with permission of the CWW, thereby giving room for transfers in the guise of gift, donations **and** is discriminatory against the captive elephant as a Schedule I wild animal.

Amendment of Section 40 (2B): by deletion of proviso after (2B), "provided that nothing in sub-sections (2A) and (2B) shall apply to the live elephant" will strengthen the WLPA, *thereby prohibiting all acquisitions of elephants,* except by way of inheritance under Section 40 (2A).

Amendment of Section 40 (2A): to provide for procedures for inheritance and due verification of records before the issue of certificates under Section 42 to the legal heirs. The words in sub-section 2A "person other than a person having a certificate of ownership" are ambiguous. It is necessary to specify

that having a certificate of ownership/guardianship shall apply only to the keeping of that particular animal and not for acquiring or receiving other animals. It is also necessary to specify that even those persons who have a certificate of ownership should declare their elephant to the CWW and apply for fresh "Guardianship by Inheritance" certificate, in the light of the amendment to WLPA and the Declaration of Stock Rules.

General and uniform rules for better upkeep and care

Amendment of Section 63 of WLPA is essential to provide powers to the Central to frame rules on the subject matter of captive elephants and any other matter that needs to prescribed under this Act for better management standards. Some of these are:

a. Captive elephant management and welfare rules.
b. Formation of Captive Elephant Welfare Committees (CEWC).
c. Formation of captive elephant rescue / care centers.
d. Declaration and surrender of tusks, trimming of tusks, broken tusks, fallen tusks, measurement of tusks.
e. Objective and scientific evaluation and grading of welfare conditions for captive elephants through identified welfare parameters, enabling better management measures.
f. Provisions for the imposition of strict penalties for committing offences relating_to irregularities and violation of welfare conditions. The penalties to include both fine and imprisonment as provided under the WLPA. Additionally, to also include spot fines.
g. Amendment in ownership clause (sec 42).

The term "guardianship" should replace the current term "ownership". To ensure that the elephants enter into a central and state system of monitoring, those in the current possession of private owners and agencies should be granted Guardianship Certificates or a "passport" with photographs and complete details, after micro-chipping.

Amendment of the Act by Addition: Consider provision for prohibition of the use of elephants in exhibitions, circuses, weddings, unregulated tourism, public functions, begging or for other entertainment.

Standards for Captive Elephant Keeping

The term "upkeep, maintenance and housing" as stated in section 42 of the Wildlife Protection Act 1972, should be clearly defined and standardised for captive elephant keeping.

Amendment of the Act by Addition: There should be provisions for seizure of elephants in cases of violation of Sections 40, 42, 43 and other sections of WLPA and rules with discretionary powers to the Chief Wildlife Warden to seize the elephants without giving a opportunity of the hearing to the owner in cases where there is an urgent need to seize the elephant in view of threat to the health, safety and wellbeing of the elephant or the public. In such cases, provision for post decisional hearing after the seizure can be included.

Curbing and prevention of capture from the wild, trade in capture and sale of elephant calves caught in the wild should be an important mandate of agencies like the Wildlife Crime Control Bureau (WCCB), which should be strengthened by funds and trained manpower.

There is an important need to address the ivory stock in the country in private and government possession and enact procedures for the correct methodology to destroy the stock. It is recommended that immediate scrutiny of ivory stocks both from wild and captive elephants is taken in the country. All stocks should be collected in the stronghold and burnt in the presence of key NGOs, officials and civil society members.

Training and certification of Mahouts

The upkeep and care of elephants in India has for centuries depended on the knowledge of the Mahout communities. However, in the modern world, they need a life of better material dignity and improved standards of

employment. Their knowledge too deserves respect and recognition, even as it needs to be through interaction with new knowledge about elephants. Better employee status with specific laws and regulations should be enacted for the profession of Mahouts. Without good mahouts, the tradition of elephant keeping can come to an effective dead end.

The Task Force recommends that Mahouts looking after Forest Camp elephants should be recruited at the cadre of Forest Guards. More than 10 years experience should be recognized for promotion to the cadre of Forester. They should be recipients of hardship allowance, accident insurance and bonus for well-kept and healthy elephants. Mahouts in private service need to be paid at par with those in government service.

All Mahouts in service and the newly recruited should undergo training to be given by the Forest Department in order to obtain a license/certification issued by the department. Training programmes should span at least six weeks to a year. The monitoring officers should grade their performance. Training should include

a. proper handling of elephants.
b. specific classes on elephant biology, behaviour, physiology and psychology.
c. simple first-aid treatment, health care, and personal hygiene.
d. Inter-camp visits within or outside the state.

Registration of Mahouts as trained and licensed elephant handlers will help to curb malpractices present in the system like ignorance of elephant handling, severe abuse to control the animals, changing elephants. Mahout training schools needs to be set up in different states.

Unavailability of Mahouts due to lack of an established network is the single-most important reason for elephant suffering and cruelties at the hands of untrained handlers. There is a need to establish a database of experienced panel of mahouts and make this information readily available.

Veterinary care and management guidelines

The Forest Department should have a separate cadre for wildlife and for veterinarians with expertise and knowledge of elephant treatment.

The Task Force recommends that lateral movement of qualified veterinarians with an interest in wildlife be recruited from both Animal Husbandry Department (AHD) and non-AHD cadres and proper pay scales, pre-requisites and promotion avenues be offered to retain them in remote areas and forest postings.

They should be recruited at the level of Assistant Conservator of Forests and should have promotional avenues up to the level of Chief Conservator of Forests.

Veterinary care and management guidelines for elephants should be formulated and made available to all owners and users of captive elephants in the local language.

It needs to be made mandatory that Forest Department veterinarians should have access to a modern and well-equipped laboratory. Veterinarians in Forest Camps should have access to timely laboratory reports enabling them to take appropriate medical action. There should be scope for veterinary research with resources allocated for investigations or follow-up. Government approvals for emergency testing should be minimized, so that valuable time needed for treating affected animals is not lost.

Temples currently owning elephants could be brought under two to three zones, and qualified veterinarians may be appointed for each zone. Providing training periodically to these doctors in temples and zoological gardens by experienced veterinarians needs to be made mandatory. Every regime that uses captive elephants should have the services of a veterinarian who is specifically knowledgeable about elephants if such services are not available on a regular basis, the guardianship should be barred.

Owners are the link between the elephants, the Mahouts and the public. Need for awareness of the captive elephant requirements by owners cannot be understated and they should be fully briefed by the Captive Elephant Welfare Committee of the many issues in maintaining the elephants and Mahouts.

General recommendations to improve management are:

Creation of life time care centers for elephants

The Director, Project Elephant, (MoEF) has proposed funding under the 11th Plan for captive elephants for establishing Elephant Rescue Centres under the Project Elephant Scheme which needs to be continued.

Categories of animals that may need protection of a care center are

a. elephants that are kept and used in captivity without proper permits.
b. elephants that have been abandoned by their private owners.
c. elephants that are diseased or in very poor condition.
d. elephants that have been brought under the department's control by orders passed by the Honorable Courts.
e. elephant calves rescued from the wild and which cannot be put back.
f. elephants captured to mitigate HEC issues.

The Rescue Center may be managed by the Forest Department or agencies authorised by the former.

Monitoring of captive elephants
Captive elephant census should be carried out once in five years with details of age and sex.

Enforcement Objectives and Enforcement Authorities

The Task Force recommends the setting up of Committees to assist the State Forest Departments to discharge their functions of regular monitoring of the

welfare conditions, evaluating the requirements of space, water, manpower and financial resources of the agencies currently holding these animals. The Captive Elephant Welfare Committee (CEWC) should be formulated to advise the Chief Wildlife Warden of every captive elephant range state, thereby bringing in effective management and implementation of the law. Working with local officials, with given terms of reference and empowered to make recommendations for change or confiscation, the committee constituted shall be responsible for management and humane treatment of captive elephants, in accordance with the proposed rules.

A handbook on captive elephant management should be created with the assistance of experts comprising of biologists, veterinarians, researchers and welfare groups with information on space, water, nutrition, exercise, Mahout details and should be made available to all private owners and agencies, in the local languages.

Conclusion

Captive elephants have specific needs for access to water, adequate nutrition and exercise. They ideally need to interact with others of their own species. Elephants are a long lived and intelligent species with a developed sense of self and relationships with other elephant kin. The Task Force is convinced of the need to act decisively to improve the quality of care of captive elephants.

Recommendations

a. It recommends eventual phasing out of the acquisition of elephants, already in captivity or wild-caught, for entertainment, commercial or other purposes by agencies, institutions or individuals.

b. The Task Force recommends an end to new commercial acquisition of wild-caught elephants by agencies, institutions or individuals

c. A one time amnesty for elephant guardianships may be given to all owners / guardians possessing elephants. All ownerships need to be declared and registered once more with fresh amendment.

d. The term "guardianship" should replace the current term "ownership" (*Refer to Annexure* 1). All elephants in the current possession of private owners and agencies are granted Guardianship Certificates after micro-chipping to bring them into a central and state system of monitoring.

e. Sale of elephants/ transfer / power of attorney / lease / gift / donation is not recommended and the law needs to be suitably amended to stop misuse of these provisions.

f. State Captive Elephant Welfare Committees may be set up (CEWCs) to assist the State Forest Departments to discharge their functions of regular monitoring the welfare conditions of captive elephants. The Committee constituted shall be responsible for management and humane treatment of captive elephants in accordance with the proposed WLPA Rules. A periodic update of captive elephant numbers should be carried out.

g. Establishment of Captive Elephant Lifetime Care Centres is necessary to deal with elephants that are abandoned, confiscated or captured. The elephants should be kept according to standards laid down by the CEWCs. The usage of elephants in circuses and for collection of alms should be discouraged/ banned. Elephants reported to be used for such purposes should be seized. This category of circus/privately owned elephants should follow the precedent of phasing out as per the 1991 ban of the five categories of wild animals (lion, tiger, leopard, bears and monkeys) in circuses.

h. Owning private stocks of ivory is contrary to India's position on the keeping, holding or acquiring of ivory and therefore has no justification. Possession and ownership of ivory tusks that come into the custody of captive elephant owners once their elephant dies should become

government property and should be destroyed after samples are collected for scientific and educational purposes. The inventory of existing stock of ivory with government and private agencies be updated and data base made. No certificates of possession should be issued, once the laws come into force.

i. Wildlife Veterinary Wings need to be set up within the state forest department with full promotional opportunities, incentives and facilities for the veterinarians with options of permanent absorptions. On a priority basis, every Elephant Reserve should have a veterinary officer oriented to wildlife.

j. Ghasis, kavadis/ or assistants to the Mahouts shall be given the same status and emoluments as Forest Guards. Mahouts in government service shall be given the same status and emoluments as a Forester, with assured promotions, at least twice in their career. Their existing health insurance, pay benefits and scales shall be increased or brought to above levels, whichever is applicable. Mahout salaries in private employment should be at par with the forest department grades.

k. All Mahouts in service and those Newly recruited should undergo training and registration by the Forest Department in order to obtain a license/certification issued by the Department. Mahouts and kawadis should be treated as frontline staff for all incentives, welfare and training.

l. Mahout training schools need to be set up within identified forest camps and all elephant owners and handlers should comply by registering and participating in this to obtain a license /certification issued by the Department.

m. The Task Force recommends effective monitoring of Sonpur Mela to discourage elephant trade.

n. Activities that cause stress and strong possibility of injury to elephants and human beings should be reviewed and if necessary prohibited.

o. Orphaned or temporarily displaced wild elephant calves should be put back into the wild following established protocols. Only those that are physically, genetically or behaviorally compromised should be sent to captivity.

CHAPTER 8

A Global Lead for India in Elephant Conservation

About one out of four nation states on earth, fifty in all harbours elephant populations living in the wild. The challenge of conserving the elephant in the new millennium is not confined to the borders of any one country. The rapid expansion of Asian economies and the hope of a better future for African peoples should not come at the cost of their natural heritage of which the elephant is a major symbol. While the problems and opportunities for conservation or co-existence are diverse and complex in every elephant range state, there is still much that can be gained through dialogue and cooperation, exchange of ideas and joint action. The curbs on the ivory trade while well known, are of a very small instance of international cooperation between countries that have for the most part shared a colonial experience. In the coming decades, such cooperation should be on a more pro-active basis.

To a large extent the future of the elephant on both continents will depend on the ability of our governments and peoples to combine the insights of science with effective governance and an ecologically aware citizenry. The elephant is an obvious candidate as an ambassador of goodwill for the countries of Asia and Africa. It is no coincidence that soon after independence the Prime Minister of India Jawaharlal Nehru gifted a female elephant calf to the Tokyo Zoo, when the previous elephant in the zoo died in the bombing of Japan by the Allied forces. It was Nehru's hope that the children of Japan could get to see what an elephant looked like. Such practices while perfectly understandable in that day and age can now give way to sustained and serious cooperation to study and protect elephants in the wild and improve their conditions in captivity by exchanging ideas in place of live elephants.

India should take the lead in fostering this global exchange as it is the major stronghold of the Asian elephant. It also has a rich tradition and culture of

elephant conservation and the scientific and technical institutional framework that can support such exchange. There is a larger logic to this, for cooperation on environmental issues is bound to play a more central role in diplomacy in the new century. The elephant, more than any other major vertebrate found in India can serve as a link to several countries.

Recommendations:

1. **Host the first ever International Elephant Congress with conclaves on science, culture and management culminating in a government led summit to adopt elephant 50:50 vision charter.**

The International Elephant Congress would bring together scholars and conservation practitioners policy makers from across the elephant range states. All three species of elephant have been subject of extensive scientific research, of studies of their history and culture, and also subject of decades of management and conservation. It is proposed the Government of India hosts a Congress in the near future, with three specific conclaves (on science, culture and management) to be organized on a professional basis. The government led summit will focus on issues of policy and culminate with vision and mission statements on the elephants of the 50 range states for the next 50 years.

2. **Encourage learning and international cooperation with 'Elephant Range Exchange Program'**

In order to facilitate exchange of ideas and learning across the 50 elephant range countries of Africa and Asia the Task Force recommends the institution of an '**Elephant Range Exchange Program'.** This can be done by exploring the possibility of securing bilateral agreements with elephant range nation states. The elephant can be a flagship for cooperation between emerging economies which share the common challenge of conserving nature while ameliorating poverty. In particular, the exchange should foster learning from different

management regimes, conflict mitigation systems and different schools of conservation thought. This should include scholars who study elephants in the wild and captivity, park managers of elephant ranges, students of human-elephant relations from social sciences or humanities and well known elephant conservationists. The concerned personnel in MoEF who deal with international affairs can draw on the expertise of NECA and associated institutions to develop such an exchange in full consultation with the Ministry of External Affairs.

3. Propose a United Nations Day for the Elephants

The three species of elephants are not only the largest terrestrial mammals on the planet but can act as natural heritage ambassadors to humanity at large. Given their close association with humans across centuries in both Africa and Asia, they can also rally support for preserving the natural environment in countries where children cannot see elephants in the wild. The institution of an Elephant Day by the United Nations can also foster cooperation and collaboration between elephant range states.

Perhaps more than any other wild animal, elephants are universally loved by children. Elephant Day therefore can be marked by essays, painting competitions and other modern multi-media activities so that the children of the twenty first century share the enthusiasm for this charismatic animal. One in four countries of the world has elephants and almost every other country is fascinated by the animal. The older image of elephants as the source of White Gold, killed for their ivory should be replaced by the image of elephants living freely in the wild.

4. Establish Trans-boundary cooperation through Asian Elephant Forum

The Task Force recommends steps to establish an Asian Elephant Forum on the lines of the Global Tiger Forum to foster cooperation in conservation, management and exchange of ideas and information on the Asian elephant.

The immediate priority should be the securing of trans-boundary elephant landscapes. The Indo-Nepal and Indo-Bhutan landscape calls for immediate action; the India-Myanmar and the India-Bangladesh trans-boundary populations are other priorities. Further such cooperation between different elephant range states can be explored, facilitated and consolidated by the said forum at an intergovernmental level. The forum should also facilitate and encourage sharing of knowledge, experiences and ideas about elephants across Asian cultures and nations. The Government of India should recognize the elephant as a cultural and ecological symbol that is shared by 13 Asian nation states and encourage bilateral and multilateral exchanges that foster this common tradition. Non-governmental bodies and eminent individuals should be members of such a forum following the precedent of the tiger forum. The Government of India acting through the MoEF should take all steps necessary including financial, administrative and logistical support for creation and support to such a forum.

CHAPTER 9

Taking Gajah to the People

In assuring elephants a future in our modern age, it would help to recognize their integral role in our shared and common past. This is especially true of India where people have for centuries, had an intimate relationship with these large animals. They have been feared and revered, trained and tamed, idolized and celebrated in equal measure. Their hold on our collective imaginations is perhaps unequalled by any other wild animal. Elephants are a living embodiment of both our cultural and natural heritage. While the former is obvious, its relationship to the latter needs added emphasis. Elephants are keystone species in the natural world shaping the landscape they live in as well as being a charismatic flagship for the wonders of the nature. As many as 18 of India's 28 States have elephant populations. Within these States, the visibility and presence when seen cumulatively is more than even the tiger.

The elephant was also one of the first animals to be accorded a measure of protection in India. The *Arthashastra*, the Asokan Pillar and Rock Edicts and later the British legislation "Elephant Preservation Act of 1873" in Madras and all of British India six years later, protected the elephant even before other wild animals in India was accorded protection. In fact the *Arthashastra* went beyond mere protection of the individual elephant and listed key elephant forests to be protected. The width of roads in these forests, were a fraction of roads elsewhere.

The 'precious elephant' is a symbol of the strength of the mind in Buddhism. Exhibiting noble gentleness, the 'precious elephant' serves as a symbol of the calm majesty possessed by one who is on the path. Specifically, it embodies the boundless powers of Buddha which are miraculous aspiration, effort, intention, and analysis.

The *Manasolasa* by Someswara, a Sanskrit manual of the Chalukyas in the 12th century (CE) refers to the herds of elephants in the forest as an index of success of king in governance. The *Arthashastra* was probably the earliest text to set out *Hasthavanas* or elephant forest in the remoter parts of the Mauryan empire to provide elephants to guard the kingdom from external threats. Elephants have fascinated the most broad-minded and visionary of Indian rulers and writers down the ages. Mughal emperor Jahangir carefully observed the differences between the African and Asian elephant dubbing the specimen of the former as 'Daryayi haathi" or elephant from over the seas. He also commissioned paintings and royal literature, depicting and featuring his favourite elephants.

The *Gajashastra* is a compilation possible dating back to the 6th century Before the Common Era (BCE). Attributed to the sage Palakapya it complies ancient lore about elephants. Other texts include the famous *Matangalila*. The *Hastaryurveda* is a well-known text from the Brahmaputra valley in north-east India. To this day Mahouts in northern India use Urdu texts that go back centuries.

The elephant-headed Ganesha is often evoked when embarking on a new venture of education and business. The gait of an elephant was the benchmark for elegance and grace in the human form and was referred to as Gajagamini in ancient Sanskrit text.

The rain bearing clouds of the monsoon that massed in the sky were compared by poets as Valmiki and Kalidasa to masses of elephants assembling in the hills. The Tamil *Sangam* as also the *Thirukkural* are replete with imagery of elephants.

The Asian elephant (*Elephas maximus*) is believed to be descended from *Elephas husudricus* whose fossil remains have been discovered in the Shivaliks of northern India. Although the exact date of the Asian elephant's first

appearance in India remains uncertain, paleontological evidences suggest that seven species of elephants and eight elephantoids lived in the land mass that we today call India.

Even practitioners of what is lightly labeled "the dismal science" often refer to the pace of India's now vibrant economy as that of a lumbering elephant rather than an agile feline.

Soon after independence, the eminent naturalist M Krishnan had even suggested that the elephant, a truly pan-Indian natural symbol, be made the national animal of India. While this honour was accorded then to the Asian lion and then the tiger, it is only fitting that the elephant also gets due recognition. More than its association with royalty, captivity or physical strength, the elephant is the embodiment of innate wisdom and emotional intelligence.

Recommendations

1. The Asian elephant should be declared India's National Heritage Animal

By according it such a status, India would convey not one but two messages. Elephants are a symbol of unity across diverse cultures, languages, creeds and faiths. In a time of rapid ecological uncertainty they embody eco-consciousness.

2. "Haathi-Mere-Saathi" Elephant Campaign

In keeping with the unique association that elephants have with culture and nature, conservation cannot be put on a firm footing without the full and active participation of the Indian youth. Beyond the well- known Hindi film of that name, the term *Haathi-Mere-Saathi* evokes companionship with the animal world through the image of an elephant.

The ubiquity of elephants in everyday lives makes them more familiar to adults and children alike than any other Indian wild animal. It would be ideal if this familiarity were accompanied by a deeper awareness of the endangerment of the wild populations that almost all these captives are drawn from. Even more so those wild herds live in increasingly fragmented and shrinking landscapes, without whose securement, their survival will become impossible. A campaign on conservation awareness of elephants can be an umbrella for a larger effort to protect and secure these landscapes which constitute an educational, cultural, natural and scientific resource for our country and its people. Additionally the elephant as a sentient being can alert people that compassion must extend not only to other humans but to other living beings.

This should be an NGO-Government initiative to spread ecological awareness about the elephants and other species and habitat.

The Government schools in the vicinity of the landscape should be a special focus of this campaign. These schools should have weekend activity trips into nearby sanctuaries and parks. Interpretation centres should be made the focus of such activities where film shows, multi-media activities and nature interpretation studies may be conducted.

Entry of children into parks and sanctuaries should be free and special programmes should be organized over weekends with activities planned to make them friends of the elephants. Summer camps should be held by NGOs and civil society groups in elephant landscapes and children encouraged to participate in such camps. These camps can be termed *Hamare Haathi* Camps or with other national language equivalents such as *Namba Yanai* in Tamil. Elephant experts should be encouraged to be resource persons to such camps as also to supervise resource material compilations for such initiatives.

Elephant Day is designated in the Wildlife Week, October 1st to 7th every year. Painting and essay competitions may be organized to commemorate the day and *Haathi Mitra* awards may be instituted. Winners can be given free trips to the nearest Elephant Reserves. Such activities ought to be in the district towns and smaller centres and not confined to the metropolitan areas and larger cities alone.

3. Start Regional Gajah Centres

NECA will facilitate the establishment of nature interpretation centres called Regional Gajah Centres. These will be designed and run by NGOs/civil society groups in partnership with government. Modeled on the Science City, Kolkata, and drawing on the best interactive media, they will serve as education centres on elephants in particular and conservation in general. These Centres could also develop libraries and archives on the wider gamut of elephant-human relations, science and culture.

CHAPTER 10

Summary Recommendations of the Elephant Task Force

Recommendations on Governance and Law

1. It is essential to strengthen, consolidate and focus efforts to conserve the elephant in India through multi-level integrated governance. This requires the creation of a statutory agency on the lines of the National Tiger Conservation Authority (NTCA), with a substantial enhancement in the budgetary outlay. This new body is to be called the **National Elephant Conservation Authority (NECA).**

2. The NECA be governed by a **Governing Council** not exceeding 15 members of which not more than seven shall be official members. Chief Wildlife Wardens of the elephant range states will be permanent invitees to the Council.

3. **State Level Councils** will formulate state level policy and coordinate efforts at the state level. These will be chaired by the respective Forest Minister. The constitution and the terms of reference will be similar to those of the National Council.

4. Ten **Elephant Landscapes** should be formally declared at the earliest. It is recommended that following five of them be declared immediately and the five others in the second phase:
    1. Kaziranga-Karbi Anglong-Intanki
    2. Kameng-Sonitpur
    3. East Central
    4. North Western
    5. Brahmagiri-Nilgiri-Eastern Ghats

These have been selected keeping in mind their ecological diversity, location in different regions of the country and their distinct conservation profiles and challenges. Their dedication to the nation and a concerted effort at integrated conservation in each has the potential to give conservation in general a larger, more holistic orientation.

5. **Elephant Reserves** should be the basic management unit for focussed elephant conservation in the country. The limits of an Elephant Reserve should lie within state boundaries. If interstate reserves exist, these unified boundaries need to be re-aligned. The 32 Elephant Reserves already declared or proposed be continued should be continued with.

6. In addition to the **National Parks and Wildlife Sanctuaries** and other **Protected Area** categories existing in the Elephant Reserves, other critical elephant habitat and corridors be brought under the PA network. Elephant Reserves encompass **National Parks, Wildlife Sanctuaries,** and other **Protected Areas and forests** under various legal categories within their boundaries. These should be continued with. Other critical elephant habitat and corridors should come under protection. If this is to be within the PA network, categories other than sanctuary or national park may be also included.

7. The entire Elephant Reserve should also be notified as **Ecologically Sensitive Area under the Environment Protection Act**. This will help provide safeguards against changes in the landscape without harming pre existing rights.

8. The boundaries of a few reserves may need to be **rationalized** so that they may be more in conformity with scientific and ecological principles ensuring the effective conservation of elephants and associated biodiversity and wildlife. It **can also take into account ground realities such as human habitation. A Committee may be constituted to rationalize the boundaries of such reserves**. NECA will oversee the process which will draw on expertise on the species and its habitats.

9. The Task Force recommends setting up an **Operational Reserve-Level Management Committee** chaired by the Director of the Elephant Reserve. A nominee of the District Commissioner, Local peoples' elected representatives (MPs, MLAs, and representatives of Zila Parishads, Panchayat and Gram Sabhas), researchers and conservationists/ scientists, NGOs and officers in charge of line departments such as railways, block development authority and the block veterinary officer should be members. This Committee will be advisory in nature for operational matters in the Elephant reserve.

10. Under the aegis of the Reserve Level Management Committee, each Director of reserves should be tasked with developing and implementing a well drawn up **Five year Management Plan** with clear goals and targets to be achieved in conformity with the broader aims and strategies of Project Elephant. The Plan should have performance indicators to measure progress at each level of management to judge the effectiveness of elephant conservation in the reserve.

11. At the Elephant Landscape Level, **a 50 year Perspective Plan** will be prepared with full transparency and under aegis of NECA. The latter will have an especially important role as it will involve close coordination and dialogue between different agencies, two or more states and stake holders at all levels. Such process can also assist and facilitate a larger long term view of how to manage landscapes at a macro level, beyond narrow confines of Reserves.

12. The NECA may commission **independent evaluations of the scheme. Such evaluation of performance indicators should be mandatory at mid-term and** at the end of **five years** for each Elephant Reserve. Scheme performance evaluation through indicated parameters is equally important. The evaluators should not have conflict of interest issues that hinder an objective evaluation.

13. **Habitat improvement and civil works can if done unwisely be a source of leakage of funds as well as damaging to conservation goals.** Details are spelt out in Annexure V. These are essential to

ensure funds are deployed for conservation through protection, and to check leakages.

14. The Task Force recommends amending relevant sections in the Wildlife (Protection) Act so that the proposed recommendations can be implemented effectively with renewed legal force.

15. The post of the Member Secretary, NECA should be an **open recruitment post** and chosen through national selection. It should be open to Indian Forest Service officers with requisite experience. Government may consider whether prior experience in NECA or the Elephant Reserves should be considered a qualification. The government should also consider recruiting non IFS and non-governmental personnel with requisite conservation and administrative experience in the NECA. This is especially necessary at the level of the new post of Regional CCFs who will assist the Secretary of NECA.

16. The **financial outlay** of Project Elephant should be increased substantially to enable objectives outlined here to be met and plans made fully operational in a reasonable time frame.

Recommendations on Estimation, Monitoring and Research

1. Assessment of elephant populations requires better protocols for estimation of numbers and equally so their demography and habitat. For this the Task Force has made several suggestions in the relevant chapter of this Report, and these should be the basis of a new protocol.

2. There is need to establish **National Elephant Baselines** as a one-off exercise and thereafter continue to evaluate this **once in five years** by a **Consortium of Elephant Research and Estimation (CERE)** anchored by the National Elephant Conservation Authority.

3. Elephant Reserves should promote long term dedicated research through **Elephant Reserve Research Stations** at the level of each Reserve open to all bona-fide researchers and scholars.

4. It is envisaged to establish **Open-air Forests Laboratories for the purpose of basic and applied experimental research** in elephant landscapes and these are run by identified institutions of excellence.

5. NECA may institute **Gajah Fellowships** and studentships to post-graduate, doctoral and post-doctoral students attached to bona-fide academic/research institutions.

6. As has been the case with the open access data post the Tiger Task Force, it is recommended that information be shared via the NECA website. Further measures in this direction may also be considered. While caution has to be exercised to ensure disclosure of location of tuskers does not help poaching, protocols developed in other elephant range countries can be studied and other information shared. It is to be stressed that such sharing among researchers, scholars and citizens is vital to the process of improving our knowledge base on the species.

Recommendations on Securing Elephant Corridors

1. The Task Force recommends that all the elephant corridors documented in *Right of Passage: Elephant Corridors of India* publication and agreed to by Project Elephant and state governments should be **notified as state elephant corridors** by respective State.

    a. **Priority one**. In order to facilitate immediate action, the prioritized 26 of the 88 documented corridors with highest ecological priority and high conservation feasibility and minimal adverse consequences for human settlements be secured.

    b. **Priority two**: The remaining 62 corridors where ecological and conservation values are medium to low may entail a human and management challenge.

    c. Elephant corridors that facilitate the movement of **multi mega-species** (tiger, leopard, rhino, and gaur) should be secured in coordination with NTCA and other agencies.

2. A**ny forest land diversion** in the elephant corridor irrespective of its size should come to FAC and not only to the regional offices of the MoEF. NECA should also be consulted to ensure that interests of elephant conservation are protected before permitting diversion.

3. Any essential infrastructural development projects including widening of roads in corridors or conversion of narrow gauge to broad gauge railway line or other such civil works such as open cut canals should only be allowed if adequate measures for movement through passes (under or over) are planned to mitigate any adverse effect due to such developments. NECA should commission elephant specific EIAs in such cases to enable site specific measures, which are to be monitored on a regular basis.

4. It is recommended that State Forest Department and NECA should make efforts to protect the corridor land through **purchase, voluntary relocation of people or securing with the involvement of local community e.g. through conservation easements**. In securing private lands for the purpose of providing connectivity/ corridor they can be purchased at prevailing market rates by NGOs and or Government. For **Scheduled Tribes, Other Traditional Forest Dwellers and all BPL households** such purchase of lands may not adequate as a package. Due consideration to a medium to long-term **Relief and Rehabilitation package** in line with GOI's draft R and R policy 2007 is essential. Such measures will give such rehabilitated people a better future and be positive for conservation.

5. In the case of encroachments on identified corridor land, the state government should pursue legal means on a priority basis.

6. Local residents of corridor fringe villages should be involved in corridor conservation by providing them incentives for maintaining their lands as corridors. These could include community forests or similar institutions.

7. Autonomous bodies are of special importance in elephant range states of North East India and deserve special mention for conservation priority and assistance. In **District Council and Autonomous Council** areas where most of the land is under community control, it is

important to sensitize local communities to help secure corridors. A community setting aside land for conservation should be **adequately compensated**. Such programmes need funding and technical assistance from NECA on a priority basis.

8. **Large-scale infrastructural** activities in identified elephant corridors should be thoroughly discussed by involving various stake holders to prevent further fragmentation and degradation. All such matters are placed before the **FAC. The NBWL and NECA should be consulted.**
9. Securing and protection of corridors should be made part of the **management plan of the adjacent PA** wherever relevant.

Recommendations on Control of Poaching and Ivory Trade

1. Several elephant areas are understaffed or staffed with middle aged personnel. **All vacant posts are to be filled with new recruits** on a priority basis preferably with local youth.
2. At least **50% of the positions be reserved for existing daily wagers** already working as trackers, anti poaching squads, patrolling and anti depredation squads.
3. Front line forest staff is to be well equipped, not just with basic needs, but also with modern equipments and trained in use and application of modern **techniques of patrolling and communications.**
4. Every Reserve should have fully equipped and properly trained anti-poaching and intelligence gathering teams.
5. **Post Mortem protocols developed by Dr Cheeran and Nair (2003) titled *Techniques and procedures for post mortem of elephants* should be strictly adhered to.**
6. Local villagers / Scheduled Tribes/ be engaged to help **regular intelligence gathering** and rewards be instituted successful information leading to seizures / raids.
7. The NECA should establish a **National Elephant Mortality database** which should be shared with enforcement agencies at regular interval on a regional basis. Research for elephant demography and interpretation of population trends by researchers is vital to

conservation. NECA in general and CERE in particular will facilitate and encourage such research.

8. As a motivation measure, the forest staff should be **properly insured.** All foresters, forest guards and temporary watchers should be covered under the **annual premium** ***life insurance cover*** in the Post Office schemes. This should be a minimum insurance provided to frontline forest staff.

   Families of forest staff should not suffer in cases of any eventualities. The employment of a member of the family of the deceased in case of causality should get utmost priority on compassionate ground. Staff in insurgent affected areas should be provided with added incentives.

9. Inter-state coordination is to be strengthened through periodic meetings and information exchange. **Joint patrolling** on border areas could be planned and deployed.

10. **Anti-poaching plans as a part of the Management Plan** for Elephant Reserves be made mandatory and reflected in the Annual Plan of Operations. Contingency planning for immediate response to emergency situations resulting from poaching to form part of the plan.

11. Daily watchers be paid **hardship allowance** of not less than Rs. **1000** per month. **Free rations/food allowance** be given to all frontline field staff including watchers and other daily wagers.

12. NECA needs to help revise and update training modules and syllabi for forest personnel to bring them in line with state-of-the-art knowledge.

13. Young, new recruits at the lower level should serve **a minimum of five years in Wildlife Divisions** after which they can be given posting at their selected divisions.

14. Sensitization in wildlife crime prevention to be carried out through periodic training to all concerned law enforcement agencies. An **information sharing mechanism** between Forest Department, police, customs and non governmental agencies working through the **National Wildlife Crime Control Bureau is to be developed.**

15. **Database for elephant related crime and criminals** for different zones at local, state and international levels to be prepared. Database should be shared on regular basis to help strategic planning to curb the wildlife trade.

16. The **Judiciary is to be sensitized** on wildlife crime, modus operandi and national and international wildlife crime scenario and any project from government or non-government agencies to be supported.

17. **Fast track Special Courts** dealing with wildlife crime need to be set up. The choice of where such courts may be set up should be left to NECA in consultation with state governments keeping in mind threat perception of elephant related wildlife crime.

18. India's well stated stance in opposition to **any international resumption of the ivory trade** should continue. GOI's policy of actively lobbying in alliance with governmental and non-governmental agencies is commendable and ought to continue.

19. Strengthen the newly created **CITES Cell** in the MOEF.

Recommendations on the Welfare of Captive Elephants

1. New **commercial acquisition** of wild-caught elephants by agencies, institutions or individuals be totally banned.

2. A **one-time amnesty for elephant guardianships** be given to all owners / guardians possessing elephants. All ownerships need to be declared and registered once more with fresh amendment. The term **"guardianship"** should replace the current term "ownership".

3. All elephants in the current possession of private owners and agencies are to be granted **Guardianship Certificates after micro-chipping** to bring them into a central and state system of monitoring.

4. **Sale of elephants/ transfer / power of attorney / lease / gift / donation is not recommended** and the law needs to be suitably amended to stop the legal manipulations currently in practice.

5. The Task Force recommends the setting up of **Captive Elephant Welfare Committees (CEWCs)** at state level to assist the State Forest

Departments to discharge their functions of regular monitoring of the welfare conditions, of captive elephants. The Committee constituted shall be responsible for management and humane treatment of captive elephants in accordance with proposed Rules. A periodic update of captive elephant numbers should be carried out.

6. The **usage of elephants in circuses** should be **banned** and their use for alms discouraged. This category of privately owned elephants should follow the precedent of phasing out as per the 1991 ban of the five categories of wild animals (lion, tiger, leopard, bears and monkeys) in circuses.

7. Owning private stocks of ivory is contrary to India's position on the keeping, holding or acquiring of ivory and therefore has no justification. This does not include those with valid and pre existing ownership certificates. **Possession and ownership of ivory tusks** that come into the custody of captive elephant owners once their elephant dies should become government property and should be destroyed after samples are collected for scientific and educational purposes.

8. The inventory of existing stock of ivory with government and private agencies is to be updated and a data base be maintained.

9. A **Wildlife Veterinary Wing** is created within the state forest department with full promotional opportunities incentives and facilities for the vets with options of permanent absorptions. On a priority basis every Elephant Reserve should have a veterinary officer oriented to wildlife.

10. Ghasis/kavadis/ or assistants to the Mahouts shall be given the same status and emoluments as Forest Guards. **Mahouts in government service** shall be given the same status and emoluments as a **Forester, with assured promotions at least twice in their career**. Their existing health insurance, pay benefits and scales shall be increased or brought to above levels, whichever is applicable. Mahouts and kawadis with the department should be treated as frontline staff for all incentives, welfare and training .Mahout salaries in private employment should be at par with the forest department grades.

11. **All mahouts in service and newly recruited should undergo training** and registration by the Forest Department in order to obtain a license/certification issued by the Department.

12. It is necessary to set up **Mahout Training Schools** needs to be set up within identified forest camps and all elephant owners and handlers should comply by registering and participating in these training programmes.

13. **Captive Elephant Lifetime Care Centres may be set up** to deal with elephants that are abandoned and confiscated or captured. The elephants should be kept according to standards to be laid down by the above mentioned Committees.

14. The Task Force recommends effective monitoring of **Sonpur mela to** discourage the trade in elephants.

15. **Activities that** cause stress and strong possibility of injury to elephants and human beings should be banned.

Human-Elephant Conflict

Recommendations for Mitigating Conflict

Given the seriousness of human-elephant conflict and its extreme gravity in certain areas, there should be a continuing programme for containing and defusing such conflict.

1. The task force recommends **conflict management task forces** that will work in priority identified areas of high conflict. **The Conflict Management Task Forces** will begin work in sites identified by the Elephant Task Force. This scheme will be funded by the NECA and will be a permanent programme to mitigate and significantly reduce conflict on a continuing basis.

2. Transparency of information is vital to build public confidence and also enable continuous re-evaluation of policies and programmes for mitigating and containing human elephant conflict. Transparency of

information as on claims for loss of life, crops or property, loss of lives of people or elephants, numbers captured or killed be maintained.

3. **Culling elephants (**killing of herds or whole groups of elephants as a technique of population management) **be ruled out as a policy instrument as it** is ethically unacceptable in the Indian context.

4. It is however not possible to rule out **killing for self defence** in extreme conditions. Such powers are to be used with caution in rarest of the rare cases as for self defence in case of a 'rogue' elephant. But this is to be done only after observing due protocols.

5. **Translocation of elephant populations** are to be considered subject to strict conditions. It will work best if done for whole herds or family groups but whether in such cases or with individual bull's viability of the approach should be carefully examined. Such translocated animals must be compulsorily monitored through the best means possible (such as telemetry) in order to ensure that they do not cause conflict elsewhere, and in order that the forest department can re-capture them in such eventuality.

6. **Reproductive control of elephant populations** in unviable situations needs serious and sustained scientific research. NECA can facilitate such research under the auspices of CERE.

7. **Capture of elephants from the wild as a conflict mitigation strategy** may not be completely ruled out but this is not to be done on an ad hoc basis and is to be used with the greatest of care and under strict safeguards.

8. Capture choices and techniques have to be guided by science and the Conflict Management Task Forces shall help in such decisions and monitor outcomes. If elephants are to be captured, such elephants are to be a government monopoly and not transferred.

9. **Fences and Trenches** can only work only as a part of a larger landscape level planned intervention (as outlined in the box sets out preliminary guidelines for their planning, application and participatory management).

10. **A moratorium on EPT is suggested and expensive electric fences without involving the community for maintenance to be discouraged. This could be** reviewed by the Conflict Management Task Forces.

11. **Anti depredation squads** can work in specific situations as in parts of North Bengal where there is extensive forests abutting fields.

12. **Considering the** persistent and common grievance in some areas that officials are not easily accessible to cultivators and other villagers affected by elephant and other wildlife crop damage, it is recommended that **public hearings be held at least twice a year at taluka level**. These must mandatorily require presence of not only the Wildlife Wing and Territorial Wing staff but also the revenue and civil authority and elected people's representatives such as the MLA.

13. The extent and severity of crop losses has led to deep resentment due to the burden on cultivators. Payments for the **work of crop protection may be considered under the auspices of the MGNREGS.** As in case of water harvesting on private lands, this will alleviate distress and reduce burden on cultivators.

14. Loss of human life to elephants in conflict situations is deeply tragic and any immediate and medium term steps to reduce it are urgent and necessary. **Ex gratia relief for loss of human life not to be less than 3 lakh rupees.**

15. There are serious policy hurdles due to the problems in recognising **wild animal damage as being subject to insurance cover**. For the present, all crop loss amounts require re evaluation, and substantial upward revisions as per the state, region and crop. **The PSU insurance**

companies should be approached by NECA/MOEF to take up and cover a few such sites on a pilot basis. Innovative schemes are already under way for mitigating losses. Schemes such as **"Grain for Grain"** require study and careful up-scaling and such attempts be encouraged and supported by government.

Recommendations on Awareness and Outreach

1. Declare the **elephant India's National Heritage Animal to** accord the species due pride of place for its central role in the country's diverse ecosystems as much as a symbol of cultural diversity.

2. Initiate **'Haathi-Mere-Saathi' awareness campaign to** inculcate ecological awareness and conservation values among children, youth and policy makers. Special emphasis may be placed on such outreach in national and regional languages especially with local schools around the Elephant Reserves.

3. St**art Regional Gajah Centres to provide f**ocal points for education and outreach about elephant behaviour, ecology, conservation and the cultures of human-elephant co-existence.

Recommendation on taking the Global Lead in Elephant Conservation

1. Host the first ever **International Elephant Congress** with conclaves on science, culture and management culminating in government led summit to adopt elephant 50:50 vision charter.

2. Encourage learning and international cooperation with '**Elephant Scholar Exchange Program**.'

3. Propose a **United Nations Day** for the Elephants

4. The Task Force recommends steps to establish an **Asian Elephant Forum** on the lines of the Global Tiger Forum, with immediate priority to securing of trans-boundary elephant landscapes.

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Annexure I

Submissions Received by the Elephant Task Force

1. A. Christy Williams, Scientist, Kathmandu, Nepal
2. A.J.T. Johnsingh, Former-Scientist, Wildlife Institute of India
3. A.P. Sankaran, President, Muttom Thayakku Devaswam Trust, Idukki District, Kerala,
4. Anon, Kerala
5. Anup Saikia, Nature's Beckon, Assam
6. Ashok Kumar, Vice Chairman, Wildlife Trust of India
7. Ayyappan, Secretary, SPC, Kerala
8. B. Ramakrishnan, Field Officer, Wildlife, Trust of India, Tamil Nadu
9. Biswajit Mohanty, Member National Board for Wildlife, Cuttack, Orissa
10. Bransdon Corrie, President Indian Institution of Foresters, Thrissur, Kerala
11. C. Arivazhagan, Peechi, Kerala
12. C. Sreekumar, High Range Environment and Wildlife Preservation Association, Kerala
13. C.M. Manikandawarrin, President Kerala State Elephant Lovers' Organization
14. Charles R.W. Corfield, Masinagudi Farmers and land Owners Association, Tamil Nadu
15. Clementien Pauws, President Karuna Society for Animals and Nature, Andhra Pradesh.
16. Debi Goenka, Executive Trustee, Conservation Action Trust, Mumbai
17. E.K. Easwaran, Forest Veterinary Officer, Konini, Kerala
18. E.V. Krishnan, President , Peruvanam Arattupuza Pooram central committee, Kerala
19. Erika Abrams, Founder, Animal Aid Charitable Trust
20. Gajaparipalana Sangham, Kerala
21. Gomathy Venkateswar, General Secretary CEMO
22. Gurudas, Secretary, PC, Kerala
23. Hari, Elephant Trade in Kerala

24. Jadavaden Namboodri, Trustee, Vayaloor Devaswom, Kerala
25. K. Ravindra Nathan Nair, President, Sree Mahadeva Temple Kanjiramattom, Kerala
26. K. Viajayan Varier, President, Pandamangalam Sree Krishna Temple Welfare Committee, Palakkad, Kerala
27. K.B. Ganeshkumar, MLA, Kerala Elephant Owners Federation, Ernakulam, Kerala
28. K.M. Chinnappa and Praveen Bhargav, Trustee, Wildlife First, Bengaluru, Karnataka.
29. Kashmira Kakakti, Scientist, Kathmandu, Nepal
30. Kedar Nath Singh, Retired Conservator of Forests, Lucknow
31. Kerala State Festivals Coordination Committee, Manchira Road, Guruvayoor, Kerala
32. Khushboo Gupta, Tata Institute of Social Sciences, Mumbai.
33. Kottakkal Sree Venkittathevar Sivakshethra Samakshana Samithi, Kerala
34. Krishnan (Renjan), Secretary, SPC, Kerala
35. Lisa Warden, Founder & Director, DOGSTOP, Ahmedabad, Gujarat
36. M.C. Malakar, Retired PCCF (WL), Assam
37. Managing Trustee, Velayudha Swami Temple, Kerala
38. Manoj Ayyapan, Secretary, Akhila Kerala Anathozilali Union, Kerala
39. Marion Courtine, DAYAKARA Trust, Auroville, Tamil Nadu
40. Maryland Wilson, President, Australian Wildlife Protection Council Inc., Australia
41. Mukti Roy, CES, Indian Institute of Science, Bengaluru, Karnataka
42. N. Choudhury, Professor of Helminthological (Retd.), Punjab Agricultural University, College of Veterinary Science, Ludhiana,
43. N. Gurunathan, Scientist (Forestry), National Research Centre for Agro forestry, Jhansi, U.P.
44. N.G. Jayasimha, Advocate, Co-opted Member AWBI.
45. Nanditha Krishna, Hon. Director, C. P. R. Environmental Education Centre, Chennai.
46. Nibha Namboodri, Kerala
47. Nirmal Ghosh, Uttarakhand

48. Nishant M. Srinivasiah, PG Programme in Wildlife Biology and Conservation, NCBS, TIFR, Bengaluru, Karnataka
49. P. Raghav Varier, President Viswambhara Kshetra Utsava Committee, Kerala.
50. P. Sankaran, President, Muttom Thayyakavu Devaswam Trust, Kerala
51. P.R.M. Nair, Secretary, Mahadev Temple, Edaprabhawagati temple, Kerala
52. P.S. Prakash, President, Sree Annapoorneshwari Kshetram Trust
53. P.T. Varghese, President, Masinagudi Farmer and Land Owners Association; Bokkapuram, Tamil Nadu
54. Pamela Gale Malhotra, Trustee, SAI (Save Animals Initiative) Sanctuary Trust, South Kodagu, Karnataka
55. PC Jayan, Secretary, Nadayial Kavu Vengallore,Thodupuza, Kerala
56. Philip Wollen, OAM, The Winsome Constance Kindness Trust, Australia
57. Pradeep Nath, CUPA, Bengaluru, Karnataka
58. Pradeep, Animal lover, Kerala
59. Prakesh Sashidharan, President, Pattathanm Sri Subramaniya Swami Temple, Devwsam, Kerala.
60. Prakesh T.K. , Secretary, Thanipadam Desman Poorasamudayam, Kerala
61. Pramod, Vinita Nayar
62. Prashanth
63. Praveen Bhargav, Wildlife First, Bengaluru
64. President, Onamkunnu Devaswom, Koothatukulam, Ernakulam,Kerala
65. President, Palamadu Sree Dharma Sashta Temple, Kerala
66. President, Pandmangalam Sreekrishna Temple,
67. President, Sree Dharmashstra Temple, Panackkal Sree Bhadra Kali Temple, Kerala
68. President, Sree Subramania Shethrasamrkashana Samithy, Thrissur, Kerala
69. President, Sreekrishna Swami Muttom, Kerala
70. President, Thrikakunnu Mahadeva Temple, Kerala

71. R.M. Nair, Kerala
72. Rajappan Nair, Secretary, Nelliakkattu Bhagavathi Devaswom Trust
73. Rajkumar Namboodiri, Kalletumkara, Kerala
74. Ravi Chellam, wildlife Conservation Society, India Program
75. Ravi Singh, Secretary General, WWF-India
76. Representatives of the Gram Panchayats, Puduserry, Akathethara, Elapully, Puduppariyam and Malampuzha, Kerala
77. Ritwick Dutta, Legal Consultant
78. Roma, National Federation of Forest Peoples and Forest Workers, Sonbhadra, U.P.
79. Sadananda, Secretary, Chumbutra Kodungallorkkav Temple Committee, Kerala
80. Sandeep K. Jain, Member, Punjab State Board for wildlife & Chief Co-Coordinator, CAPE-India.
81. Sathya Radhakrishnan, Tamil Nadu
82. Savitha Jain, Secretary, the Hospitality Association of Mudumalai, Kerala
83. Secretary and President, Chakkulathukavu Ummaahwsri Temple, Kerala
84. Secretary, Chumbutra Kodungallorkkau Temple Committee, Kerala
85. Secretary, Edppalam Samudayam, Kerala
86. Secretary, Elikulam Bhagvathy Devaswam, Kerala
87. Secretary, Kaukkad Sree Ayyappa temple, Kerala
88. Secretary, Kerala State Elephant Lovers' Association, Guruvayoor, Kerala
89. Secretary, Kerala Temple Protection Society
90. Secretary, Kodumbbukkav Ayyappaswami Temple, Kerala
91. Secretary, Kottayam Chembott Sri Durgadevi Temple, Kerala
92. Secretary, Kurumakkav Temple Advisory Committee, Kerala
93. Secretary, Muthaliyar Madom Devaswam Trust, Thodupuzha East, Kerala
94. Secretary, Onamunnu Devaswom, Kerala
95. Secretary, Sreekantha Nellor Mahavishnu Temple, Kerala
96. Secretary, Thanipadam Desam Poorasamudayam.

97. Secretary, Vasudevapuram Kshetrakshena Samithy, Virupakka, Kerala
98. Shivaji Charan Nayak, Wild Orissa, Orissa
99. Siddhartha Kumar Gogoi, Assam
100. Sree Mahadeva Temple Kanjiramattom, Thodapuzha East, Kerala
101. Srinivas Vaidyanathan, Foundation for Ecological Research, Advocacy and Learning, Pondicherry And E. Somanathan, Planning Division, Indian Statistical Institute, New Delhi
102. Sriya, Animal welfare columnist, *The Hindu*
103. Subramaniyam and others, Vada Kumbhakonam, Devaswam, Tamil Nadu
104. Suchitra V. Srinivasan.
105. T. R. Shankar Raman, Nature Conservation Foundation, Mysore, Karnataka
106. T.A. Nedangadi, Peechi, Kerala
107. T.A. Nedungadi, Secretary, Sree Subramanyakovil Committee, Kerala
108. T.A. Rajeev, Peechi, Thrissur
109. T.K Gopalakrishnan, President, Sree Pera Bhagawati Temple
110. T.N. Arun Kumar and others, Advocate, All Kerala Elephant Owners Association
111. Tintu, Secretary, SPC, Kerala
112. Trustee, Nelliakattu Bhagvathi Devaswom Trust
113. Udhayan, Tirupattur, Tamil Nadu
114. V.K. Venkitachalam, Secretary, Elephant Lovers' Association, Thrissur, Kerala
115. Valavoor Devaswom, Thrissur, Kerala
116. Velaudha Swami, Managing Trustee, Kurrathikotayil Sree Kalimuthappanakavu, Nilambur, Kerala
117. Visakha Society for the Protection of Animals, Andra Pradesh
118. Wildlife Protection Society of India, Palakkad, Kerala
119. Y.V. Jhala, Wildlife Institute of India, Dehra Dun
120. Arupjyoti Saikia, Dept. Of Humanities, Indian Institute of Technonology, Guwahati.
121. Vijay D. Anand, Rocha Foundation, Bangalore.

Annexure II

List of Hearings held by the Elephant Task Force

1. Regional Hearing, Southern Region, Bengaluru, Centre for Ecological Sciences, Indian Institute of Science, Bengaluru, Karnataka,2 April 2010.
2. Regional Hearing , Central-Eastern Region, Bhubhaneshar, Orissa, 17th April, 2010.
3. Regional Hearing, Southern Region, Kerala Forest Research Institute, Peechi, Kerala, 30th April 2010.
4. Regional Hearing, North Eastern Region, Guwahati, Assam, 23rd April 2010.
5. Regional Hearing, Northern Region, Delhi, 8th May 2010.

Field Visits of the Elephant Task Force

1. Field Visit, Bandipur, Karnataka and Mudumalai, Tamil Nadu, 3rd and 4th April 2010.
2. Meeting with Forest Department Officers, Wildlife and Territorial Wings, Karnataka, Mysore, 4th April 2010.
3. Chandaka Wildlife Sanctuary, Orissa, 17th April, 2010.
4. Pabitora Wildlife Sanctuary, Assam, 24th April 2010.
5. Guruvayoor Temple complex, Kerala, 1st May 2010.

Annexure III

List of Landscape and Elephant Rserves in India with 2005 Census Population

Sl. No	Elephant Range	Elephant Reserve with date of notification	State	Total Area (Sq. Km)	P.A. in ER (Sq. Km.)	Population in 2005
1	East-Central Landscape (South West Bengal- Jharkhand-Orissa)	1. Mayurjharna ER(24.10.02)	W. Bengal	414	-	96
		2. Singhbhum ER (26.9.01)	Jharkhand	4530	193	371
		3. Mayurbhanj ER (29.9.01)	Orissa	3214	1309	465
		4. Mahanadi ER (20.7.02)♣	Orissa	1038	964	464
		5. Sambalpur ER (27.3.02)♣	Orissa	427	427	284
		6. Baitarni ER#	Orissa	1755	-	108
		7. South Orissa ER#	Orissa	4216	750	138
		8. Lemru #	Chattisgarh	450	-	-
		9.Badalkhol-Tamorpingla- #	Chattisgarh	1048.30	1154.93	-
	Total			**17092.3**	**4797.93**	**1978**

2	Kameng -Sonitpur Landscape (Arunachal – Assam)	10. Kameng ER (19.6.02)	Arunachal	1892	748	
		11. Sonitpur ER (6.3.03)*	Assam	1420	420	612
		Total		**3312**	**1168**	**612+**
3	Eastern South Bank Landscape (Assam-Arunachal)	12. Dihing-Patkai ER (17.4.03)	Assam	937	345	295
		13. South Arunachal ER (29-2-08)	Arunachal	1957.50	378.13	129
		Total		**2894.5**	**723.13**	**424**
4	Kaziranga-Karbi Anglong-Intanki Landscape (Assam- Nagaland)	14. Kaziranga – Karbi Anglong ER (17.4.03)	Assam	3270	1073	1940
		15. Dhansiri-Lungding ER (19.4.03)	Assam	2740		275
		16. Intanki ER (28.2.05)	Nagaland	202	202	30
		Total		**6212**	**1275**	**2245**
5	North Bengal-Greater Manas Landscape (Assam- W. Bengal)	17. Chirang-Ripu ER (7.3.03)	Assam	2600	526+	658
		18. Eastern Dooars ER (28.8.02)	W. Bengal	978	484	300-350
		Total		**3578**	**1010**	**1008**

6	Meghalaya Landscape (Meghalaya)	19 Garo Hills ER (31.10.01)	Meghalaya	**3,500**	402	**1047**
		20. Khasi Hills ER#	Meghalaya	**1331**	**-**	**383**
		Total		**3831**	**402**	**1430**
7	Brahmagiri-Nilgiri-Eastern Ghat Landscape (Karnataka- Kerala-Tamilnadu-Andhra)	21. Mysore ER (25.11.02)	Karnataka,	6724	3103	4452
		22. Wayanad ER (2.4.02)	Kerala	1200	394	636
		23. Nilgiri ER (19.9.03)	Tamilnadu	4663	716	2862
		24. Rayala ER (9.12.03)	Andhra	766	525	12
		25. Nilambur ER (2.4.02)	Kerala	1419	90	281
		26. Coimbatore ER (19.9.03)	Tamilnadu	566	482	329
		Total		**15320**	**5310**	**8572**
8	Anamalai-Nelliampathy-High Range Landscape (Tamilnadu-Kerala)	27. Anamalai ER (19.9.03)	Tamilnadu	1457	300	179
		28. Anamudi ER (2.4.02)	Kerala	3728	780	1726
		Total		**5185**	**1080**	**1430**

9	Periyar-Agasthyamalai Landscape (Kerala-Tamilnadu)	29. Periyar (2.4.02)	Kerala	3742	1058	1100
		30. Srivilliputtur ER(19.9.03)	Tamilnadu	1249	568	638
Total				**4991**	**1626**	**1738**
10	North-Western Landscape (Uttaranchal-U.P.)	31. Shivalik ER (28.10.02)	Uttarakhand	5405	1340	1510
		32. Uttar Pradesh ER (9.9.09)	U.P.	744	-	NA
Total				**6149**	**1340**	**1510+**
TOTAL				**65270.8**	**18732.03**	**21200+**

Approved by Govt. of India, but not yet notified by the State Government.

♣ Proposal for extension approved by GOI , but not yet notified by the State.

Annexure – IV(a)

Priority I Elephant Corridors

Northern India

1 Chilla-Motichur
2 Rawasan-Sonanadi (Via Landsdown)
3 South Patlidun-Chilkiya
4 Malani Kota

Central India

1 Simlipal-Satkosia
2 Baula-Kuldhia
3 Kotgarh-Chandrapur
4 Buxa-Ripu at Sankosh
5 Ankua-Ambia

North East India

1 Pakke-Doimara at Dezling
2 Pakke-Papum at Longka Nullah
3 Kalapahar-Daigurung
4 Kaziranga- Karbi Anglog at Panbari
5 Kaziranga- Karbi Anglong at Kanchanjuri
6 Pakke-Doimara at Tipi
7 Baghmara-Balpakram
8 Siju Rewak

Southern India

1 Edayarhalli-Doddasampige
2 Kaniyanpura-Moyar
3 Anaimali at Punachi
4 Anaimalai between Siluvaimedu-Kadamparai
5 Chamranagar-Talamalai at Muddahalli
6 Kalamali - Singara and Avarahalla
7 Moyar-Avarahalla
8 Tirunelli - Kudrakote
9 Buoolavampatti-Attapadi
10 Anaimalai at Waterfalls Estate

Annexure IV(b)

Priority II Elephant Corridors

Northern India

1 Kansrau-Barkote
2 Motichur-Gohri
3 Rawasan-Sonanadi (Via Bijnor FD)
4 Chilkiya-kota
5 Fatehpur-Gadgadiya
6 Gora Rankhu and Gorai-Tanda
7 Kilpura-khatima-surai
8 Lagga Bagga - Kishenpur

Central India

1 Mahilong-Kalimati
2 Chandil-Matha
3 Dalma-Chandil
4 Dalma-Rugai
5 Jhunjhaka-Banduan
6 Dalapani-Kankrajhor
7 Dumriya-Nayagram
8 Dumriya-Kundaluka and Murakanjia
9 Leda-Bera
10 Anjadbera-Bichaburu
11 Karo-Karampada
12 Badampahar-Dhobadhobil
13 Badampahar-Karida East
14 Kahneijena-Anantpur
15 Tal-Kholgarh
16 Nuahgaon-Baruni
17 Mahananda-Kolbari and Tukriajhar

18 Apalchand-Mahananda
19 Apalchand-Gorumara
20 Apalchand-Kalimpong at mal block (Via Sylee)
21 Apalchand-Kalimpong at mal block (Via Meenglass)
22 Chapramari-Kalimpong
23 Rethi-Central Diana
24 Rethi-Moraghat
25 Dumchi-Rethi
26 Titi-Dumchi
27 Buxa- Titi (Via Torsa)
28 Buxa- Titi (Via Beech and Barnbari)
29 Nemati - Chilapata

North East India

1 Pakke-Papum at Seijosa Nullah
2 Durpong-Doimukh at Khundakhuwa
3 Dulung-Subansari
4 D'ering - Mebo at Sigar Nalah
5 D'ering - Mebo at Kongkul
6 Kotha Burhidihing
7 Upper Dihing East - Upper Dihing West Block at Bogapani
8 Upper Dihing East - Upper Dihing West Block Between Golai-Pawai
9 Kukurakata-Bagser at Amguri
10 Charduar-Singri Hill
11 Saipunj-Narpuh
12 Rewak-Imangiri
13 Nokrek-Imangiri
14 Ranggira-Nokrek

Southern India

1 Karadikkal-Madeswara
2 Tali
3 Chamrajnagar- Talamalai at Punjur

4 Talamalai-Guttiyalattur
5 Avarahalla-Sigur
6 Kalhatti-Sigur at Glen Corin
7 Nilambur Kovilakam - New Amarambalam
8 Periya at Pakranthalam
9 Kottiyur-Periya
10 Kallar at Gandhapallayam

Annexure V

Guidelines for Civil Works and Habitat Protection

Protection is the key to the survival of the Elephant Reserves and Forest Departments have done commendable work in this direction. While asking for increased financial outlay, and recognising that the protection of the Elephant Reserves will be a major focal point, it is important to caution on certain key field level issues. This is important to ensure that availability of resources does not get misdirected in a manner that dilutes the gains achieved through years, even decades of dedicated protection.

Certain key issues in implementation and resource utilization on the ground require serious redress. Unless these are addressed in a systemic fashion, the infusion of fresh funds in itself will not have positive impact. Field visits and discussions with managers, scientists and conservationists have shown a pattern in the way resources are sometimes being utilised. Before going into operational recommendations below, it is important to make two observations. Protected Areas and forests in general require protection for regeneration *not* water and soil harvesting. Similarly, while road construction and civil works are essential in forest areas for effective protection, these require monitoring and scrutiny. In general these are labour intensive activities and if wage norms are observed can not only generate seasonal employment but reduce damage to habitat and disturbance due to use of heavy machinery.

It is strongly recommended these points below be built into all perspective, management and annual plans. It is the view of the Task Force that these measures will significantly improve the quality of protection, reduce waste and also focus energies on activities with a sound scientific basis while also being programmes of an employment generating nature. The Forest Department may actively consider how to carry these into operation.

1. **Soil and moisture conservation is not recommended within the Elephant Reserves.** This includes rain harvesting pits - this activity should be banned inside PAs based on several scientific studies that clearly indicate the eco-system services forests provide, including water harvesting and regulation. Protection of vegetation will be a

better way of restoring water recharging of acquifers and soil quality that have dried up.

2. **The usage of heavy machinery within PAs such as JCBs, excavators, ploughers is not advisable.** The use of heavy machinery is best avoided in ERs as it
    a). Causes heavy disturbance to wildlife and habitats.
    b). Significantly reduces employment opportunities for local communities alienating them further from conservation, and closing off avenues to earn additional income.
    c). Ideally, these jobs may be given to SCs, STs and BPL families
    d). There is also scope for misuse of work time with single owners which will hereby be reduced.
    e). Local labourers are better in that they can identify and selectively remove weeds like *Lantana camara* and avoid soil compacting or damage to non-target indigenous species of plants and shrubs. Labour is better than machinery for control of invasives.

3. **It is not advisable to utilise MGNREGS money within the Elephant Reserves for "construction works" including roads, tanks, ponds, check dams.** The rural jobs scheme is to be deployed with care to maximise positive impact and minimise ill effects. MGNREGS can be utilised for providing wages for farmers to guard their own crop fields near the Elephant Reserves, as incentives to help in protection or for eco-development activities in villages (implemented through non-forest department staff). It could also be recommended that, in case of PAs. Government should modify the MGNREGS guidelines that it necessarily need not be used for 'asset building' (as is the current rule). Our Elephant Reserves themselves are natural assets which should be protected.

4. **Unchecked water hole creation needs scrutiny and transparency due to possible adverse effects on wildlife and habitat.** It wastes resources and may even have adverse affects on the natural cycle. Water holes are often created even in high rainfall regions. Studies

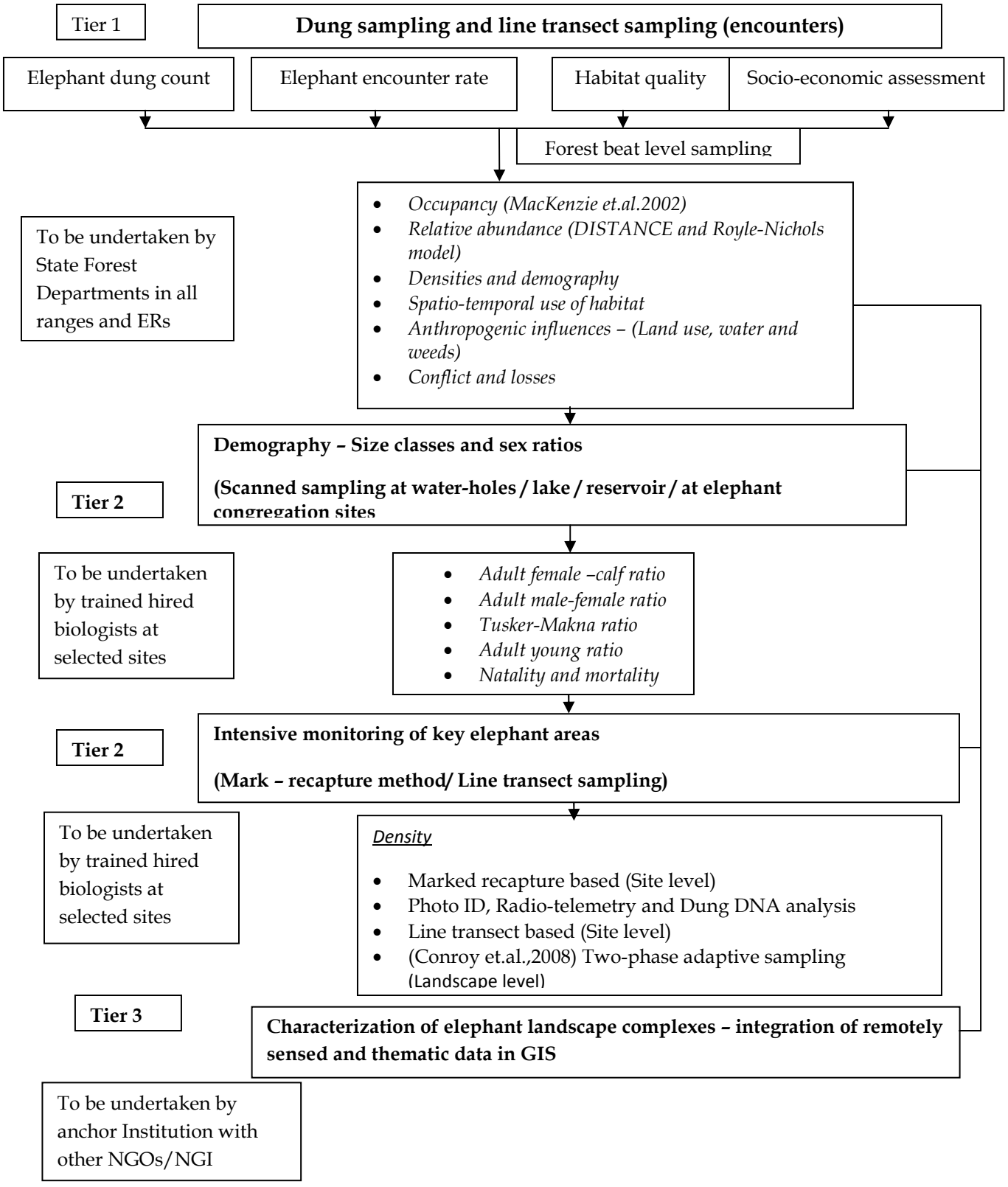
show these may reduce elephant calf mortality and artificially drive up numbers in certain habitats. This is untenable and unnatural (this is in addition to the natural sources especially when there are waterholes 2 kms from major rivers like the Kaveri). Elephants are intelligent social animals capable of finding water and do not need care in the wild as they do in captivity. Alternately, waterhole construction is can be a source of 'leakage' of funds. The idea that uniform distribution of animals is necessary to avoid 'clustering' or over crowding' is commonplace. Quite to the contrary artificial water provision can interfere seriously with natural factors governing distribution. It can also artificially reduce mortality, which goes against the norm of letting nature take its course in Protected Areas.Desilting of natural ponds is an option that is far better than creating waterholes. Natural desilting is to be given priority and water hole creation strongly discouraged. Water development - we need rapid reconnaissance of the water availability in all Elephant Reserves (both natural and artificial). Some Elephant Reserves have 1 artificial tank/sq km of forest. Water sources , both natural and human made should be mapped with costing of water hole creation. Mapping is to be done with costing. Once these figures for all the Elephant Reserves, this activity can only be based on the data. This assessment can be done by NECA with the help of CERE. All information should be public. Once these are in place, Working or Management Plans will limit themselves to achieving these targets in phased manner, not on *ad hoc* basis.

5. **Civil works are necessary but if used unwisely they can lead to leakage of funds and actually be damaging to wildlife**. All civil and construction works including roads (and also water holes or check dams) are to be based on a long term Perspective Plan that evaluates the landscape and identifies requirements. Habitat development or activities with impact on habitat will be based on proper ecological assessment. The road density in Nagarahole are not conducive to conservation and many have been laid under recently available funds for wildlife protection (Gubbi 2010).It is important that the Elephant conservation efforts not repeat these very same errors.

6. **Budgeting should be provided when there is cross comparison of activities over previous years carried out by independent experts** (APOs will clearly tell us previous activities). The process of developing the Annual Management Plans/Annual Plan of Operation needs thorough review (including the new Plans arising out of special elephant conservation programmes). NECA should have all its Reserves putting up plans, expenses incurred and results for public scrutiny on websites.

Annexure VI

Flow Diagram of elephant monitoring



Annexure VII

Enumeration of Elephants-2005 : Guidelines for calculating Dung Decay Rate for Elephant Reserves by retrospective method

A. Stratification of Elephant Zone

1. Each Forest Division (FD)/ Protected Area (PA) constituting the Elephant Reserve (ER) should be stratified as follows on the basis of the elephant densities known from the previous (viz. 2002) census:

    1. High density /High usage strata (**H**): > 1 elephant/km ^{2}
    2. Medium density / Medium usage strata (**M**): 0.5- 1 elephant/ km ^{2}
    3. Low density /Low usage strata (**L**): Below 0.5 elephants/ km ^{2}
    4. No usage-elephant free zone (not to be included in the calculation of 'effective elephant habitat' while extrapolating sample data).
2. For quick stratification, a 'forest beat' may be taken as the unit of stratification and it may be allotted to **H**, **M** or **L** on the basis of the majority of its area falling under a particular stratum. For example, if majority of the area of a beat falls under **H**, the entire beat may be allotted to **H**.

3. A stratified map of the FD / PA should be prepared on a large scale map, say 1:50,000.

Note: If information about elephant densities is not available, the stratification can also be done on the basis of habitat types and a map prepared in the same manner as above. There may be more than 3 strata depending on the habitat types found in the FD / PA.

B. Measuring Dung Decay Rate (also called Dung Disappearance Rate) or DDR

1. **Calculation of DDR needs an experiment on a sample of dung piles scattered over various strata. A number of visits to the field are made, adding fresh dung piles to the sample and recording the state of the previously marked dung piles.**

· A fresh dung pile is one which is 0-24 hours old.

· State of a dung pile is recorded as **Present** (=1) or **Absent (**=0**)**. **Present** is any stage where some dung material is left.

Absent is a stage where only traces (e.g. plant fibre remains, termite moulds, mud, etc.) are left and no dung material is present. Absent also includes '**total disappearance**' of dung pile (e.g. washing away in heavy rains).

2. Number of Dung piles to be marked for calculating DDR:

 An ideal target is to have about 120 dung piles for each stratum within the ER. Assuming that there are 3 strata, the total target for the ER = 360.

3. Initiating the Experiment:

It takes about 105 days to complete the experiment. The experiment should begin about 14 weeks (98 days) before the proposed date of census by dung count method. Assuming that the census is planned for 8th April 2005, we may start the experiment on 1st January 2005. Conversely, we may conduct the census about 5-8 days before recording final observations on the sample of marked dung piles.

4. Selecting dung piles:

It is required to visit the field **every fortnight** as per the following schedule, searching for **fresh elephant dung** (less than 24 hour old) **in each stratum** and marking the same for future reference:

No. of Visit	Date of Visit	No. of fresh dung piles to be selected and marked			
		Stratum-1	Stratum-2	Stratum-3	Total
1	1.1.2005	17	17	17	51
2	16.1.2005	17	17	17	51
3	31.1.2005	17	17	17	51
4	15.2.2005	17	17	17	51
5	2.3.2005	17	17	17	51
6	17.3.2005	17	17	17	51
7	1.4.2005	18	18	18	54
8	16.4.2005	- Final recording of observations (Present / Absent)-			
Total		120	120	120	360

- Slight deviation in the date of visit (a day earlier or a day later) is permissible.
- If the requisite number of dung piles are not available on a particular day of visit, the shortfall can be made up during subsequent visits.

[**Note**: Assuming that there are 6 FD / PAs in the ER, the target can be distributed, say @ 60 dung piles for each FD/PA (i.e., 20 dung piles for each stratum within a FD/PA). The targets need not be equally distributed, but the final target for the ER should remain intact. The Divisional Forest Officer / Park Manager may further sub-allot the targets to his Range Officers. Thereafter, a Range-wise schedule for selecting and marking fresh dung piles can be prepared in the same manner as above.]

5. Marking dung piles:

Each dung pile should be marked and numbered uniquely using **one** of the methods listed below:

I. Metal pegs and tags and numbers written with indelible paint.

II. A wide wooden peg with numbers written on top with indelible paint.

III. If dung piles are close to trees than some bark can be removed and the number written with indelible paint.

[**Note**: Use of GPS can also be made to record the location of the marked dung-piles].

6. Observations:

I. During each visit, the previously marked dung piles should be visited and their state (Presence / Absence) noted.

II. If, however, a marker is missing and the marked dung pile can not be located accurately, it should be excluded from the sample and a fresh dung pile should be included in its place.

III. During the last visit (i.e. 16.4.2005), the state (Presence / Absence) of all previously marked dung piles should be noted. No fresh dung piles are to be marked on this visit.

7. Precautions:

- **Under no circumstances, the dung piles marked earlier should be handled or disturbed.**

- Dung piles produced by domesticated elephants should not be included in the sample.

- The dung piles should not be selected too close to water holes, rivers or reservoirs where they can be easily washed away.

8. Recording Observations:

A Dung Decay Rate Observation Form is given in the Separate Forms may be filled up in each Range / Division. However, a consolidated form may be prepared for the entire ER based on the observations made on the last day (i.e. 16.4.2004).

DUNG DECAY RATE OBSERVATION FORM

Stratum No.	Dung Pile No.	Date of Marking	Location (Block/ Comptt.)	State of the marked dung piles on the date of visit (Present = 1, Absent = 0)								
				1.1.05	16.1.05	31.1.05	15.2.05	2.3.05	17.3.05	1.4.05	16.4.2005 (Final Observation)	
				State	State	State	State	State	State	State	Age (in days) of the dung pile*	State

*Age of the dung pile to be calculated from the date of marking

Annexure VIII

ELEPHANT CENSUS 2005 : SUGGESTED METHODOLOGY AND DATES

Sl. No.	Elephant Range	Elephant Reserve	State	Methodology	Dates
I	Eastern India	1. Mayurjharna ER	W. Bengal	Total Count + 30% Block-Sampling (along with Fixed Point Count)	Total Count: 1st week of May 2005
	(South West Bengal-Jharkhand-Orissa)	2. Singhbhum ER	Jharkhand		Count
		3. Sambalpur ER	Orissa		
		4. Mahanadi ER	Orissa		
		5. Brahmani ER	Orissa		
		6. Mayurbhanj ER (**MIKE**)	Orissa	Total Count + Dung Transact (along with Fixed Point Count)	Total Count: 1st week of May 2005 Dung-decay rate experiment to begin in 1st week of Feb.2005 Dung Transact: After 14 weeks
II	North Brahamputra	7. Kameng ER	Arunachal	Total Count + 30% Block-Sampling (along with Fixed Point Count)	Total Count: 1st week of March 2005
	(Arunachal – Assam)	8. Sonitpur ER	Assam		Count

III	South Brahamputra (Assam- Arunachal)	9. Dihing-Patkai ER (**MIKE**)	Assam	Total Count + 30% Block-Sampling (along with Fixed Point Count)	Total Count: 3rd week of March 2005 Block-sampling: Next day of Total Count
		10. Deomali ER (**MIKE**)	Arunachal		
IV	Kaziranga (Assam- Nagaland)	11. Kaziranga – Karbi Anglong ER	Assam	Total Count + 30% Block-Sampling (along with Fixed Point Count)	Total Count: 3rd week of March 2005 **Block-sampling: Next day of Total Count**
		12. Dhansiri-Lungding ER	Assam		
		13. Intanki ER	Nagaland		
V	**Eastern Dooars** (Assam- W. Bengal)	14. Chirang-Ripu ER (**MIKE**)	Assam	Total Count + Dung Transact (along with Fixed Point Count)	Total Count: 2nd week of March 2005 Dung-decay rate experiment to begin in 1st week of Jan. 2005 **Dung Transact: After 14 weeks**
		15. Eastern Dooars ER (**MIKE**)	W. Bengal		
VI	Garo Hills (Meghalaya)	16. Garo Hills ER (**MIKE**)	Meghalaya	Total Count + Dung Transact (along with Fixed Point Count)	Total Count: 2nd week of March 2005 Dung-decay rate experiment to begin in 1st week of Jan. 2005 **Dung Transact: After 14 weeks**
VII	Nilgiri –Eastern Ghat (Karnataka- Kerala-Tamilnadu-Andhra)	17. Mysore ER (**MIKE**)	Karnataka,	**30% Block-Sampling + Dung Transact (along with Fixed Point Count)**	Block-Sampling: 1st week of May 2005 Dung-decay rate experiment to begin in 1st week of Feb. 2005 **Dung Transact: After 14 weeks**
		18. Wayanad ER (**MIKE**)	Kerala		
		19. Nilgiri ER (**MIKE**)	Tamilnadu		

III	South Brahamputra (Assam- Arunachal)	9. Dihing-Patkai ER (**MIKE**)	Assam	Total Count + 30% Block-Sampling (along with Fixed Point Count)	Total Count: 3rd week of March 2005 Block-sampling: Next day of Total Count
		10. Deomali ER (**MIKE**)	Arunachal		
IV	Kaziranga (Assam- Nagaland)	11. Kaziranga – Karbi Anglong ER	Assam	Total Count + 30% Block-Sampling (along with Fixed Point Count)	Total Count: 3rd week of March 2005 **Block-sampling: Next day of Total Count**
		12. Dhansiri-Lungding ER	Assam		
		13. Intanki ER	Nagaland		
V	**Eastern Dooars** (Assam- W. Bengal)	14. Chirang-Ripu ER (**MIKE**)	Assam	Total Count + Dung Transact (along with Fixed Point Count)	Total Count: 2nd week of March 2005 Dung-decay rate experiment to begin in 1st week of Jan. 2005 **Dung Transact: After 14 weeks**
		15. Eastern Dooars ER (**MIKE**)	W. Bengal		
VI	Garo Hills (Meghalaya)	16. Garo Hills ER (**MIKE**)	Meghalaya	Total Count + Dung Transact (along with Fixed Point Count)	Total Count: 2nd week of March 2005 Dung-decay rate experiment to begin in 1st week of Jan. 2005 **Dung Transact: After 14 weeks**
VII	Nilgiri –Eastern Ghat (Karnataka- Kerala- Tamilnadu-Andhra)	17. Mysore ER (**MIKE**)	Karnataka,	**30% Block-Sampling + Dung Transact (along with Fixed Point Count)**	Block-Sampling: 1st week of May 2005 Dung-decay rate experiment to begin in 1st week of Feb. 2005 **Dung Transact: After 14 weeks**
		18. Wayanad ER (**MIKE**)	Kerala		
		19. Nilgiri ER (**MIKE**)	Tamilnadu