

220

GOVERNMENT OF ASSAM
OFFICE OF THE CHIEF CONSERVATOR OF FORESTS::ASSAM::
REHABARI :: GUWAHATI

Phone No. (Off.): 27484
Phone No. (Res.):

Gram : ASCHIEFOR ::
Post Box No. :: 7 ::

No. WL/Pg. 17(8)
Dtd. Guwahati, the 11th Feb., '87.

To
The Secretary to the Govt. of Assam,
Forest Department, Dispur,
Guwahati - 6.

Sub : PROPOSED MEASURES FOR FIGHTING ELEPHANT
DEPREDAATION IN THE STATE.

Ref : Verbal orders of the Hon'ble Minister, Forests.

Sir,

Under the prevailing circumstances elephant depredation has taken a very serious turn. Besides extensive damage to agricultural crops, there are more than 50 cases of loss of life caused by elephants every year during the past several years (some figures are appended). As a result, rural people, specially in the villages near the wildlife areas, are becoming more and more antagonised against conservation efforts and the forest officers, who are involved in such efforts. The socio-economic confrontations is gradually eroding into the conservation efforts itself which is naturally most undesirable.

The Experts' Committee which went into the details of all pros and cons about this aspect had recommended that at least temporarily some elephants should be allowed to be captured, as a measure to control the depredation, in other words to contain the aspect of the socio-economic aspect of elephant management in the State. But simultaneously, the committee also suggested that in the true interests of the species, the lost elephant habitat should be brought back to the elephants, as it was found that due to large scale encroachment of most of the Reserved Forest areas, specially the low lying areas (which are more suitable as grazing grounds for the elephants), most elephant habitats in the State had been fragmented. This was the major reason for massive increase of elephant depredation in the State during the recent past.

Government of India then made it obligatory that any capture of the elephants must be done -

1) Departmentally,

2) By identifying the degrading animals, under clause of Indian Wildlife Act. No sale of such captured animals was also allowed in this process.

This was, obviously, a very impracticable proposition and though the points of involving very high cost of operation and subsequent maintenance and also lack of availability of expertise within the departmental resources was pointed out, yet no response was received.

A discussion was held with the Joint Secretary to the Government of India, Forest and Wildlife Department on the 18th of December last and I have proposed that, since there is hardly any practical hope of getting back any elephant habitat back from encroachers, we have been left with no other alternative but to concentrate on maintaining a manageable population level of the population of the species. Naturally, we are left with no other way but to capture some elephants from the degrading herds. This can be done departmentally by recruiting some professional **Fundies** and **mahuts** and acquiring some **kunki elephants** for the department. These Fundies and Mahuts can be recruited, provided such posts are created, but acquiring Kunki elephants will be difficult on two points - firstly, the huge cost factor and secondly the problem of finding such trained animals in the market. In the long run it is possible to train up some captured elephants as Kunkies, but this may take 3 to 5 years.

Meanwhile, if the plan is accepted, we may recruit some Fundies and Mahuts and also purchase only a few Kunki elephants, as per availability of funds. We can probably hire some Kunkies for the rest of the Fundies for the proposed period of capture at prevalent competitive rates and capture elephants by Mela Shikar method in troublesome areas, which are by and large already identified. Few aspects for making such capture may require clarifications as below :

1) It is not necessary to identify the deprading leading elephants of the herds, because of the elephants in a herd, irrespective of their size or age, all the animals in a herd take part in the depredation. Secondly, capturing even the younger age-group animals will result into the whole herd leaving the area of depredation, at least temporarily, which has been experienced for long and which prompted the operation of **Anchored Mela Shikar** method of capturing elephants in the State.

2) The capturing of subadult animals is not going to upset to any significant extent the total composition of the population structure, as suspected by some. This can be realised from the fact that capturing of the subadults during the long history of domestication of elephants in the State, there had been no such illeffect in the sex ratio or in the population structure of the elephants. this is not going to upset even the breeding potential. Because such capture of the subadults are known to induce early oestrous in the mothers. Care only may be taken to see that the sex ratio in the captured animals is maintained at 50:50 as far as practicable.

On the other hand, this will also effect the controlling of the rise in population of the elephants in near future. At the same time, the captured elephants do breed in captivity.

The Joint Secretary to the Govt. of India, Forest & Wildlife Deptt. has verbally assured me that this method to deal with the socio-economic problems of man-elephant confrontation may be acceptable. But some relevant aspects need be pointed out.

a) what is to be done with the captured elephants ? If no sale of such captured elephants are allowed, it will become a burden on the department to maintain these elephants subsequently. When domestic elephants and their calves are legally allowed to be sold there should be no legal embargo in disposing of such captured elephants. The idea of banning such sale is to stop trade in endangered animals. But when even seriously threatened animals are allowed to be purchased for zoos and even for the circus performances, it appears irrelevant to ban Government sale of elephants, which has become necessary for the sake of preservation of the species itself.

b) Elephants are being widely used for and other reasons. This cannot be stopped.

c) Man-Elephant relation depends largely on training and subsequent use of such animals. The relation on the face of the tremendous socio-economic changes has remained very favourable in Assam, though now a little. With complete ban of capture of elephants, the man-Elephant relation will certainly get transformed into one of simple confrontation, least suited for preservation of the species. Even I.U.C.N. directives say that traditional local customs relating to wild animals should be allowed to continue on this consideration.

If this plan is acceptable to Government of India, we will have to recruit at least the following staff :-

	<u>Fundies</u>	<u>Mahuts</u>	<u>Kunkies</u>
1) Darrang Divn. (Mangaldoi)	2	2	2
2) Darrang West	2	2	2
3) Darrang East	2	2	2
4) North Lakhimpur	2	2	2
5) Digboi	2	2	2
6) Dibrugarh	2	2	2
7) Doom Dooma	2	2	2
8) Jorhat	2	2	2
9) Nagaon	2	2	2
10) Kamrup East	2	2	2
11) Kamrup West	2	2	2
12) North Kamrup	2	2	2
13) Ate Valley	1	1	1
14) Kokrajhar	1	1	1
15) Kachugaon	1	1	1
16) Silchar	2	2	2
17) Karimganj	2	2	2
Total	31	31	31

Besides, some trained elephants as Depot Kunkies shall have to be acquired. These Depot Kunkies may be stationed at selected suitable elephant depots, which shall have to be carefully chosen. But I think, we may require about 12 such elephants

Depots in the entire State, which will involve recruiting another 12 mahuts and 12 elephant attendants.

At present we may probably concentrate only on selected areas, depending on the intensity of depredation. Naturally, the most effected areas are :

- 1) Jorhat
- 2) Kamrup East,
- 3) Mongaldoi,
- 4) Darrang West,
- 5) Darrang East,
- and 6) Silchar.

This means that at least 12 posts of fundies and 12 posts of Mahuts will have to be created and 12 kunki elephants are to be purchased for the purpose. It will also imply that 6 more posts of Mahuts and 6 posts of Elephant Attendants (Ghashis) will have to be created and 6 more Depot Kunkies are to be acquired. the total immediate requirement of personnel will be :

Fundies - 12, Mahuts - 18, Attendants - 6.

A total of 18 elephants will have to be purchased.

In case of difficulty in creation of these posts, suitable skilled persons may be employed either on work charge basis or on contract service. Kunki Elephants may also be hired at prevalent competitive rates. The cost factor can be worked out, in case the plan is acceptable and approved.

Government of India should also be requested to allow sale of the departmentally captured and trained elephants, which may not be required for the departmental use. If this is not allowed, there will be problem with such captured elephants in future because of the recurring expenditure that will be involved in maintaining an increased number of such captured elephants.

Simultaneously, we must try to get the lost elephant habitats within our Reserved Forest Areas for the interest of preservation of the species, for which we are desperately making an attempt. The amount that will be required in containing the

elephant depredation will have to be borne from the departmental budget, but this should not curtail other plans of work. The final financial involvement can be easily worked out when the scheme is approved. A decision in this regard may kindly be conveyed.

Yours faithfully,

Enclosure -

A write up on management
of elephants.

(S. Deb Roy),
Chief Conservator of Forests,
Wildlife,
Assam :: Guwahati.

Memo No.

Dtd. Guwahati, the 11th Feb., '87

Copy to :

1) The P.S. to the Minister, Forests. This has a reference to the Honourable Minister's verbal instructions and may kindly be brought to his kind notice.

2) The Chief Conservator of Forests, General, Assam for necessary information and action.

(S. Deb Roy),
Chief Conservator of Forests,
Wildlife,
Assam :: Guwahati.

11/2/87

F.C. Signed by C.F.(w)
Deb Roy
11/2



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BOMBAY NATURAL HISTORY SOCIETY,
HORNBILL HOUSE, O. P. LION GATE
SHAHID BHAGAT SINGH ROAD,
BOMBAY - 400 023.

Telegram : HORNBILL Bombay

Telephones : { 243421
243869
244085



Bombay Natural History Society

Regd. under Societies Registration Act. No. XX1 of 1960 [No. 448 dt. 14-3-1928]

Regd. under Bombay Public Trusts Act, 1950 [No. F 244 (Bom) dt. 6-7-1953]

HORNBILL HOUSE, DR. SALIM ALI CHOWK

SHAHEED BHAGAT SINGH ROAD

BOMBAY - 400 023.

Ref: 2080/93

26th June 1993

Mr S Deb Roy
24/4 Type v
Lodi Complex
New Delhi 110 003

Dear Debroy,

I saw your letter of the 14th instant on my return to Bombay from the seminar. I must say we were all disappointed that you were unable to be present. Your views and guidance would have been helpful. The seminar was very successful and there was very good interaction with scientists from other parts of the country and particularly from Africa.

I must say I am shocked to read of the situation in Cachar and I hope that the Government of India is aware of the position and that some efforts would be taken to find some solution to the problems in Assam. Please do send us a copy of your note on 'Mila Shikar' if you can trace it.

kindest regards

Yours sincerely,

J C Daniel
Honorary Secretary

J/sa.

तार :

Telegram : PARYAVARAN,
NEW DELHI

दूरभाष :

4360549

Telephone No

टेलिफोन

Telex : W 66186 DOE IN

Fax : 4360678

No. F भारत सरकार 94 WL.I

पर्यावरण एवं वन मंत्रालय

GOVERNMENT OF INDIA

MINISTRY OF ENVIRONMENT & FORESTS

पर्यावरण भवन, सी.जी.ओ. कॉम्प्लेक्स

PARYAVARAN BHAWAN, C.G.O. COMPLEX

लोदी रोड, नई दिल्ली-110003

LODI ROAD, NEW DELHI 110003

No.F.8 - 14 / 94 WL.I

June 28, 1994

To

The Chief Conservator of Forests (WL)
& Chief Wildlife Warden,

Govt. of AP/Andhra Pradesh/ Assam/ Bihar/ KN/ Kerala/ Meghalaya/

MP/ Madhya Pradesh/ Jh/ Jharkhand/

Subject: Action Point on Carrying Capacity of Elephant Ranges -
Habitat Use Patterns.

Sir,

Kindly recall the discussions held on the subject of carrying capacity during the second meeting of the Steering Committee of Project Elephant held in Delhi on 2nd March 1994. Notwithstanding the fact that basic information available on this subject is not adequate, it is felt that an examination of the present status of stress to which the elephant ranges are subject may help in visualising an approach for the scientific management of elephant ranges. Your help is solicited in the collection and collation of existing information in the possession of the local forest and wildlife officers as a basis for benchmark studies on the present status of elephant habitats in the state. In order to facilitate a bird's eye view of the prevalent situation the following actions are indicated at this stage :

(a) Record of the movement patterns/migration routes of elephant herds on map covering elephant ranges within the state, preferably on a single map on a convenient scale. for the entire state.

(b) Mapping of forest range units wherever elephant herds are known to spend reasonable number of days (more than one week) foraging before moving on to the next such unit. The location may be indicated by a light colour wash (yellow for 1-4 weeks, green for 5-8 weeks, dark blue for more than 2 months of continuous stay in any location). This is to be depicted in the same map in which migration movement patterns are being indicated. Each location may be given an alphabetic identity (a, b, c....etc.).

(c) On the same map, high intensity deperadation areas may be indicated by a broad red line at the interface between forest and the

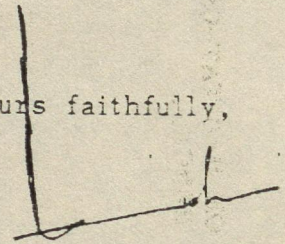
village/areas under occupation by human being. Each such area may be given a numerical identity (e.g. (1), (2), (3).....)

(d) Supplementary data required to be annexed with the map should include information as indicated in the enclosed format.

(e) Wherever the informations sought to be shown on the map are subject to further confirmation, such locations may be indicated by a question mark (?).

You are requested to forward the above mentioned map and information at an early date.

Yours faithfully,



(Vinod Rishi)
Additional Director (WL)

Encl : Form - 1/Ep

**SUPPLEMENTARY INFORMATION ON HABITAT-USE PATTERN
IN ELEPHANT RANGES.**

Name of the State :

Details of forest ranges falling along the migration/movement routes of the elephant herds

S.No.	Division	Range	Geographical Area	Estimated Geog. Area used by herd elephants during their stay.	Estimated cattle overlap area.	Estimated area under red-line interface.	Number of cases of elephant deprecations in red line interface.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
							Loss of life	Crop / property damage.

Note :- Column (5) may need approximate value in hectares.

Column (6) refers to area of overlap in hectares between elephant forage area and area of forest where cattle graze.

Column (7) Indicate areas where elephant herds are regularly driven back from the croplands into the forest. Give, in terms of L X B = A.

SURVEY OF STATUS OF MAN-ELEPHANT CONFLICT

PART I

Year

State

A. (Year-wise)

Division	Attacks on Man			Crop Damage				Damage to Other Property				TOTAL Ex-gratia Paid (iv)+(viii) +(xii)
	No. of cases		Amount of Relief Paid	No. of villages affected	No. of cases reported	Extent of damage	Amount of Relief Paid (viii)	(No. of cases)			Amount of Relief Paid (xii)	
	Death	Injury						Domestic Stock	Structures	Others (specify)		
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(ix)	(x)	(xi)	(xii)		

PART -II

B. Elephants (Year-wise for the State) : Year..... State.....

Division	No.		Deaths of Elephants				Capture of Elephants					
	Age	Sex	Natural Deaths	killed by people	killed by poachers	killed by other causes	TOTAL	Height	Age	Sex	Number	TOTAL caught

PART -III

Prosecution status (Year-wise for the State)- of offences related to elephants) :

Year.....

Division	No. of offence cases detected	No. of offenders arrested	No. of cases filed	No. of cases pending in the courts.	No. of cases of conviction



S.C. DEY
ADDITIONAL ICF(WL)

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भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
पर्यावरण भवन, सी. जी. ओ. कॉम्प्लेक्स
PARYAVARAN BHAWAN, C.G.O. COMPLEX
लोदी रोड, नई दिल्ली-110003
LODI ROAD, NEW DELHI-110003

D.O. No.F.8-14/93-WL-1

Dear Shri

Dated the 16th Aug. 1994

The Ministry had earlier written to the Chief Wildlife Warden of your state regarding the introduction of flexible component in the salary scale for Veterinary Officers and Research Officers, so that suitable manpower can be drawn in for manning such posts which are existing in your state particularly in the protected areas. Similarly request was also made to improve the pay scales of Mahout at par with the car drivers on the ground that the cost of the elephant is as much as that of car and it is not readily available for purchase, and the mahouts not only drives the elephant but are also responsible for maintaining them.

2. It appears not much has been done in the matter in your state so far. I may mention here that for proper management of protected areas, placing of suitable Research Officers and Veterinary officers is essential so that scientific data can be developed with respect to all protected areas and care of the animals both in wild as well as in captivity can be taken properly. Presence of domesticated elephant with its mahout is also essential for efficient patrolling of the interior forest areas as well as taking round the tourists inside the protected areas. These are essential for the protection of habitat and habitants as well as developing people's interest in the conservation of wildlife.

3. May I, therefore, request you to initiate steps, if not already taken, for introduction of flexible component in the salary scales for the Veterinary officers and Research officers in the wildlife wing of your state, and raising the pay scales of mahout equivalent to that of car drivers. It will be appreciated if the action taken in the matter is intimated to me at an early date.

With kind regards,

Yours sincerely,

(S.C. DEY)

RC
Sured 15/8/94
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D.O. No. 8-14/93 WL-1

Shri M.V. Natarajan
Forest Secretary
Govt. of Andhra Pradesh
Forest Department
HYDERABAD- 500 004.

Shri G.P. Shukla
Forest Secretary and PCCF
Govt. of Arunachal Pradesh
Forest Department
ITANAGAR - 791 111.

Shri C. Babu Rajeev
Forest Secretary
Govt. of Assam
Forest Department
DISPUR.

Shri K.A.S. Subramain
Forest Secretary
Govt. of Bihar
Forest Department
PATNA.

Shri K. Pande
Forest Secretary
Govt. of Karnatka
Forest Department
BANGALORE- 560 003.

Shri S. Mitra
Forest Secretary
Govt. of Meghalaya
Forest Department
SHILLONG

Shri E.T. Surup
Forest Secretary
Govt. of Nagaland
Forest Department
KOHIMA

Shri H.S. Sarkar
Forest Secretary
Govt. of Orissa
Forest Department
BHUBNESHWAR

Shri A.P. Muthuswamy
Forest Secretary
Govt. of Tamilnadu
Forest Department
MADRAS.

Shri Mohinder Singh
Forest Secretary
Govt. of Uttar Pradesh
Forest Department
LUCKNOW.

Shri Kalyan Biswas
Forest Secretary
Govt. of West Bengal
Forest Department
CALCUTTA.

①
Recd
D
18/12/77

New Delhi

Insurance

... to refer to your Office ...
... dated the 18th May, 1977 ...
... a copy of details of the ...
... scheme (CIS) introduced in the country

Section Officer (Credit II)
D.P.R. 2401



WII/COMMTS.RES/GEN/51

Date: 16.3.95

To,

Shri Vinod Rishi
 Director (PE)
 Government of India,
 Ministry of Environment and Forests
 Paryavaran Bhawan, CGO Complex,
 Lodhi Road,
 NEW DELHI - 110 003

Sub: Comments on Project Elephant - Scheme for establishing a Centre for capture, training and management of elephants in Southern Region at Kudanad, Ernakulum District of Kerala regarding...

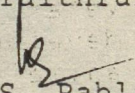
 153422
 28/3/95
 Sir,

This is with reference to your letter No. 8-18/93 WL I dated 3 February, 1995 seeking our comments on the above referred scheme. Our comments on the proposed Centre are as follows:

1. As we understand the matter regarding reviving the science and art of traditional capture methods of wild elephants was discussed by the Project Elephant - Steering Committee, and it was decided to establish a Centre which will be responsible for capture, isolation of elephant herds those are in conflict with human beings in the fragmented/disturbed forest areas. Since the mandate of the Project Elephant is beyond the territory of any State/Region, it would be appropriate to enhance the scope of the proposed Centre beyond the State of Kerala or Southern Region. The objectives can thus be redefined in this context.
2. A clarification is needed before the final decision is taken whether the present scheme of a Centre is a replacement of the Mahout Training Centre as proposed in the Agenda Notes of earlier Steering Committee meeting or it is a second such Centre? In later case duplication can be avoided.
3. An organisational chart for the proposed Centre has not been provided in the scheme. There is a cursory reference that the activities of the proposed Centre would be placed at the disposal of the DFO, Malayattur Forest Division, Kodanad. Likewise services of the Forest Veterinary officers available with the Forest Department will be used for the Centre. Since the proposed activities of the Centre are going to be major ones, including capture of elephants, rearing and four training programmes on a regular basis, it would be appropriate to have a full time in-charge at DFO level or atleast an experienced Veterinarian posted at the Centre on a permanent basis.

(Contd...2)

4. There is no mention regarding the capacity of proposed Centre i.e. number of elephants likely to be captured in a year, number of elephants can be reared in the new facility at any given time, etc. The assessment regarding proposed infrastructure requirement can be done on the basis of these details.
5. Use of modern methods of elephant capture through chemical immobilisation should not form the part of the proposed mahout training course as they cannot be authorised to handle such matters. However, a general information can be provided to them.
6. The scope of proposed training courses can be restricted to mahouts and Rangers only. Since the IVRI plans to commence a Diploma Course on Wildlife Husbandry and Health Management for veterinarians, a specialised component on the elephant management in captivity and disease could form the part of their proposed Diploma Course.
7. There is a need to appoint a Committee for framing syllabus/ curriculum for above recommended two training courses. The Committee can make specific suggestions for the topics, number of lectures, identification of resource persons, recommended literature for reading, examination, details of field exercises, likely cost per trainee, etc.

Yours faithfully

 (H.S. Pabla)
 Joint Director

[Faint, mostly illegible text at the bottom of the page, possibly bleed-through or a second page of a letter.]

S No. 8 (R)

भारतीय पशु चिकित्सा अनुसंधान संस्थान

इलाहाबाद - 243122 (उ.प्र.)

INDIAN VETERINARY RESEARCH INSTITUTE

Izatnagar - 243 122 (U.P.)

G.C. Mohanty
M.Sc., Ph.D.(Kansas State,USA),
LECTOR

D.O.No.F
Dated 17th June, 1995

To

The Add. Inspector General(Wildlife),
Govt. of India,
Ministry of Environment & Forests,
Parayvaran Bhavan, C.G.O. Complex,
Lodhi Road,
NEW DELHI-03.

Dear Sir,

This has reference to letter No.F.8-14/93 dated 30.5.1995 from Mr. Vinod Rishi, Director(Project Elephant). In this connection I am to inform you that Academic Council of IVRI Deemed University has approved the programme on National Diploma Course on "Zoo and Wild Animal Health Care & Management". The admission notice for the Course has already been sent to various wildlife organizations of the country. Secretary, Ministry of Environment & Forests has also been informed about the same by our Registrar(Copy enclosed). The Course is for veterinarians to be sponsored by the State Animal Husbandry Departments & Zoo & Wildlife Organizations. A copy of the syllabus of the Course is enclosed herewith for your kind perusal, which has also the concurrence of the Veterinary Council of India. The course programme includes health care, diseases & management aspects on elephants.

I like to inform you that in the running of this course the involvement of experts from various disciplines of wildlife will be ensured. The participants while on field practical orientation trips to different facilities will be learning from the experts, who will also be invited to deliver lectures.

With kind personal regards,

Sincerely yours,

G.C. Mohanty
(G.C. Mohanty)

Telephone : Off. :

Resl. :

Gram : Vetex, Telex : 577-205 IVRI IN

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to B-11 for his information
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A copy sent to Dir (Asst) on 5/7/95.
2/6/95

भारतीय पशु चिकित्सा अनुसंधान संस्थान

इ. प्र. नं. 243122 (उ. प्र.)

REGISTERED

DEEMED UNIVERSITY

INDIAN VETERINARY RESEARCH INSTITUTE

Isa Nagar - 243 122 (U.P.)

S.R. KASHYAP
Registrar

No.F.5-1/95-Exam

Date : 13.6.95.

To

The Secretary,
Ministry of Environment & Forests,
C.G.O. Complex, Lodhi Road,
NEW DELHI.

Sub.: ADMISSION NOTICE OF NATIONAL DIPLOMA COURSE IN ZOO AND
WILD ANIMAL HEALTH CARE AND MANAGEMENT 1995-96.

Sir,

Kindly find enclosed herewith a copy of Admission Notice of National Diploma Course in Zoo and Wild Animal Health Care and Management 1995-96 to be commenced at this Institute from 7th August, 1995.

In the aforesaid course two seats have been kept reserved for nominees from SAARC countries.

It is requested that the admission notice may kindly be arranged to be circulated to SAARC countries with the request that the applications of Foreign Nationals possessing the required qualification should be routed through the Secretary, Department of Agricultural Research & Education, Ministry of Agriculture, Govt. of India, Krishi Bhawan, New Delhi.

The fees from Foreign Nationals will be charged as per details given in Annexure-I enclosed herewith.

The last date for receipt of applications complete in all respect is 10.7.95.

Yours faithfully,

Encl. : As above.

S.R. Kashyap
[S.R. KASHYAP]
REGISTRAR

13/6/95

Copy to :-

1. Shri S.C. Dey, Add. I.G.(WL), Min. of Environment & Forests, CGO Complex, Lodhi Road, New Delhi, for information.
2. The Secretary, Central Zoo Authority, Barrack No.IV, Bikaner House, Shahjahan Road, New Delhi, for information.

Telephone : Off. :

Resi. :

Gram : Vetex, Telex : 577-205 IVRI IN

Care and Management at IVRI, Izatnagar for Veterinarians of State Departments and Zoo and Wildlife Department, etc. This has been approved by the Veterinary Council of India also. The said Diploma Course will be like other Diploma Courses for 10 months duration commencing from July, 1995.

The State Animal Husbandry Departments, Deptt. of Environment and Forest, Directors of Zoo of various States, Deptts. of Conservator of Forests all are requested to nominate their officers who fulfil the qualifications for this Diploma Course.

ELIGIBILITY

- (i) Degree or Diploma in Veterinary Science with excellent/good academic record. Experience of working in Wildlife/ Zoo Deptt.
- (ii) Proficiency in English Language.
- (iii) Age below 55 years

TRAINING DURATION

The training is spread over 2 semester, each of 20.5 weeks duration with semester break in between. Consequently, the entire training duration is of about 10 months. The course will start from 3rd July, 1995. Last date for joining the course is 10th July, 1995. **No candidate will be allowed to join after 10th July, 1995.**

ADMISSION

Admission is open only to in-service candidates sponsored by the State Animal Husbandry Departments/ Army/ Foreign Agencies, State Zoo Deptts., Deptt. of Environment and Forests, etc., Wildlife Deptt.

SEATS

The number of seats earmarked for this National Diploma Course is 10 only including one or two seats for the nominees of SAARC countries.

SELECTION

Applicant's academic record and field experience form the basic criterion for selection.

SEATS ALLOTMENT

After receiving the nominations/ seats requirement from all State A.H. Deptts./ Army and Wildlife and Zoo etc. upto due date, the seats allotment will be finalised accordingly and informed to each department well in advance. No department will be informed individually before finalising the seats allotment.



भारतीय पशु चिकित्सा अनुसंधान संस्थान

इजतनगर - 243 122 (उ. प्र.)

DEEMED UNIVERSITY

INDIAN VETERINARY RESEARCH INSTITUTE

Izatnagar - 243 122 (U.P.)

POST-GRADUATE NATIONAL DIPLOMA COURSE
IN
ZOO AND WILD ANIMAL HEALTH CARE AND MANAGEMENT

Admission Notice for 1995-96 Session

THE INSTITUTE

The Indian Veterinary Research Institute (IVRI) has risen to the present stature from a modest beginning as Imperial Bacteriological Laboratory (IBL), the first research laboratory of the country, established at Pune (Maharashtra) on 9.12.1889. The IBL was shifted to Mukteswar in Kumaon Hills, U.P. in 1893, since Mukteswar appeared to be an ideal place for conducting research on highly infectious diseases of animals, in isolation and under a suitable climate. Consequently, widening horizons of research and increased production of sera and vaccines necessitated establishment of a campus, sprawling over an area of 307 hectares at Izatnagar (U.P.) in 1913. In 1925 the IBL was elevated to the status of a full fledged Institute - 'The Imperial Veterinary Research Institute' (IVRI). With the dawn of Indian independence, the name of the 'Imperial Veterinary Research Institute' was changed to 'Indian Veterinary Research Institute' (IVRI). Presently, IVRI with headquarter at Izatnagar has 3 Campuses and 3 Regional Stations. In recognition of its contribution to research, education and extension, Deemed University status has been conferred by University Grants Commission (UGC) on IVRI with effect from 16th November, 1983.

The multifarious activities of IVRI, such as research, education, extension, consultancy, development of man-power and natural resources, research collaboration at National and International levels, are manned by experts in Veterinary and Animal Sciences through 20 Divisions, 15 Sections/ Special Laboratories and 4 Centres. Summing up, the contribution of IVRI to Animal Health and Animal Reproduction has paid rich dividends to the Nation.

NATIONAL DIPLOMA PROGRAMME

It has been observed that the Veterinary Graduates possess the elementary knowledge about the wildlife medicine. They do not have due exposure and practical experience on various aspects of wildlife husbandry, management, breeding, nutrition, tranquillization, curative and preventive medicine and disease diagnosis and control. Facilities for such practical orientations are also not existing in Veterinary Colleges in the country.

Keeping the above in view it has been decided to introduce a Post-graduate Diploma Course in Zoo and Wild Animal Health

PRESENT POST HELD AND SALARY
DRAWN:

3. THE MANNER IN WHICH THE TRAINING
OBTAINED WILL BE UTILISED:

14. NAME AND ADDRESS OF THE AUTHORITY
SPONSORING FOR TRAINING
WITH
TELEGRAPHIC ADDRESS:

15. NAME OF COURSE:

16. SESSION

DATE:

SIGNATURE OF THE CANDIDATE
DESIGNATION

Recommendation of the forwarding officer:

SIGNATURE AND DESIGNATION OF
FORWARDING OFFICER
WITH SEAL

Recommendations of the Head of the Department and Sponsoring/
Nominating Authority:

SIGNATURE OF HEAD OF THE DEPTT.
WITH SEAL
DATE:

SIGNATURE OF SPONSORING
AUTHORITY WITH SEAL
DATE:

no/

EXAMINATION SECTION
UNIVERSITY OFFICE
INDIAN VETERINARY RESEARCH INSTITUTE
IZATNAGAR- U.P.
PIN: 243 122

APPLICATION FORM FOR NATIONAL DIPLOMA COURSES

(TO BE FILLED IN BLOCK LETTERS)

1. NAME IN FULL:
2. FATHER'S/HUSBAND'S NAME:
3. WHETHER MARRIED OR UNMARRIED:
4. WHETHER FROM RURAL OR URBAN AREA:
5. WHETHER SCHEDULED CASTE/
SCHEDULED TRIBE:
6. DATE OF BIRTH AND AGE:
7. PERMANENT ADDRESS:
8. PRESENT ADDRESS (PLACE OF
POSTING) IN FULL:
(Any subsequent alteration
to be notified to the Director,
I.V.R.I., Izatnagar)
9. OFFICIAL ADDRESS:
10. QUALIFICATIONS:
(The division/marks obtained in
each examination should be
indicated)
 - a. BASIC
 - b. PROFESSIONAL
11. PARTICULARS OF ANY RESEARCH
LABORATORY EXPERIENCE:

Fix
LATEST PASSPORT
SIZE PHOTO
HERE

FEEES FOR NATIONAL DIPLOMA COURSES (10 MONTHS' DURATION)
OF FOREIGN CANDIDATES (CHARGEABLE FROM EACH CANDIDATE)

Sl. No.	Items	Amount in Rupees	
1.	Caution Money	200.00	(Refundable)
2.	Registration fee	10.00	(Non-refundable)
3.	Tuition fee	300.00	"
4.	Games fee	20.00	"
5.	Identity Card fee	10.00	"
6.	Examination fee	226.00	"
7.	IVRI Student Welfare fund	10.00	"
8.	Marksheet fee	15.00	"
9.	Provisional Diploma Certificate fee	5.00	"
10.	Diploma Certificate fee	20.00	"
	Total	816.00	

1. Institutional Economic fee US \$ 200 per month per candidate.

OTHER CHARGES

1. Lodging Charges : Rs. 500/- per month per candidate (charges for Minnett House).
2. Expenses of food: Rs. 75/- (approx.) per day per candidate.
3. Field Trips : The field trips will be suggested and arranged by course coordinator and charges of T.A./D.A. will be borne by the sponsoring authority.

NOTE: The above charges are subject to revision, if considered necessary.

*

D E C L A R A T I O N

I Dr. _____ declare that I

will participate in compulsory study tour which is the part of the curriculum.

Date:

Signature of the candidate

SIGNATURE OF HEAD OF DEPTT.
WITH SEAL

SIGNATURE OF SPONSORING
AUTHORITY WITH SEAL

The field trips will be suggested and arranged by course coordinator and charges will be borne by the candidates. (charges for transport, food, etc. approx. 12% per day per candidate)

*

STUDY TOUR

The study tours during II semester which are compulsory to attend by all the candidates. The tour expenditure approx. Rs.5,000/- to Rs.10,000 - will be borne by concerned department of the candidate.

LAST DATE

Duly completed application form should reach to the Registrar, IVRI, Izatnagar Distt. Bareilly 243 122 (U.P.) latest by 10 July, 1995. Applications received after the closing date will not be considered in any case. Any candidate who reports to IVRI after scheduled date will also not be allowed to join under any circumstances. Only those applications which have been forwarded by the sponsoring authority will be considered.

(14)
(2)

NATIONAL DIPLOMA COURSE IN ZOO
AND WILD ANIMAL HEALTH, CARE
AND MANAGEMENT _ I.V.R.I.

1. Course duration : 10 months (1995-96 Course started on 3.7.95)
2. No. of trainees/course: 10 (including 1-2 for SAARC countries).
3. Eligibility (i) Inservice, sponsored candidates below 55 years of age with a Degree or Diploma in Veterinary Sciences and Experience of working in Wildlife/Livestock Management.
- (ii) Proficiency in English Language.
- (iii) Sponsorship from :
(a) State Animal Husbandry Departments
(b) Army,
(c) Foreign Agencies,
(d) State Zoo Departments,
(e) Department of Environment and Forests,
(f) Wildlife Department,
4. Award of Certificate Diploma in Zoo and Wild Animal Health Care and Management.
5. Cost (Tentative) (i) Academic costs. Rs. 816.00 (Rs.200 Caution Money Refundable)
- (ii) Boarding and Lodging Rs.33,000.00
- (iii) TA& DA for Field Trips only - To be borne by the Sponsoring Authority.
- Rs.33,816.00

- or say Rs.34,000 per year per candidate excluding TA & DA.

In addition Institutional Economic Fee of US\$ 200 per month per candidate will be payable, presumably by SAARC candidates only (Rep. of IVRI may confirm).

10-8-1/93 wle

To

Sh. S. Deb Ray,

A-16, Shalimar Apppts

S. EAT Plaza II

209 Masjid Math

New Delhi - 110049.

2/-

भारत सरकार के अधीन

आवास विभाग

भारत सरकार

Ministry of Est. & ...

भारत सरकार/पर्यावरण

भारत सरकार/एच/सी/सी/सी

नई दिल्ली/New Delhi

INDIA
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100
SERVICES
शासकीय



संख

Telegram : PARYAVARAN,
NEW DELHI

दूरभाष :

Telephone :

टेलिक्स (द्विभाषीय) :

Telex : (bi-lingual) : W-66185 DOE IN

FAX : 4360678

भारत सरकार

पर्यावरण एवं वन मंत्रालय

GOVERNMENT OF INDIA

MINISTRY OF ENVIRONMENT & FORESTS

पर्यावरण भवन, सी० जी० बी० कॉम्प्लेक्स

PARYAVARAN BHAWAN, C.G.O. COMPLEX

लोदी रोड, नई दिल्ली-110003

LODHI ROAD, NEW DELHI-110003

Dated the 14th September, 1995

No. 8-1/93 WL I

To

Shri S. LeRoy,

A-16 SHALIMAR APARTMENTS

S. EXT. PLAZA II

209 MASJID MOTH

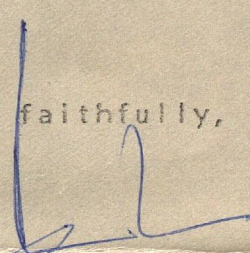
NEW DELHI - 110049.

Sub: Management of Feral Elephants in Andamans.

Sir,

Kindly find enclosed a copy of proposal for making Interview Island Sanctuary as 'Project Elephant' received from the Chief Wildlife Warden, Andaman & Nicobar Islands. Your views/comments in this regard are solicited specially on the question whether such feral elephant should at all be kept in Andaman Forest ecosystem which is as such not a habitat for elephants.

Yours faithfully,


(VINOD RISHI)
DIRECTOR (PE)

No. F 7(G.1)/10-477

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FOREST
ANDAMAN AND NICOBAR ISLANDS

Port Blair, dated the 3rd August, 95.

To,

The Director, 'Project Elephant',
Ministry of Environment & Forests,
Government of India,
Paryavaran Bhawan,
C.G.O. Complex, Lodi Road,
New Delhi - 110 003.

Sub: Management of Feral elephants in Andamans.

Sir,

4052W4
7/8/95

I am enclosing herewith a brief proposal for making Interview Island Sanctuary as 'Project Elephant Area' prepared by the Chief Wild Life Warden, Andaman & Nicobar Islands. As the proposal reveals, the % of these elephants has risen to around 70. In fact, technically these elephants are feral but their behaviour pattern and living style is just like wild elephants.

number

This Administration is facing lot of difficulties to manage these herds of elephants, who cause disturbance and depredation to cultivation areas in North Andamans. The number of such 'pachyderms' has now crossed the carrying capacity of the Island, which is just 133 sq. kms. There is a smaller satellite herd of 7-8 feral elephants in North Andaman forests who cause damage to the property of the farmers in North Andaman Island. Their activities are posing serious problems since they normally roam very close to the villages.

7/8

We seek guidance and technical help including financial support from Government of India ('Project Elephant') so that such groups of feral elephants could be brought under suitable management system under which a few elephants may be able to flourish in the island, keeping in view its carrying capacity and nearness to cultivation areas. Another story "Where Feral Elephants Reign" is also enclosed for kind perusal.

Sh. Khan

196

: 2 :

We look forth to an early help from the Ministry of Environment & Forests in this regards. A study of these elephants was conducted by Salim Ali Centre for Ornithology and Natural Sciences recently (Report enclosed).

Encl: as above

Yours faithfully,

(C.P. Oberai),

Principal Chief Conservator of Forests,
Andaman & Nicobar Islands.

6/3/8

Copy to:

The Chief Wild-Life Warden, Andaman & Nicobar Islands for information and necessary action with reference to his letter No. CWLW/WL/49/574 dated 1st August, 95.

PROPOSAL FOR MAKING INTERVIEW ISLAND SANCTUARY AS
'PROJECT ELEPHANT' AREA.

Introduction:

The Indian elephant (*Elephas maximus*) is one of the largest terrestrial herbivore and is found in one of the largest island sanctuary in the Andaman & Nicobar Islands. This island also known as Interview Island (latitude 12°46'56"-12°59'02" North and Longitude 92°39'04"-92°43'23" East) was declared as sanctuary during January, 1985. Situated south-west of the main North Andaman Island, it is seperated by approximately 20 Kms. of sea from Mayabunder and has an area of 133 Sq.Kms.

Past History

Sometime during the early 50s a logging Firm from Calcutta (M/s P.C. Ray & Co.) was contracted to start timber operations in these islands. This firm during the course of its pre-logging operations had proposed for laying tracks for locomotives as well as they had brought elephants from the mainland to assist in timber operations. By some reasons of fate, the operation of timber extraction could not materialise and elephants brought by the firm were left which have now become feral.

Topography

The terrain is mostly flat except for some steep rugged hills which are situated on the south-east of the island. The altitude varies from 0-87 metres.

Flora

The Andaman tropical evergreen forests as well as the Andaman semi-evergreen forests alongwith littoral forests and mangrove forests are the major vegetation types found in this island conforming to Forest Types 1A/C2, 2A/C1, 4A/L1 and 4B/TS2. Elephants generally prefer dry deciduous forests though the ideal habitat

would be grass lands adjacent to dry deciduous forests and can sustain one elephant per 2-5 Sq.Kms. In the absence of the dry deciduous forests in Interview Island, the elephants confine themselves to the semi-evergreen forests which are dominated by species such as, Padaul, Gurjan, Youngpeing, Lakuch and Bania trees. Approximately 90-100 Sq.Kms. of this island is covered with semi-evergreen forests and is considered the preferred habitat of the elephant.

Typically a rain forests such as those found in the Andaman & Nicobar Islands would sustain a population of one elephant per 20 Sq.Kms. which is not the case in Interview island sanctuary.

Fauna

Besides the elephant, fauna found in this island is the Andaman Wild Pig and the Cheetal among the mammals, though the Water monitor lizard, the Salt Water Crocodile and the turtles are also found. Birds such as the Oriole, Myna, Pigeon, Parakeet are found in plenty.

Conservation strategy

These elephants which were left during the 60s' consequent to abandoning of the timber operations in Interview island and numbering about 40 have now turned feral and their population has increased to approximately 70. Shiva Ganesan, (1994) has estimated their population around 70 with a growth rate of 1.82% per year. Due to reduced preferred habitat by the elephants - they prefer semi-evergreen/dry deciduous/grass lands vis-a-vis their increased population from 40 in the early 60s' to 70 at present, it has become evident that the population of these feral elephants needs to be controlled. It is with these in mind that this island sanctuary, where a few elephants have increased in an island eco-system and have consequently attracted much attention, has come to light. The following strategy needs to be adopted.

- i) To conserve and protect the elephant population and to ensure that they remain healthy and viable within the island eco-system.

: 3 :

- ii) To conserve and protect the habitat of the elephant and if necessary to improve upon it.
- iii) To create conditions through eco-development and mitigation of man-elephant relationship.
- iv) To take stringent measure to protect the elephant from poaching and other extraneous threats.
- v) To create infrastructure and facilities including man power training for conservation support activities, vety. care, humane method of tranquilisation and transportation etc.
- vi) To increase and create facilities for research related to the ecology of the elephant vis-a-vis island eco-system.
- vii) To educate people about the ecological significance of conserving the elephant.
- viii) To supplement to the needs of the elephant by planting of indigenous species that are preferred by them.
- ix) To conserve and to augment the water resources which are scarce in this island.
- x) To strengthen the present infrastructure so as to prevent any poaching by providing walkie-talkie etc.
- xi) To translocate such elephants and train them for domestic use.

WHERE FERAL ELEPHANTS REIGN

C.P. Oberai *

Interview Island, measuring about 131 sq km lies in suspended isolation, some 20 km west of Mayabunder in Middle Andaman. The island suddenly gets in hot news due to increasing number of feral elephants. It got the status of wild life sanctuary during 1985, mainly to protect the population of feral elephants. According to a study conducted by Salim Ali Center of Ornithology and Natural History, Coimbatore, there are estimated 70 feral elephants in the island sanctuary.

FERAL ANIMALS :

Oxford Encyclopaedia Dictionary defines the word feral as "wild, untamed, uncultivated, brutal, escaped from captivity". In Andamans, there are also feral goats in Barren island, semi-wild buffaloes in Nancowri group of islands and a few feral dogs in Interview island. It is rather interesting to trace out the evolution of feral animals. While the Danish government had, during eighteenth century, brought many cattle to Kamorta and other nearby islands, and raised fodder grass by clearing off the forest, the project was later abandoned. These cattle turned feral. In Barren island, British sailors left a few domestic goats at Barren, which in course of time turned feral. They sustain on salt water, happily.

PC RAY COMPANY :

Government of India invited global tenders to extract 75000 cubic meters of timber from forest of North Andaman. This contract was awarded to M/s P.C. Ray & Co. of Rangoon (Burma). The Company ran in legal complications and financial crunch and abandoned the project, leaving behind 40 elephants, who turned feral, multiplied to reach the present population of over 70.

INTERVIEW ISLAND :

We approach the island by ML Sagar Tarang, cruising from Mayabunder via Austin Creek, through exclusive mangrove lined creeks. Evergreen Tropical forests also appears at places with glorious, giant Gurjan trees, making their presence felt even from a large distance. Marshall Kundolna, the veteran Master of the boat anchors the boat at a safe distance from the island. We approach the shore in a dug-out dingi. There is a wide water hole at the entrance of the island, where the water falls from about fifty meters height.

* Principal Chief Conservator of Forests, A & N Islands.

ELEPHANT HABITAT :

While the major vegetation types in the island are Andaman tropical evergreen, Andaman semi-evergreen, littoral and mangrove forests, the elephant's habitat is mainly confined to semi-evergreen forest dominated by *Sterculia companulata*, *Dipterocarpus alata*, *Artocarpus lakoocha*, *A. chaplasha*, and *Pterocarpus dalbergiodes*. Salim Ali Center of Ornithology and Natural History scientists estimated the population of elephants by dung density method, since direct sighting was not possible due to thick under growth. Habitat degradation and crop raiding incidence were also used as inferences. The survey gave an estimated population of 70 elephants over an area of 71 sq.km. of elephant habitat. Thus the population has grown in the last 31 years at the rate of 1.82 % per year. Some 30 tree spp. are recorded as elephant food of which the prime trees are *Pometia pinnatta*, *Mimusops littoralis*, *Trema amboinensis*, *Planchonia andamanica*, *Bassia bytracea*, *Ficus* sp., *Sterculia companulata*, *Bombex*, *Calamus* sp., *Licula peltata*, *Pandanus* spp.

HABITAT DEGRADATION :

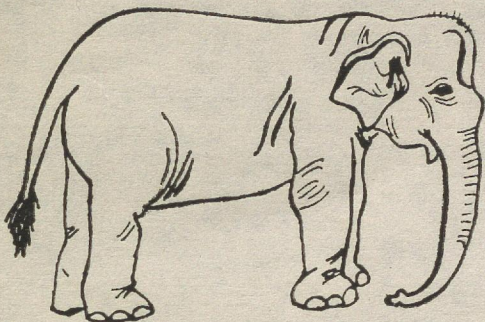
Growing number of elephants over limited habitat is posing carrying capacity problems. The pachyderms are uprooting several pole trees and debarking other trees like *Trema amboinensis*, *Planchonia andamanica*, *Sterculia companulata*, *Personnia excelsa*, *Artocarpus chaplasasa* etc.

QUESTION MARK ? :

What is the future of such feral group of elephants, whose depredation is on the increase due to limited habitat and absence of sound management practice? This transition has no doubt, given a unique opportunity to study the long term impact and dynamics of introducing large herbivore into the island system. Should these herds of feral elephants continue as they are? A school of habitat managers suggests that some elephants may be removed from the island in a phased manner to keep the population at the carrying capacity of the area. This may help in averting further damage to the habitat and future inter or intra group fight in the pachyderms for food and survival.

FUTURE STRATEGY :

While the debate between environmentalists and habitat managers continues inconclusively, the number of feral elephant increases at the rate of 1.82% per year. There is no precedence to fall back upon for guidance due to unique problems of island eco-system. People say that the feral elephants sometimes crossover to other islands of North Andamans, but it is yet to be confirmed if the pachiderms can swim over open sea and creeks having crocodiles and sharks. Perhaps, "Project Elephant" launched by the Environment Ministry may be able to give right direction on management of feral elephants.



**KINDNESS TO ANIMALS AND
RESPECT FOR ENVIRONMENT**

Correspondence Address : M-39, Main Market,
Greater Kailash-I, New Delhi-110048

May 1997

Dear Friends,

Enclosed is a letter, appealing frantically for all of us to do something to save the temple elephants (as well as other elephants) from inhuman tortures at the hands of their mahouts !

The endearing call for help, and the request for anonymity by the writer has propelled us to send out this appeal so that we could collectively write to the concerned authorities to put an immediate stop to the inhuman behaviour these elephants are subjected to.

We are all aware that Elephants are protected under the Wildlife Protection Act 1972. The offenders are also violating the Prevention of Cruelty to Animals Act 1960. In spite of that, crimes are committed against this noble animal, and the offenders get away scot free.

Enclosed are excerpts from the above mentioned letter which speaks for itself.

Unfortunately, even religion—which puts the elephant on a pedestal—as Lord Ganesha—does not prevent the cruelty meted out to these pachyderms.

Please, urgently write to the following :

- (1) The Chief Secretary, to the Government of Kerala,
Trivandrum, Kerala
- (2) The Minister of State
Shri Saifuddin Soz.
Ministry of Environment and Forests,
Paryavaran Bhawan, CGO Complex,
Lodi Estate, New Delhi-110003.
- (3) The President of India.
Rashtrapati Bhawan, New Delhi
- (4) Mr. I.K. Gujral,
Hon'ble Prime Minister of India
7 Race Course Road, New Delhi
- (5) The Director
Wildlife Institute of India.
Post Box No. 18, Chandrabani,
Dehradun-248001, U.P.

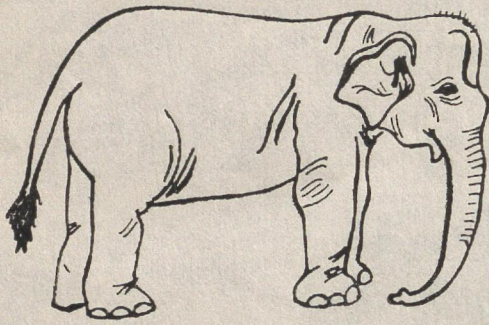
Thank you for your action in advance.

Yours Sincerely,

Sd/-

Camellia Satija
(Founder Trustee)

Encl—Letter



URGENT APPEAL

EXTRACTS FROM THE LETTER

31.3.1997

To

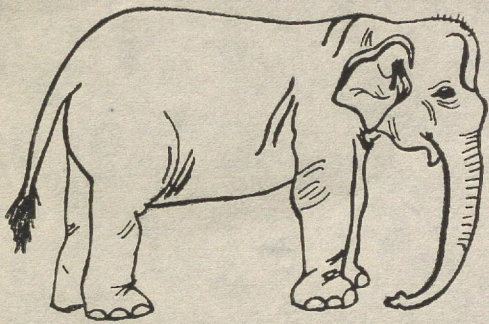
Camellia Satija, KARE

M-39, Greater Kailash-I, New Delhi-110048

Madam,

I live in Trichur town in Kerala which is referred to as the 'cultural capital of Kerala'. Our town is famous for the 'Trickur Pooram'. People from all over the world come to our town to attend this festival. The main attraction to this festival is the enormous no of elephants that attend it. The festival begins every year on the Mesha Month (This year on April 18th 1997) on the day of the star 'Pooram' It continues for 2 days from the very begining to the very end elephants have to be present in every function related. They stand in the unbearable sunshine heat from morning till night & throughout the next day. Along with heat they have to suffer numerous punishments in the hand of the people who come to the festival. Many of them entertain themselves by throwing stones at the elephants while many other want to have the hair from the elephants' tail. These hairs are tied to rings & people wear them with the belief that it will make them courageous & help ward off the frightining things. The mahots charge them at the rate of Rs. 15 to 20 per tail hair they plucking out. I happened to know of this from one of my friends who had been to the festival. Through out the day they stand there tolerating all this & no food or rest is allowed till the next day when all the functions end & they get back home. This happens every year and no one has ever protested about such atrocities to elephants. A lot of times it happens such that mahots are intoxicated & they beat them up thoroughly many elephants get angry & many of them kill their mahots & gets out making a lot of havoc in the city. As the festival takes place on a ground in the heart of our town called 'Thekkinkadu Maidan', there is nothing to prevent the elephants once they get loose. Usually they cause damage to life & property which is not reimbursed unless the owner of the elephant agrees to.

Few years back it happened so that, an elephant had got loose & had already killed its mahot & was running around tearing down compound walls & houses. Veterinary doctors had been brought in to shoot the elephant with sedatives & to bring it under control. One of the doctors made a shot but the needle stuck to the shoulders of the elephant but that had no effect on it. Then it turned to face the doctor who shot him & charged at him. He turned & ran but before he could get far enough, the man fell down & the elephant got to him. The elephant swing him in the air brought him down on the ground really hard a number of times & tore him to shreds with his tusk squashed him to the ground. As if all that was not enough the elephant stood guard to



the mutilated body till the other doctors managed to shoot him down with sedative guns. Further investigation showed that the elephant was showing signs of madness which occurs periodically in most male elephants. The mahots had disregarded the signs & had beaten him up. The mahot had escaped but the doctor had died for a crime for which he was not guilty, No charges were brought up against anyone.

In this letter I have enclosed a clipping of a newspaper article about elephants in our town & the cruelties to them. Along with the clipping there is also the news about the latest "elephant" murder in our town. As the news articles is in Malayalam, I would translate it for you.

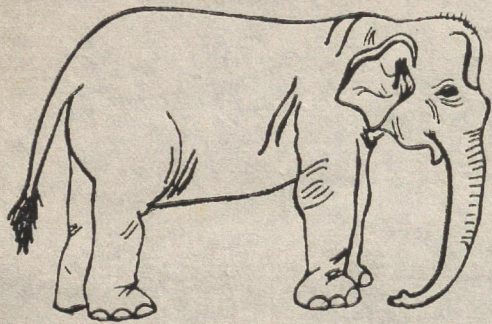
"The name of the deceased elephant was Vishnu. Of late, his name used to appear frequently in newspapers because of his murderous tendencies. In the last 6 months he had gone mad & attacked people 8 times. Mahots had thoroughly beaten him up & there were severely infected sores on his body. Even then he was forced to go to the forest to carry timber. Since Saturday March 15th 1997 he was extremely tired but no one cared for him. Mahots say that he was very tired. On Tuesday evening & during the night they had heard him roar. But they did not care for that either. The next morning when the mahots tried to wake him up, it was then that they realised that he had died.

Most of the times he was severely beaten up by his trainers & once the villagers had to intervene when the mahots continued to beat & hurt the already beaten up elephant."

In the photo of the deceased elephant, I have marked the sores on the body of the elephant which are clearly visible in the photograph. There was no news of any of the mahots being charged for killing a protected animal.

At the Sankarankulangara Temple in Kanattukara Trichur, I myself have seen the elephants being beaten up by their trainers for such silly mistakes as not lifting their legs when they are asked to. Once I had made a complaint to the SPCA hospital about the beating up. I lodged the complaint at 11 A.M. & when I called there the next day to inform them that it had not stopped at all they tell me that they had come to enquire about the matter at 4 P.M. & could not find anything there. This happened in 1994. I live close to the ground where elephants are tied up during the day & it is really heart breaking to hear there cry out from pain.

Kindly tell me if anything could be done to prevent catching elephants from the forest, breeding them & using them for carrying timber from the forest exhibiting them as substances of honour in temples. I would really like to help in preventing cruelty to elephants & all other such animals especially in temples. I am a Hindu myself but I do not think that to worship a god or goddess necessarily means to imprison an elephant & impose all those cruelties on him in the name of worship.



In the temple near my house, everyday I see children trying to hurt the elephants throwing stones at them & a few of my neighbours regularly manage to bring home the coconut leaves given to the elephant. The leaves are supposed to be eaten by the elephant. Instead they end in the hands of my neighbours who bring them home & burn them after they are dried. Every morning the elephants have to go through "Beating up-in-the name of bath" session after that they are tied up underneath the peepal trees & some are left out without any shade at all to themselves. It is such atrocities happen. After the death of the star of our temple, a beautiful male elephant, now they have brought a little one about 5 or 6 years old. He has to suffer a lot. He is made to carry loads & loads of coconut leaves & palm leaves which is supposed to be his food. If he accidentally lets one leaf fall down from his little trunk, the mahots beat him with an iron stick & pull his ears with an iron hooks & pulls it causing a lot of pain to that little one. It is really unbearable to watch it. There is no one to whom I can complain about all this as there is no efficient system as yet to prevent cruelty to animals in Trichur. Kindly inform me about what has it to done under the circumstances. After the earlier incidence with the SPCA I have not complained to them about anything as I feel that it is of no use. Kindly keep my name and address confidential. But please do something to stop the crimes towards elephants in our town.

SINCE ANNONYMITY
WAS REQUESTED—
WE HAVE WITH HELD
THE WRITERS IDENTITY
AND ADDRESS

From S. DEB ROY - A-16, Shahimar Apts.

South Ex Plaza II
New Delhi - 110049

तार
Telegram : PARYAVARAN,
NEW DELHI

To The Director, Project Elephant,
Paryavaran Bhawan.

दूरभाष :
Telephone :
टेलीग्राम (द्विभाषीय) :
Telex : (bi-lingual) : W-66185 DOE IN
FAX : 4360678

Dear Sir,
I am enclosing herewith my comments about the National Elephant Conservation Action Plan, of which an executive summary had been sent to me. If you feel proper, these comments may please be circulated amongst other members also.

No. 8-5196 WL I

Yours faithfully

भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
पर्यावरण भवन, सी० जी० ओ० कॉम्प्लेक्स
PARYAVARAN BHAWAN, CGO COMPLEX
लोदी रोड, नई दिल्ली - 110003
LODHI ROAD, NEW DELHI-110003

Dated: 16.6.97

To

S. Deb Roy

All members

Copy to the Addl. I.G.F. Wildlife, Paryavaran Bhawan, New Delhi

Steering Committee,

Project Elephant.

Sub: Executive summary of National Elephant Conservation Action Plan.

Sir,

Kindly find enclosed herewith a copy of the executive summary of the "National Action Plan for elephant conservation in India". Your comments, if any, may be sent to the Director (PE) latest by 30th June, 1997.

Yours faithfully,

(SURESH CHUGH)
JOINT DIRECTOR (WL)

COMMENTS

Comments:

With regard to the executive summary of the National Elephant Conservation Plan Action Plan, I have the following observations, which is put in brief below -

1) The Plan outwardly ^{looks} sounds good. But an intensive look may reveal a number of chinks. Project Elephant is probably the most daunting wildlife programme undertaken at present. ~~Very~~ Daunting, because the most crucial problem facing this project is appears to me to be that of lack of adequate 'SPACE' for the species, amongst other problems like poaching, and degradation & shrinkage of their natural habitat etc. In fact the spatial problem is actually getting accentuated with the passage of every day (literally) owing to the continued rise in human population and its consequent demand for land. It is not an easy problem to tackle, specially ~~and~~ with ~~the~~ our unenviable reputation of losing

something like 47000 hectares ⁽²⁾ of forest land annually to contain the thrust of Development, Agriculture and even settlement of human populations (mainly by regularising forceful encroachment of forest areas). During the last 50 years we have lost nearly 10% of our ~~for~~ erstwhile forest areas and worse still, continue with the process even now, despite Forest Conservation Act. To find an ideal solution in favour of the Elephant under these real ground problems will be anything but easy.

Unfortunately for the elephant, most good grazing grounds of this species is eminently suitable for agriculture and this is where the battle is lost even before it is fought. There is plan to identify and establish 'corridors' to link up patches of elephant habitats, a consequence of fragmentation of their erstwhile composite habitats. But when we talk and plan to take up this essential component of the Plan, on ground we are losing newer areas of the habitat, more fragmentation of the ^{existing} ~~whatever~~ elephant habitat taking place due to human thrust. The end result is -ve.

During the five years or so of the Project, I wonder what may be the achievement on the ground, though a good amount of funds have already been spent by various states on this plea. Even otherwise corridors have been identified more arbitrarily than in scientific considerations, compatible to elephant behaviour. Some of these corridors, even if established, may not be of much worth, as elephants may make very little use of these passages, while alternate 'corridors' which could be used by the elephants, escaped identification, or considered impossible to be acquired from human occupation. Some of the important probable corridors have not even been mentioned. Some examples may not be out of place in this context.

1) Manas - Buxa - Jaldapara has been rightly identified as an Elephant reserve. But at present there is no link between Buxa and Manas, the traditional passages being gobbled up by Tea plantations or human habitations, even so elephants still do sometimes cross and recross the river Sankosh and ~~cross~~ visit the other area. No corridor seems to have been planned in this important Interstate Elephant reserve.

2) A huge area ~~54000~~ (17,000 acres) of R.F. land at Amtaka, under Aic valley Division of the Manas Tiger Reserve, had been illegally diverted in 1971 and settled with some people ^{on political considerations}. This entire area is vitally important for the elephants of Manas and legal settlement of this area remains till to-day unworked. Forest authorities have tried repeatedly to restore this area to its original status but without success. I consider survival of this area, which is not very suitable for agriculture, is a must, but there is just no mention of this area, which can be considered now as the most important corridor.

3) There are some other passages between two blocks of forests in this area also in this Elephant reserve in Nalbari & Darrang districts, but no mention has been there in the plan. The number of elephants shown in

Manas Bura Elephant Reserve has been shown at around 800. This could be a grossly under-estimated figure. Manas Tiger Reserve, which is of 2,837 sq. kms. with an equal or even more, ^{elephant} area in adjacent Bhutan, may easily hold over 2,000 elephants even today. In fact this probably remains as the largest elephant habitat in the North-east with a truly viable population. Basing on three successive elephant censuses taken in Manas Tiger Reserve during ~~1977~~ 1977, '78 and '80, the total population in this composite habitat of Assam including the Bhutan part, had been estimated by me as nearly 2,500 during early 1980s. The source of information about Manas-Bura Elephant Reserve thus appear to me to be totally inaccurate.

- * 4. Balipara Reserve Forest, southward to Salomibari, near Tezpur, cannot be considered as a corridor to its true sense. Besides, the southern part is a thickly populated area since long past and will be impossible to be established as an elephant corridor.

Charduar - Rowta to Singri Hill Reserve Forest - Kochmara - Burachaperi cannot be considered as a corridor, though elephants sometimes use this area for grazing. In fact, Kochmara - Burachaperi is located south of Singri across the river ~~of~~ Brahmaputra. Singri is a small reserve forest on the North bank of the Brahmaputra, surrounded by tea-estates and human habitation on three sides and holds no local resident population of elephants. Besides the improbability of establishing a corridor here, which will be of no practical use for the elephant, even an attempt of acquiring land for such purpose will evoke public resentment against the project.

The actual problem in this area, (Kameng - Sonitpur Interstate Elephant Reserve) stems out from large scale encroachment of the natural elephant habitat along the highly productive Himalayan foothills, both in Assam and in Arunachal. Large chunks of prime elephant country has been encroached upon in Sonitpur and North-Lakhimpur districts only recently. Besides one entire Reserve Forest (Gehpur) had been forcibly occupied by Bodo tribals in 1982.

There are two military shooting ranges within this area which is causing incalculable ecologic problems for not only elephants but all other wild fauna. Apart from that almost the entire area has undergone unprecedented habitat degradation during the past two-three decades. Except in Namiri-Pakhri protected area

completed, elephants have no respite in any area which include even a sanctuary called Sonai-Rupai.

If the cause of the elephant in this area has to be really to be saved, these heavy biotic-influences has to be eliminated first rather than taking a plan for establishing some improbable corridors. I have some reports that this area has seen some large scale poaching of Tuskers by some Aruna-chali groups of Mishmi poachers, who have established links with the Bodo poachers. As far as my information 70-80 Tuskers from this area (between Buxa in the west upto North Lakhimpur in the east) have been eliminated by these poachers between '93 & '95. Large Tuskers are no longer common in this region.

Haldbari-Kuthuri has been named as a probable corridor near Kaziranga. But this area cannot be termed as a 'Corridor' for the Elephants, though the wildlife authorities of Assam are trying since long to get this area free of human intrusion. This area ^{used to be} a shelter for wild animals during the high floods and was thinly populated even during the sixties. But a large number of tribal people (mostly) have occupied the base of the Karbi Anglong hills during the recent past. Some Elephants do use a corridor only at Haldbari, but not anywhere else.

One of the two major migration routes of the Elephants in this area had been Kamchajuri-Burapahar area. There is a distinct route which the elephants still use even now. But this route (corridor) is continuously being gobbled up by encroachers. Even a tea plantation has come up within the last few years right on the route. I consider it to be of very high importance to keep ~~to~~ this (and all such routes elsewhere) route clear of human disturbance. In fact, I consider this aspect should be granted more priority than creating new corridors.

There are many more areas in Karbi Anglong, Galashat and Nongong districts where ~~an~~ occasional migration routes are being snapped up by human ~~set~~ encroachment, which should be immediately looked into. The Ringma R.F., Doiang R.F. etc. which not too long ago formed the composite ~~&~~ elephant habitat in this region are all but gone. Illegal felling of trees in the Karbi Anglong areas and very intensive shooting is spelling disastrous effect on not only Elephants, but also on other wild animals which includes the Hoolock gibbon, Clouded leopard and Golden cat etc. The innumerable large and small scar marks on the hills south of Kaziranga and the ~~&~~ continuously enlarging human settlement along the bottom of these hills will bear testimony to what I am trying say. It is futile and useless to talk about "Corridors" if the ongoing fragmentation of the remaining habitat blocks cannot be saved. Besides, these corridors (at least most of them) will remain only in paper and will never be reality.

Let me remind that Govt. of India had paid something like Rs 400,000/- to relocate some 150 families in western part of Baguri in the foot hills areas of Karbi Anglong. The Dist. Council authorities had agreed to relocate these people and accepted the money. But later on these families were never shifted. Instead, more and more people encroached extensive areas and the total number of families in this area will probably exceed 2000 by now! Do you think it will now be possible to create/establish corridors in such ^{south of Kaziranga} areas?

5) Degradation of the natural ecosystems in the elephant habitat, almost anywhere in the North-east, has seriously affected the ^{natural} crop composition and crop density. For example Morn species which is considered highly useful has been very nearly eliminated from many areas, specially in the western part of Assam. Come has similarly disappeared from extensive areas. Some species of plants which are preferred food of the elephants have become sparse or even rare in many areas. There are also signs of overgrazing (by elephants) in many grass land areas, which I have noticed both in Kaziranga and Manas. In Rajaji Milletus (Rohini) has been severely overutilised by the elephants. I don't know if any research would either support ~~my~~ ^{my} tentative observations or prove the same to be wrong.

This fact should be immediately looked into very carefully, as degradation and alteration/modification of the natural ecosystems will certainly have far reaching consequences on the future viability of the species as this will undoubtedly affect the required nutrition of the elephants in future. Simply talking about habitat management will, I am afraid, not lead us to anywhere. A proper and pin-pointed management plan is essential, which can be taken up, based on proper research on this aspect. → Continued in next page

6) Population management is essential to deal with the above point. The elephant population in most large elephant populations is still rising, which will accentuate the above problem even further. Besides, elephants are bound to come out of their habitat and raid human settlements, specially agricultural fields. This in turn will add to the already acute man-elephant conflict.

To deal with this problem the only feasible way seems to be determining the elephant population size that can be supported by the available extent of natural habitat. In other words the "carrying capacity" of ~~the~~ such areas in relation to the elephants and their conspecifics has to be determined. Admittedly this is easier said than done. While we may probably take up some research in this direction, we may probably take up certain areas where degradation of habitat has already set in because of overutilisation of the natural habitats by the elephants by allowing capture of some elephants. This has already been done in some areas, but I feel, mostly on adhoc basis. A more scientific and specific line of action is called for. Elephants from the wild has been captured regularly for hundreds of years in various areas of this country. Such capture numbers had no scientific reason. The only reason for such capturing and domestication of elephants had been the demand for domestic elephants for various purposes. But such capturing and domestication of the elephants had resulted into keeping the population size within reasonable limits. I don't see any other feasible way to deal with this particular aspect.

In this regard mention may be made about the extensive exploitation of bamboos from the central Assam hill region. In this large contiguous hill forests extensive Jhooming is practised by the resident tribal people. After Jhooming such areas produce almost pure bamboo with grass, which later on succeeds into secondary mixed forest. Such bamboo and secondary forests are excellent habitat for the elephants. But due to very intensive exploitation of bamboo from these areas elephants have been badly disturbed and herds of elephants are descending into the adjoining plains and raiding ~~crop~~ agricultural crop. The concentration of elephants in the Kaziranga National Park has gone up steeply during the last 10 to 15 years, may be due to this disturbance caused on the adjoining hills. Earlier on Kaziranga used to have barely 50 elephants during the floods. Prior to the floods most of the elephants used to move up onto the hills. But presently ~~over~~ 200-300 elephants stay in Kaziranga even during the high floods and their number rises to nearly 1000 or ~~to~~ more during January to May. Considering the size of Kaziranga, which is not even 500 sq. km., this concentration of the elephants is certainly very high. Such facts certainly deserves serious consideration in relation to Project elephant.

7) Another fall out of the heavy biotic influence in the elephant habitat in the N-E region has become quite noticeable during the past decade or so. The elephants in this region have become ^{in their behaviour} much more aggressive than normal. There has been an appreciable change, and even herds of elephants consisting of females and sub-adults display serious aggressive behaviours toward human presence, apparently for no reason of provocation. Previously such behaviours amongst herds had been non-existent and such elephant herds could easily be driven away by simply making vocal noise or even by clapping hands. But at present many human deaths are reported, ~~by~~ caused by elephant herds. This possibly shows that the elephants are psychologically tormented almost 24 hours by close presence of human beings who trample the elephant niche almost continuously. This also shows the spatial problem faced by the elephants, when it has been forced to share the habitat (or most part of it) with the homosapians. All the same and whatever the reasons may be, this change in behavioural pattern of the species into a dangerous trend. The elephants seem to have lost their privacy and tranquillity, which is likely to have very dangerous far-reaching consequences.

8) The male-female ratio in adult elephants as brought out in recent census operations is another very dangerous and ominous trend. The sex ratio in many populations (specially in the South) appears to have gone highly skewed. The sex ratio during the early Eighties had been somewhere like 2 (Males): 7 (females). This may easily be traced in earlier records. But the present sex ratio (in the South) varies from 1:15 to 1:50 (or even more) and the same may not be much better elsewhere.

This top-sided sex ratio in the ~~sex ratio~~ elephants may prove to be a potent danger to the future "Breeding potential" and the so-called gene dispersed dispersal. It is likely that the B.P. ^{possibly} may sharply drop within the next decade or two and the resulting ~~into~~ population crash. It may even result in sub-adult males (immature males) mating with the closely related receptive females which ultimately cause genetic drift and depression in the long run. This aspect probably deserves a close look for seeking a possible solution immediately.

8) The management plans are expected to be prepared in the respective states which should take due care about all the factors (decimating factors) pertaining to the respective states. But the national plan should, I feel, provide an adequate guideline for covering up all these and may be more such decimating factors. Many of the elephant ranges are spread across two or even more states, crossing the political boundaries. The composite management plans should take care of the differential situations pertaining to the various states. Interstate management of elephant populations will be highly complicated, specially when situations may demand to involve other countries like Bhutan, Bangladesh and Myanmar. Central govt. should therefore see to the intricacies and oversee preparation of such management plans.

In this note I have preferred to pick up specific cases only in the North-east, as I am aware about the prevailing situations there. The conditions in other areas may ^{also} be carefully examined in the same line. In this connection special care should be taken to deal with the Northern (or North-western) population. The composite habitat in this region has been ^{badly} fragmented during the past 25 years and Rajaji N.P. in particular is facing very serious problems. It is all too well-known and need not be discussed afresh. Establishing the required corridor in this region appears to me to be a far cry. Intensive study, planning and coordination between the Central and the State Govt. will be necessary to deal with the complicated situation, & much beyond the simple mentioning of establishment of a corridor in this region.

In almost all cases the elephant ranges will be spread across the areas covered by the Project elephant. Such areas cannot be kept out of consideration. The working plans in those areas have to be carefully looked into and adequate prescriptions incorporated, if necessary, for compatibility of elephant management. Such management practices should have a common objective of ground water management, which will help agricultural productivity in the downstream areas.

Some carefully selected areas containing 'Niches' of the elephants should be declared as 'Core areas' or 'National parks' for providing some 'undisturbed areas' to the elephants. This may set right the change in behavioural pattern of the elephants as also help the species in breeding.

9) Capturing of elephants, even though allowed sometimes as a technique of population management, is faced with the problems of disposal of the captured (from the wild) and trained animals. As per Wildlife Act these animals cannot be sold or otherwise given to any private party/individuals. Since we have hardly any other alternate way to control the elephant populations, it should be carefully thought if the Act could be amended and disposal of the captured animals be allowed to be disposed of in the open market. Since we have in this country a large number of domesticated elephants (duly registered or not!), we should not have any problem in this age old traditional practice to be revived.

10) Lastly I am strongly opposed to the idea of 'Training' the Mahuts!
 The expertise of handling the elephants by the Mahuts is intimately mixed with their keen knowledge of the behaviour of the elephants and understanding of their own animals. There are many intricacies and unwritten aspects in this profession, which is possible to be appreciated, realised and learnt over long period of time through apprenticeship, being attached to a good Mahut. The profession of a Mahut occupies all his time and demands much more than what is ~~offered~~ ^{expected} in govt. services. It is really a way of life.

In India the profession of Mahuts (and Fundhis) had been more or less a family tradition. Of late this tradition has been broken and this seems to be the major reason, why good and efficient Mahuts are becoming a 'rare commodity'. Most of the present day Mahuts don't know their own mounts well, don't know much about elephant behaviour and know almost nothing about common ailments of the elephants.

What I think we should do is to grant a respectable position to the Mahut class with better pay and service conditions, so that the aged traditional Mahuts are available again through revival of their old customs and traditions. The humane aspect and the psychological side in this profession cannot be made a part of training by some people who are not themselves 'Mahuts' and who ~~has not~~ does not have the "Feeling".

Man's ~~the~~ traditional compassion towards the elephant, his tolerance and even reverence towards the species is on the wane. This all important point must be kept in sharp focus in planning.

S. DEB ROY,
 Member, Steering Committee,
 Project Elephant.

July 1, 1997

From.

S. Deb Roy
A-16 Shalimar Apts.
South Ex. Plaza II
New Delhi - 110 049

To.

The Director
Project Elephant
Paryavaran Bhavan
CGO Complex, Lodi Road
New Delhi - 110 003

Dear Sir,

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Yours faithfully

S. Deb Roy

Copy to the Addl. I.G.F Wildlife, Paryavaran Bhavan, New Delhi

COMMENTS :-

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Unfortunately for the elephant, most good grazing grounds of this species is eminently suitable for agriculture and this is where the battle is lost even before it is faught. There is plan to identify and establish "Corridors" to link up patches of elephants' habitats, a consequence of fragmentation of their ~~erst~~while composite habitats. But when we talk and plan to take up this essential component of the plan, on ground we are losing newer areas of the habitat, more fragmentation of the existing elephant habitat taking place due to human thrust. The end result is -ve.

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human occupation. Some of the important probable corridors have not even been mentioned. Some example may not be out of place in this context.

1). Manas-Buxa-Jaldapara has been rightly identified as an Elephant reserve. But at present there is no link between Buxa and Manas, the traditional passages being gobbled up by Tea plantations or human habitations. Even so elephants still do sometime cross and recross the river Sankosh and visit the other area. No corridor seems to have been planned in this important Interstate Elephant reserve.

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Chardwar - Rowta to Singri Hill Reserve Forest-Kochmara-Burachapori cannot be considered as a corridor, though elephants sometimes use this area for grazing. Infact, Kochanara-Burachapori is located south of Singri across the river Brahmaputra. Singri is a small reserve forest on the North bank of the Brahmaputra, surrounded by tea-estates and human habitation in three sides and holds no local resident population of elephants. Besides the improbability of establishing a corridor here, which will be of no practical use for the elephant, even an attempt of acquiring land for such purpose will evoke public resentment against the project.

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There are two military shooting ranges within this area which is causing incalculable ecologic problem for not only elephants but all other wild fauna. Apart from that almost ^{the}entire area has undergone unprecedented habitat degradation during the past two-three decades. Except in Nameri-Pakhui protected area complex elephants have no respite in any area which include even a sanctuary called Sonai-Rupai.

If the cause of the elephant in this area has really to be served, these heavy biotic-influences has to be eliminated first rather than taking a plan for establishing same improbable corridors. I have some reports that this area has seen some large scale poaching of Tuskers by some Arunachali groups of Mishmi poachers, who have established links with the Bodo poachers. As per my information 70-80 Tuskers from this area (between Buxa in the west upto North Lakhimpur in the east) have been eliminated by these poachers between '93 & '95. Large Tuskers are no longer common in this region.

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One of the two major migration routes of the elephant in *the* area had been Kanchanjuri-Burapahar area. There is a distinct route which the elephants still use even now. But this route (corridor) is continuously being gobbled up by the encroachers. Even a tea plantation has come up within the last two years right on the route. I consider it to be of very high importance to keep this (and all such routes elsewhere) route clear of human disturbance. In fact, I consider this aspect should be granted more priority than creating new corridors.

There are many more areas in Karbi anglong, Golaghat and Nowgong districts where seasonal migration routes are being snapped up by human encroachment, which should be immediately looked into. The Rangma R.F., Doiang R.F. etc. which not too long ago formed the composite elephant habitat in this region are all but gone. Illegal falling of trees in the Karbi anglong areas and very intensive Jhooming is spelling disastrous effect on not only elephants, but also on other wild animals which includes the Hoolock gibbon, Clouded leopard and Golden cat etc. The innumerable large and small ~~marks~~ ^{skars} on the hills south of Kaziranga and the continuously enlarging human settlement along the bottom of these hills will bear testimony to what I am trying say. It is futile & useless to talk about "Corridors" if the ongoing fragmentation of the remaining habitat blocks cannot be saved. Besides, these corridors (at least most of them) will remain only in ~~pro~~ and will never be reality.

Let me remind that Govt. of India had paid something like Rs. 4,00,000/- to relocate some 150 families in western part of Baguri in the foot hills areas of Karbi anglong. The Distt. council authorities had agreed to relocate these people and accepted

the money. But later on these family were never shifted. Instead, more and more people encroached extensive areas and the total no. of families in this area will probably exceed 2,000 by now ! Do you think it will now be possible to create/establish corridors in such conditions ?

5). Degradation of the natural ecosystems in the elephant habitat, almost anywhere in the North-east has seriously effected the natural crop composition and crop density. For example Morus species which is considered highly useful has been very nearly eliminated from many areas, specially in the western part of Assam Cane has similarly disappeared from extensive areas. Some species of plants which are preferred food of the elephants have become sparse or even rare in many areas. There are also signs of over-grazing (by elephants) in many grass land areas, which I have noticed both in Kaziranga and Manas. In Rajaji Mellotus (Rohini) has been ~~rarely~~^{severely} overutilised by the elephants. I don't know if any research would either support my tentative observations or prove the same to be wrong.

This fact should be immediately looked into very carefully, as degradation and alteration/modification of the natural eco systems will certainly have far reaching consequences on the future viability of the species as this will undoubtedly effect the required nutrition of the elephants in future. Simply talking about habitat management will, I am afraid, not lead us to anywhere. A proper and pin-pointed management plan is essential, which can be taken up, based on proper research on this aspect.

In this regard mention may be made about the extensive exploitation of bamboos from the central Assam hill region. In this large contiguous hill forests extensive jhooming is ~~is~~ practised by the resident tribal people. After jhooming such areas almost pure bamboo with grass, which later on succeeds into secondary mixed forest. Such bamboo and secondary forest are excellent habitat for the elephants. But due to very intensive exploitation of bamboo from these areas elephants have been badly disturbed & herds of elephants are descending into the adjoining plains and raiding agricultural crop. The concentration of the elephants in the Kaziranga National Park has gone up steeply during the last 10-15 years, may be due to this disturbance caused on the adjoining hills. Earlier on Kaziranga use to have barely 50 elephants

produce

during the floods. Prior to the floods most of the elephants used to move up on to hills. But presently 200-300 elephants stay in Kaziranga even during the high floods and ~~these~~ numbers rises to merely 1000 or more during January to May. Considering the size of Kaziranga, which is not even 500 sq. Km., this concentration of the elephants is certainly very high. Such facts certainly deserves serious consideration in relation to Project elephant.

6). Population management is essential to deal with the above point. The elephant population in most large elephant populations is still rising, which will accentuate the above problem even further. Besides, elephants are bound to come out of their habitat and raid human settlements, specially agricultural fields. This in turn will ~~add~~ to the already acute man-elephant conflict.

To deal with this problem the only feasible way seems to be determining the elephant population size that can be supported by the available extent of natural habitat. In other words the "Carrying capacity" of such areas in relation to the elephants & their conspecifics has to be determined. Admittedly this is ~~x~~ easier said than done. While we may probably take up some research in this direction we may probably take up certain areas where degradation of habitat has already set in because of over utilisation of the natural habitats by the elephants by allowing capture of some elephants. This has already been done in some areas, but I feel, mostly on adhoc basis. A more scientific and specific line of action is called for. Elephants from the wild has been captured regularly for hundreds of years in various areas of this country. Such capture nos. had no scientific reason. The only reason for such capturing and domestication of elephants had been the demand for the domestic elephants for various purposes. But such capturing and domestication of the elephants had resulted into keeping the population size within reasonable limits. I don't see any other feasible way to deal with this particular aspect.

7). Another fall out of the heavy biotic influence in the elephant habitat in the North-East ~~reason~~ has become quite noticeable during the part decade or so. The elephants in this ^{region} ~~reason~~ have become much more aggressive than normal. There has been an appreciable change in their behaviour and even herds of elephants consisting of females and sub adults display serious agnostic

behaviour toward human presence, apparantly for no reasons of provocation. Previously such behaviour amongst herds had been non existant and such elephant herds would easily be driven away by simply making vocal noise or even by clapping hands. But at present many human deaths are reported, caused by elephant herds. This possibly shows that the elephants are psycologically tormented almost 24 hours by close presence of human beings who trample the elephant niche almost continuously. This also shows the spatial problem faced by the elephants, when it has been forced to share the habitat (or most part of it) with the homosapiens. All the same and whatever the reasons may be, this change in behavioural pattern of the species sets a dangerous trend. The elephants seem to have lost their privacy and tranquility which is likely to have very dangerous far-reaching consequenses.

8). The male-female ratio in the adult elephants as brought out in recent census operations is another very dangerous and ominous trend. The sex ratio in many populations (specially in the south) appears to have gone highly askewed. The sex ratio during the early Eighties had been somewhere like 2 (male): 7 (females). This may easily be traced in earlier records. But the present sex ratio (in the south) varies from 1 : 15 to 1 : 50 (or even more) and the same may not be much better elsewhere. This lop-sided sex ratio in the elephants may prove to be a potent danger to the future "Breeding Potential" and the so called gene dispersal. It is likely that the B.P. may sharply drop within the next decade or two resulting into a possible population crash. It may even result in sub adult males (immature males) mating with the closely related receptive females which ultimately cause genetic drif and depression in ^{the} long run. This aspect probably deserves a close look for seeking a possible solution immediately.

The management plans are expected to be prepared in the respective state, which should take due care about all factors (decimating factors) pertaining to the respective states. But the national plan should, I feel, provide an adequate guideline for covering up all these and may be more such decimating factors. many of the elephants' ranges are spread across two or even more states, crossing the political boundaries. The composite management plan should take care of the differential situations pertaining to

various states. Interstate management of elephant populations will be highly complicated, specially when situation may demand to involve other countries like Bhutan, Bangladesh and Myanmar. Central Govt. should therefore see to the intricacies and oversee preparation of such management plans.

In this note I have preferred to pick up specific cases only in the North-East, as I am aware about the prevailing situations there. The conditions in other areas may also be carefully examined in the same line. In this connection special care should be taken to deal with the Northern (or North-western) population. The composite habitat in this region has been badly fragmented during the past 25 years and Rajaji N.P. in particular is facing very serious problems. It is all too well-known and need not be discussed afresh. Establishing the required corridor in this region appears to me to be a far cry. Intensive study, planning and coordination between the Central & the State Govt. will be necessary to deal with the complicated situation, much beyond the simple mentioning of establishment of a corridor in this region.

In almost all cases the elephant ranges will be spread across the areas covered by the Project elephant. Such areas can not be kept out of consideration. The working plan in those areas have to be carefully looked into and adequate prescriptions incorporated, if necessary, for compatibility of elephant management. Such management practices should have a common objective of ground water management, which will ^{also} help agricultural productivity in the down stream area.

Some carefully selected areas containing 'Niches' of the elephants should be declared as 'Core areas' or 'National Parks' for providing some undisturbed areas to the elephants. This may set right the change in behavioural pattern of the elephant as also help the species in breeding.

9). Capturing of elephants, even though allowed sometimes as a technique of population management, is faced with the problems of disposal of the captured (from the wild) and trained animals. As per Wildlife Act these animals cannot be sold or otherwise given to any private party/ individuals. Since we have hardly any other alternate way to control the elephant populations, it should be carefully thought if the Act could be amended and disposal of

the captured animals be allowed in the open market. Since we have in this country a large no. of domesticated elephants (duely registered or not!), we should not have any problem in this age old traditial practice to be revived.

10). Lastly I am strongly opposed to the idea of "Training the Mahuts". The expertise of handling the elephants by the Mahuts is intimately mixed with their keen knowledge of the behaviour of the elephants and understanding of their own animals. There are many intricacies and unwritten aspects in this profession, which is possible to be appreciated, realised and learnt over long period of time through apprenticeship, being attached to a good Mahut. The profession of a Mahut occupies all his time and demands much more than what is expected in Govt. services. It is really a way of life.

In India the profession of Mahuts (and Fundies) had been more or less a family tradition. Of late this tradition has been broken and this seems to be the ^{main} ~~measure~~ reason, why good and efficient Mahuts are becoming a 'rare commodity'. Most of the present day Mahnts don't know their own mounts well, don't know much about elephant behaviour and know almost nothing about common ailments of the elephants.

What I think we should do is to grant a respectable position to the Mahut class with better pay and ^{service} conditions, so that the age old traditional Mahuts are available again through revival of their own customs and traditions. The humane aspects and the psychological side in this profession cannot be made a part of training by some people who are not themself 'Mahuts' and who does not have the 'Feeling'.

Man's traditional compassion towards the elephant, his tollerance and even ^{reverence} ~~rurrence~~ towards the species is on the wane. This all important point must be kept in sharp focus in planning.

S. DEB ROY,
Member, Steering Committee,
Project Elephant.

No. 8-5/96 WL-I

2-12/94 WL-I

To,

Shri S. Deb Roy
A-16, Shalimar Apartments
South Ext. Plaza II
209, Masjid Moth
New Delhi - 49

जनसत्ता सरकार सेवाधर्म/O.I.C.O.
व्यवस्थापक/Despatcher
पर्यावरण एवं वन विभाग
Ministry of Env. & Forests
नई दिल्ली/New Delhi

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तार

Telegram : PARYAVARAN,
NEW DELHI

दूरभाष :

Telephone :

टेलिक्स (द्विभाषीय) :

Telex : (bi-lingual) : W-66185 DOE IN

FAX : 4360678

भारत सरकार

पर्यावरण एवं वन मंत्रालय

GOVERNMENT OF INDIA

MINISTRY OF ENVIRONMENT & FORESTS

पर्यावरण भवन, सी० जी० ओ० कॉम्प्लेक्स

PARYAVARAN BHAWAN, CGO COMPLEX

लोदी रोड, नई दिल्ली-110003

LODHI ROAD, NEW DELHI-110003

No. 8-12/94 WL I

Dated: 23.7.97

To
Shri S. Deb Roy,
A-16, Shalimar Apartments,
South Extension, Plaza-II
209, Masjid Moh,
New Delhi-49.

Sub: Use of Elephants in Cultural Programmes.

Sir,

It has been brought to our notice that when the elephants are used in cultural programmes, e.g., in Kerala or elsewhere, cruelty is being inflicted on the animals. It is understood that these are age old traditions in respective concerned regions. It will be greatly appreciated if your expert views/comments are made available on a specific point whether the elephants subjected to such programmes undergo unbearable stresses and strains, and come to serious harm to the extent that the people may realise that such a practice should be discontinued.

Yours faithfully,

(VINOD RISHI)
DIRECTOR (PE)

तार

Telegram : PARYAVARAN.
NEW DELHI

दूरभाष :

Telephone :

टेलिक्व (द्विभाषीय) :

Telex : (bi-lingual) : W-66185 DOE IN

FAX : 4360678

भारत सरकार

पर्यावरण एवं वन मंत्रालय

GOVERNMENT OF INDIA

MINISTRY OF ENVIRONMENT & FORESTS

पर्यावरण भवन, सी० जी० ब्रो० कॉम्प्लेक्स

PARYAVARAN BHAWAN, CGO COMPLEX,

लोदी रोड, नई दिल्ली-110003

LODHI ROAD, NEW DELHI-110003

Dated: 23.7.97

No. 8-5/96 WL I

To

Shri S. Deb Roy,
A-16, Shalimar Apartments,
South Ext., Plaza -II
209 Masjid Moth,
New Delhi-49.

Sub: Executive Summary of National Elephant Conservation
Action Plan - Comments thereof.

Ref: This Ministry's letter of even number dated 16.6.97

Sir,

Kindly find enclosed a copy of comments received from
Shri J.C. Daniel, ~~Shri J.C. Daniel~~ & Prof. D.K. Lahiri Choudhury
on the above cited subject for information and kind perusal.

Yours faithfully,

(VINOD RISHI)
DIRECTOR (PE)

278

BOMBAY NATURAL



HISTORY SOCIETY

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PRESIDENT OF INDIA

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PRESIDENT
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I.A.S. (Retd.)

Ref: 2782/97

24th June 1997

Mr Suresh Chugh
Joint Director (WL)
Ministry of Environment and Forests
Paryavaran Bhavan, C G O Complex
Lodi Road, New Delhi 110 003

Dear Mr Chugh,

Sub: Executive Summary of National
Elephant Conservation Action Plan

Thank you for the above action plan. I feel that it is very well written and only needs to properly put into effect.

On page 5:- I would suggest including an additional item under objectives namely training in captive management, Genetic flow between isolated populations, control of female population and management of sex ratio imbalances.

On page 7:- I find that the Chief Wildlife Wardens will be nodal officers. Unfortunately the Chief Wildlife Warden usually does not have staff members to whom he can delegate functions of management of the Project Elephant programmes.

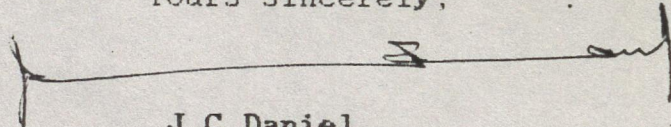
On page 12:- I would suggest that particular attention be given to proposed development plans in areas adjoining elephant reserves as they are likely to have an impact on the ER.

On page 14:- I note that capture and translocation of problem elephant populations is a priority item. However, this is going to become a critical issue as we are unlikely to find areas where elephants can be safely translocated.

I am happy to note that under protection and law enforcement there will be provision for assisting officials against counter cases by offenders.

On page 16:- I note that there is a provision for training and capacity building. It is high time a school for the capture, training and management of elephants and training of mahouts is established. I have been suggesting these for many years and it is unfortunate that this has never borne fruit.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'J C Daniel', written over a horizontal line.

J C Daniel
Honorary Secretary

J/sa.

27.6.97.

Mr. Suresh Chugh,
Joint Director (WL),
Ministry of Environment & Forests,
Govt. of India,
Paryavaran Bhavan, CGO Complex,
Lodi Road, New Delhi 110003.

Sub : Execution Summary of National Elephant Conservation
Action Plan.

Ref : Yours no. 8-5/96 WL I, dated 16.6.97

Dear Sir,

I received your above letter on my return to town from tour on 24.6.97. As I am going out to the field again on the 28th morning and your time limit is 30th June, I put my brief comments on your draft below. For details kindly see my separate drafts on each state which are with Mr. Vinod Rishi, Director, Project Elephant.

Your para ref :

1.3 (iii) : Manipur is a small seasonally migrant population from Myanmar, and hence should be included in the list. Mizoram now has a very small population < 10 in the South and about 2-4 in the North-West of the State (Dampah WLS), and so Mizoram should also be mentioned.

1.3 : Elephant Range in India

Description of districts in States of Arunachal Pradesh, Assam, Bihar, Meghalaya, Orissa, Tripura(?), West Bengal are incomplete and not up to date; therefore, the total no. of districts as well as the geographical area of districts as given are incomplete and inadequate. Areas of elephant range in eastern and north-east India are available in my statewise draft Action Plans with Mr. Rishi.

1.4 Para 2:

The mid-point calculation of population estimate may be confusing. Please remember, as most of such count were done on total count basis, the question of range "does not arise" as range, i.e. range of 95% confidence limit only applies to sampling.

2180

1.5 Para 5 :

Point that J.F.M. is contributing to man-elephant conflict needs a more cautious phrasing, as it may throw out wrong signals.

5.1.1

Sl. No. 2 :

Manas - Buxa - Jaldapara should go to North-Eastern region where it has been repeated with different figures. See north-eastern region. Kindly recheck the estimated area and population for each of the elephant reserve from my draft.

Sl. No. 4 :

Dibru-Deomali ER is proposed to be deprioritised, though it should in remain of the list, with this proviso clearly mentioned.

Sl. No. 5 :

West Garo Hills ER has been wrongly described. It should be Proposed South and West Garo Hills and West Khasi Hills ER. There is no mention of the newly-proposed Nongkhylllem-Khri catchment ER which needs inclusion.

Corridors :

Sl. No. 3: Assam - Arunachal Pradesh

Elephant migration routes from Arunachal Pradesh (Dibru - Deomali ER) needs feasibility study before inclusion.

Meghalaya :

The concept of corridor in Meghalaya is inappropriate though this was widely used in Meghalaya Action Plan where extension and consolidation were proposed, though the word used was corridor. I have discussed this point in details with Meghalaya Forest Deptt. Officials, especially with Mr. T.T.C. Marak who agrees that the use of the word may give out wrong signals as it implies a narrow strip of land. This has been repeatedly pointed out by me.

Sl. Nos. 1, 2, 3, 12, 14, 15, 16, 17, 18, 19, 20 in particular have no relevance as these are not part of the proposed ER.

West Bengal :

The priority areas of corridor in West Bengal have been indicated in my draft Action Plan. These could be starred and their priority status explained in a footnote.

Regarding statements on financial implications, I have discussed the matter with Mr Rishi on the phone. The requirements of individual States, as asked for, are highly unbalanced. For

example, nothing has been asked for in Eastern India for land acquisition. For survey and demarcation Bihar has asked for much more than Orissa with a much larger elephant zone which includes large areas of PF and USF. Assam should have asked for a larger amount under this head as wide areas of USF are involved in Karbi Anglong. Under Range Management Meghalaya in their Action Plan asked for a tidy amount when they wanted to manage all their elephant ranges. This idea has now been abandoned, but the head and the amount remains. Apparently neither Bihar nor West Bengal has asked for anything under the head Conflict Mitigation, which seems very strange. As for Dangerous Animals, apparently there is no demand from West Bengal, the demands from Assam and Arunachal Pradesh are at par. These indicate that State plans need balancing after discussion. In my view the matter should not be left entirely to the mechanism of APO where a State with a stronger lobby often manages to get a disproportionately high allotment unrelated to an overall plan.

These are some of my of my immediate reactions. I regret I do not have enough time in hand for a more detailed analysis with reference to the draft Action Plans if I am to meet your deadline.

Yours faithfully,

(D. K. Lahiri Choudhury)
 Member, Steering Committee,
 Project Elephant.

Dr. Ahmed
Pl. Insp. a proposal

20/7/97

GOVERNMENT OF ASSAM
OFFICE OF THE CHIEF CONSERVATOR OF FORESTS: WILDLIFE: ASSAM:
R.G. BARUAH ROAD: GUWAHATI-24.

No. WL/FG.40/4/Camp Elephant,

dt. 20/7/97.

To: ✓ The Dean,
Faculty of Veterinary Science,
Assam Agricultural University,
Khanapara, Guwahati - 22.

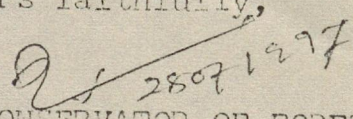
Sub: Project proposal on Health Management of Camp
Elephant of Assam State Forest Department.

Ref: This office letter No. WL/FG.40/4/Camp Elephant,
dt. 15-10-96.

Sir,

I am enclosing herewith a copy of Govt. letter
bearing No. FRP.30/97/13, dt. 7-7-97 the contents of which
are explicit for your information.

Enclosed:
As stated above.

Yours faithfully,

CHIEF CONSERVATOR OF FORESTS:
WILDLIFE: ASSAM.

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Smt R
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GOVERNMENT OF ASSAM
FOREST DEPARTMENT ::::: DISPUR.

NU.FRP. 30/97/13, Dated Dispur, the 7th July, 1997.

From : Smti R. Saikia, ACS,
Deputy Secy. to the Govt. of Assam.

To
✓ The Chief Conservator of Forests (Wildlife),
Assam, R.G. Baruah Road, Guwahati-24.

Sub : Project proposal on Health Management of Camp
Elephant of Assam State Forest Department.

Ref : Your letter No.WL/FG. 40/4/Camp/Elephant
dt. 15.10.96.

Piv

Sir,

In inviting a reference to the letter cited
above on the subject, I am directed to say that your
project proposal on - Health Management of Camp Elephant
of Assam State Forest Department submitted to the Govt.
vide letter under reference is hereby approved.

Yours faithfully,

Deputy Secy. to the Govt. of Assam,
Chief Forest Deptt., Dispur.

ST

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GOVERNMENT OF ASSAM
OFFICE OF THE CHIEF CONSERVATOR OF FORESTS: (NL): ASSAM:
R.G. BARUAH ROAD: GUWAHATI-24.

Sd/-
27/11/96
No. NH/FG.40/4/Camp Elephant dt. ¹⁵.../10/96.

To:

The Commissioner & Secretary to the Govt.
of Assam, Forest Deptt., Dispur, Guwahati-6.

Sub: Project proposal on - Health Management of
camp Elephant of Assam State Forest Deptt.

Sir,

I would like to inform you that the Dean Faculty of Veterinary Science, Assam Agricultural University Khanapara, Guwahati has submitted a project proposal on Health Management of Camp Elephants of Assam State Forest Deptt. at Kaziranga for approval of the same by the undersigned under cover of his letter No. AUU/CVSc/WII(S)/96-97/4091, dt. 7-9-96 (copies enclosed).

The above proposal is approved by the undersigned in principle. The proposal has some implications and advantages.

The State Forest Deptt. is obtaining veterinarians from the State Veterinary Deptt. on deputation. The health care of elephant being a specialised knowledge cannot be equipped with by the deputed veterinarian.

Health care of elephant is a team work. To take care of 30-40 elephants single handedly is a very difficult task for the lone FVO.

Proper health management of elephants requires the support of a diagnostic laboratory which the FVOs are lacking and functioning without such facilities.

Contd..P/2...

Knowledge and experience that an FVO accumulates retains no longer in the Deptt. when his deputation ends. Naturally the new FVO has to start from the level zero.

The proposal is advantageous to his Deptt. from the following point of view.

For proper health management of elephants the expertise of different veterinary discipline is necessary. The College having teachers of varied discipline may offer service of team of experts.

The College has sophisticated diagnostic facilities which could be made available for regular monitoring of health status of the elephants and to detect diseases before they manifest clinically.

Health record of each and every camp elephant could be maintained in the college through computer using a software called 'MEDARKS' provided by International Species Information System (ISIS) and could be accumulated and shared by teachers of the college and would not be lost when the FVO is recalled to his parent Deptt.

The modalities of action programme would have to be worked out jointly after approval of the proposal by the Govt.

You are therefore requested to persue the proposal and communicate Govt. approval to the proposal at an early date.

Yours faithfully,

R. S. K. 15/10/16
CHIEF CONSERVATOR OF FORESTS:
MUDLIE:ASSAM.

Contd..P/3...

OFFICE OF THE DEAN
FACULTY OF VETERINARY SCIENCE, ASSAM AGRICULTURAL UNIVERSITY
KHANAPARA, GUWAHATI-781 022

Memo No. AAU/CVSc/WII(s)/96-97/4091/

Dtd. : 7-9-96.

From : Dr. A.R. Gogoi,
Dean, Faculty of Veterinary Science.

To : Sri P. Lahan,
Chief Conservator of Forest (Wildlife Division),
R.G. Baruah Road, Guwahati-781 024.

Sub. : Health Management of Camp Elephants of Assam State Forest Dept.: A Proposal.

Sir,

The College of Veterinary Science at Khanapara has long been associated with the health care of the camp elephants of Assam State Forest Department. Considering the vital duties these elephants perform, like patrolling and transporting tourists, the Forest Dept. cannot afford but to keep them in perfect health. The services offered by the College in this regard is however, till now, on a referral basis. Veterinarians deputed from the State A.H. & Veterinary Department are primarily responsible for the elephants' health care. In our opinion the present protocol of the Forest Dept. of deputing veterinarians from the State A.H. & Veterinary Department suffers from the following shortcomings.

- (1) Health care of elephants is specialised knowledge which not all deputed veterinarians may be equipped with.
- (2) Health care of elephants is teamwork. Caring for 30-40 camp elephants (as in Manas TR and Kaziranga NP) single-handedly is too stupendous a task for the long FVO.
- (3) Proper health management of elephants requires the support of a diagnostic lab. The FVOs are presently functioning without such facilities.
- (4) The wealth of knowledge and experience that an FVO accumulates is not available to the Forest Dept. when the former's deputation ends. The new FVO to start from level zero.
- (4) Information about elephant diseases is constantly being updated and published in journals. More often than not, FVOs do not have access to these latest findings.

Prompted by the desire to provide better health care to the camp elephants and encouraged by our confidence in our ability to deliver efficient and comprehensive elephant health management service, I, propose the Forest Dept. to entrust the health care of camp elephants to this College of Veterinary Science.

The benefits of the proposed arrangement would be substantial.

- (1) For proper health management of elephants the expertise of different veterinary disciplines is necessary. The college, with a staff strength of about 150 teachers distributed in 14 disciplines, is in a unique position to offer at a single place the integrated and multidisciplinary service service of a team of experts drawn from varied fields.

(2) Preventing a disease, rather than curing it after it has occurred, is a prudent practice. The college has sophisticated diagnostic facilities which would be made available for regular monitoring of health status of the elephants and to detect diseases before they manifest clinically.

(3) Health records of each and every camp elephant would be maintained in the college in a computer database using a software called "MEDARKS" provided by International Species Information System (ISIS). This information about the elephants' health status would be accumulated and shared by teachers of the college, and not lost, as it happens now, when an FVO is recalled to his parent department.

(4) The academic environment of the college permits us to have access to the latest information on elephant health management.

Enclosed herewith is the first draft of the proposal wherein the working modalities of the action programme have been described. Finer details could be worked out jointly after the Forest Dept. gives its assent to this proposal. It would be necessary to submit this proposal to the Ministry of Environment and Forest, or elsewhere, for funding. Wildlife Institute of India, Dehradun, is aware of this initiative and has expressed its willingness to move the MOEF to have the project funded.

We realise that accepting this proposal would necessitate certain policy changes involving the Govt. of Assam at the ministerial level. Should any representation or further documentation be required from our end for materializing this arrangement we would gladly do so. We shall appreciate if the Forest Dept. pursues this proposal in right earnest.

Yours faithfully,

Sd./

(A.R. GOGOI)
Dean,
F.V.Sc., A.A.U. (K).

Memo No. AAU/CVSc/WII(S)/96-97/4092-97 dtd. : 7/9/96.

Copy for information to :

- 1) Principal Chief Conservator of Forest, Dept. of Forest, Rehabari, Guwahati-781 008.
- 2) P.A. to the Minister for Forest, Govt. of Assam.
- 3) Dr. S.C. Pathak, I/C Wildlife Cell, C.V.Sc., Khanapara.
- 4) Dr. Pradeep Malik, Principal Coordinator, IWHC, Wildlife Institute of India, P.O.Box-18, Dehradun-248 001.
- 5) Dr. F. Joshua Dein, National Wildlife Health Centre 6006 Schroeder Road, Madison, Wisconsin-53711, USA.
- 6) Dr. Nasser Ahmed, Wildlife Health Co-ordinator, Indian Wildlife Health Cooperative, Eastern Regional Centre, CVSc, Khanapara, Guwahati-781 022.

Dean,

Faculty of Vety. Science,
Assam Agril. University,
Khanapara, Guwahati-22.

PROJECT PROPOSAL
on
HEALTH MANAGEMENT OF CAMP ELEPHANTS
of
ASSAM STATE FOREST DEPARTMENT

Submitted for approval of :

CHIEF CONSERVATOR OF FOREST
(WILDLIFE DIVISION)
DEPARTMENT OF FOREST
R.G. BARUAH ROAD,
GUWAHATI-781 005.

Submitted by :

THE DEAN
FACULTY OF VETERINARY SCIENCE
ASSAM AGRICULTURAL UNIVERSITY
KHANAPARA, GUWAHATI-781 022.

- A. TITLE OF PROPOSAL : Health Management of Camp Elephants of Assam State Forest Dept.
- B. OBJECTIVES : (1) To provide comprehensive health management service to camp elephants of Assam State Forest Dept.
(2) Additional objectives listed under Section "F".
- C. PROJECT SITE : One Field Diagnostic Lab cum Veterinary Care Centre (FDL cum VCC) is proposed to be established at Kaziranga NP.
(2) The College of Veterinary Science at Khanapara will supervise and coordinate the activities of the FDL & VCC.
- D. TECHNICAL MANPOWER : (1) The FDL & VCC would be manned by one Forest Veterinary Officer (FVO) and one Forest Veterinary Field Assistant (FVFA). The FVO and the FVFA would be deputed from College of Veterinary Science for proper implementation of technical suggestions from the College regarding elephant health care.
(2) An Advisory Body for Elephant Health Management (AB-EHM) would be constituted at C.V.Sc. to provide supervisory technical support to the FVO. The members for the Advisory Body would be drawn from different Clinical and Paraclinical disciplines of the college.
(3) The AB-EHM would additionally provide health care service to camp elephants that are placed in areas other than Kaziranga NP.
- E. COORDINATING & LIAISONING : (1) The Wildlife Health Coordinator (WHC) of Indian Wildlife Health Cooperative Programme at CVSc., Khanapara, would be given the responsibility of liaising with the Forest Dept. on behalf of the college.
(2) The Wildlife Health Coordinator would additionally be responsible for coordinating between the FVO and the AB-EHM.
- F. FVO's JOB DESCRIPTION : (1) To provide health care to camp elephants under his Jurisdiction.
(2) To do postmortem examination of wild animals as and when required by the Forest Dept. and certify the cause of death.
(3) To treat disabled wild animals found in and around the protected area.
(4) To carry out researches on elephants and other wildlife species leading to better understanding of wildlife diseases.
(5) To initiate and to carry out disease containment activities in conjunction with Forest Department and CVSc. in case of epizootics among wild animals or among domestic livestock that threaten wild animals.
(6) To follow suggestions of AB-EHM, WHC, and any other advisory body constituted for wildlife disease study.

(7) To vaccinate domestic animals living around the protected area. The services of the students of C,W,Sc. would also be utilized for this purpose.

(8) To motivate farmers living around the protected area to take-up eco-friendly livestock rearing practices.

- G. FVFA's JOB DESCRIPTION : (1) To carry out any activity detailed by the FVO.
- H. SALARY : (1) The FVO and the FVFA will be on deputation to Forest Dept. and, hence, they would draw their salary from Forest Dept.
(2) No salary need to be paid to members of AB-EHM or to Wildlife Health Coordinator.
- I. FUNDING : Funding will be sought from Ministry of Environment and Forests (MOEF), or elsewhere, for the following:
(1) Setting up of FDL cum VCC at Kaziranga NP.
(2) Purchase of Medicines, diagnostic sera, and Vaccines for elephants.
(3) Photo-documentation of wildlife diseases.
(4) Purchase of Books and Journals, and charges for electronic search of computer databases.
(5) POL for vehicle (vehicle for movement of Advisory Body members would be provided by Indian Wildlife Health Cooperative Programme at C.W.Sc.)
- g. BUDGET REQUIREMENT : Details of budgetary requirement of would be made available after this proposal is accepted by Forest Dept.
- K. RESPONSIBILITIES OF COLLEGE OF VETERINARY SCIENCE, KHANAPARA : (1) To provide on deputation professionally competent FVO and FVFA to Forest Dept.
(2) To provide the services of AB-EHM for supervising the activities of the FVO.
(3) To maintain complete clinical records of all Camp elephants in computerised databases.
(4) To make available the sophisticated diagnostic facility at CVSc for detection of wildlife diseases.
(5) To assist Forest Dept. in creating immune belts around P.A.S.
(6) To provide extension service for motivating farmers living around protected areas to adopt eco-friendly livestock rearing practices.
(7) To carry out researches leading to better understanding of wildlife diseases in general and of elephants in particular.

- L. RESPONSIBILITIES OF FOREST DEPT. : (1) Provide infrastructure for setting up of FDL & VCC at Kaziranga NP.
(2) Provide residential quarters to FVO and FVFA at project site.
(3) Payment of salary to FVO and FVFA.
(4) Purchase of medicines and diagnostic sera and chemicals when budgetary support from funding organisation terminates.
(5) Payment of DA, TA, and POL charges to touring members of AB-EHM when budgetary support from funding organisation ends.
(6) Opportunities for researches for better understanding of wildlife diseases in general and of elephants in particulars.
- M, POSITION OF FVO IN ORGANISATIONAL HIERARCHY : (1) Administratively, the FVO shall be under the control of Park Director to whom the FVO shall report directly.
(2) For professional and technical guidance, the FVO shall abide by the directives of AB-EHM, WHC, and any other Advisory Bodies constituted by the Dean, F.V.Sc., for the purpose of wildlife study.
- N. PROJECT PERIOD : At will, i.e. the project shall continue as long as the Collaborating agencies, viz., the Forest Dept. and C.V.Sc., desire so.

45 SUHASINI GANGULY SARANI
CALCUTTA 700025 PH: (91-33) 455 1144

Mr. V. Rishi,
Director, Project Elephant,
Govt. of India,
Ministry of Environment & Forests,
Paryawaran Bhawan, C.G.O. Complex,
Lodi Road, New Delhi - 110003.

14.08.1997.

Ref. : Yours no. 8-5/96 WL I Dt. 23.7.97.

Sub : Executive summary of National Elephant Conservation
Action Plan - comments thereon by Mr. J.C. Daniel &
Mr. S. Deb Roy.

Dear Mr. Rishi,

Mr. Daniel's comments :

P.7 Nodal Officers

As some of the field officers within Elephant Reserves may be of CF rank (e.g. Directors of Tiger Reserves) there may be administrative difficulty if the nodal officer is of the same rank. Hence the proposal to have the C.W.L.W. as the nodal officer, now usually of CCF rank.

P.12 Development in fringe areas

This may be looked after under the eco-development programme.

P.14 Translocation

I agree with Mr. Daniel on this point, but would recommend its retention in the Plan as an option.

Mr. Deb Roy's comments :

P.1 Para 3 I fully agree with Mr. Deb Roy that PE has very little to show on the ground. I wrote to the Ministry sometime back on this subject.

Para 2 Manas-Buxa-Jaldapara E.R. Jaldapara-Buxa corridor has been planned.

Manas-Buxa Corridor : At present elephants come to Buxa through New Lands TG via Bhutan. Occasional herds come to Kumargram across the Sankosh, never staying more than a fortnight at a time. I have been seeing this movement pattern since 1976. The state of encroachment being what it is on Shankosh river bed and on the east bank of the river, I wonder if anything more can be done here for the present other than relying on the Bhutan corridor.

Ai Valley (Assam) : The problem is old and well known and the situation has only become worse. I believe even the northern part of Ai Valley is now gone. No elephant was reported from Ai Valley in the 1993 count.

→ I think the Executive Summary missed out the point that Assam Forest Department in their Action Plan stated that restoration of corridors on the North Bank was not feasible and put their emphasis on the South Bank. Most of the problems mentioned by Mr. Deb Roy are decades old. Mr. Deb Roy also recalls futile earlier attempts to rectify the situation. I have personal knowledge of the encroachment situation from Rowta through Charduar-Gohpur (whole Reserve gone) - Lali- Pabha etc. I am personally inclined to accept the State F.D.'s assessment of the situation; but no doubt discussion may be held with Assam F.D. on the subject. After all they are the implementing authority. I personally do not see how we can pressurize the Assam Forest Department to achieve what a committed man like Mr. Deb Roy failed to achieve as a DFO, as a Conservator, as the CCF, and as the head of the Central Wildlife set-up.

No. of elephants in Manas-Buxa : The number 800 is based on the 1993-count figures. The count was carried out by Mr. P. Lahan, then F.D., Manas, under his personal supervision. Contrary to Mr. Deb Roy's assessment that no. of elephants in Bhutan equalled the no. in Manas, Bhutan's representatives claimed at the AESG meeting at Chaingmai in 1988 that they had about a hundred elephants on their side of the border. I believe the low figures from Manas in 1993 were due to elephants having taken refuge in Bhutan, fleeing from insurgent activities.

Balipara - Salonibari : I agree with Mr. Deb Roy that this is not a corridor in the proper sense, but a seasonal passage; but this was listed as "corridor" in the Assam plan. You would recall no representative from Assam attended the Dehradun meeting in June 1996 where the Action Plan was finalized. The draft Action Plan suggests examining this problem in detail including the feasibility of blocking the passage. A study is now in progress to examine the problem under Project : Man-Elephant Conflict.

Charduar-Rowta : I agree with Mr. Deb Roy. Unfortunately this was listed as "corridor" in the Assam Action Plan. Comments made above on Balipara-Salonibari apply here as well.

Poaching of tuskers in Arunachal and North Lakhimpur : The situation is quite as grim as Mr. Deb Roy outlines. The 1993 census figures revealed it first. This has been noted in the Action Plan and remedial course of action suggested.

Haldibari (Kaziranga) : Panbari, Haldibari, and Kanchanjuri have been listed as corridors in Assam Action Plan. Studies now show that Panbari is a corridor for elephants in small nos. coming into Kaziranga from Karbi-Anglong East; Haldi-

bari is not a corridor at all; and the only migration route of elephants is at Kanchanjuri where the movement appears to be to Nagaon through the eastern part of Mikir Hills Reserve, and not to Nambor, as generally believed.

Bamboo exploitation : This is believed to be a serious problem and has been listed as such. This is being done, largely by Govt. agencies like HPC taking the forests on lease.

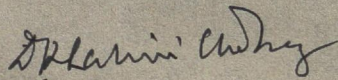
High-density of elephant population in Kaziranga : Mr. Deb Roy is absolutely on the dot in this matter. I need not remind Mr. Deb Roy that Kaziranga-Karbi Anglong ER has been proposed precisely to address this problem. I now feel that inclusion of a part of Nagaon in the proposed ER may be crucial.

Capture of elephants and their disposal (P.9): The amended Act does not bar transfer of captured animals to private individuals/parties by sale or otherwise. The Act is silent on disposal of elephants captured under Sec. 12(bb). I think the principle is laid down in Sec. 39. Captured animals should be State Govt. property, unless captured from centrally declared Sanctuaries and National Parks, and their disposal guided by Sec. 39(3) of the Act. Insistence on government ownership is unreasonable and contrary to the spirit of the Act - most glaringly so in States like Meghalaya where they have never had any departmental elephant and have no tradition or expertise in training and looking after captured wild elephants. If the Ministry insists on the State Government's retaining the captured animals even when they do not need them, the Ministry would be morally obliged to pay for their upkeep and maintenance. I gave a note to the Ministry on these lines quite sometime ago.

As I do not have Mr. Deb Roy's address, I should request you to forward the enclosed marked copy of this letter to him.

With regards,

Yours sincerely,



(D. K. Lahiri Choudhury)

cc. Mr. J.C. Daniel.

✓ Mr. S. Deb Roy.

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तार

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भारत सरकार

पर्यावरण एवं वन मंत्रालय

GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS

पर्यावरण भवन, सी० जी० एच० कॉम्प्लेक्स

PARYAVARAN BHAWAN, C.G.O. COMPLEX

लोदी रोड, नई दिल्ली - 110003

LODHI ROAD, NEW DELHI - 110003

Dated: 15.9.97

No. 8-2/97 WL I

To

Shri S. Debroy,
A-16, Shalimar Apartments
N. Delhi

Sir,

Kindly find enclosed a copy of write up on "Evidence for effectiveness of an Oleo-Resin Capsicum Aerotd as a repellent against wild elephant in Zimbabwe" by Ferrel V. Osbourn and L.E.L. Rasmussen received in this Ministry. Your comments on the same is solicited.

Yours faithfully,

(VINOD RISHI)
DIRECTOR (PE)

EVIDENCE FOR THE EFFECTIVENESS OF AN OLEO-RESIN CAPSICUM AEROSOL AS A REPELLENT AGAINST WILD ELEPHANTS IN ZIMBABWE

Ferrel V. Osborn¹ and L.E.L. Rasmussen²

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37 Lewisam Ave, Chisipite, Harare, Zimbabwe (Correspondence should be sent to this address)

²Oregon Graduate Institute, Beaverton, Oregon, USA

ABSTRACT

Between July 1993 and May 1994 a series of tests was conducted on free-ranging elephants in Zimbabwe to evaluate the effectiveness of a Capsicum-based aerosol as an elephant repellent. Reactions from the elephants were observed in 80% of three types of tests in Hwange National Park and 89% of two types of tests in the Gokwe Communal Lands. The test results suggest that this Capsicum solution has validity as an elephant repellent over both short (20-30m) and intermediate (50-100m) ranges and that Capsicum is an effective short-term repellent. No data were collected on possible long-term effects. These preliminary results suggest that this chemical may act as a practical elephant deterrent when combined with aversive conditioning of problem elephants. Research is continuing into improving the delivery system and the methodology of application.

INTRODUCTION

Elephants cause considerable damage each year to both subsistence-level agriculture and commercial crops in Africa and Asia. For example, Asian elephants (*Elephas maximus*) in Sumatra annually destroy millions of dollars worth of agricultural crops, including date palms and sugarcane (Sterba, 1989). In India, several hundred people lose their lives to raiding elephants each year (Sukumar, 1989). The African elephant (*Loxodonta africana*) is increasingly in conflict with humans throughout sub-Saharan Africa. Especially vulnerable to elephant depredation are drought-prone areas where crop-raiding elephants threaten food security. Both excessive costs and ambiguous results have hampered the development of effective, non-lethal repellents and deterrents.

There is a pressing economic and social need for a reliable, low cost, easy-to-use elephant repellent. However, elephants are highly intelligent and it is notoriously difficult to modify the behaviour of free-

ranging animals. A number of logistical challenges must be accommodated in order to modify effectively the behaviour of a solitary 'problem' elephant or a group of crop-raiding elephants. Crop-raiders quickly habituate to false threats (e.g. drum beating, shouting, etc.), and in some cases persistent bulls have not been deterred by gunfire, including shooting one of the group (R. Martin, pers. comm.). Kangwana (1993) played back tape recordings of Maasai cattle to elephants which have periodically been hunted or injured by the Maasai. She concluded that elephants retreated from the recordings because of an association made between the danger posed by the Maasai and the sounds of their cattle.

A number of studies of elephant communication have demonstrated possibilities for manipulating elephant behaviour with play-backs of vocalisations. Bull elephants were attracted by play-backs of recorded post-copulatory rumbles (Poole *et al.*, 1988; Poole & Moss 1989; Langbauer *et al.*, 1991). Play-backs using the musth rumble repel non-musth males, but not musth males or females (Poole, unpublished). There are a number of other calls which could be used to attract or repel elephants which are less well understood, but perhaps could be used in the future. The problem with elephant sounds is that most are of very low frequency and thus require expensive equipment to record and play-back (Anon. reviewer, pers. comm.).

In addition to the need for fast-acting repellents, longer lasting deterrents are needed for application in vulnerable crop-raiding regions. The results of tests in Malawi and South Africa involving a German manufactured deer repellent "HATE-C4" have been equivocal. In Malawi, Bell & McShane-Caluzi (1984) reported no significant decrease in crop damage. In South Africa, La Grange (1989) reported positive results with "HATE-C4" but no details were given. This chemical was also tested in Amboseli National Park on refuse dumps in 1981 but the elephants ate the treated material nonetheless (Anon. reviewer, pers. comm.).

35

EVIDENCE FOR THE EFFECTIVENESS OF AN OLEO-RESIN CAPSICUM AEROSOL AS A REPELLENT

The control of crop damage by insects, birds and mammals through the use of long-lasting, passive deterrents, is an active area of research in Europe and North America. To control insect predation, attractant pheromones are often combined with lowered amounts of pesticide (Booth, 1988). A variety of non-lethal repellents specific to birds have been used to protect important agricultural crops (Avery, 1989; Mason, 1989; Nolte *et al.*, 1993c). Among mammals, mink and coyote urine deterred mountain beaver damage to Douglas fir trees in the western United States (Nolte *et al.*, 1993a, 1993b). North American deer avoided predator urine (Melchioris & Leslie, 1985; Muller-Schwarze, 1972; Sullivan *et al.*, 1985; Swihart *et al.*, 1991). Elk were deterred from feeding on alfalfa by coyote urine (Andelt *et al.*, 1992).

The problem of people-habituated and refuse-raiding black and brown bears prompted a search for deterrents and repellents (Hunt, 1983). Free-ranging and captive bears in a variety of situations have been tested (Hunt, 1984). One of the most promising chemical deterrents has been a Capsicum-resin aerosol. This mixture has been used to repel attacking bears and to condition aversively, habituated, problem bears (Smith 1984; Hunt, 1984, 1985). Because the active principle may affect several sensory systems, the exploration of its possible use as an elephant deterrent was considered. Two unpublished studies in Kenya on the use of Capsicum were known prior to our initial investigation. Capsicum was tested on refuse dumps in Amboseli National Park (Anon. reviewer, pers. comm.) and Capsicum was applied to fence posts in the Laikipia District (V. Booth, pers. comm.). Both tests yielded negative results.

Capsicum, usually derived from the dried, ripe fruits of several species of the family Solanaceae, for example *Capsicum frutescens* (African chillies) or *Capsicum annum* (Tabasco pepper, Louisiana long pepper) are very complex mixtures; over 80 peaks have been detected (using chemical tests) in the head space of Tabasco pepper seeds, including alcohols, aldehydes, ketones, esters, hydrocarbons and furans (Ingham *et al.*, 1993). Capsicum stimulates extrinsic (non-olfactory) innervation in the olfactory mucosa, namely the trigeminal nerve. Capsicum eliminates or severely reduces trigeminal chemosensitivity in the nasal cavity without significantly affecting olfaction or taste (Mason *et al.*, 1987). Trigeminal response to volatile chemical stimuli disappears in human adults chronically tested with large doses of Capsicum (Silver *et al.*, 1985, 1991). Especially relevant to studies involving repellency and deterrence to Capsicum are

the relationships between sensitisation and desensitisation and repetitive tests and/or long-term use (Green & Shaffer, 1993; Green, 1991).

In elephants, as in other mammals, the nasal mucosa, both olfactory and respiratory, receive sensory innervation via two branches of the trigeminal (cranial V) nerve. Chemical stimuli, such as the complex Capsicum aerosol used in these tests, may stimulate a variety of sensory receptors including those of olfactory, vomeronasal and trigeminal systems, on entering the nasal cavity (Tucker, 1963, 1971). The elephant, with its long nose, possesses one of the most extensive trigeminal systems known. Its large turbinate areas makes the elephant a highly macrosomatic mammal; its sense of smell is one of the most acute in the animal kingdom. In this nasal region a variety of senses interplay (Rasmussen, 1994).

This report presents the findings of two series of experiments to test the effectiveness of Capsicum spray on wild elephants. The first set was designed to ascertain whether the spray had any effect on the elephants and if so, to establish the range of reaction. The second set was designed to identify potential logistical modifications needed for application of the spray as a deterrent.

MATERIALS AND METHODS

Tests were conducted on wild African elephants at two locations in Zimbabwe: Hwange National Park (22 tests between 16 and 22 July, 1993) and in the Gokwe Communal Lands (GCLs) surrounding the Sengwa Wildlife Research Area (SWRA) (18 tests between February and May 1994).

The chemical tested was OC-10 (made by Bushwacker Backpacking Co.), a 10% oleo-resin Capsicum solution which was propelled from a 15oz aerosol canister. The resin was atomised on firing and had a spray width of approximately one metre and an initial range of four to five metres. The oleo-resin floats in a cloud and can remain effective for up to 75m in a light wind. Partial controls were employed to discount the effect of the investigators presence and/or the discharge of the cans' contents.

In all tests it was likely that the elephants would have been able to smell the testers. In order to control for the presence of people (i.e. scent and sound), a period of 10 to 20 minutes was allowed to pass before testing. This period increased the probability that the reactions



Two men spraying to demonstrate the initial range of the Capsicum units.

which were recorded were elicited by the spray, rather than the presence of the researchers.

The tests in Hwange were conducted in three types of situations. In seven trials elephants were tested by investigators on foot. The elephants were sighted at random (i.e. the first encounter off the road network) and approached from down-wind so as to determine age and sex. The testers would then move up-wind and spray after a short control period. Seven tests were conducted opportunistically from the vehicle when one or more elephants were within range (between 25-50m) and the wind was favourable. Elephants which appeared to react to the vehicle were not tested. After a pre-test control period the spray was fired in a wide burst towards the selected elephant. The average distance from the vehicle to the elephants in these tests was approximately 40m. In eight tests a radio-controlled remote firing stand was used at waterholes. The stand was located up-wind from a pre-selected water hole, camouflaged with grass and elephant dung and fired from a distance of approximately 250m. The experiments were video-taped from approximately 150m down-wind. After the elephants arrived at a waterhole a pre-test period of 10 minutes was allowed to elapse before the experiment commenced. The test was aborted if the elephants appeared to react to the observers or the sight or smell of the spray stand during this interval.

The 18 tests in the GCLs were conducted in cultivated areas on groups of habituated crop-raiding bulls. In 12 tests the spray was administered while the investigator was on foot and in six tests the remote stand was used. In this series all tests were conducted at night. The sessions were video-taped on nights with moonlight using light-enhancing equipment. The taping began at least 10 minutes prior to the stimulus release. When the elephants entered a selected field, the group was counted, the sexes noted, and individual identification made whenever possible. The owner of the field would then attempt to chase the elephants from the field by traditional means (shouting, throwing burning sticks or shooting sling shots). If after a short period the elephants did not leave the field, the test would begin. The tester moved into position up-wind of the elephants at a distance of 30-50m. When the control period (5-10 minutes) had elapsed, the camera personnel alerted the tester to fire. The firing time was recorded on video tape. An entire can was expelled per trial and the test continued for 30 minutes or until the elephants were out of sight. The area was monitored to ascertain whether elephants returned to the field the same night. However, revisitation rates to fields by tested elephants were not known due to the inability to identify individuals at night.

Observations of the resin cloud indicated that the spray held together for 20 minutes or more in little or no

EVIDENCE FOR THE EFFECTIVENESS OF AN OLEO-RESIN CAPSICUM AEROSOL AS A REPELLENT

Photo credit: Ferrelly Osborn



Test field 4 in GCLs, retarded by drought, then destroyed by elephants.

wind and was still effective after travelling 50-75m in a light wind. Depending on the wind velocity and the distance between the elephants and the testers, a period of 30 seconds to two minutes elapsed before reactions were observed. This period, after the spray was fired and before the elephant reacted, indicated that the animals were not reacting to the sound of the aerosol can, but probably to the components in the spray. When the spray was fired it created a sound similar to that of a high pressure air hose. During the initial spray stand tests, elephants within five metres of the stand seemed frightened by the unusual sound and retreated before inhaling the spray.

RESULTS

The 22 tests conducted at Hwange National Park resulted in 19 (86%) positive responses (Table 1). Of the eight trials with the spray stand, five appeared to cause a repellent reaction. In the other three tests the elephants appeared to react to the sound of the can firing rather than to the spray itself. The nearest animal down-wind of the stand was the first to be affected by the mist from the spray; the animal froze momentarily and audibly expelled air. Affected elephants shook their heads and vocalised, often roaring and trumpeting, before moving off. In four of the tests the

elephants stopped, then touched their eyes repeatedly with their trunks, before re-orientating and moving off rapidly.

The seven trials from the vehicle, conducted exclusively on bulls found singly or in small groups, resulted in the selected animal retreating in all tests. When the spray reached each elephant, it froze, exhaled air and 'periscoped' with its trunk towards the source of the spray. Upon testing the air, the elephants immediately shook their heads vigorously. In all seven tests the bulls turned away from the spray and moved off rapidly. The presence of the vehicle and the testers may have influenced the reaction of these elephants, but the subjects appeared to be unaware of the testers' presence. In each test the "reaction" was recorded after a period of time which corresponded to the rate the Capsicum travels in light wind conditions.

Results from the third type of test, with the investigator on foot, were similar, except that in three of the tests the subjects first 'bluff charged' (moving towards the testers rapidly then stopping and vigorously shaking their heads) before being sprayed. No hesitation was observed after the elephants inhaled the spray, unlike among those observed from the vehicle and during the remote stand tests.

Table 1 Results of tests in Hwange National Park (July 1993).

Test	# Ele	Mode	Location	Reaction	Results
1	FG17	ST	WH	Retreat	After 17 seconds
2	FG9	ST	WH	Unclear	After 31 seconds moved off
3	B4	OF	BSH	Retreat	Closest bull moved first (15 seconds) followed by three (28 seconds)
4	B3	V	BSH	Retreat	All three retreated (21 seconds)
5	FG15	ST	WH	Disorientate & retreat	Group confused for 18 seconds, then moved off rapidly
6	FG12	ST	WH	Retreat	Group moved off after 33 seconds
7	B2	OF	BSH	Retreat & vocalise	Closest bull touched trunk to eyes
8	B1	OF	BSH	Retreat	(27 seconds)
9	FG7	ST	WH	Unclear	FG smelled testers, waited 20 minutes, then reacted to the sound of the stand
10	FG12	V	BSH	Retreat	FG inhaled spray and retreated rapidly
11	FG6	ST	WH	Unclear	FG moved off in panic because of sound of spray stand
12	B1	OF	BSH	Retreat & vocalise	Bull became disorientated and roared, bluff charged
13	B4	V	BSH	Retreat	Closest bull exhaled air, paused, and all moved off together
14	FG9	ST	WH	Retreat	FG retreated when cow closest to stand inhaled spray
15	B2	V	BSH	Retreat	Bull did not react immediately but after 30 seconds
16	B1	OF	BSH	Retreat	Into thick bush
17	FG11	ST	WH	Retreat	FG after two cows inhaled spray
18	B1	V	BSH	Retreat & vocalise	Bull vocalised (roars and rumbles) after inhaling spray
19	B4	V	BSH	Retreat	The first bull's reaction seemed to cause the others to retreat
20	B6	V	BSH	Retreat	First bull to inhale spray charged
21	B1	OF	BSH	Retreat	Thick bush
22	B1	OF	BSH	Charged	Bull charged and when sprayed retreated

FG = family group; B = bull; WH = water hole; BSH = bush; ST = spray stand; V = vehicle; OF = on foot

EVIDENCE FOR THE EFFECTIVENESS OF AN OLEO-RESIN CAPSICUM AEROSOL AS A REPELLENT

Table 2 Results of tests in the Gokwe Communal Lands (February-May 1994)*

Test #	# Ele	Mode	Reaction	Results
Test 1	4	ST	Retreat	Bulls moved off rapidly after inhaling spray
Test 2	2	OF	Retreat	Reaction of the first bull occurred 2:50 seconds after stimulus was released
Test 3	7	ST	Retreat	After 25 seconds, stand approx 30 minutes.
Test 4	UNCL	OF	Retreat & disorientate	Bulls became disorientated; after 28 seconds, moved off; 20 minutes paused, then off in a new direction
Test 5	2	ST	Unclear	Bulls seemed to react to the sound of the spray
Test 6	7	OF	Retreat	Closest group of four retreated rapidly; other three left after 15 minutes
Test 7	14	OF	Retreat & vocalise	Bulls moved from the field slowly
Test 8	2	OF	Retreat	Wind erratic: bulls reacted after 58 seconds
Test 9	9	OF	Retreat	Bulls appeared to panic: moved towards testers then retreated
Test 10	1	ST	Retreat	Bulls moved across field in panic after inhaling spray
Test 11	1	OF	Retreat	Bulls immediately left field after inhaling spray
Test 12	6	OF	Retreat	Two groups of three bulls; only one group retreated
Test 13	3	OF	Retreat	Bulls retreated 2 minutes after first reaction
Test 14	8	OF	Retreat & disorientate	Group became disorientated and moved in a number of directions before retreating
Test 15	4	ST	Retreat & vocalise	First bull vocalised; group moved towards stand, then retreated
Test 16	2	OF	Retreat	Bulls were 20 metres apart; only one bull moved
Test 17	UNCL	OF	Unclear	Sound of the spray
Test 18	4	OF	Retreat	Bulls all moved from the field in different directions

*All test were conducted on bulls at night on agricultural land.
ST = spray stand; OF = on foot

Results from the 18 tests in the GCLs, as recorded on video tape, revealed a similar pattern of response throughout (Table 2). In two tests it appeared that although the conditions seemed satisfactory, the elephants did not inhale the spray. In the other 16 remaining tests, the elephants seemed to ignore the sound of the spray being fired and continued to feed. The elephant in contact with the spray immediately stopped feeding and raised its head in alarm. This action was followed by an audible exhalation of air, then a rumble or roar. The rest of the group froze until the next animal in line inhaled the spray. The elephants then emitted a series of excited trumpets, rumbles and roars, followed by a hurried and disorientated exit from the field in the opposite direction from which the spray came.

DISCUSSION

The data presented in this study suggest that Capsicum oleo-resin spray possesses short-term repellency towards African elephants. Affected elephants retreated and did not continue their normal routine (i.e. drinking at a waterhole or continuing to feed). However, in these field tests we could not eliminate completely the variables of human scent and the sound of the firing can. It is impossible to quantify precisely the reaction of a wild elephant to a specific stimulus in a situation with numerous confounding factors. This difficulty has been pointed out in the study by Langbauer *et al.* (1989, 1991) on the reactions of elephants to play-backs of infrasonic calls. These investigators recognised that actions as subtle as lifting the head or increased ear fanning could be considered responses. They usually had no way of asserting whether the responses they recorded were a response to the play-back or to infrasonic calls from distant elephants. With regard to these Capsicum tests, it is similarly difficult to ascertain the details of how the elephants were affected. Tests on captive elephants would be more conclusive, but ethical considerations of tests with irritants pose a constraint.

Can elephants be aversively conditioned?

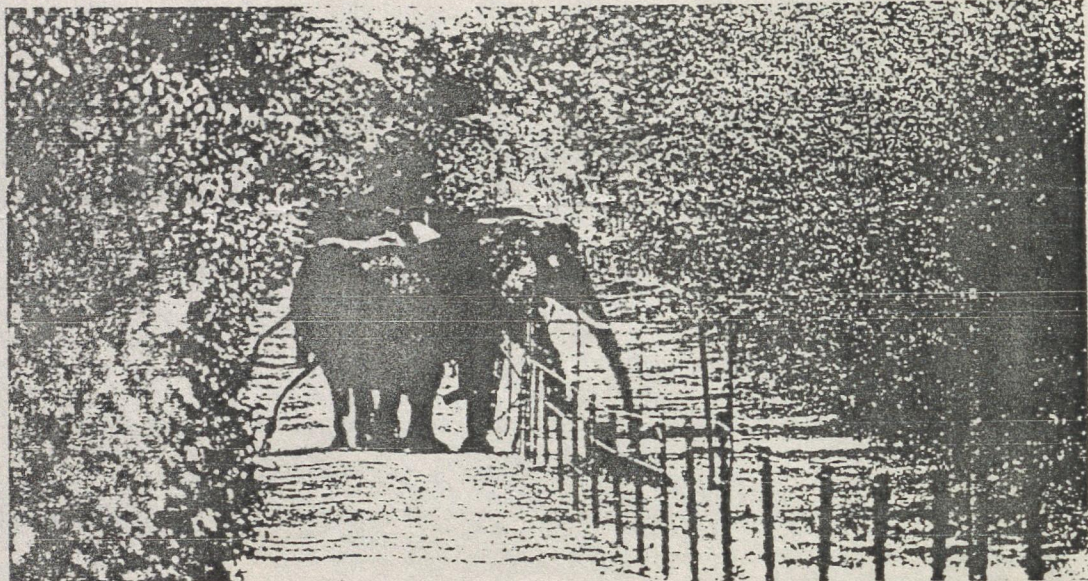
Information from wildlife managers and recent field observations during this study suggest that crop-raiding may be taught by example from a small number of older bulls to younger ones. We suggest that elephants which are "initiators" of destructive behaviour should be targeted for behaviour modification. If a relatively small number of bulls are inciting others to engage in destructive behaviour, problem populations could be

controlled by altering the actions of a few individuals. If the elephants which initiate crop-raiding could be taught to avoid agricultural areas a serious economic problem could be ameliorated. Conditioning through the use of aversive stimuli (i.e. pepper spray) when the elephant is engaged in an undesired behaviour, may be sufficiently disturbing to cause the raider to associate adversity (i.e. itching skin, watering eyes, burning sensation in the trunk mucosa, trigeminal pain reception) with the particular behaviour (i.e. crop destruction). Theoretically, elephants could be discouraged from foraging in agricultural areas. In this experiment the repellent, but not the deterrent properties of this spray have been demonstrated.

In 1982, Hunt (1984) offered two definitions in the context of Capsicum spray research on bears: "Repellents are activated by humans and should immediately turn an animal away in a close approach or attack. A deterrent should prevent undesirable behaviours by turning an animal away before a conflict occurs. Deterrents need not be monitored or manually activated by humans". Our current studies are aimed at increasing the effectiveness of Capsicum as a deterrent now that we believe we have demonstrated its repellent properties. The possibility that an elephant may associate a sound (whistles or horns) with the adverse reactions (pain) to the Capsicum is currently being evaluated. Periodic reinforcement of a sound with Capsicum spray may be necessary, if an elephant learns that the single stimulus of sound is a false threat.

The economic considerations of the application of these chemicals are very important. It is recognised that the logistical hurdles regarding the cost and effective application are formidable. The Capsicum aerosol which was tested is relatively expensive (US\$18 per unit) and has to be imported. However, electric fencing schemes in Zimbabwe are funded by foreign donors at an installation cost of US\$500 to \$1500 per km (Hoare, 1992). Most crop damage in Zimbabwe occurs between February and May (Taylor, 1993; Hoare & Mackie, 1993), followed by eight months of relatively low levels of conflict. Considering these factors, non-permanent deterrents may become more economically viable over time. In addition, the value of subsistence agriculture cannot be measured in purely economic terms. Often the affected crop is the only source of food for rural families. The time spent defending crops and sourcing the availability of alternative food must be considered. If the chemical experiments described above are successful in deterring elephants, these technologies could be simplified and administered by local wildlife authorities during the crop-raiding season.

Photo credit: Ferrel V. Osborn



Bulls crossing through an electric fence.

Future areas of research

The responses of an animal are dictated by genetic selection pressures, learning experiences and instinctive propensities of particular species (Bullard, 1985). Protecting crops from animal consumption with a chemical compound with which the animal is unacquainted, may be less effective than a biological product which has been repeatedly encountered by the animal in its environment. The understanding of the repellent and attractive properties of natural scents and their components is only in the initial stages of development. Tests to assess the effectiveness of chemical repellents that include natural products such as elephant pheromones or other semio-chemicals, are being planned. Such chemical communicators could prove to have long-term biological effectiveness and, similar to insect pheromones, could be synthesised and used in economically viable pest control programmes.

Chemical compounds with potential species-specific deterrent capabilities may prove an effective way to deter elephants. Gorman (1986) tested African elephant temporal gland secretion as an elephant repellent with somewhat ambiguous results. However, areas of potential research include studies similar to the recent study of the chemical senses of Asian elephants which specifically examined how female elephants communicate sexual receptivity (Rasmussen *et al.*, 1993). The ongoing studies of musth awareness chemosignals emitted by musth Asian bulls and perceived by females (Perrin *et al.*, 1994, Perrin *et al.*,

submitted) also offer possibilities for future elephant attraction, repulsion and containment. The avoidance reactions exhibited by female elephants to specific light volatile fraction from musth bulls when expelled from air canisters (Perrin *et al.*, submitted) are also potentially useful. It has been suggested that elephants secrete different chemical components through the temporal glands depending on differing situations (Anon. reviewer, pers. comm.). Synthesised temporal gland secretions from periods of intense fear (i.e. culling) could be used as a repellent.

Ongoing and future work in this project

Ten crop-raiding bull elephants were radio-collared in the SWRA of Zimbabwe and their movements monitored during the 1994/5 wet season. Fields adjacent to SWRA were defended with Capsicum in an effort to determine the validity of this method which will be tried again during the 1995/6 growing season. Improvements aimed at the design of the Capsicum delivery system and reduction in the cost per unit are ongoing (e.g. an inexpensive Capsicum powder grenade). Field testing of semio-chemicals and identified elephant pheromones is planned for early 1996.

Farmers, researchers and wildlife managers in Africa and Asia are exploring techniques for repelling elephants. However, very few of these data are published. For example, farmers in Kenya burn chili peppers claiming the smoke keeps elephants away. It

has been suggested that a slowly burning Capsicum device, made by a farmer and placed around his fields, might keep elephants away (Anon. reviewer, pers comm). We are very interested in any ideas or suggestions regarding the control of elephants by chemical means and we invite correspondence to the first author's Zimbabwe address.

To conclude, with proper design, a Capsicum or chemical-based technique could be a cost effective supplement, or even an alternative to electric fencing or the shooting of problem elephants. The results of our first experiments offer hope that chemical repellents such as Capsicum may provide affordable, non-lethal tools for managing elephants in areas of conflict with humans.

ACKNOWLEDGEMENTS

We thank the Director of the Department of National Parks and Wild Life Management, Zimbabwe for granting permission to conduct these tests. We also thank Frank Potts, Mark Russell, Russell Taylor, Bill Pounds, Lucy Welford, Simon Anstey, and an anonymous reviewer for comments.

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Samsar
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INDIAN WILDLIFE HEALTH COOPERATIVE

Eastern Regional Centre

P.O. Box-1

College of Veterinary Science
Assam Agricultural University
Khanapara, Guwahati - 781022
FAX: +91-361-522028

20th September, 1997

Shri S. Deb Roy
A-16, Shalimar Appartment
South Extension, Plaza-2
209 Masjid Moth
New Delhi-110 049

Dear Sir,

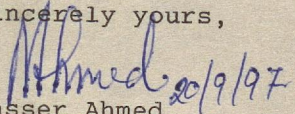
Kindly recall our meeting at Wildlife Institute of India, Dehra Dun, in September last year at the time of the Institute's Annual Research Seminar. I took the opportunity of our meeting there to discuss with you the Camp Elephant Health Management proposal submitted to Assam State Forest Dept. by the College of Veterinary Science at Khanapara. I had given you a copy of the proposal, but for your ready reference I have enclosed herewith another copy of it.

Very briefly the proposal was about giving the college the direct responsibility of the veterinary care of the working elephants of the Forest Dept. The proposal has recently been cleared by the Govt. of Assam. Photocopies of the letters of approval are enclosed. As per the proposal, the Forest Dept. should be giving us a quarter in Kaziranga to set up the Elephant Care Centre. While the college is in a position to put a fulltime veterinarian to run the centre and pay his salary, it lacks funds to equip the laboratory. The college is therefore looking for a sponsor to fund the purchase of instruments, diagnostic chemicals, and medicines for the elephants. It is pertinent to mention here that immunising domestic livestock living around the park would be the centre's another important activity.

Encouraged by your assurance during our Dehra Dun meeting that finding funds in the range of Rs.2 lakhs to Rs.3 lakhs should not be a problem, I have ventured to write this letter seeking your help and advice in equipping the Elephant Care Centre in Kaziranga. Please let me know what further details I should provide in support of my proposal for grants. While Rs.3 lakhs should be sufficient for setting up of a decent laboratory, any amount over and above this would be utilised to stock up medicines for the elephants.

Hoping to receive soon an encouraging response from you.

Sincerely yours,


Nasser Ahmed
Wildlife Health Coordinator
P.O.Box 1
Khanapara
Guwahati-781 022



environmental investigation agency ltd.

FOR THE ATTN OF
MR S DEB ROY

FROM
DEBBIE BANKS

Deb Roy

Two pages to you as requested,

love to you + your family,

Debbie

(87)

GOVT. OF ASSAM : FOREST DEPTT.
OFFICE OF THE DIVISIONAL FOREST OFFICER, E.A.W.D. DIVN. DC. AJAI
Memo No. A-WLG/elephant Health Care/98/1473-74, Dated: 20/8/98.

20/8

To,

The Director,
Kaziranga National Park,
Bokakhat.

Receipt 1190

22/8/98

Subj:- Outstanding bill for departmental
elephant health care

Sir,

With reference to the subject cited above, I am to inform you that an amount of Rs. 56,674/- (Rupees fifty six thousand six hundred seventy four) only, accrued as arrear of payment for expenditure incurred in treatment of departmental elephants from time to time in Kaziranga, Western and Eastern Range under this Division. The supplier of medicines meant for elephants have expressed inability to continue with the supply of medicines on credit unless the previous dues are cleared immediately. The details of amounts outstanding against each Range as well as the Division are as follows:

E.A.W.D. Division :- Rs. 30,571.00
Kaziranga Range :- Rs. 8,148.21
Western Range :- Rs. 13,245.49
Eastern Range :- Rs. 4,709.30
Total :- Rs. 56,674/-
Say Rs. 56,674/-

Therefore, I would request you kindly to take up the matter with appropriate authority for allocation of funds immediately to liquidate the arrear amount payable to medicine supplier in the interest of providing proper veterinary care to depttl. elephants of Kaziranga National Park.

Yours faithfully,

Sd/-
Divisional Forest Officer,
Eastern Assam Wildlife Division,
Bokakhat.

Copy to the Chief Conservator of Forests, Wildlife, Assam, Guwahati-1 for favour of information.

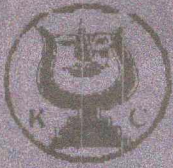
Fax 0044-11-4903486

Sd/-
Divisional Forest Officer,
Eastern Assam Wildlife Division,
Bokakhat.

Fax 044-181-57-7801

Copy forwarded to :-

Ms Debbie Capps, Environmental Investigation Agency, U.K. for information and necessary action.



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B. D. NIMALIGARH-785615. Dist. Golaghat (Assam)

Date 05/08/1998

To,
The Director,
Kaziranga National Park
P. O. Bokakhat
Dist. Golaghat (Assam)

Dear Sir,

Hereunder we are submitting a list of outstanding POL bills which are remaining unpaid since a long time. Kindly arrange to pay the bills at the earliest possible and oblige.

	Bill No.	Date	Rs.	Amount	Vehicle No.
(1)	146/KRB/97-98	31/5/97		3893/-	AS 02/3228
(2)	145/KRB/97-98			887/-	Generator
(3)	149/KRB/97-98			3045/-	AS 02/3228
(4)	306/KRB/97-98	30/6/97		3000/-	POL Car.
(5)	307/KRB/97-98			2083/-	Motor Boat (OBM)
(6)	308/KRB/97-98			3000/-	AS 25/3905
(7)	310/KRB/97-98			2543/-	AS 02/3228
(8)	423/KRB/97-98	31/7/97		1805/-	- do -
(9)	422/KRB/97-98			2007/-	AS 25/3905
(10)	421/KRB/97-98			3742/-	POL Car
(11)	427/KRB/97-98			7500/-	AS 02/3228
(12)	605/KRB/97-98	30/9/97		3890/-	- do -
(13)	716/KRB/97-98	31/10/97		8871/-	AS 02/3228, AMU-9301
(14)	717/KRB/97-98			8581/-	AXA-5362, AS-25/3905
(15)	803/KRB/97-98	30/11/97		2193/-	AS-25/3905, Ambulance
(16)	804/KRB/97-98			2555/-	AS-05/5585
(17)	889/KRB/97-98	31/12/97		3112/-	AMU-9301, AXA-5362, Ambulance
(18)	894/KRB/97-98			1143/-	AS-05/5585, Ambulance
(19)	1151/KRB/97-98	28/2/98		1530/-	AXA-5362
(20)	1273/KRB/97-98	31/3/98		5218/-	AS 02/3228
(21)	1277/KRB/97-98			745/-	AMU-3172
(22)	53/KRB/98-99	31/4/98		4021/-	AS-02/3228
(23)	189KRB/98-99	31/5/98		4088/-	- do -

Total Rs 75210/-

Rupees-Seventyfive thousand eight hundred sixty only

Copy to: The D. F. C. Bokakhat for information.

Fax.No.0171 4900436

C.C. - Debbie Bance, E.I.A. U.K. for information & necessary action.

Yours Faithfully
For Kashiram Choudhury & Co

Director 14.06.98

Kaziranga National Park

45 SURASINI GANGULY BARRACK
CALCUTTA 700 025:PH-481144

Mr Vinod Rishi
Director, Project Elephant
Ministry of Environment and Forests
Paryavaran Bhawan, Lodi Road, CGO Complex
New Delhi 110 003

Sub: Economics of the Use of Domesticated Elephants.

Dear Mr Rishi,

I enclose a draft questionnaire for the CWLWs/PCCFs of the elephant-bearing States of India which will help us to work out the economics of the use of domesticated elephants in India. This may kindly be circulated from your end with request that in addition to the copies for you and AIGF(WL), a copy may kindly be sent to me direct. Circulated by the Ministry, this will have a better chance receiving response within a reasonable time than if circulated by me. Suggestions to improve the questionnaire from you and Mr Dey would be very welcome.

2522/WL-795
SK

With best wishes,

Yours sincerely,

D.K. Lahiri Choudhury 19/5
D.K. Lahiri Choudhury

Encl: as above.

cc. Mr S.C.Dey, AIGF(WL) with a request for comments and suggestions.

F.No 8-9/95 WL-2
5-10-95
31/5

[Signature]
30/5

ECONOMICS OF THE USE OF DOMESTICATED ELEPHANTS QUESTIONNAIRE

1. NAME OF STATE :

2. NO. OF ELEPHANTS IN GOVT. OWNERSHIP (AS ON 31.3.95) :

	1	2	3	4
	Captive born	Captured	Purchased	Total
(a) Adult male (8'+)				
(i) Tusker				
(ii) Makna				
(b) Adult female (7'+)				
(a) Cow				
(b) Heifer (Sarin-- no calf)				
(c) Sub-adult male (5'-8')				
(i) Tusker				
(ii) Makna				
(d) Juvenile (4'-5')				
(i) Male				
(ii) Female				
(e) Calf (4 & below)				
(i) Male				
(ii) Female				
Total				

3. (i) NO. OF ELEPHANT CAMPS where these animals are kept (as on 31.3.95) :
(ii) Location of each camp & the no. of animals in each with category-wise break up as in 2 above.

4. COST OF UPKEEP OF EACH ANIMAL P.A.

	Cost	No. of attendants	Remarks
A. (i) Adult male	:		
(ii) Adult Female	:		
(iii) Sub-adult male & female	:		
(iv) Juvenile & calves	:		
B. Break-up of above:			
(i) (a) Salary of mahout p.m.:	:		
(b) Scale	:		
(c) Total no. employed	:		
(d) Total sanctioned strength	:		

- (ii)(a) Emoluments of daily-rated-mahouts p.d. :
- (b) Total no. so employed:
- (iii)(a) Salary of Kabadi/Patawallah/Meti p.m :
- (b) Scale :
- (c) Total no. so employed. :
- (d) Total sanctioned strength. :
- (iv) Cost of concentrated diet p.d.

1	2	3	4
Cost p.d.	Wt. of grain; kind of grain; measure of juggery & salt.	Cooked uncooked.	Remarks

(a) Adult male:

(b) Adult female:

(c) Sub-adult male & female :

(d) Juvenile male & female :

- (v) Cost of overheads for cooking meals for elephants :
- (vi) Average annual cost of maintenance of *pilkhana*, including cost of construction :
- (vii) Average annual cost of construction & maintenance of mahouts' & attendants' quarters :
- (viii) Cost of veterinary care :-
 - (a) Salary/allowance :
 - (b) Medicine :
- (ix) Others :

5. PRESENT USE OF GOVT. ELEPHANTS IN NOS IN EACH OCCUPATION:

	1	2	3	4
	A/male	A/female	Sub-A/ male & female	Total

- (a) Logging
- (b) Patrolling

TOURIST
CARRIERS

NOTE: Please indicate in a note here areas of overlap, quantified if possible, i.e., the extent to which the same elephant is used for different purposes.

- 6. AVERAGE LAYOFF/REST PERIOD (elephant- days lost) p.a. for adult and sub-adult animals due to
 - (a) Closure of P.A. to tourism :
 - (b) Prescribed weekly rest, if any:
 - (c) Musth :
 - (d) Pregnancy and post-parturition nursing period :
 - (e) Illness :
 - (f) Others :
 - (g) Are elephants left in the forest, hobbled, to graze on their own when the NP/WLS is closed to tourists? If so, indicate period, and clarify if grain rations are kept suspended during the period.

(Please add explanatory notes, if and where necessary)

7. TOURISM:

- (a) Rate charged p. head for carrying tourists:
- (b) Maximum no. permitted to be carried by an adult animal, including children :
- (c) Average no. of days an animal is so employed p.a.
- (d) Total no. of elephant-days so utilized :
- (e) Total income from carrying tourists p.a. :
- (f) Average income per animal from tourism :
- (g) Give your assessment of elephant ride as a tourist attraction and its contribution to the inflow of tourists to a p.a.

8. LOGGING:

- (a) Average cost per cm^3 of extracting logs from forest to depot using elephants :
(Please give separate estimates for hilly and plains areas, if possible)
- (b) Cost of extraction by manhandling of log per m^3 by
 - (i) direct employment of labour :
 - (ii) Minimum daily wages payable in the State:
 - (iii) By contractor :
- (c) Average cost per m^3 of loading logs onto lorry at depot, using elephants :
- (d) Average cost per m^3 of manhandling logs onto lorry at depot by
 - (i) direct employment of labour :
 - (ii) by contractor :

9. PRIVATE OWNERSHIP:

(a) No. of elephants which are owned in the State, other than temples & religious foundations with age and sex classification as in (2) above:

(b) No. of elephants with temples and religious with age and sex classification as in (2) above:

(c) Cost of hiring elephants p.d. from private owners for the purpose of ceremonial processions etc., and whether it is normal practice in the State :

10. AVERAGE LOCAL PRICE OF AN ELEPHANT:

(a) Adult Male
(i)Tusker :
(ii)Makna :

(b)Adult Female
(i) Cow :
(ii) Heifer :
(i.e.has not calved)

(c) Sub-adult Male
(i)Tusker :
(ii)Makna :

(d)Sub-adult Female:

(e) Juvenile and Calves :

11. GENERAL OBSERVATIONS AND REMARKS BY THE STATE AUTHORITIES:
(use additional sheets, and attach reports, if required)

Date.....

Sd.....
Designation & Seal

[Kindly fill the form in triplicate and send a copy each to :

- (i) Sri S.C.Dey,Additional I.G.F.(WL);
- (ii)Sri Vinod Rishi,Director,Project Elephant,Ministry of Environment and Forests, Paryavaran Bhawan, CGO Complex, New Delhi 110 003;
- (iii)Professor D.K.Lahiri Choudhury, Member,Steering Committee, Project Elephant, 45 Suhasini Ganguly Sarani,Calcutta700025.]