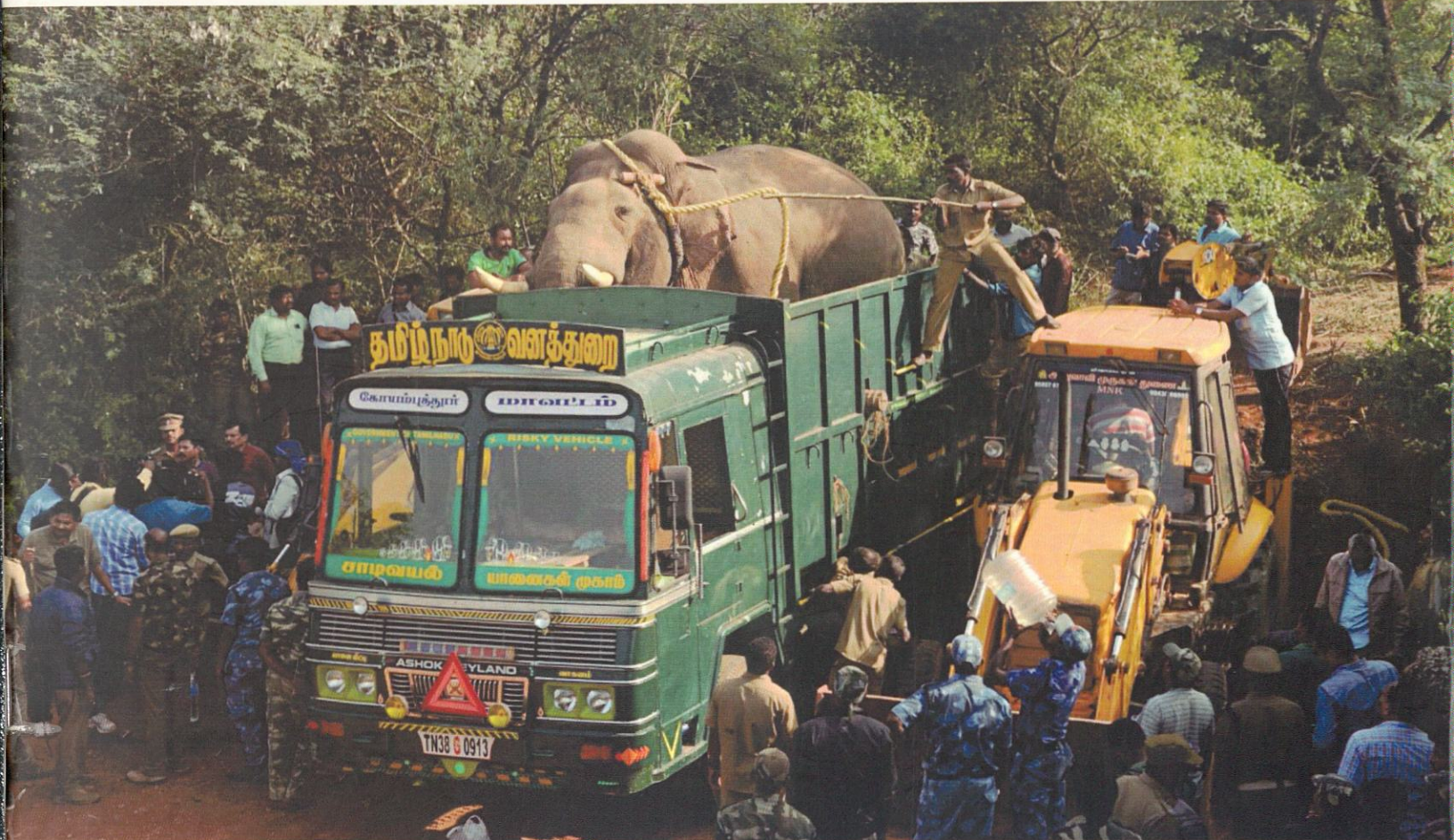


2021

Transportation Essentials for Asian Elephants

Technical Manual (TR/2021/04)

Project Document: Mitigation of Human–Elephant Conflict
in and around Rajaji Tiger Reserve with Emphasis on
Mitigation Strategies during Kumbh 2021



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Transportation Essentials for Asian Elephants (Technical Manual TR/2021/04)

A manual produced as part of a collaborative project between Uttarakhand Forest Department and Wildlife Institute of India titled *Mitigation of Human–Elephant Conflict in and around Rajaji Tiger Reserve with emphasis on mitigation strategies during Kumbh 2021*

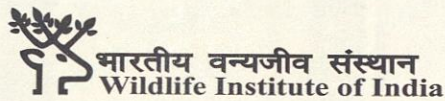
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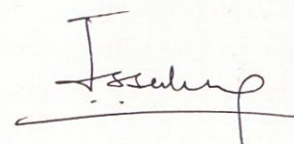


elephant

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Foreword

Uttarakhand supports an astounding biodiversity that is home to a variety of vertebrate fauna and flora. The Terai and the Shivalik tracts of Uttarakhand harbours considerable population of elephants in well-protected habitats providing a safe haven for their conservation, which rests on effective protection and timely resolution of conflict between elephants and people. Moving captive elephants for patrolling purposes and occasionally capture and movement of wild elephants are part of field management. Owing to frequent elephant movement for management-related reasons, there is a long-felt need to have ready references on safe transportation practices that forest officers in the field can easily understand the use. I am delighted to know that WII team has made an earnest attempt to address this gap by bringing out this very important manual on safe transportation of elephants. I am sure that field officers who are in forefront of implementing conflict mitigation activities will immensely benefit from technical manuals like this.



Jabar Singh Suhag, IFS
Principal Chief Conservator of Forests (Wildlife) &
Chief Wildlife Warden
Uttarakhand Forest Department

Foreword

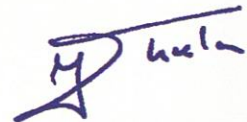
India is one of the biodiversity-rich nations across the globe, with the landmass supporting stable populations of endangered mega-fauna such as Asian elephants. Having the largest population of Asian elephants among the thirteen range countries, India also has its share of problems that needs to be dealt with on a regular basis at the human–elephant interface front. The varying facets of HEC often challenge managers, especially when decision-making is often handicapped by the delay in organising problem management resources. Elephant management might also involve translocation and moving elephants to captivity. It may be essential to mobilise *kumki* elephants for driving wild elephants from human-use areas and for routine reserve monitoring activities. In all these cases, transportation of elephants becomes essential. Elephant transportation is a cumbersome activity and involves an element of risk for the elephant and the personnel involved if preparatory activities are not adequate. Despite a long tradition of handling elephants, both wild and captive, a comprehensive document on elephant transportation, with due consideration to biological and veterinary aspects was not readily accessible to field managers causing considerable hardship in the field. This technical manual is a step in the right direction towards addressing the gap by providing a ready reference on essentials of safe transportation of elephants. I sincerely wish that this reaches out to field officers managing elephants and their habitats in the country. I am sure that they will find the manual useful.



Dr Dhananjai Mohan, IFS
Director
Wildlife Institute of India

Foreword

Our National Heritage Animal, the Asian elephant, has had a long association with humankind since time immemorial. Over the years, due to intensifying anthropogenic pressures, elephant habitats are being threatened extensively, resulting in intense negative interactions, in the form of what is broadly referred to as Human–Elephant Conflict. These interactions are further confounded by population-level changes, dynamic ranging patterns, and behavioural changes of the species. Regardless of the causal factors, addressing human-elephant conflicts in a time-bound manner is critical to garner the support of local communities towards elephant conservation. Although that are a variety of conflict mitigation strategies that are tried across different landscapes, moving wild elephants for translocation and captivity become essential in extreme situations when human lives and public safety are compromised. To aid in monitoring wildlife habitats and managing conflict situations, mobilizing captive elephants also becomes inevitable. Thus, transportation of both wild and captive elephants become necessary from time to time. Safely moving large animals like elephants require skills, experience and adequate planning. Lessons learned from elephant transportation should be properly documented in writing and widely disseminated so that they can readily referred to by others. This shall help in minimizing the mistakes that are repetitive. This technical manual is an attempt to list down the precautionary measures and best practices that can maximize the safety of elephants and the personnel involved in elephant transportation. My heartfelt wishes to my colleagues who have come up with this manual. Building on the resources and details provided in this manual, I hope that elephant transportation in unavoidable circumstances becomes well planned and executed, and least stressful to the majestic pachyderms.



Dr Yadvendra Dev Jhala
Dean, Faculty of Wildlife Sciences
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Executive Summary

Transportation of both captive and wild elephants is a necessity for a variety of management reasons. However, unplanned and poorly executed transportation can cause enormous stress to the elephants, jeopardize their safety and compromise their well-being. Such operations can also pose considerable risks to the frontline staff, elephant handlers, veterinarians and other support personnel involved. In order to minimize risks to both elephants and the personnel involved, meticulous planning and consideration of a number of critical points are essential. Proper justification of the need to transport elephants is crucial. Equally critical is the need to evaluate availability of trained manpower with adequate experience and other essential resources to safely transport elephants. Although elephant transportation is not uncommon, precautionary measures to be considered and best practices to be followed to minimize the risks to both the elephants and the personnel involved are not readily accessible for the field managers. The frontline managers at the helm of the operations are often handicapped when such ready references are not available.

Acknowledging this lacuna, this document aims at aiding managers dealing with captive and wild elephants to be better prepared to safely transport elephants. The document is intended for veterinarians, wildlife biologists, and field officers working in the field. It details the preparatory essentials for elephant transportation, aspects of loading and restraining elephants, safety considerations, vehicle preparation for the travel and veterinary considerations. Considering that there are Rapid Response Teams (RRTs) at most conflict-prone forest jurisdictions, this manual hopes to aid the RRT to be prepared to handle elephants during conflict situations.



Transportation Essentials for Asian Elephants (Technical Manual)

PROLOGUE

Elephant transportation is becoming a frequent exercise than before in most elephant-range states across India, largely owing to conflict management. In addition, states that keep captive elephants for a variety of management needs also have transportation of elephants as a routine practice. Situations warranting elephant transport, in specific, may include that of wild elephants captured for translocation or captivity purposes; movement of weak, injured, and sick elephants for medication, frequent movement of *kumki* elephants for conflict management purposes, and rescue and rehabilitation of stranded elephant calves. Transportation of elephants by road, rail, air and other means is cumbersome and entails potential risks of injury and death of the animal; personnel and staff members involved in transportation, and general public as well.

Therefore, handling and transporting elephants require careful consideration of a number of technical and statutory factors. As a result, recognizing and adopting best practices that

are practical to follow in the field during an operation is a first step in the right direction. Although transportation of elephants is frequent in elephant ranging states, little technical guidance is readily accessible to field personnel for reference. Taking this lacuna in to account, the objective of this manual is to provide basic protocols that can be followed by field personnel involved in the transportation of elephants by road. Transportation can be for a short distance (few kilometres within the division) or long distance (several kilometres between districts and even across state boundaries). Some of the points could also apply well in the context of the routine transportation of elephants seen in places like Kerala (in case of animals used in festival settings), where transportation is often done haphazardly with disregard to safety requirements.

ESSENTIAL CONSIDERATIONS

Transportation itself could be stressful for the elephants if crucial welfare considerations are ignored and operation is poorly planned in the first place. Laws et al. (2007) shows how transportation of elephants by trucks could induce stress in elephants, as evidenced by their faecal glucocorticoid metabolite (FGM) concentrations, which can even last up to 72 hours post-transportation. While stress responses are an adaptive mechanism for the animal to cope with external stressors, the same over prolonged period could cause chronic stress, which further impairs long-term survival and fitness in the animals. Therefore, the need to transport elephants should be well thought out and justified by the competent authorities before embarking on the assignment. Equally important is an assessment and retrospection of in-house technical capacity by the competent authority intending to carryout elephant transportation. It is advisable to seek consultation of experts if in-house capacity is inadequate to carry out a safe transport operation.

PLANNING AND LOGISTICS

1. Constituting a team for transportation

An organized team is invaluable for long-distance transportation (between divisions covered over hundred kilometres). An official not below the rank of Conservator of Forests should be in charge of the field operation. The designated officer can constitute the team comprising of the following personnel:

- i. Transportation officer-in-charge (in the rank of a Divisional Forest Officer)
- ii. An experienced veterinary doctor and a veterinary unit (comprising of para-vets)
- iii. Mahouts and Kavadis (of the respective elephants in case of captive elephants and in case of newly caught wild elephants, senior mahouts with considerable experience in handling elephants should be included in the team)
- iv. Additional mahouts for assistance (preferably two per elephant) can be deputed
- v. Assisting field personnel (Loaders and assistants)
- vi. Security team comprising of a Forester and a minimum of two Forest Guards.

2. Legalities involved in transporting elephants

Handling and transporting elephants require written orders from the Chief Wildlife Wardens of the respective states or from the Director of Wildlife Preservation depending on the purpose of the exercise. Considering the usage of sedatives and arms (drug-delivery system), legalities pertaining to the same should also be adhered to. Details on legal aspects regarding transporting elephants are provided in Table 1.

Table 1 - Legalities involved in transporting elephants

| Context | Relevant laws and policies |
|--|--|
| Conflict-related capture/translocation | Written order from the Chief Wildlife Warden of the concerned state (refer WPA 1972, section 11a) |
| Rescue of diseased/injured animal | Same as above |
| Interstate transportation (for departmental purposes) | Clearances from Chief Wildlife Wardens of origin and destination states. Also refer to Protocols for transportation of wild animals (CZA 2012) |
| Within state/interstate movement of captive elephants | In addition to above guidelines, also refer to Captive Elephant Management and Maintenance Rules, wherever applicable (Example: CEMR 2003, Kerala Forest and Wildlife Department) |
| Use of narcotic drugs for controlling the animals | Refer to NDPS Act 1985, Section 8 |
| Other drugs (sedatives and tranquilisers) | Adherence to Drugs and Cosmetics Act 1940 |
| Research-related capture, handling and movement of elephants | Written permission from the Chief Wildlife Warden of the concerned state (WPA 1972, section 12). Where required, necessary permissions/approvals may be obtained from the Director of Wildlife Preservation, and the National Biodiversity Authority (Biodiversity Act 2002) |

3. Vehicle selection

In areas where transporting elephants is frequent, it is handy to design a elephant-specific trucks with low chassis with good clearance. Low chassis vehicles are relatively safe, easy to load and off-load elephants even in absence of ramps especially for captive elephants. When low chassis trucks are not available, then the trucks selected for transportation should be carefully examined for the following:

- i. The flooring of the truck is wooden. Metal floors heat up soon and may cause blisters in the sole of the elephants. Further, drag chains may also rub against metal floor often and generate considerable noise causing discomfort to the elephants.
- ii. Winch system is useful while loading elephants that are not familiar with trucks. The winch can gently drag and guide the animal towards the truck, especially in the case of tranquilised animals, in the absence of *kumki* elephants.

WINCH SYSTEM FOR LOADING ELEPHANTS INTO TRUCK

This consists of a hydraulic pulley system wherein the iron cables with heavy duty metal hooks/carabineers can be attached to the neck rope or leg ropes of the sedated animal. On activating the hydraulic system, the pulley will turn and start drawing the elephant towards the truck gently. This is especially useful in the case of loading elephants that are apprehensive of trucks. They can gently be guided towards the vehicle, and if need be, a small nudge from the rear end will help in smooth loading of the animal.



- iii. The sidewalls or the flaps of the truck should be at least seven feet in height on either side with the walls having wooden planks. In West Bengal and Karnataka Lahiri-Choudhury (1991) report use of sidewalls in the truck that are about six feet in height. The average height of Asian male elephant is around nine feet and the cow elephant is around eight feet. A truck with low wall height poses several problems: Firstly, elephant gaze around and may get afraid, distracted or restive of other vehicles passing by. Moreover, low walls will expose the elephant fully and may attract unnecessary attention of crowd, by passers and other vehicles. Moreover, while applying sudden brakes or negotiating a hairpin bend in a ghat road, an elephant may be tipped off balance exposing them to a serious risk of falling down from the moving vehicle. High sidewall trucks can also be seen in countries such as Sri Lanka, where translocation has become a routine affair owing to large number of elephants outside parks, in human-dominated landscapes (Fig. 1).



Figure 1: A translocation operation in progress in Sri Lanka, carried out by the Department of Wildlife Conservation (DWC). Notice the high sidewalls and build quality of the truck.

- iv. The truck should have a drain to let out urine and water. The dung should be removed periodically manually with a shovel.
- v. Lighting in the truck should be adequate. The rear- and sidelights of the trucks should be well-lit and lustrous and not obscured by dirt and should be in good working condition. A truck without adequate rear and side lighting should not be used for transporting elephants.

4. Preparing the truck for the road travel

- i. The fitness, built, and working condition of the trucks should be pre-checked and certified by the officer-in-charge of transportation before loading elephants into truck. The air pressure in the tyres should be kept minimum so that the vehicle takes the subtle bumps well, not wobbly, causing discomfort to the elephants. Engine condition, brakes, and emission should be thoroughly checked before loading elephants. The sidewalls of the flaps should have sufficient openings for ventilation and also for emergency darting.
- ii. The truck should be fully fuelled before loading the elephants. It is risky to drive the trucks loaded with elephants into fuel pump stations and therefore should be avoided at any cost. The officer-in-charge for loading the elephants in to trucks

should ensure that the vehicle has sufficient fuel to cover the entire distance without having the need to refill often in the en route. However, in case of long-distance transportation, minimal number of fuel pit stops should be taken, instead of frequent breaks. Similarly, it is important to check the oil and other essential consumables.

- iii. The availability of tools and spare parts including the spare tyres should be thoroughly checked before loading the elephants in to the truck. If tyres are not in good shape, then the truck should not be used for transit.
- iv. The floor of the vehicle should be thoroughly cleaned and disinfection a few days prior to loading the elephants. This takes care of potential contaminants/microorganisms that could possibly cause foot infections in elephants.
- v. The protruding nails in the wooden floor and the sidewalls, rusted hinges and keels, and all other sharp metal objects should be removed or set all right. The protruding nails can pierce the sole of the elephant causing it pain, distress, and long-term complications to the foot.
- vi. In addition to the sidewalls, another GI bar needs to be provided one feet above the wall for additional safety. Another half feet above that, a PVC pipe for the entire length of the side and across the truck maybe provided to negotiate electric wires and cables on main roads (Fig. 2a). A similar temporary setup may be observed in the Kerala Forest Department Elephant Rescue Ambulance during rescue operations; (Fig. 2b).
- vii. Depending on space availability, a small water tank of ~200 litre capacity should be safely kept in the truck for all water provisioning needs. In new trucks, this can also be attached to the chassis, parallel to the fuel tank to meet urgent water needs during transportation.

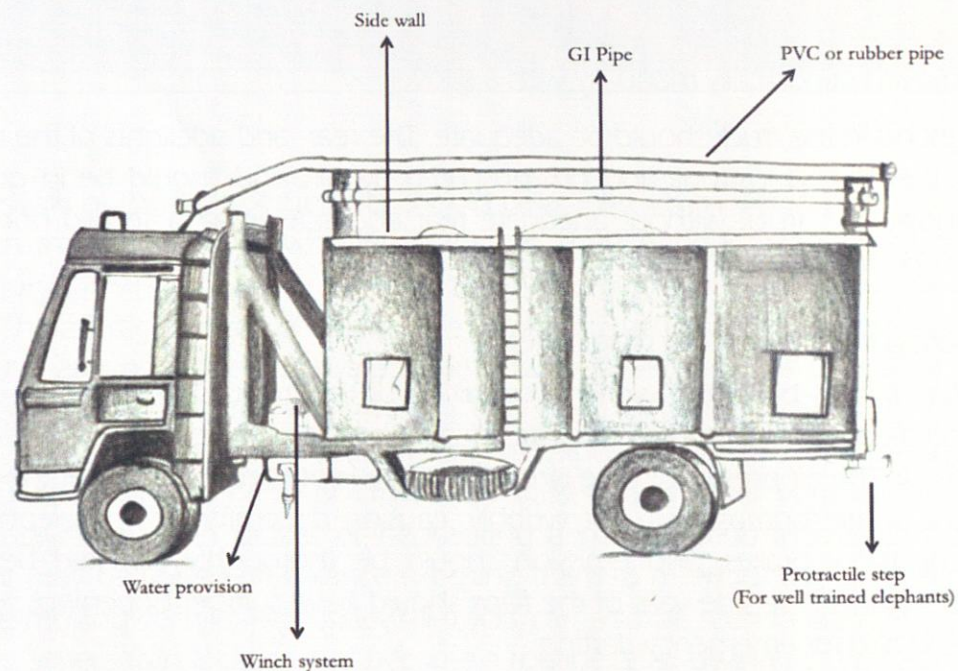


Figure 2a: Sketch of a truck customized for elephant transportation with a hoisting winch



Figure 2b: Kerala Forest and Wildlife Department elephant rescue vehicle prepared for operation. Note the topmost lining with PVC material to negotiate electric lines.

5. Planning travel routes and en-route safety considerations

- i. It is important to define the travel route beforehand and send a pilot vehicle a few days in advance to check the road condition, road works underway to avoid unnecessary diversions. This is especially critical when elephants are taken for the first time ever in a route. Pilot vehicle should essentially comprise of a forester and an experienced mahout.
- ii. The pilot vehicles should check for potholes and low hanging wires on the route. If potholes are too many, then it is advisable to find alternative roads. Underpasses, if any, should be checked for their height to avoid any accident.
- iii. If there are low hanging wires, the DFO and other competent authorities should report that to the Electricity Board and get the sagging wires fixed, or temporarily get power disconnected when the elephant-loaded truck passes through those areas.
- iv. Wherever possible, it is advisable to avoid passing through major towns and crowded villages.
- v. It is advisable to avoid peak traffic hours when passing through towns and cities. Peak traffic hours in the towns and cities usually last between 8 AM to 10 AM and 4 PM to 7 PM and therefore, entering towns in those hours should be avoided.
- vi. It is advisable to avoid passing through narrow, village, and dirt roads. In these roads, the electricity wires more often pass close to the road and often such wires sag dangerously close to the ground.

- vii. As far as possible, it is advisable to use National and State Highways even if these roads are a few kilometres longer.
- viii. The stopover locations to meet forage and water needs of the elephants should be planned in advance. As far as possible, such stopovers should ideally be premises of divisional forest offices, range forest offices, spacious forest guesthouse premises, timber depots and forest nurseries. If such facilities are not available en-route, then other government establishments such as Public Works Department guesthouses, revenue department campuses, or government school grounds may be selected. In government establishments, it is easier to mobilize water and fodder for elephants and also keep out trespassers.
- ix. If more number of elephants are to be transported, then it is important to have a pilot vehicle (lead vehicle) in the front with officer-in-charge of the unit and a surveillance vehicle with veterinarians and other technicians moving up and down the convoy of trucks. Maintaining the convoy in crowded cities could be difficult as numerous vehicles (cars, trucks and motorcycles) may penetrate in to the convoy and break it. Thus, seeking police support to lead the convoy in an organized manner may be essential in such scenarios.

6. Induction of vehicle crew (drivers, assistants and cleaners)

- i. It is always advisable to hire drivers with prior experience of driving elephant-laden trucks. Elephant movement may elicit fear in inexperienced drivers. In particular, newly caught wild elephants and elephants that are not wholly trained may frequently try to break out. This could lead to vehicle mildly swaying. Drivers should not panic in these circumstances. Therefore, in areas where elephants are frequently transported, it is imperative to engage experienced drivers.
- ii. The drivers should not be allowed to consume alcohol or use habit-forming drugs during the entire operation. Drunken drivers should not be allowed to drive. In case of long distance travel (> 100 kilometres), a substitute heavy-vehicle license-holder familiar in driving such trucks may accompany the team to drive on shift basis
- iii. The drivers should be instructed to drive the trucks at a maximum speed of 40 km per hour in four-lane National Highways and 30 km per hour in all other roads. In the interest of elephant foot care, the absence of which can cause long-term debilitation, the prescribed speed limits should never be exceeded even if road condition is good and traffic is less. In the bad roads (with lot of potholes and humps), the trucks should operate at 20 km per hour. The officer-in-charge of the unit should periodically check for compliance. It is often observed that elephant handlers out of sheer ignorance and over-confidence prompt the drivers to drive fast. This should be strongly discouraged.
- iv. The drivers should be instructed to maintain lane discipline in the Highways and not change lanes often. They should desist from overtaking other vehicles unnecessarily.
- v. The drivers should be advised to take extra precaution while driving in single-lane highways and on *Ghat* sections.

7. Luring elephants into vehicle

- i. Elephants might show reluctance to get in to the trucks. If trained large and dominant *kumki* elephants are not available, then loading the elephants in trucks will be difficult. Therefore, training the elephants to get in to the trucks may be important. In Mahasamund Forest Division, Chhattisgarh, Forest Department used an old, disuse truck to successfully train elephants to get in to trucks by slowly luring the elephants in to the truck. In forest camps, once basic training is completed for newly caught animals, next stage involves making it comfortable in boarding onto and alighting from a truck, and get it accustomed to movement in the vehicle.

HABITUATING ELEPHANTS TO TRUCKS: MAHASAMUND EXPERIENCE

At Mahasamund in Chhattisgarh, the Government of Chhattisgarh brought five captive elephants from the state of Karnataka for use in wild elephant conflict management. The five elephants did not have adequate training to get into the truck. The elephants were always forced into trucks by *kumki* elephants. At Mahasamund camp, the elephants did show apprehension when mahouts tried loading them into truck. In order to overcome the apprehension on the part of elephants to get into trucks, the mahouts began training aimed at habituating the elephants. In the first phase of training, a stationary truck was kept near the ramp that was specifically designed for loading elephants. Jaggery, sugarcane and other preferred food items were placed to lure elephants into the truck. It took over a week for most of the elephants (2 young adult cows, two adult bulls and a sub-adult bull) to loose fear of the truck (a novel object). Overtime, the initial apprehension on the part of elephants subsided and they started moving into the truck to access the food items kept there. After this first phase of training, elephants were lured into a truck with engine on. In the last phase, after luring elephants into truck, the truck was driven around. The young bulls showed apprehension to get into the truck whenever older bulls were loaded before them. This apprehension could be a reflection of dominance responses on the part of younger bulls. The whole period required to wholly train the elephants to comfortably get into trucks took about 15 days.

- ii. If large *kumki* elephants are available, then persuading younger elephants into trucks is easier (Fig. 3). However, in the absence of large *kumki* elephants, and if elephants are not "truck-trained", then they have to be lured by providing food that they like. This of course may not work all the time.
- iii. In forest camps, it is imperative to have permanent ramp to load and off-load elephants. Lahiri-Choudhury (1991) suggests two types of ramps namely U-shaped and open-ended. Experienced mahouts may off-load their elephants anywhere making use of "make-shift" ramps. For this purpose, even a bund in the forest or field would be sufficient.
- iv. The winch mentioned in an earlier section also assists in guiding the animal onto the truck.
- v. Elephants are apprehensive of anything novel, and hence to avoid such fearful behaviour and associated resistance, they should ideally be loaded front facing, i.e. the animal facing the cabin of the truck. This would allow the animal to get a feel of

the surface and get comfortable before getting loaded, rather than loading it with rump facing the cabin. Often, head-on confrontations occur between the *kumki* elephants and the elephants to be transported while loading them with rump facing the cabin. This could lead to lot of handling injuries and may cause enormous stress in the animals, which could be considerably avoided.

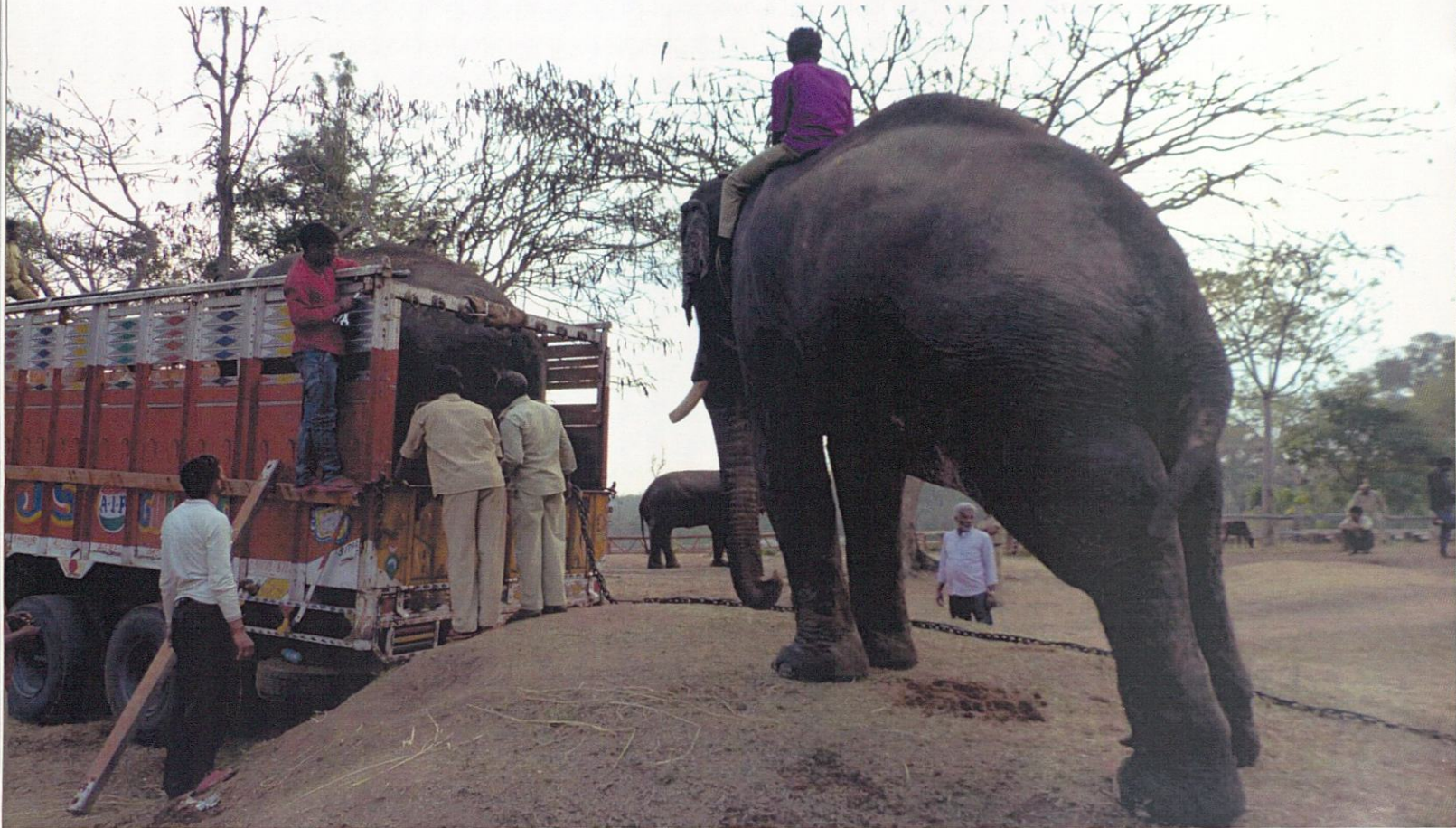


Figure 3: Trained dominant *kumki* elephants are very handy in goading the elephants into the trucks

8. Positioning and restraining elephants in the vehicle

Restraining elephants for transportation is one of the most difficult tasks that require highly skilled personnel who understand elephants and have prior experience in the task. Effective restraining of elephants during transport is central for the safety of elephants, their handlers and the entire unit. Handlers and mahouts engaged in the task of restraining elephants in the truck should be well-versed in roping, particularly putting knots, hitches and splices. This task requires not only expertise, but speed in execution as well.

- i. Elephant should not be allowed to lie down in the vehicle while transporting. During the entire transportation period, the elephant should be made to stand comfortably.
- ii. The elephant should be made to stand in the platform close to the rear wheels where the weight carriage of the truck is usually optimal.
- iii. Logs should be placed horizontally across the sidewalls of the truck – one in the rear and one in the front, near the trunk. The logs should be secured with heavy-duty bolt nuts. The log in the front should be placed above the chest and below

the eyes of the elephant. During transportation, elephants may drape their trunks on the log. Sometimes, when the elephant is sedated, it may drift on the log and start sleeping. Thus, the log should be heavy and secured well with the truck.

- iv. While transporting captive/trained elephants that are accustomed to human presence, it is advisable to keep vacant space between the cabin and the elephant to keep fodder and a drum of clean water. In this vacant space the mahouts and their *kavadis* (grass cutters) can take turns to sit and observe the elephant during the transit time.
- v. The practice prevailing in Tamil Nadu camps is to tether a foreleg and a diagonally opposite hind leg with chains. The chains will be tied to the truck chassis securely. In case of transporting a newly caught wild elephant, in addition to two legs secured with chains to the truck chassis, the other two legs will be secured with a heavy duty rope. The ropes are handy while offloading the elephants as *kumki* elephants can then drag the captive with ropes.
- vi. In most FD trucks these days, the ropes pass through small holes next to where the legs will be placed inside the truck, and will be tied onto the chassis for better strength (Fig. 4).



Figure 4: Restrained newly caught wild animal, after loading

- vii. In case of unpredictable captive elephants, if mahouts lack confidence, hobbles may also be used.
- viii. Care should be taken to ensure that the ropes used are either Manila hemp or Hairy Sterculia (*Sterculia villosa*). Nylon should be avoided as much as possible, to avoid abrasions, and burns caused when used for prolonged periods.
- ix. In addition to tethering the legs to the chassis, a rope around the neck is also being

used in the south Indian camps. The rope around the neck will be tethered to the log placed in the front.

TRANSPORTATION OF TUSKER CHINNA THAMBI: A CASE STUDY

The tusker Chinna-Thambi was a young adult that was captured from Coimbatore Forest Division as part of a conflict mitigation strategy, and was translocated to the Anamalai Tiger Reserve. However, in less than a week, the animal moved out of the Reserve, and started moving through densely populated, agriculture-dominated spaces, thereby aggravating the problem. Following this, there was a decision made to capture the animal. The legalities involved in the process of obtaining permissions to take the animal into captivity also provided enough time to carry out preparatory measures that included even liaising with line departments, which made transportation of the animal back to the same Reserve where he is currently maintained as a captive elephant smooth. Route was planned and executed by avoiding areas with low-lying wires, and elephant-compatible trucks were arranged from the State Forest Department of the neighboring state of Kerala. A ramp was constructed at the capture site simultaneous to the elephant securing process, post-darting, and animal was loaded with minimal difficulties, with support from *kumki* elephants.



9. Planning travel duration

- i. Since elephants should not be allowed to lie down while transporting, it is absolutely essential to take the travel time into account. Cheeran et al (2009) reported transportation of 34 elephants from central Kerala to Delhi by train – which took over 45 hours (Fig. 5). Likewise, bringing elephants from the Sonepur mela to south Indian states, especially Kerala, used to be a regular practise until its recent ban. This also used to be carried out on trucks through journeys lasting about a fortnight, crossing multiple state boundaries. Recently, five elephants were transported by road from Kodagu, Karnataka to Raipur, Chhattisgarh and it took five days of continuous travel (with stopover for food and water). During the entire travel period, elephants stood in the truck and when they were off-loaded only in the final destination, their legs were stiff and probably numb as well.



Figure 5: Elephants in train wagons while being transported from Kerala to New Delhi for the Asiad in 1982

- ii. It is advisable to not transport the elephants for more than 15 hours a day (Dublin & Niskanen, 2003). Thus, for long distance transportation (interstate movement), it is important to plan for a longer duration of the journey. During such long-distance travels, wherever possible, it is advisable to off-load the elephants for a short walk, rest and feeding. However, this can be done only if elephants are comfortable in loading the trucks without much goading. In case of orphaned calves' transportation, continuous journey should be avoided, and multiple breaks should be taken, and feeding should be carried out at regular intervals. People tend to have a curiosity to approach, touch, and caress calves, but such kind of physical contact should be completely avoided, with exception for the handler and the veterinary officer
- iii. Elephants may get restless after getting loaded into the truck. Continuous reassurance from mahouts is critical to calm them down. Thus, mahouts and *kavadis* should be always with their elephants and "interact" with them continuously.
- iv. Preferable travel time is during early morning hours and evening hours. Hot hours of the day may be avoided to rule out possibilities of extensive dehydration of the animal.

10. Fodder and water for elephants en route

- i. While transporting elephants for a longer distance, it is important to consign a fodder truck along with the trucks carrying elephants. The fodder truck should have supplies for the travel period and additional two days for safety reasons. The cut fodder truck should always accompany the elephant truck.



Figure 6: Elephants need a great deal of water and fodder. Planning for them in advance is crucial for hassle free transportation

- ii. In each elephant-laden truck a 200-litre capacity water tank should be kept. The tank should be accessible to elephants all the time – both for drinking water as well as splashing over. Two 100-litre spare tanks with water should be carried in the fodder truck.
- iii. Providing clean water to elephants for drinking purposes is crucial. Water from bore well in the forest nurseries may be the ideal choice to replenish the tanks and also to spray over the elephants. Water from village ponds and tanks should be avoided as village cattle may heavily use them.
- iv. Without replenishing/refilling the tanks, the journey should not be commenced.

11. Food and supplies for the unit

- i. Food and water is essential not only for the elephants, but also for personnel involved in the operation. The stopover for food should be in clean and hygienic places. Health concerns arising out of unhygienic eateries may affect the team, the journey, and the execution of the plan.
- ii. Basic utensils for cooking may be carried in the fodder truck, for quick refreshment pit stops for the crew.

SAFETY CONSIDERATIONS

1. Surveillance vehicle

A surveillance vehicle comprising of veterinarians and officer-in-charge of the unit should continuously monitor the elephants. The surveillance team may note the following critical points periodically:

- i. To check if elephants exhibit any aggressive behaviour such as breaking the flaps, logs and violently swaying the body. Sometimes, the situation may warrant medical intervention.
- ii. Elephants that are tied to a place may sway due to boredom. Swaying increases blood circulation as well. Therefore, some level of swaying may not be a problem, but drivers should be told about this. Excessive swaying in some cases is also a sign of distress indicating that the animal is uncomfortable. In such cases, a break may be provided.
- iii. Elephants may sometimes display signs of uneasiness or restlessness such as drifting down, shivering, and others. Immediate veterinary intervention may be required in such conditions.
- iv. Elephants may put their trunks out and keep scanning the surroundings. This could be very dangerous as vehicles passing by or low-lying wires could cause accidents.

2. Crowd management

- i. Elephants generally attract lot of crowd. Curious onlookers, village children and others may throng to see and photograph the elephants. This can often provoke the animal, especially in non-sedated conditions, and hence, crowd should never be allowed to approach the elephants and should be instructed to watch from a safe distance.
- ii. If the crowd is turning unruly, then, the officer-in-charge of the transportation should immediately liaison with the local police and get police support and protection for the unit.
- iii. The officer-in-charge of transportation should discourage holding elephant-laden trucks on highways or at certain points for people, often VIPs, to get a glimpse. Priority should be on taking the animal to a safe point at the earliest.
- iv. At times, drivers and others involved in the operation may sneak and pluck the tuft from elephant's tail brush. Elephant hairs are kept as souvenirs and embossed in finger rings. This is a cruel practice and should be strongly admonished. Further, it is illegal as well and offenders are liable to be prosecuted under the provisions of Wildlife (Protection) Act, 1972.

VETERINARY CONSIDERATIONS

I. Pre-transport health checkup for elephants

Pre-transport health assessment is important and the veterinary officer should provide a fitness certificate. More often than not, the mahouts and elephant handlers, out of overconfidence and ignorance suggest that their elephants are fit for travel. This must not be encouraged and a veterinary officer must carefully consider a number of points before certifying an animal fit for transportation.

- i. Detailed physical examination of the animal should be carried out by the veterinary team. General condition of the animal should be recorded in detail in the movement register, prior to transportation. In the event of poor health, it should be immediately reported, and transportation should be reconsidered at that point. Veterinary Officer should issue a fitness certificate prior to transportation of animal. Relevant biological samples for health assessment (hematological & biochemical profile), parasitological examination (ecto-parasite, endo-parasite and hemo-protozoans) and select infectious diseases (Tuberculosis, Elephant Endotheliotropic Herpesviruses, Haemorrhagic septicaemia and other relevant diseases) may be carried out to support decision making.
- ii. The *musth* status of the bull elephants should be carefully checked before commencing the transport. Previous years records may be referred to understand the *musth* schedule of the elephants. Physical examination and lab analysis of blood sample may help ascertain the same more objectively.
- iii. The elephant foot is designed to bear the heavy weight of the animal. When standing and not engaged in any activity, elephants sway (move back and forth or sideways). This swaying may facilitate blood circulation. This should be considered very closely.
- iv. Elephant should not be having any foot problems like foot rot, arthritis, chronically infected toenails, pododermatitis and other major problems.
- v. All the elephants should be vaccinated with tetanus toxoid and it is advisable to go for a booster in the event of poke or puncture wound.
- vi. Transport of pregnant elephants and lactating mothers should be avoided.
- vii. Young calves should not be transported if unaccompanied by nursing females. In the case of rescued orphan calves, it is advisable to soon introduce them to allomothers and nursing females. Transport of rescued orphan calves is discussed in detail in a later section.
- viii. Transport of weak, injured and sick elephants should be avoided.
- ix. If elephants were immobilized in the past, it is important to go through the details such as dosages administered, drug inducement time, complications, if any, and others.

2. Veterinary drugs and equipment to be carried

During emergency situations, such as elephants trying to break loose, showing severe signs of uneasiness, hyper-aggression and other situations, it may be important to tranquilize the elephants. The following drugs and remote darting guns and consumables are to be carried. The readers are advised to refer Nigam et al (2020) for understanding nuances of elephant immobilization.

Table-1: Drugs to be carried during transportation of elephants

| S.no | Drug | Type | Dosage and effect |
|------|---------------------------|-------------------------------|----------------------------------|
| 1 | Xylazine hydrochloride | Sedative | 0.04 – 0.08 mg/kg (for sedation) |
| 2 | Atipamezole hydrochloride | Reversal drug for Xylazine | 1 mg per 8-12 mg Xylazine |
| 3 | Yohimbine hydrochloride | Reversal drug for Xylazine | 0.125 mg/kg body weight |
| 4 | Acepromazine | Tranquilizer | 40-50 mg/1000kg body weight |
| 5 | Azaperone | Short-acting tranquilizer | 0.240 mg/kg |
| 6 | Haloperidol | Immediate-acting tranquilizer | 40-100 mg total dose |
| 7 | Perphenazine enanthate | Long-acting tranquilizer | 200-250 mg total dose |

Drugs to handle any emergency during transport should always be carried and should include antibiotics, analgesics, antipyretics, hemostyptic, antihistaminic, respiratory and cardiac stimulants, antiseptics etc.

OFF-LOADING AND QUARANTINE CONSIDERATIONS

- i. Off-loading elephants is generally easier than loading (Cheeran et al., 2009). Nevertheless, a ramp that is safe to off-load elephants is essential.
- ii. Well-trained elephants can be loaded and off-loaded using a protractile step that can as seen in a few trucks in states such as Kerala (Fig. 7). However, in case of newly caught wild elephants, proper ramp needs to be prepared to avoid risks and accidents (Fig. 8).



Figure 7: A trained elephant alighting from a truck using the protractile step

- iii. Travel fatigue may affect the elephants for a few days. The elephants that have undergone a long-distance travel must not be put to work immediately. Laws et al. (2007) have demonstrated that stress hormone metabolites could increase by 389% in elephants following transportation by trucks, especially in the immediate 48 hours. Hence, care has to be taken to ensure that the animal is maintained in relatively stress-free conditions, following the travel. Depending on the temperament of the animal, the mahout can decide on the off-loading confinement of the animal.
- iv. Elephants should be monitored for any abnormal behaviour such as extensive stereotypy, physical, visible signs of colic, and other health issues.
- v. It is important to monitor their feeding for a few days till they settle down. Long distance travels may sometimes affect elephants' digestion. High fibrous feed such as *Caryota* palm fronds as seen commonly in Kerala, may be avoided, to avoid gastrointestinal issues.
- vi. In case of translocation of captive individuals, and introduction to a new camp, if there are elephants in the release site, sufficient care should be taken to avoid any immediate physical contact between the elephants. Bulls in particular may show aggression to each other. Overtime, they may be slowly and carefully introduced to each other.

LINE DEPARTMENTS TO BE INVOLVED

- i. The National Highway Authority of India should be informed in advance so that elephant-laden trucks are not made to wait in the toll gates and are cleared via VIP lanes.
- ii. The District Superintendent of Police (of the districts in which the transportation unit moves) should be informed in advance so that police support can be immediately mobilized whenever need arises. While passing through crowded regions, Police could escort the transport vehicle in order to avoid traffic congestion and associated chaos. During the capture operations (in case of wild elephants), the Police Department could even consider declaring CrPC 144 in order to maintain law and order situation for the smooth execution of the operation. Communication should be sent in advance to the local Police officials along the route designated for transportation.
- iii. The District Collector and the civil administration (of the districts in which the transportation unit moves) should be informed in advance so that local support in case of emergencies can be easily mobilized.
- iv. Electricity boards need to be informed in advance to turn off low-lying wires in case small roads need to be taken.
- v. The pilot vehicle can also liaise with local railway stations for train timings, in case the travel is along railway tracks or have to cross railway level crossings, to avoid issues. Some elephants tend to display fear for train noises.

DOCUMENTS TO CARRY

- i. Individual elephant files (containing the details of the elephant, and five important registers--feeding, movement, disease and treatment, vaccination, and work registers) should be carried along with the elephants. It is prudent to carry only the photocopies and not the original files.
- ii. Route maps of the travel should be carried.
- iii. Requisite permits and authorization letters issued by the competent authority/s should be carried. It is prudent to take multiple copies.
- iv. Copy of letter of communication by the officer-in-charge to other departments.
- v. Official identity cards of the personnel involved.

TRANSPORTATION OF WILD ELEPHANTS

In case of transportation of newly caught wild elephants, most of the points discussed in the aforementioned sections would hold true. Nevertheless, transporting wild elephants is far more difficult and requires experts and experienced mahouts in the team. Wild elephants that are transported may either be retained in captivity or released back in the wild (process of translocation). We draw attention of the readers to a set of guidelines on *in-situ* translocation of elephants prepared by the African elephant specialist group of the IUCN (Dublin & Niskanen, 2003). This set of guidelines has discussed a few issues that are pertinent in the context of transportation of Asian wild elephants as well.

- i. Ramp needs to be prepared to load the animal successfully onto the truck. The best way of doing this is to make a minor excavation to drive the truck platform to ground level as shown in the image (Fig. 8). This would avoid any inclination and hence would help in easy loading of the wild animal with minimal pressure applied. Kerala Forest Department has been doing this for all their recent operations, setting an example. In case, where that is not possible, an inclined ramp can also be prepared (Fig. 9)

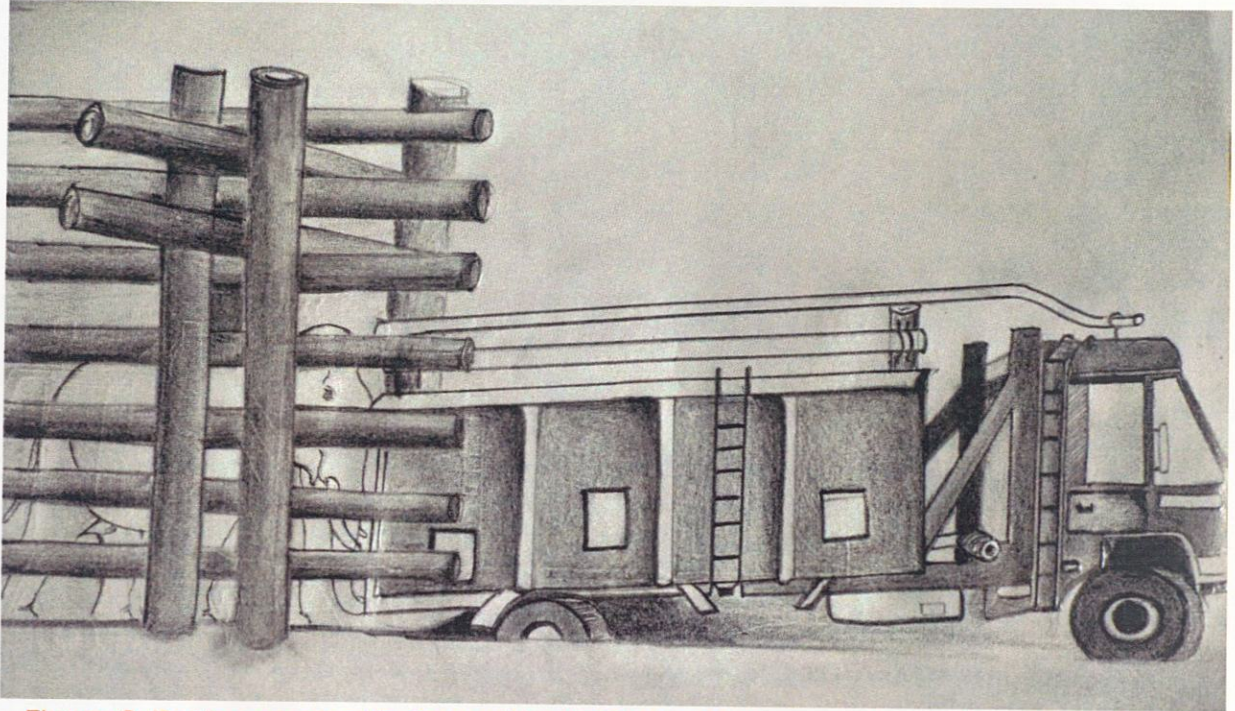


Figure 8: Earth excavated in front of the kraal for alighting newly caught wild elephants directly into the training enclosures.

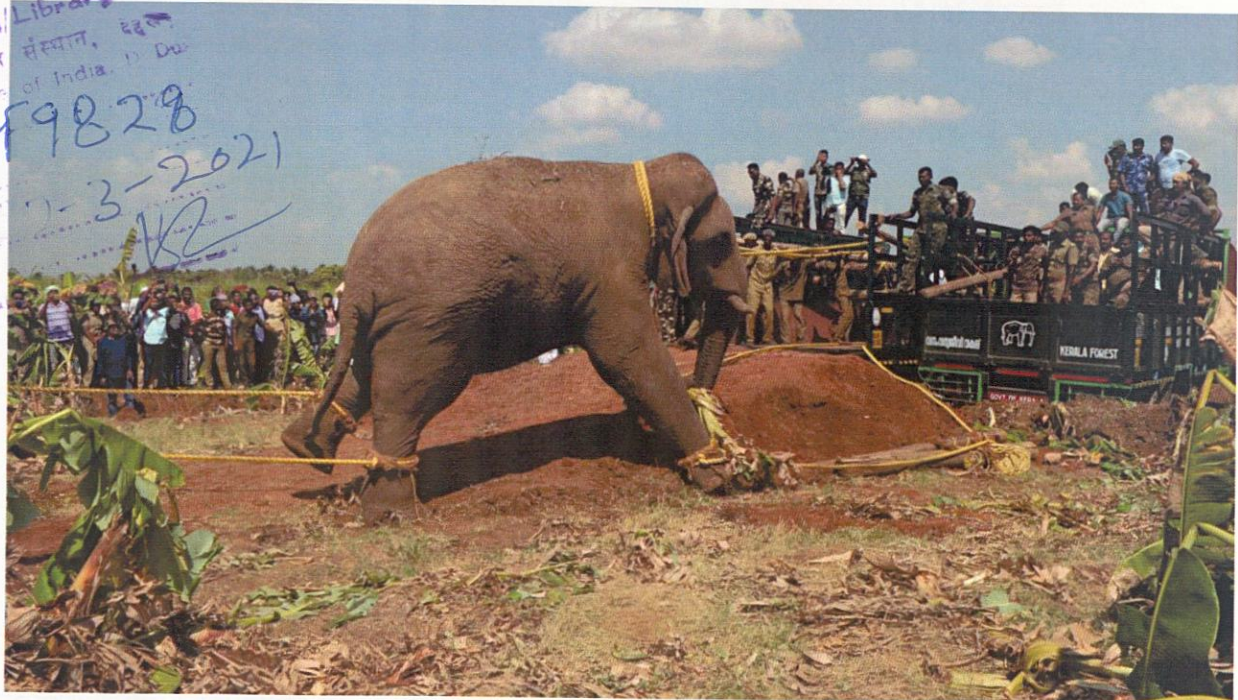


Figure 9: Use of inclined slopes to gradually load newly caught wild elephants on to the truck

- ii. Avoid physical confrontation with *kumki* elephants. This physical confrontation with *kumki* elephants, often aggressive, as seen in a few states is completely avoidable, by adopting the loading protocol mentioned earlier in this technical manual, wherein animal needs to be loaded head-first. In such cases, *kumki* elephants can gently nudge the animal at the rear end and push them into the truck. This will avoid significant trauma to the wild animals, which are already be under tremendous stress. In addition, using trained adult females or tusk-less bulls or *makhnas* for pushing from behind can prevent tusk gore wounds on the rump and pelvic regions of the wild animal.
- iii. In some cases, animals can also be hoisted using a crane as done in African countries, wherein the sedated or tranquilised animal is harnessed appropriately and lifted. Similar efforts are made even while transporting elephants by means of ship between the Indian mainland and the Andaman and Nicobar islands (See Figure 10).



Figure 10: Elephant transportation by ship—Animal being hoisted using crane and the weight supported by netted harnesses

TRANSPORTATION OF RESCUED CALVES

In the wake of increasing number of (abandoned) calf rescues from human-dominated landscapes or reserve boundaries, a protocol in transporting calves may be of use to managers.

- i. Calf needs to be moved to an area with minimal human interaction as soon as rescued, and transportation arrangements need to be made at the earliest.
- ii. Transportation vehicle should be well covered, and well ventilated.
- iii. Floor and sides should have soft paddings to avoid any possible injury.
- iv. Bedding material made of hay or leaves may be provided. Mattresses or other cotton bedding may end up getting consumed and could lead to enteritis in the animal.
- v. Multiple pit stops need to be taken while transporting them, and milk replacer should be given at regular intervals.
- vi. If adult females are available at the camp, they could be brought in for the rescue, for allo-mothering support.
- vii. Mahouts or departmental staff who are experienced in handling calves should be given the responsibility to rescue, transport, and care for the animals.

BUDGET FOR THE OPERATION

The number of elephants to be transported, distance to be travelled, the number of contract and daily wages personnel involved, and the number of days of operation planned are essential to consider for budgetary planning. In areas where elephant transportation is frequent, maintenance costs for the vehicle, support vehicles, tranquilizers, and personnel costs can be significant and therefore, needs to be estimated accurately and included in the annual budgets. Proper budgetary allocation is essential for hassle-free exercise. Lack of funds, as a consequence of poor budgetary planning can lead to poorly implemented fieldwork.

EPILOGUE

Elephant transportation is increasingly becoming a common affair, with widening of human–elephant interface, and associated conflict incidents, wherein removal of elephants, either for translocation or for permanent captivity, is often becoming inevitable. In such cases, preparatory actions often tend to be in a haphazard manner, largely owing to the emergency nature of issues that need to be dealt with. In this regard, officials, especially in areas that have problems concerning large mammals such as elephants should always be prepared to deal with the same. This manual aims at aiding the managers in equipping their respective rapid response teams to handle similar situations, in a planned and organised manner. Elephant transportation needs to take into account a wide array of things, both logistical and the biological aspects of the animal, and this manual has attempted to enlist relevant details, while also discussing the legalities involved. The manual also summarises the list of drugs that veterinarians in-charge need to procure prior to the transportation, thereby providing insights to personnel in non-range states to handle elephant-related issues in a better way. This, along with the manual on *Capture and Handling of Free-Ranging Asian Elephants*, thereby aims to provide a comprehensive overview on capture (for translocation or captivity, in emergency situations), handling, and transportation of Asian elephants, ensuring better preparedness among managers and officials associated with human–elephant conflict management.

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Glossary

| | |
|---------------------------------|---|
| Kumki | Trained captive elephants that aid in managing wild elephants in operations such as driving, capturing and training |
| Musth | A period of increased sexual activity of adult males marked by surge in plasma testosterone levels, temporal gland secretion (viscous fluid secretes from a small orifice near the eyes), urine dribble and in general, heightened aggression (Rasmussen et al. 2002) |
| Mahout | Elephant trainer and attendant |
| Kavadi | Deputy of a mahout who performs tasks such as fodder cutting, assisting bathing elephants, and taking care of elephants in the absence of the mahout |
| Bull elephant | An adult male elephant |
| Cow elephant | An adult female elephant |
| Kraal | An enclosure for confinement of elephants. Kraals are usually of 12' x 12' x 12' dimension and are used to hold elephants for training purposes |
| Lactating females | Female elephants that produce milk and suckle calves |
| Drug induction | The time taken for the drug to take the desired effect on the elephants |
| Translocation | Movement of elephants from one site to another for conservation or conflict management purposes |
| Captivity | Held captive. Wild elephants that are held in captivity are firstly trained (for a few months) and then held in forest camps, rehabilitation centres, zoos and others |
| Rehabilitation or rescue centre | A camp facility where elephants captured or rescued from the wild are trained and held captive. In some rare cases, the elephants may be temporarily held for medication and released back into the wild |
| Nursing females | Lactating adult female elephants with dependent offspring |
| Allomother | Individual females other than biological mother that foster young elephants |

Appendix I – Examples of transportation from other elephant range states/countries



Elephant crated for transportation by sea (Andaman & Nicobar Islands)



Transportation of an elephant by a boat in Peninsular Malaysia



Elephant crate being hoisted onto truck in Madhya Pradesh, India