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Research Article
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Case Study of the Rescue and Release of a Female Elephant and Calf that Strayed into Jagatpur, Odisha, India

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Abstract. In September 2022 two adult female elephants and a calf strayed into the city of Jagatpur, Cuttack, Odisha, triggering intense human elephant conflict. Following a tragic barrage accident that killed one female, the surviving adult was immobilised and transported to the Kapilash Rescue Centre. Subsequently, the calf who independently navigated back into forested habitat, was also darted and transported to the centre. After comprehensive veterinary care, both were translocated to the Kandhara Reserve Forest and released. Post-release monitoring showed stable movement, strong mother and calf bonding, and successful reintegration.

Background

The State of Odisha holds about 2000 wild Asian elephants (*Elephas maximus*), which is about 74% of the elephant population in eastern India. Elephants are found in around 65% of the State. The Maniabandha-Jhinkala Reserve Forest, Kapilash Sanctuary and the adjacent Reserve Forests (RF) of Patapuri, Megha, Lahada, Gondia, Deogan, Ramei and Aswakhol, located in the Dhenkanal District, together with the Charbatia, Dalijod and Brahmapur RFs located in the Cuttack District forms a single landscape with elephants. Elephants move around these forests and also cross the Mahanadi River into the Chandaka Wildlife Sanctuary situated in the Khordha District. Jagatpur is an industrial town located in the Cuttack District. It lies near the Mahanadi River about 10 km from Cuttack city.

On 27th September 2022 night, three elephants, consisting of a juvenile about 5 feet tall and 2 adult females, strayed into the urban area of Cuttack. The elephants crossed the Birupa branch of the Mahanadi River, close to the Jobra barrage around 3 am and entered the densely populated Pondasahi colony of Cuttack. There was a lot of commotion as people spotted the elephants, resulting in the elephants getting separated from each other and an elderly lady getting killed by one of the adult females. Then this female was chased along roads and moved further into town. Another person was killed in the melee and 3 persons were injured. The other adult female and calf moved back to the river and crossed back into Cuttack town at a point upstream of the Jobra barrage. On encountering people on the other side also, they moved back into the river and tried to retrace their path. The calf slipped into one of the open gates of the Jobra barrage and was carried downstream. The adult female got stuck in the gate and drowned. This was about 5:30 am. The calf subsequently got out of the river and stayed in the riverside vegetation. The female that moved into town was there the whole day and continued to be chased around the streets.

Information from previous sightings suggested that the three elephants had moved from the Dhenkanal Kapilash Sanctuary to Baniabandha RF, in the Khuntuni range of Attagarh Division (Fig. 1). They were identified in Mahabirod range inside Dadraghati RF on 3rd September 2022 and moved downstream along the Brahmani River. On 14th September they crossed the Brahmani River at Sogar in Khamakya West range and entered Dhenkanal range. They stayed for one week in Megha RF and then moved into Kapilash Sanctuary moving along the railway tracks. On 23rd September they entered Baniabandha RF which is adjacent to

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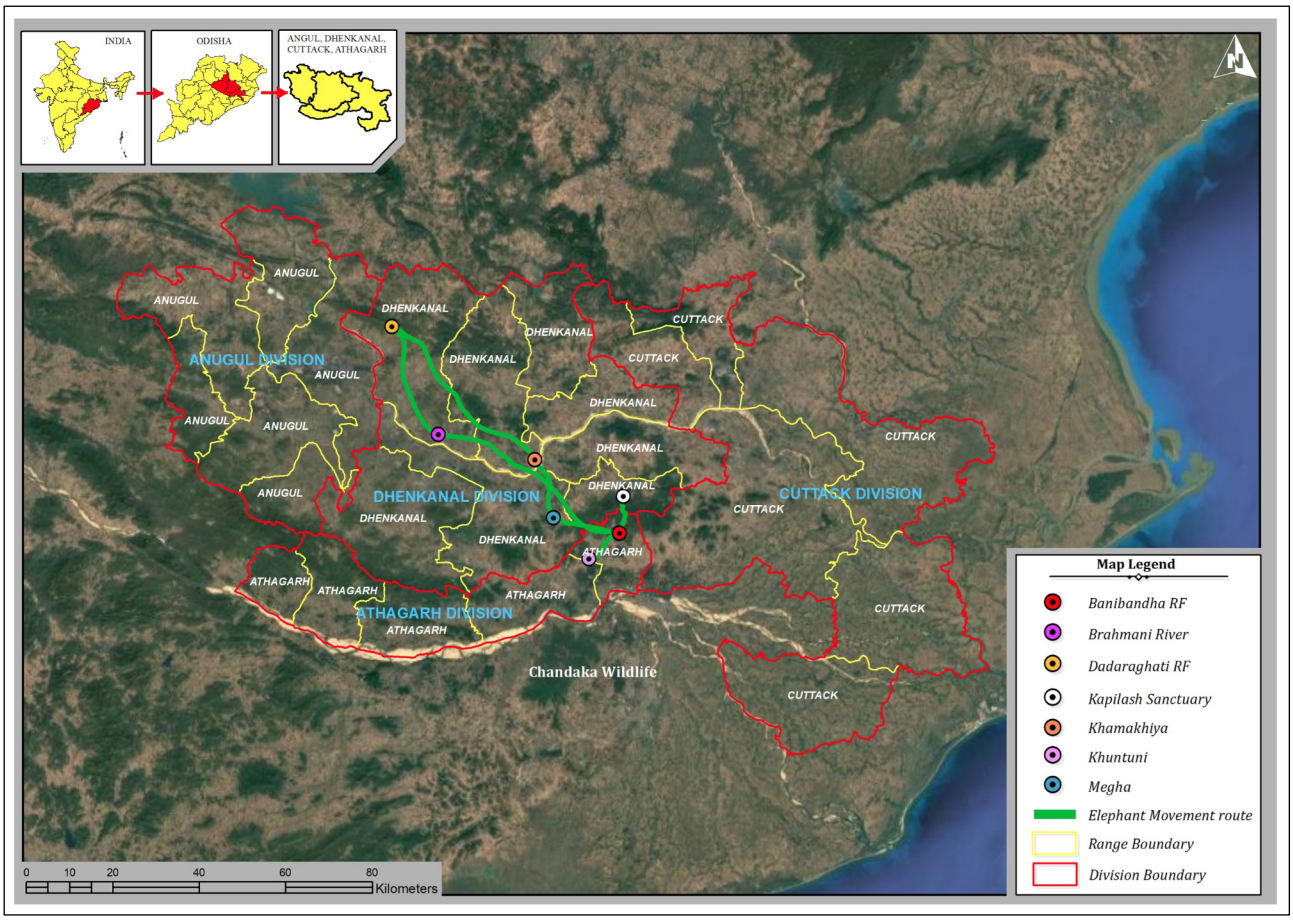

Figure 1. Movement data of elephants, based on sightings.

Kapilash Sanctuary inside Attagarh Division. There was another group of 17 elephants at the time, but the 3 elephants were moving separately. The Attagarh Division squad tried to drive the elephants back to the forest when they entered the Khuntuni habitation but were unsuccessful. The elephants continued to stay in small forest patches in the fringes of the town.

The female in the city was tranquilised by the City Forest Division at Jagatpur Industrial estate with the help of the Nandankanan Zoo veterinary team headed by Dr. Gupta on the 28th September around 4:30 pm.

The next day early morning, she was loaded onto a truck (Fig. 2), using a crane and belts, and brought to Kapilash Rescue Centre and put into a kraal (Fig. 3). She measured 238 cm at the shoulder. She came out of sedation and was active on 29th September morning and tried to break out. She took water but did not eat the *Ficus bengalensis* feed provided. On 29th evening she fed on banana stems and leaves. On the 30th she was relatively calm and ate more. She had a cut injury on the lower portion of the trunk and several superficial abrasions on the body, probably inflicted when she broke through a barbed wire fence, which were treated. She was lactating and it was noted that milk had oozed out of the mammary glands while strapping and lifting her at Jagatpur. She was kept in the kraal until 3rd October when she was moved out for release.

Rescue of the calf

The calf was initially left out in Jagatpur and kept under observation. It moved from Jagatpur

Figure 2. Loading the adult female.

Figure 3. Unloading the adult female from the truck and moving her into the kraal.

on 28th September evening to the Haripur Dam area and entered the Kapilash Sanctuary from Chattigarh side on 30th September night. At about 3 am on 1st October it moved close to a resident group consisting of 2 females and a calf less than 1 year and followed them. At about 7 pm it entered paddy fields at Sorisipada village bordering the sanctuary. After about one hour it moved towards the north and entered Ramei RF passing through Jamunali village, moving along a village road. The calf moved along the villages of Jamunali and Deojhar and reached the Gundraposi Dam back waters. From here it moved into paddy fields and fed. It stayed in the fields till about 5 am and then started retracing its path back and reached Gundraposi dam dyke, from where it entered some cashew fields inside Ramai RF by daybreak.

It was then decided to capture the calf. In the evening of 2nd October, it was expected that the calf would once again move along the previous day's path to the paddy fields. A spot was identified where the elephant was expected to cross a culvert over a canal, to reach the paddy fields. The team consisting of DFO Dhenkanal, ACF, Veterinarian Dr. Kishore Sahoo and a biologist were positioned at the culvert by 5:30 pm. The calf came out of the cashew fields around 6 pm and took the path towards the culvert. It was expected the calf would enter the culvert and a shot could be taken on the left thigh. But as it became dark, a torchlight had to be focussed on the calf, and it charged towards the team. Consequently, he was shot on the right shoulder. After the shot, the calf moved for about 150 m before becoming immobilised. The needle was firmly lodged in the shoulder and could not be pulled out. The pliers with the team did not help. Therefore, an incision was made, and the needle was finally removed using needle-nose pliers. The incision site was stitched immediately. The process was done during lateral recumbency of the animal. The calf was walked in sedation with the help of a JCB (loader-excavator machine) on to a truck and taken to Kapilash Rescue Centre. The calf reached the rescue centre by 8:30 pm, was kept chained about 15 m from the kraal with the female and showered with water.

Observation on the behaviour of the calf

After coming out of sedation, the calf tried to pull itself free from the chains. It succeeded in removing the screw of one of the chains by using its trunk. It calmed down when a sub-adult male elephant was brought near it (Fig. 4). The calf was fed *Ficus bengalensis*, banana stems and leaves and thereafter slept in lateral recumbency for 3 hours. It made stomach rumblings which were responded to by the adult female and by a male that was held in a boma at the rescue centre (a tusker which killed about 30 humans and was captured from Talcher Forest Division 3 years ago and kept in a 3-ha area). After the calf was brought, the adult female stopped feeding and tried to reach the calf. It was not

Figure 4. Calf interacting with other captive elephants.

known if the calf belonged to the dead or the captured female. However, the captured female was lactating and the behaviour of the elephants indicated that the calf was likely hers.

Decision to release the elephants in the wild

A number of locations for the release of the elephants were considered.

1. Near the last forest area elephants were located, at the boundary of the Kapilash Sanctuary and Maniabandha RF

This site was very close to the rescue centre. But the landscape was highly fragmented and National Highway 55, Railway lines and an industrial area were adjacent. The elephants had moved out from this area and entered Khuntuni town. It was thought that if they were released here, they may once again enter human habitations. Also, the possibility that they were unlikely to belong to this landscape and the failure of a previous attempt to release elephants here because of public protests were considered.

2. To release in a distant place at Kandhara RF of Hindol Range with the adjacent landscape of Olaba RF and Satkosia Tiger Reserve

Here a previous elephant release was successful. The forest had plentiful vegetation and perennial water. With a large extent of forest area, the elephants were thought unlikely to stray into human habitations immediately after the release. The public could not interfere with the release as the site was interior. However, the site was in a different landscape. Since the female elephant was about 35 years old, there was a possibility that she may try to return to her original home-range.

3. Release back at Dadraghati forest where they were previously identified

These forests were the landscape the elephants were from. The area was highly fragmented and there was high crop depredation. They would have to be transported 120–150 km and since it was Durga puja time, several traffic congestion points would have to be negotiated in the transport. The transport and release could not be kept secret and there was every likelihood the public would stage protests and not allow the release of the elephants.

Considering the above options, it was decided to release the elephants in Kandhara RF. The site had perennial streams and bamboo, climbers, grasslands, and diverse trees. There was an existing ramp for release of the elephants. If the elephants started to move away from Kandhara Forest there were connecting corridors, which they could use without coming into conflict. The site was about 75 km from the rescue centre and the transportation could be done in 2 hours.

The transportation was planned for 3rd October night. It was decided to load the elephants on to the vehicles by 11 pm and start moving by 12 midnight. The site of release could then be approached by around 3 am and the animals released by 5 am.

Preparation for the transportation

Only 4 persons were intimated on the release planning: DFO Prakash Ch. Gogineni, ACF Subrat Patra, Dr. Kishor Ku. Sahoo veterinarian and Swarup Fullonton zoo biologist. The ACF was involved in the preparation of the vehicles for carrying the elephants. Two trucks were hired and modified by removing the back door and welding hooks for chaining. A veterinarian and biologist monitored the elephants' feeding the whole day. The body temperature, respiration rate, blood oxygen saturation, signs of any external injuries and overall health conditions were checked, a trunk wash done and blood collected for analysis.

A Dan-inject tranquilising gun and a 10 ml dart was used to dart the calf. Additional drug delivery to the female and the calf was done by Dan-inject Jab stick.

Tranquilisation and loading of the elephants on to the vehicles

The calf was tranquilised and loaded on to the vehicle by pulling with ropes and chains. The operation started at 10 pm and was completed by 11 pm. Then the female was tranquilised and

loaded on to another vehicle (Fig. 5). The process was completed at 12:30 am. Both the elephants were marked with a small white identification mark and microchipped behind the left ear lobe. Meanwhile it was noticed that the calf was in lateral recumbency, and the body temperature had risen, due to a lapse in showering with water while the female was being loaded. Immediately the calf was showered with water, upon which it stood up and all the parameters were found to be normal. The team was ready to move by 1 am.

Transportation of the elephants

The two vehicles with the elephants were accompanied by 5 additional vehicles with Forest Department staff, totalling about 25 persons. On the way the vehicle was stopped thrice for monitoring the health of the animals. The ACF had coordinated with the Electricity Department to switch off the power in stretches as the vehicles moved to prevent any mishaps. The vehicle platform height was about 2.1 m. making the total height of the elephant while on the vehicle about 4.9 m. If it extended its trunk, it could reach a height of around 6.7 m. This would potentially put village electric supply lines on roadsides within reach of the elephant, particularly because sagging of electric wires occurred in some areas.

The vehicles stopped between Dhenkanal and Bhapur road as the power was not switched off and the personnel in charge were not responding. As the vehicle stopped, the female elephant became restless, started trumpeting and got excited and another dose of tranquilisation drugs was given. After a 25 min halt the vehicles started to move again. The rest of the trip was completed without any problem and the forest road at Kanaka was reached at about 5 am. Meanwhile there was drizzle from 2 am onwards and the intensity of rain increased as the vehicles climbed the road with increasing elevation. The vehicle carrying the calf skidded off the track and the tyre sank into soft earth (Fig. 6). Efforts were made for an hour to try and move the vehicle out but failed. Meanwhile the rain became heavier, and the road became very dangerous for any further movement of the vehicles. A JCB was procured for pulling the vehicles out

Figure 5. Female loaded on the truck.

but could not reach the stuck vehicle for some time because the earth adjacent to the road was very soft. Since 5 am the animals were active, and health parameters were checked. Another round of tranquilising drugs was given to keep them calm while the JCB was working. After the JCB reached the stuck vehicle, all efforts were made to move it out, but the JCB also failed. At 10 am the decision was made to release the animals.

Release of the elephants

At this time the vehicles were about 2 km away from the intended release site. The location of the vehicles was in a flat area and the nearest water sources were at about 2 km away uphill and 5 km down-hill. It was not possible to move the vehicles further as the heavy rain had made the road dangerous for movement of heavy vehicles. The JCB started on making a ramp with soil dug from adjacent to the road at about

Figure 6. Vehicle stuck on the road.

10 am. First the ramp was made for the vehicle with the calf and then for the other. Each took about 25–30 min.

The calf was once again given a tranquilising dose and then brought down the ramp. While bringing down, the calf fell sideways, and its chest region hit the edge of the truck. The fall happened because there was a sight gap between the ramp and the truck body, which was not noticed. The calf stopped breathing, and the doctor immediately injected the revival injection and heart pumping was done. After about 2 min the calf began respiration and stood up. Relieved, the team got back to work. The calf was fastened to a nearby tree and was slowly becoming active (Fig. 7).

Meanwhile the ramp for the female was completed. The female was tranquilized, moved down the ramp (Fig. 8) and antidote administered at about 12 noon.

Observation after the release of elephants

The calf which had become very active was freed without any restraint. The calf turned towards the female, crossed the other vehicles and reached her. On seeing the calf, the female moved towards it, taking a few steps while sedated (Fig. 9). The calf lost balance and lay down in lateral recumbency while the female stood adjacent to the calf and felt it with the trunk. The doctor confirmed both individuals were in good health and the calf was breathing properly.

After 2 hours the female became quite active, and the team decided to leave the site. A group

Figure 7. Calf being tied to a tree.

Figure 8. Unloading the adult female.

of 4 persons were left behind to observe the animals.

The observers at the site reported that the calf woke up from sleep at about 9 pm and moved uphill towards the intended release site along the forest road. In the morning the staff once again reported both animals were sighted near the Nalah at Vejia.

Post release tracking and behaviour

Both the individuals were observed and tracked in the ensuing days. The animals on the second day moved actively and travelled around 8 to 10 km, exploring Kandhara RF. They stayed together the next week near a water body in Kandhara RF. Two resident herds were present nearby, but they did not mix with the herd. After about 15 days they moved south into Attagarh division of Olaba RF. The last sighting was reported after 2 months from Nuagad RF in Attagarh Forest Division near a village when they were seen feeding on the edge of a crop

Figure 9. Female and calf after release.

field, about 30 km from the release site towards the south and near the Satkosia Sanctuary.

Details of drugs used

Male calf

With respect to its size, the male calf was estimated to have a body mass of around 650 kg.

For capture, the calf was immobilised with 150 mg Xylazine HCl (1.5 ml, "*Xylamed 100 mg/ml – Bimeda*") and 100 mg Ketamine HCl (1.0 ml, "*Ketamina 100 mg/ml – Biowet Pulawy*"). Both drugs were administered as a mixture by Daninject dart projector, intramuscularly at 6:20 pm. The calf showed clear signs of sedation by 6:40 pm.

Antibiotic treatment consisted of 6750 mg Ceftriaxone and Tazobactam ("*Intacef-Tazo 3375mg – Intas*") and 3200 mg Enrofloxacin (32 ml, "*Flobac SA – Intas*"), both administered intramuscular by hand injection through a 20 ml syringe. As anti-inflammatories 75 mg Flunixin Meglumine (15 ml, "*Flunimeg – Zydus AH*") was given by intramuscular route by hand injection. The skin lesion created by darting was topically treated by infusing 6 ml of Penicillin Ointment ("*Pendistrin SH – Zydus AHL*"). Sedation was reversed by injecting 15 mg Yohimbine (1.5 ml, "*Yohimbe – Equimed USA*") intramuscularly.

After reversal at 7:00 pm, it took the calf 3.5 h to fully recover.

For loading on the truck, the calf was sedated with 120 mg Xylazine HCl, 80 mg Ketamine HCl and 1.8 mg atropine sulphate (3.0 ml, "*Tropin 0.6 mg/ml – Neon lab Ltd*"). All the above drugs were administered intramuscularly as a cocktail through a jab stick at 10:15 pm. The elephant was completely under standing sedation within 15 min.

Furthermore, 12 mg of Dexamethasone (3.0 ml, "*Dexona Vet – Zydus AHL*"), 300 mg Etofylline & Theophylline (6.0 ml, "*Deriphyllin – German Remedies*") and 2 mg Adrenaline Bitartrate (2.0 ml, "*Vasocon – Neon*") were administered by intramuscular route. Sedation was reversed by injecting 12 mg Yohimbine intramuscularly. Full recovery took 3 h.

The male calf was unloaded from the truck at 10:45 am on the following day. During release the elephant was again sedated by the use of 100 mg Xylazine HCl, 100 mg Ketamine HCl and 16 mg Hyaluronic acid (2 ml, "*Hytas One – Intas*") administered as cocktail by jab injection. In addition, 1000 mg Ceftiofur Sodium injection (1 g, "*Xyrofur 1 – Intas*"), 3200 mg Enrofloxacin and 75 mg Flunixine-meglumine were administered intramuscularly. Rehydration was achieved by intravenous administration of 500 ml normal saline infusion.

Female elephant

The adult female's body mass was estimated to be around 4000 kg.

For capture and loading, the adult female was sedated with 350 mg Xylazine HCl and 150 mg Ketamine HCl by intramuscularly as cocktail through jab stick at 11:05 pm. The elephant showed signs of complete sedation at 11:20 pm. During transportation, a top-up of the sedatives was done by jab stick injection consist of 300 mg Xylazine HCl and 200 mg Ketamine HCl for smooth transportation.

For the process of unloading and release, the female was sedated again using 300 mg Xylazine HCl, 300 mg Ketamine HCl and 24 mg Hyaluronic acid by intramuscular jab stick injection. Sedation was reversed with 30 mg yohimbine intramuscularly. Reversal took about 2 h.

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