



INDIAN RHINO VISION 2020

ATTAIN A POPULATION OF 3000 WILD RHINOS
IN ASSAM DISTRIBUTED OVER SEVEN OF ITS PAS
BY THE YEAR 2020

BOMA / ENCLOSURE TEAM

FINAL REPORT

Laokhowa - Burhachapori Complex

Prepared by

P. Sivakumar, Bibhab K. Talukdar, Kaushik Barua

Hiten K. Baishya & Smarajit Ojah

December 2013

BOMA / ENCLOSURE TEAM REPORT
for
Laokhowa Burhachapori WLS Complex

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(P. Sivakumar)



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GOVERNMENT OF ASSAM
OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS, WILDLIFE, ASSAM,
BASISTHA, GUWAHATI-29

No. WL/FG.41/ Rhino Translocation/ 2005

Dated Guwahati, the 29th October, 2013

As decided in the meeting of the Task Force for Translocation on Rhinos within Assam dated, 28th October 2013 the team for the Rhino Boma / Enclosure preparation at Burachapori WLS under IRV2020 is constituted as follows –

- | | |
|--------------------------------------|----------|
| 1. DFO Nagaon WL Division | - Leader |
| 2. Sri. Bibhab K. Talukdar, Aaranyak | - Member |
| 3. Sri. Kaushik Barua, AEF | - Member |
| 4. Sri. Hiten K. Baishya, WWF-India | - Member |
| 5. Sri. Smarjit Ojha, LBCS | - Member |

Terms of Reference :

1. The team will be responsible for designing of the boma, implementation of the design during execution of the works and continued monitoring and technical inputs for proper maintenance and functioning of the boma as required for the safety of the rhinos under the IRV2020 program.
2. The team will work under the supervision and guidance of the COO, TCC.
3. The team will obtain necessary advise from veterinary experts at CWRC, Bokakhat & CVSc Khanapara for the design.
4. The team may also take the help of individuals to accomplish necessary activities.
5. The team will be supported from the IRV2020 program for their operation.
6. The team will submit their suggestions regarding the boma design, execution plan and along with a tentative budget to the COO, TCC within 20th November 2013

[Suresh Chand, IFS]

Principal Chief Conservator of Forests (Wildlife)
and Chief Wildlife Warden, Assam
and Chairman, Task Force for Translocation of Rhinos within Assam

Copy to,

1. The PCCF & HOFF, Assam, Rehabori, Guwahati for his kind information.
2. The COO, TCC.
3. All members.
4. Sri. Amit Sharma, WWF-India for necessary co-ordination and facilitation.

[Suresh Chand, IFS]

Principal Chief Conservator of Forests (Wildlife)
and Chief Wildlife Warden, Assam
and Chairman, Task Force for Translocation of Rhinos within Assam
Basistha, Guwahati - 29

IRV-2020
RHINO BOMA / ENCLOSURE PREPARATION
Laokhowa Burhachapori WLS Complex
FINAL REPORT

INTRODUCTION

The Task Force for Translocation of Rhinos within Assam, at a meeting on 28th October, 2013 constituted a team for the preparation of Rhino Boma / Enclosure at Burhachapori WLS under Nagaon Wildlife Division under IRV-2020. The initial proposal for translocation of rhinos to Laokhowa and Burhachapori WLSs was submitted by the DFO, Nagaon Wildlife Division and subsequent assessment reports were submitted by the Habitat and Security Assessment Committees favouring translocation of rhinos to the complex. The primary responsibility of the Rhino Boma / Enclosure Team was designing of the boma, implementation of the design during execution of the works and continued monitoring and technical inputs for proper maintenance and functioning of the Boma as required, for the safety of the rhinos under IRV-2020 programme.

SITE VISIT

The Rhino Boma / Enclosure Team consisting of the DFO, Nagaon Wildlife Division, Sri Bibhab Talukdar of Aaranyak, Sri Kaushik Barua of AEF, Sri Hiten K. Baishya of WWF-India and Sri Smarajit Ojah of LBCS conducted 3 (three) site visits on the following dates on November 16, 2013, December 2, 2013 and December 3, 2013. In between, Sri P. Sivakumar, DFO Nagaon Wildlife Division and Sri Smarajit Ojah made 4 more visits to follow-up work pertaining to fence alignment and mapping.

STRATEGY

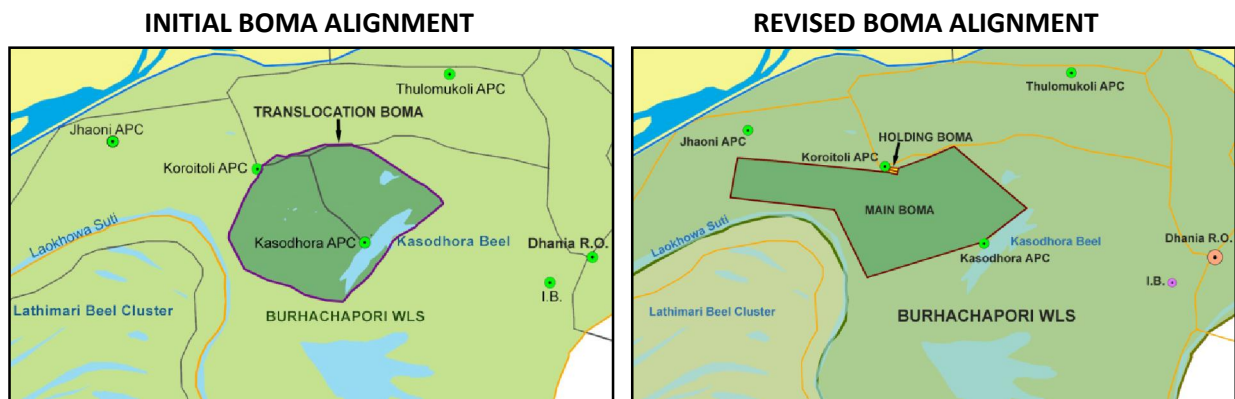
The Team which was constituted by the Rhino Task Force to finalize the Boma details at Burhachapori WLS, to hold translocated rhinos under IRV 2020 has taken into consideration the following before drawing out the final design –

1. Proximity to existing patrol roads/paths and camps.
2. Water source – both existing and developable.
3. Natural Food Source.

4. Habitat – to ensure maximum replication of rhino habitat within a controlled area keeping in view flooding during monsoons.
5. Terrain – to ensure constructability, durability, ease of maintenance and effective functioning of the electric fence.

REALIGNMENT OF THE RHINO BOMA / ENCLOSURE

The Boma team, after its first field visit on November 16, 2013 decided that there should be certain changes to the initial 1 sq. km area selected for the construction of the Boma. The initial alignment included a major portion of the Kasodhora Beel in Burhachapori WLS. However the Boma team felt that inclusion of the Kasodhora Beel would pose significant technical obstructions in the construction and alignment of the electric fence. Moreover the cost incurred in construction of the electric fence to include the Kasodhora Beel would be very high. In this backdrop, the team decided to exclude the Kasodhora Beel and align the boundary along the western end of the Beel. Further, the team explored the grassland between Koroitoli and Jhaoni area of Burhachapori and decided that there is adequately suitable habitat in this area for rhinos. Therefore, the team decided to extend the Boma up to the Jhaoni region of Burhachapori WLS.



BRIEF OVERVIEW OF THE HABITAT INSIDE THE TRANSLLOCATION BOMA

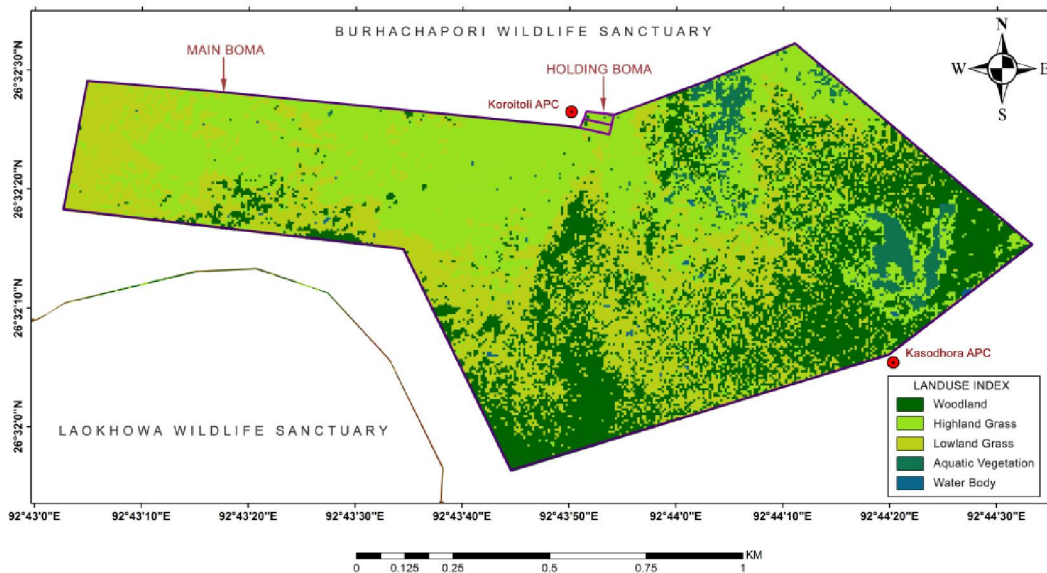
The habitat of the proposed 1.39 sq. km Boma for holding the rhinos has overall domination of grassland vegetation. Based on the percentage of occurrence, the dominant grass species are - *Imperata Cylindrica*, (*Ulu Kher*), *Saccharum elephantinus* Robx. (*Borota kher*), *Vetiveria zizanoides* (*Birina*) and *Hemarthria compressa* (*Locosa ghanh*). The eastern part of the boma has comparatively more woodland coverage with dominant tree species being *barringtonia acutangula* (*Hijal gach*, freshwater mangrove). The western part, on the other hand, has more of a parkland topography of scattered isolated trees dominated by species like

Ziziphus jujuba Lamk. (*Bogori gach*) and Albizzia procerae.benth (*Koroi gach*). The elevation of the western part of the Boma is comparatively higher than the eastern part. The overall inundation during high flood in the western part seems to be not more than 1-2 feet. A number of isolated water bodies dot the entire area, most of which, however, are non-perennial in nature. These water bodies are being used by animals like the Asiatic Wild Buffaloes for wallowing.

HABITAT DEPICTION OF THE TRANSLOCATION BOMA



LAND USE / LAND COVER MAP OF MAIN AND HOLDING BOMA

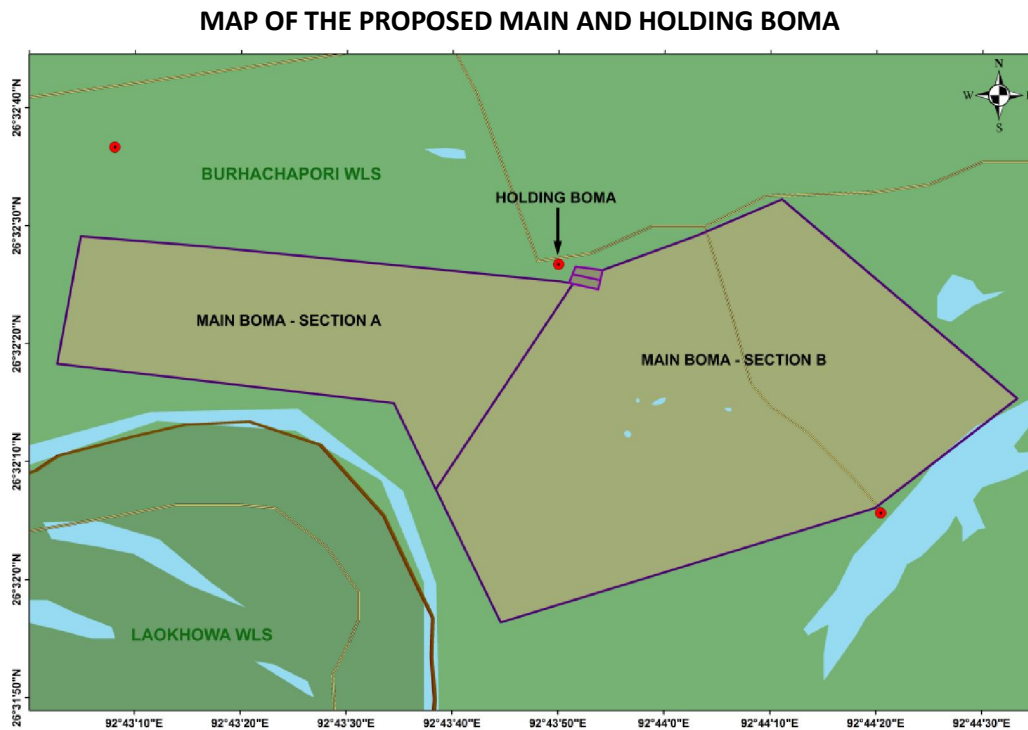


TRANSLOCATION BOMA DESIGN LAYOUT

The Boma / Enclosure for housing the translocated rhinos should be divided into two basic parts -

- a. Holding Boma &
- b. Main Boma.

Since rhinos would be translocated straight from the wild, it is suggested to release them to a Holding Boma first and keep them there for about 60 days before releasing them into the Main Boma. This would get the rhinos oriented to an electric fence situation and contain them within the permissible perimeter of the electric fence as far as possible. The translocated rhinos should be moved into the Main Boma after approximately 60 days, once they are seen to be adapted to the desired levels of response to an electric fence.



AREA AND PERIMETER MEASUREMENTS OF MAIN AND HOLDING BOMA

BOMA	Area			Perimeter			
	Total	Section A	Section B	Total	Section A	Section B	Intermediate
Holding Boma	38826 sq.ft.	18729 sq.ft.	20097 sq.ft.	812 ft.	421 ft.	391 ft.	242 ft.
Main Boma	1.39 sq.km	0.45 sq.km	0.94 sq.km	6.07 sq.km	2.78sq.km	3.29 sq.km	0.65 sq.km

HOLDING BOMA DESIGN LAYOUT

An area of 38825.87 sq. feet (3607.1 sq. m.) in front of Koroitoli APC of Burhachapori WLS is to be used for construction of a Holding Boma. This Boma would have a division, A and B, in between so as to hold two pairs of rhinos in each section. Holding Boma A Section will have a total area of 18728.92 sq. feet (1739.9 sq. m.) and Holding Boma B Section will have a total area of 20097.29 sq. feet (1867.1 sq. m.). The total perimeter of the Holding Boma will be 247.6 meters.

The Boma would consist of concrete pillars of the size 8inch x 8inch / 10 inch x 10 inch and further strengthened depending upon impact points. The concrete pillars would be 12 to 15 feet apart from each other. These pillars would be of 6 feet height and grouting length would be 3 feet. The pillars would have a concrete base and wherever required should also have tie beams to increase impact stress. There will be five holes in each pillar. Through each of these holes, $\frac{3}{4}$ inch steel cable of 3 ton capacity would pass horizontally. $\frac{1}{2}$ inch steel cable cables will be fixed vertically along the $\frac{3}{4}$ inch steel cable at a distance of 12 inch so as to create a fortified mesh. The concrete pillars would have provisions both inside and outside to attach components to secure an electric fence wires.

There will be six strands of charged wire inside along with a trip wire. The power units for the electric fence will be housed in Kasodhora APC. A trip wire will be placed in the inner side of the Holding Boma, and will be 2.5/3 feet away from the fence and at a height of about 12 inches above ground. Outside the Holding Boma, there will be three strands of electric fence wire to keep wild elephants away. The Holding Boma would also have a passage in between to connect both the sections. This passage will have a secured sliding door which can be operated manually.

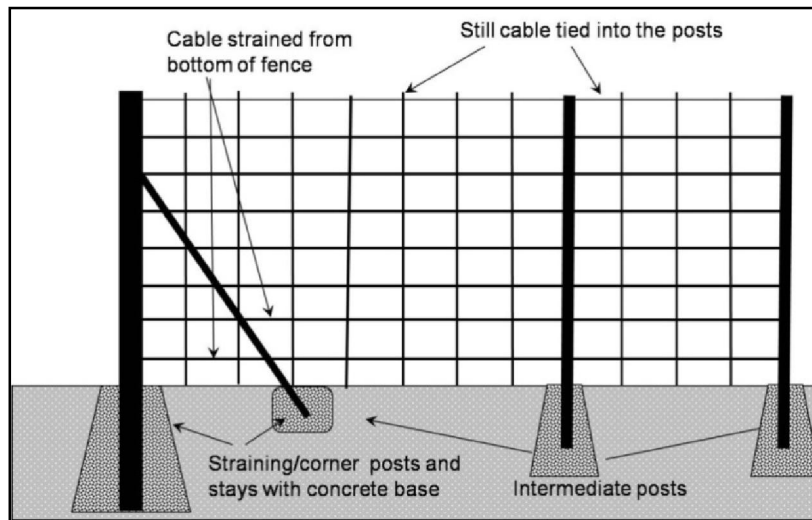
The wall dividing the two sections of the Holding Boma will also be made up of steel cables and shall have six strands of electric fence wire along with a trip wire on both sides. This is to ensure that Rhinos housed in the two sections of the Holding Boma will maintain a safe distance from each other.

The Holding Boma will have a separate energizer system and the Main Boma will also have a separate energizer in place. The trip wire and the outer three strands will have separate power units. In addition, the trip wire may be fitted with alarm so that warning alarms are sounded in case of any breakage.

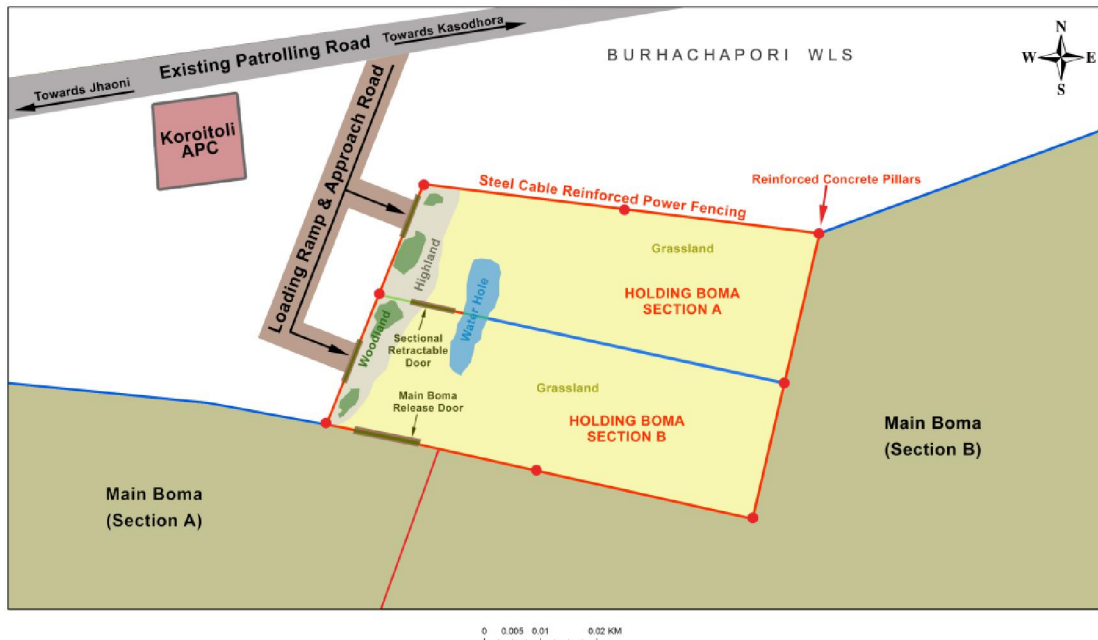
Two water holes will be developed inside both the sections of the Holding Boma for drinking water and wallowing space for the rhinos. In times of need water will be supplied from external sources such as making provision of electric water pump at Koroitoli APC.

The Rhinos would be released into the Holding Boma through an elevated loading ramp. This being done to ensure that during release they cannot turn around and get out of the Holding Boma. The Holding Boma will also have a temporary two strand electric fence fitted onto bamboo poles to halt the initial charge of the released rhino. This Holding Boma will share two walls with the Main Boma. One sliding release gate will be located to the southern wall of the Holding Boma from where the translocated rhinos will eventually be let out into the Main Boma.

DIAGRAM OF THE STEEL-CABLE REINFORCED ELECTRIC FENCING OF THE HOLDING BOMA



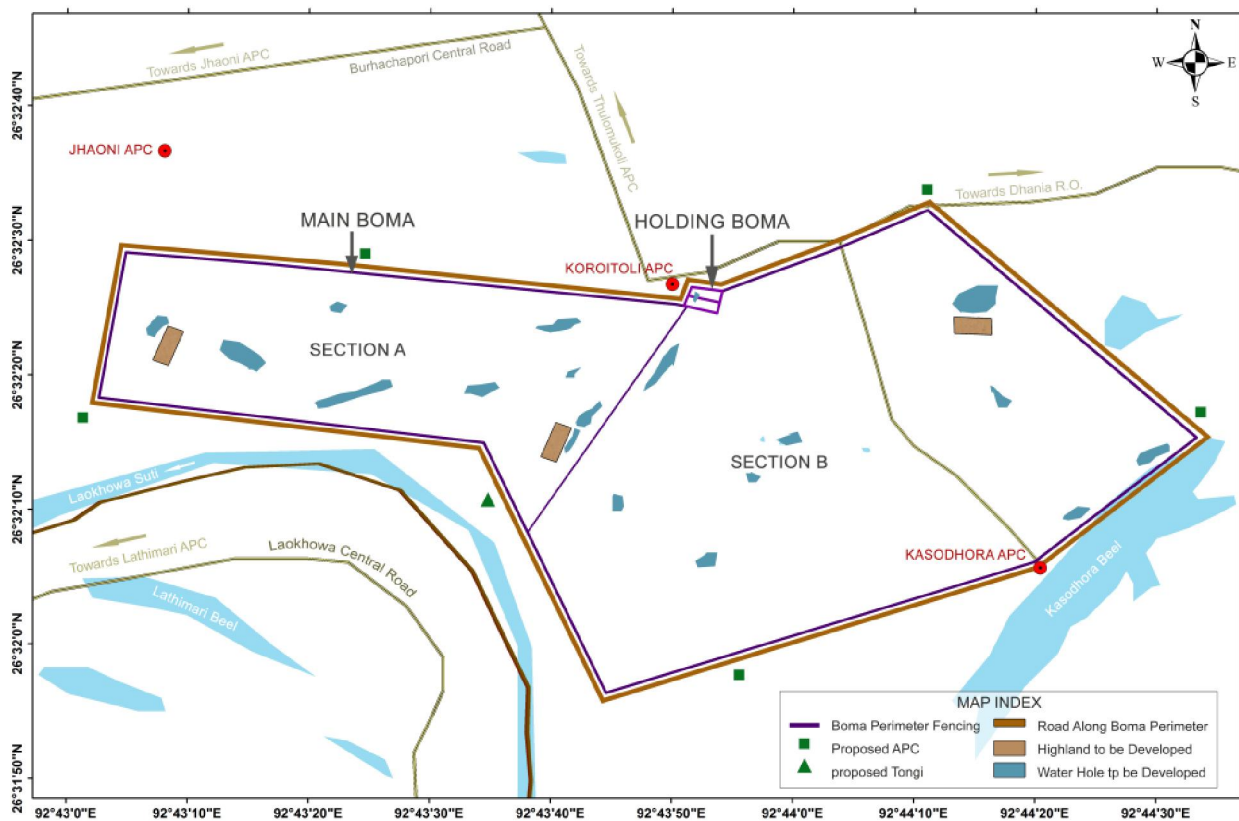
LAYOUT MAP OF THE HOLDING BOMA



MAIN BOMA DESIGN LAYOUT

The Main Boma will have a total area of 1.39 sq. km. The Main Boma will be located in the Kasodhora-Koroitoli-Jhaoni region of Burhachapori WLS. This Boma will be divided into two sections - Section A and Section B. Section A comprises mostly of grassland and is a comparatively highland area while Section B is a mix of grassland and woodland habitat with lower elevation as compared to Section A. During high flood (benchmark set against the flood of July 2013), the average inundation in Section A is between 1 to 2 feet. In Section B, high flood inundation ranges between 2 to 5 feet. However, flood water inundation up to this maximum level normally remains for a couple of days to a week at most. Based on these parameters, the Main Boma was divided in to two sections - A and B. During high floods, Section B will be closed off and the translocated rhinos will be held in Section A which would have 2 highlands. There will be provision to cut off power supply to Section B during high floods.

LAYOUT OF THE HOLDING AND MAIN BOMA SECTIONS



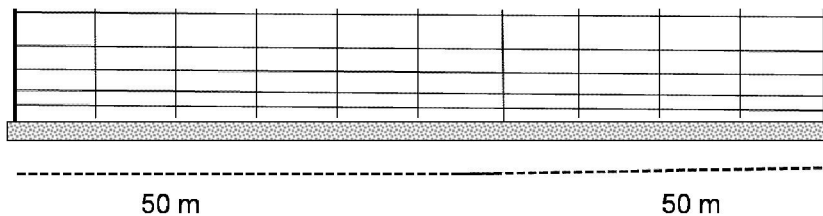
The Post of the fence will be a combination of both concrete and Iron posts. The concrete posts will be used as the strain or the corner posts and the intermediate posts will be iron post. The size of the concrete posts will be about 5 inch x 5 inch, 6 feet above the ground with 2 ½ feet grouting length. It is observed that the iron posts are more flexible and should be

more helpful to resist the impact by Rhino to a certain extent. All the posts will be covered with live wire in both the side so that they will be secured from outer as well as inner side from Rhino and elephants. The strain posts will be 50 meter apart from each other and in between 9 intermediate iron posts will be placed 5 meter apart from each other. The fence will be of 5 strands, the first strands will be at a height of about 1 foot above the ground level and the next three strands will be 1 foot apart from each other and the last strand will 1.5 feet apart from the 4th strand at a height of 5.5 feet above ground. There will be small sized holes drilled in the fence posts to attach the insulators for holding the fence wires.

In case of crossing the wetland or water logged area concrete check dams or spillovers with manually operated sluice gates wherever necessary shall have to be built for the fence to pass through those areas. During the survey it was found that at least in 5 locations concrete structures have to be made for the power fence to pass. The aggregate length of the area in 5 locations will be about 450 meters.

There should also be an exit door in the Main Boma. Further, a footpath along the entire Boma periphery will be constructed for patrolling as well as for facilitating the easy cleaning of the fence lines undergrowth. The entire vegetation along the fence and till a distance of at least 3 feet from the fence on either side have to be cleared and maintained as such for effective functioning.

LAYOUT OF THE FENCE DESIGN BOMA



DESIGN OF THE CONCRETE CHECK DAM SYSTEM



FENCE DESIGNS OF THE HOLDING AND MAIN BOMA



FOOT PATROL PATH ALONG THE BOMA FENCE WITH CLEARED VEGETATION



CONCLUSION

The Boma / Enclosure team undertaken extensive field work and repeated field visits in order to assess the best possible design layout for the rhino holding and main Bomas. The team had to make certain adjustments to the initial recommended Boma alignment due to the problem of construction of the electric fencing through unsuitable terrain, mostly involving crossing of the fence over a wetland body viz. Kasodhora. The team, after discussions and debates finalized the Kasodhora-Koroitoli-Jhaoni area of Burhachapori WLS for locating the Boma. The team also proposed the construction of a Holding Boma in addition to the Main Boma. The rhinos would be initially released into the Holding Boma. The Holding Boma would be fortified with additional security infrastructure and this Boma would be used to ensure that the rhinos adapt to the electric fences. After the rhinos adapt adequately to their new environment, they would be released into the Main Boma. The team has put forward a number of recommendations and designs for the construction of the Holding and Main Bomas. All possible efforts were undertaken by the team in order to ensure that the Bomas / Enclosures

are as foolproof as possible. Here, it must be pointed out that the proposed designs, at times, may warrant some amount of modifications and flexibility during field implementation, which will be determined by contingent situations during actual construction stage.

ACKNOWLEDGEMENT

We are thankful to all who has made this assessment possible. Our thanks to LBCS members, all the Range Officers and field staff of Laokhowa & Burhachapori WLSs, staff of the Divisional Office, Nagaon Wildlife Division and the Local Protection Squad members for their help and support during the habitat assessment.

BOMA / ENCLOSURE TEAM DURING FIELD VISIT



Field Inspection by the Boma Team along Forest Staff and LPS Members



Discussion on the Boma Alignment



Birds-eye View of the Boma Construction Site



Boma Team Members