





## MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE प्रयावरण, वन एवं जलवाय परिवर्तन मंत्रालय

## Central Zoo Authority

केन्द्रीय चिडियाधर प्राधिकरण

EMAIL & BY POST

F. No. 9-3/2011-CZA(NS) 2965/2018

By Post/Email DATE: 94,04.2018

Sh. Kartick Satyanarayan Co-founder, Wildlife SOS, D-210, Defence Colony, New Delhi - 110 024 (Email: kartick@wildlifesos.org)

Sub:- Research project titled "Study on utilization pattern by Sloth bear and enrichment requirement in non-conventional captivity" - regarding.

Ref:- (i) Your office letter no. /WSOS/ABRF/780 dated 06.07.2017.

- (ii) This office letter no. 9-3/2011-CZA(NS)/1035/2017 dated 07.06.2017.
- (iii) This office letter no. 9-3/2011-CZA(D)/2017/2016 dated 11.07.2016.
- (iv) Your office letter no. /WSOS-O46 dated 11.04.2016.
- (v) This office letter no. 9-3/2011-CZA(NS)/554/2016 dated 04.04.2016.
- (vi) This office letter no. 9-3/2011-CZA(NS)/6775 dated 03.03.2015.
- (vii) Your office letter no. nil dated 05.02.2015.
- (viii) This office letter no. 9-3/2011-CZA(NA)/2604 dated 10.04.2013.
- (ix) This office letter no. 9-3/2011-CZA(NA)/785 dated 10/14.05.2012.

The Central Zoo Authority had signed an MoU with Wildlife SOS organization for the above mentioned project to be completed within 24 months from 30.11.2011 for grant of Rs. 5.95 lakh. As per the MoU, the first installment for an amount of Rs. 3.00 lakhs (Rupees three lakhs only) was released to the Wildlife SOS during the month of November, 2011.

- 2. To assess the progress made towards achieving the project objectives, the Central Zoo Authority had requested you to submit annual progress report for the year 2011-12 vide reference (ix). However, no response has been received from your end.
- 3. The Central Zoo Authority again requested you to submit annual progress report for the year 2011-12 vide reference (viii). Again no response has been received from your end till 05<sup>th</sup> February 2015. The Wildlife SOS vide reference (vii) has submitted the utilization certificate for the first year grant and requested to release the balance amount of Rs. 2.95 lakhs towards the 2<sup>nd</sup> year of the study. Further, informed that the Utilization certificate has been send to the Central Zoo Authority during December, 2012 and December, 2013 with request to release the 2<sup>nd</sup> year grant. However, annual progress report of the research project has not been submitted.
- 4. In response to this, the Central Zoo Authority vide reference (vi) has informed you that as per the Article 5 of the signed MoU the 30% of the total approved grant will be released on the submission of the

E-mail: cza@nic.in, Website: http://www.cza.nic.in

first year progress report and appraisal by the Central Zoo Authority. Accordingly, the Central Zoo Authority has requested you to submit annual progress report for the project at the earliest. However, no progress report was submitted from your end.

- 5. The Central Zoo Authority vide reference (v) has again informed you that the progress report of the project has not been received from your end and requested to submit the detail final report of the project for approval on or before 15.04.2016 to this authority, or surrender the grant released towards the project with interest accrued to this effect.
- In response, the Wildlife SOS has submitted the progress report (2012-2013) of the project and requested to consider the release of the second installment of the approved grant vide reference (iv). The progress report has been reviewed at the Central Zoo Authority office. The observations and suggestions on the report were communicated to you vide reference (iii). It was also requested to complete the study as per the MoU according to methodology approved to achieve the aim of the project and submit a detail report again to the Central Zoo authority at the earliest for further necessary action. However, again no report has been received from your end in spite of one year duration.
- 7. The Central Zoo Authority vide reference (ii) again requested you to submit a pre-final draft report of the project as per approved methodology with in a period of one month for review and approval or surrender the earlier released grant towards the project with interest accrued thereon. The Wildlife SOS, New Delhi vide reference (i) submitted a revised report of the aforesaid study.
- 8. The pre final draft report has been reviewed at the office of Central Zoo Authority. It was observed that the amendments/suggestions communicated by the Central Zoo Authority earlier on the report vide reference (iii) were not incorporated in the report. The observations were also made on the report as per the signed MoU and the proposal approved for the carrying out the study. The observations are mentioned below:

S. No.	Objective as per MoU	Work conducted	Remarks
Article 1 (i)	The Sloth Bear Rescue Facility, Agra/ Wildlife SOS will take up all four objectives in study as mentioned in the proposal and will achieve the outcome as stated.	On perusal of the report, it was observed that four objectives mentioned in the proposal and MoU, have not been completely achieved. Although the efforts has been made towards achieving the objectives but the same has not been done completely on scientific pattern.	Not carried out as per the MoU.
		The proposal says that the Scan sampling will be carried out at intervals of five minutes and behavioural parameters such as animal location and few animal activities (Resting, playing, fighting, repetitive pacing, climbing, continuous rubbing, drinking, digging, vocalization, licking its paws, or other parts, eating, growling, etc. will be recoded in	

		predesign formats. However, the study says that the Scan sampling was carried out at intervals of 30 minutes and behaviour parameters such as animal location and few animal activities (Resting, Sleeping and Moving) has been recorded without any proper detailed analysis with regard to time frame. The use of predesigned formats used for collection of the data during the study is not clear, as no format has been enclosed/ referred in the report.	
Article 1 (ii)	The Sloth bear Rescue Facility, Agra/Wildlife SOS shall collect all relevant information of Sloth bear on behaviour ecology, enrichment & housing of sloth bear in captivity from individuals, libraries and internet.	It is not evident from the report that this objective has been achieved scientifically as only brief information on bear biology has been included in the report. The focus of the study should have been to collect information on behavior, ecology, enrichment and housing of Sloth bear in captivity.  However, the report does not include any detail relevant information of Sloth bear behaviour ecology, enrichment and housing of	Not carried out as per the MoU.
Article 1 (iii)	The Sloth bear Rescue Facility, Agra/Wildlife SOS will review existing enrichment practices, upkeep and veterinary care of sloth bear in Indian zoos and at abroad based on literature, and also implement feasible practices as proposed in the proposal. Review of the existing housing and enrichment practices would be one of the chapters of the proposed	sloth bear in captivity from individuals, libraries or internet.  As per the objective, review of the existing housing and enrichment practices would be one of the chapters of the proposed study. However, the report does not include any review regarding any existing enrichment practices of sloth bear in Indian zoos or even at abroad. The report only includes the enrichment activities done during the study in the ABRF, that also very briefly.	Not carried out as per the MoU.
	<u>study.</u>	enrichment practices, upkeep and veterinary care of sloth bear in Indian zoos and at abroad based on literature.  However, the report does not include any review in respect of upkeep and veterinary care of sloth bear in Indian zoos and at abroad based on literature. This should	

<u> </u>		hove been done for the reference	
Article 1 (iv)	The study may include all aspects which are directly or indirectly related to bring positive attitude in sloth bear behaviour, care and management e.g. activity pattern of animal, designing of enclosures, enrichment, veterinary care, and dietary etc.	have been done for the reference and use for other zoos for reducing the stress to animal and improve the health of the animal at respective zoos which is very essential for the animal welfare.  It was to carry out the aspects which are directly or indirectly related to bring positive attitude in sloth bear behaviour, care and management e.g. activity pattern of animal, designing of enclosures, enrichment, veterinary care, and dietary etc. This would be very useful & helpful to the other zoos housing the bear for the reference and welfare of the captive animals.	Not carried out as per the MoU and incomplete.
		However, as per the report it has been observed that nothing related to objective has been mentioned anywhere in the report.	
Article 1 (v)	The Sloth bear Rescue Facility, Agra/Wildlife SOS will prepare sloth bear management plan for such non-conventional power fenced enclosure to guide other zoos for similar & other species.	It was planned to study the utilization of solar power fenced enclosure by sloth bear so that a Management plan for nonconventional power fenced enclosure (sloth bear enclosure) to guide other zoos for similar & other species shall be prepared.	Not carried out as per the MoU and the study is incomplete.
		However, it has not been done.	
	Impact of the study should be reflected on bear behaviour through proper results comparing the upkeep with and without enrichment practices.	Bear behavior with enrichment has been mentioned in brief. However, the comparison with and without enrichment practices on upkeep of Sloth bear has not been done.	×
Article 1 (vi)	The Sloth bear Rescue Facility, Agra/Wildlife SOS shall take inputs or collaborate with various organizations e.g. Wildlife Institute of India, Sloth bear Expert Group of IUCN, and individuals in refining the methodology for collecting the information on enrichment and housing of Sloth bear and its utilization and utility of the study for Wildlife SOS and animal both.	It appears that no expertise input has been taken for the study from the Indian or the international specialists of the Bear species since it is not mentioned in the report. The study required consultation for technical inputs and collaboration in study with the Forest Department, Uttar Pradesh; Wildlife Institute of India, Dehradun and Sloth bear expert from Bear Specialist Group of SSC and IUCN to achieve the objective of the study.	Not carried out as per the MoU.

	However, it has been observed that no collaboration has been done with any expert, zoo or organization nationally or internationally for the study. It appears that even from the	
	study. It appears that even from the Wildlife Institute of India, expert on	
	the subject has not been consulted.	

9. The Research Proposal received from the Wildlife SOS for the study has mentioned four objectives and methodology for the study. The CZA approved grant based on this proposal. However, it is observed that the same has not been followed. The details in this regard are mentioned below:

(ii) Five separate enclosures to be selected for studying the utilization pattern  (iii) Enclosures to be divided into grids to study space utilization  Scan sampling to be carried out at interval of five minutes  (iv) Recording of following behavioral parameters in predesigned formats:  (iv) Recording Animal activities were to be observed during study, in addition to others:  (a) Animal location  (b) Following Animal activities were to be observed during study, in addition to others:  i. Resting ii. Playing iii. Fighting iv. Repetitive pacing v. Climbing vi. Continuous rubbing vii. Digging vii. Digging vii. Digging vii. Digging viii. Growling etc  (v) Selected enclosures and different periods of the days are covered (vi) Analyses of the results  Carried out The scan sampling has beer carried out at intervals of 30 minutes duration approposed for the Study. Hence, No done as per the Proposal. No pre-designed format has been approposed for the Study. Hence, No done as per the Proposal. No pre-designed format has been approposed for the Study. Hence, No done as per the Proposal. No pre-designed format has been approposed for the study instead of 5 minutes duration approposed for the study instead of 5 minutes duration approposed for the Study. Hence, No done as per the Proposal. No pre-designed format has been approposed for the study instead of 5 minutes duration approposed for the study instead of 5 minutes duration approposed for the study instead of 5 minutes duration approposed for the study instead of 5 minutes duration approposed for the study instead of 5 minutes duration approposed for the study instead of 5 minutes duration approposed for the study instead of 5 minutes duration approposed for the study instead of 5 minutes duration approposed for the study	1 []til	ization of solar power fenced enclosures by Sloth bear		
tilization  Scan sampling to be carried out at interval of five minutes  Scan sampling to be carried out at interval of five minutes  Recording of following behavioral parameters in predesigned formats:  (iv) Recording of following behavioral parameters in predesigned formats:  (iv) Recording of following behavioral parameters in predesigned formats:  (a) Animal location  (b) Following Animal activities were to be observed during study, in addition to others:  (a) Resting  i. Resting  ii. Playing  iii. Fighting  iv. Repetitive pacing  v. Climbing  vi. Continuous rubbing  vii. Dirinking  viii. Digging  ix. Vocalization  x. Licking its paws, or other body parts xi. Eating  xii. Growling etc  (v) Selected enclosures and different periods of the days are covered  (vi) Analyses of the results  Not carried out at intervals of 50 minutes carried out at intervals of 50 minutes duration approposed for the Study, Hence, No done as per the Proposal.  No pre-designed format has beer used as per the report submitted since the same has not beer annexed in the report. Not done as per the Proposal.  Mentioned  The report has mainly mentioned about the following activities only: Resting Sleeping Moving  Other activities have been clubbed together. The each activity studied should be elaborated as the activities incuted may be once on twice in a day, but play very important role in the life of animal For example, the bear may drink water once in a day but is very important activity of animal. Or perusal of the data, it is observed that it has not been done scientifically.		Five separate enclosures to be selected for studying the	Carried out	
minutes    Carried out at intervals of 30 minutes duration during the study instead of 5 minutes duration as proposed for the Study. Hence, No done as per the Proposal.    Recording of following behavioral parameters in predesigned formats:    Recording of following behavioral parameters in predesigned formats:    Recording of following behavioral parameters in predesigned format has been used as per the Proposal.    Resting the same has not been annexed in the report. Not done as per the Proposal.    Mentioned the same has not been annexed in the report has mainly mentioned about the following activities only:   Resting till Playing to together. The each activity studied should be elaborated as the activities included may be once of twice in a day, but play very important role in the life of animal to the following drivities included may be once of twice in a day, but play very important role in the life of animal. For example, the bear may drink water once in a day but is very important activity of animal. Or perusal of the data, it is observed that it has not been done scientifically.    (v) Selected enclosures and different periods of the days are covered	(ii)	• • •	Carried out	
predesigned formats:  (a) Animal location (b) Following Animal activities were to be observed during study, in addition to others:  i. Resting ii. Playing iii. Fighting iv. Repetitive pacing vi. Continuous rubbing vii. Drinking viii. Digging ix. Vocalization x. Licking its paws, or other body parts xi. Eating xii. Growling etc  (v) Selected enclosures and different periods of the days are covered (vi) Analyses of the results  used as per the report submitted since the same has not been annexed in the report. Not done as per the report submitted since the same has not been annexed in the report. Not done as per the report submitted since the same has not been annexed in the report. Not done as per the report submitted since the same has not been annexed in the report. Not done as per the report submitted since the same has not been annexed in the report. Not done as per the report. Not done as per the report submitted since the same has not been annexed in the report. Not done as per the report. Not done an extending the report. Not done as per the report.	(iii)		carried out <u>at intervals of 30</u> minutes duration during the study instead of 5 minutes duration as proposed for the Study. Hence, Not	
(b) Following Animal activities were to be observed during study, in addition to others:  i. Resting ii. Playing iii. Fighting iv. Repetitive pacing v. Climbing vi. Continuous rubbing vii. Dirinking ix. Vocalization x. Licking its paws, or other body parts xi. Eating xii. Growling etc  (v) Selected enclosures and different periods of the days are covered  (vi) Analyses of the results  The report has mainly mentioned about the following activities only: Resting Sleeping Moving  Other activities have been clubbed together. The each activity studied should be elaborated as the activities included may be once on twice in a day, but play very important role in the life of animal For example, the bear may drink water once in a day but is very important activity of animal. Or perusal of the data, it is observed that it has not been done scientifically.  (vi) Analyses of the results	(iv)		Not done as per the Proposal.	
during study, in addition to others:  i. Resting ii. Playing iii. Fighting iv. Repetitive pacing v. Climbing vi. Continuous rubbing vii. Drinking ix. Vocalization x. Licking its paws, or other body parts xi. Eating xii. Growling etc  (v) Selected enclosures and different periods of the days are covered  (vi) Analyses of the results  about the following activities only: Resting Sleeping Moving  Other activities have been clubbed together. The each activity studied should be elaborated as the activities included may be once or twice in a day, but play very important role in the life of animal. For example, the bear may drink water once in a day but is very important activity of animal. Or perusal of the data, it is observed that it has not been done scientifically.  Resting Sleeping Moving  Other activities have been clubbed together. The each activity studied as the activities included may be once or important role in the life of animal. For example, the bear may drink water once in a day but is very important activity of animal. Or perusal of the data, it is observed that it has not been done scientifically.  (v) Selected enclosures and different periods of the days are covered		(a) Animal location	Mentioned	
ii. Playing iii. Fighting iv. Repetitive pacing v. Climbing vi. Continuous rubbing vii. Drinking viii. Digging ix. Vocalization x. Licking its paws, or other body parts xi. Eating xii. Growling etc  (v) Selected enclosures and different periods of the days are covered  (vi) Analyses of the results  Other activities have been clubbed together. The each activity studied should be elaborated as the activities included may be once or twice in a day, but play very important role in the life of animal For example, the bear may drink water once in a day but is very important activity of animal. Or perusal of the data, it is observed that it has not been done scientifically.  Not carried out				
iv. Repetitive pacing v. Climbing vi. Continuous rubbing vii. Drinking viii. Digging ix. Vocalization x. Licking its paws, or other body parts xi. Eating xii. Growling etc  (v) Selected enclosures and different periods of the days are covered  (vi) Analyses of the results  Other activities have been clubbed together. The each activity studied together. The each activity end activities included may be once of twice in a day, but play very important role in the life of animal. For example, the bear may drink water once in a day but is very important activity of animal. Or perusal of the data, it is observed that it has not been done scientifically.  (v) Selected enclosures and different periods of the days are covered		ii. Playing		
vii. Drinking viii. Digging ix. Vocalization x. Licking its paws, or other body parts xi. Eating xii. Growling etc  (v) Selected enclosures and different periods of the days are covered  (vi) Analyses of the results  activities included may be once or twice in a day, but play very important role in the life of animal. For example, the bear may drink water once in a day but is very important activity of animal. Or perusal of the data, it is observed that it has not been done scientifically.  Carried out		iv. Repetitive pacing Other activities have been v. Climbing together. The each activity		
ix. Vocalization x. Licking its paws, or other body parts xi. Eating xii. Growling etc  (v) Selected enclosures and different periods of the days are covered  (vi) Analyses of the results  important role in the life of animal For example, the bear may drink water once in a day but is very important activity of animal. Or perusal of the data, it is observed that it has not been done scientifically.  Carried out  Not carried out		vii. Drinking	activities included may be once or	
that it has not been done scientifically.  (v) Selected enclosures and different periods of the days are covered  (vi) Analyses of the results  Not carried out		ix. Vocalization x. Licking its paws, or other body parts xi. Eating	important role in the life of animal. For example, the bear may drink water once in a day but is very important activity of animal. On	
are covered (vi) Analyses of the results Not carried out			that it has not been done	
	(v)			
2. Developing new enrichment techniques for wider application				
(i) Use of following material and combinations for	(i)	Use of following material and combinations for		

(a) Different kinds of woods (b) Barrels (c) Food items (d) Combination of various food items (e) Resting platforms (e) Resting platforms (f) Fruit scent sprays (g) Different kind of artefacts (h) Use of water Not mentioned (ii) Non-feeding enrichment includes: (a) Objects to play (b) Olfactory materials (c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: Shelter structures like caves etc. Not carried out (liwe vegetation Climbing structures Carried out Not mentioned Climbing structures Carried out Not mentioned Climbing structures Carried out Not mentioned Carried out (f) Water sources (g) Loose substrate (digging, resting) Not mentioned (h) Other permanent movable furnishings Not mentioned (i) Other unmovable permanent furnishings Not mentioned (ii) Other unmovable permanent furnishings Not mentioned (iii) Feeding enrichment measures used: (a) Designed to increase search time (e.g. sucatter or hide) (b) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (f) Designed to increase extraction time (e.g. puzzle feeder) (g) Designed to increase extraction time (e.g. puzzle feeder) (g) Designed to increase number of feeding times in a day (v) Preparation of Comprehensive list of enrichment views (r) Persparation of comprehensive list o		identifying and developing enrichment devices:		
(c) Barrels (c) Food items (d) Combination of various food items (e) Resting platforms (f) Fruit scent sprays (g) Different kind of artefacts (h) Use of water Not mentioned (ii) Non-feeding enrichment includes: (a) Objects to play (b) Offactory materials (c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: Shelter structures like caves etc. Live vegetation Climbing structures (f) Water sources (g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (i) Other permanent movable furnishings (ii) Other permanent movable furnishings (iii) Increase in enclosure area/size (c) Designed to increase extraction time (e.g. scatter or hide) (b) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (f) Designed to increase extraction time (e.g. puzzle feeder) (g) Designed to increase extraction time (e.g. puzzle feeder) (g) Designed to increase extraction time (e.g. puzzle feeder) (g) Preparation of Comprehensive list of enrichment aday (v) Preparation of Comprehensive list of enrichment system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears Not carried out as per proposal Not carried out to carried out (a) Carried out to carried out (b) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase extraction time (e.g. buzzle feeder) (g) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase temporal variability of feeding times (change from feeding at set times (g) Designed to increase temporal variability of feeding times in a day (g) Preparation of Comprehensive list of enrichment and vith those enclosures without enrichment devices (g) Preparation of Comprehensive list of enrichment devices (			Carried out	
(c) Food items (d) Combination of various food items (e) Resting platforms (f) Fruit scent sprays (g) Different kind of artefacts (ii) Use of water (iii) Non-feeding enrichment includes: (a) Objects to play (b) Olfactory materials (c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: (b) Major exhibit change: (c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: (b) Major exhibit change: (c) Shelter structures like caves etc. (d) Area rotation within enclosures (e) Major exhibit change: (f) Water sources (g) Loose substrate (digging, resting) (g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (i) Other unmovable permanent furnishings (ii) Other unmovable permanent furnishings (iii) Feeding enrichment measures used: (a) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (e) Designed to increase extraction time (e.g. puzzle feeder) (f) Designed to increase extraction time (e.g. puzzle feeder) (g) Loose substrate (a) permanent movable furnishings (iii) Perparation of Comprehensive list of enrichment aday (v) Preparation of Comprehensive list of enrichment aday (vi) Preparation of Comprehensive list of enrichment aday (vi) Preparation of Comprehensive list of enrichment and with those enclosures without enrichment techniques on the behavior of the Sloth bears (v) Amount of food given and consumed and time utilized noted for assessing the acceptance of new items (vi) Preparation of Comprehensive list of enrichment and with those enclosures without enrichment devices (vi) Preparation of Comprehensive list of enrichment and with those enclosures without enrichment devices (vi) Preference level over enrichment techniques on the behavior of the Sloth bears (vi) Preparation of Comprehensive list of enrichment devices (vi) Preparation of enrichment devices (vi) Preparat				
(d) Combination of various food items (e) Resting platforms (f) Fruit scent sprays (g) Different kind of artefacts (h) Use of water Not mentioned (ii) Non-feeding enrichment includes: (a) Objects to play (b) Olfactory materials (c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: Shelter structures like caves etc. Not carried out (live vegetation Climbing structures (f) Water sources (g) Loses substrate (digging, resting) (h) Other unmovable permanent furnishings (i) Other unmovable permanent furnishings (ii) Other unmovable permanent furnishings (iii) Feeding enrichment measures used: (a) Designed to increase search time (e.g. puzzle feeder) (b) Designed to increase extraction time (e.g. puzzle feeder) (c) Designed to increase extraction time (e.g. puzzle feeder) (r) Preparation of Comprehensive list of enrichment and with food, whole food) (r) Preparation of Comprehensive list of enrichment system of 1 to 4  Limpact of the various enrichment techniques on the behavior of the Sloth bears Not carried out but not elaborately Not carried out only for selected item system of 1 to 4  Limpact of the various enrichment techniques on the behavior of the Sloth bears Not carried out as per proposal Not carried out as per proposal		——————————————————————————————————————		
(e) Resting platforms (f) Fruit scent sprays (g) Different kind of artefacts (h) Use of water (h) Use of water (a) Objects to play (b) Olfactory materials (c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: (b) Major exhibit change: (c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: (f) Training to get immersed in activity (g) Area rotation within enclosures (g) Not mentioned (g) Live vegetation (limbing structures (g) Live vegetation (limbing structures (g) Lose substrate (digging, resting) (g) Lose substrate (digging, resting) (h) Other permanent movable furnishings (g) Lose substrate (digging, resting) (h) Other permanent movable furnishings (g) Cher unmovable permanent furnishings (g) Other unmovable permanent furnishings (g) Other unmovable permanent furnishings (g) Increase in enclosure area/size (g) Designed to increase search time (e.g. live prey such as ants and termites) (g) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. live prey such as ants and termites) (e) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. live prey such as ants and termites) (e) Designed to increase extraction time (e.g. live prey such as ants and termites) (g) Preparation of Comprehensive list of enrichment (e) Designed to increase in enclosure and time utilized noted for assessing the acceptance of new items (g) Designed to increase extraction time (e.g. live prey such as ants and termites) (h) Designed to increase extraction time (e.g. live prey such as ants and termites) (g) Designed to increase extraction time (e.g. live prey such as				
(f) Fruit scent sprays (g) Different kind of artefacts (h) Use of water Non-feeding enrichment includes: Not carried out (a) Objects to play (b) Olfactory materials (c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: Shelter structures like caves etc. Live vegetation Climbing structures Carried out (f) Water sources (g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (i) Other unmovable permanent furnishings (ii) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase extraction time (e.g. puzzle feeder) (v) Preparation of Comprehensive list of enrichment and with those enclosures without enrichment system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears (iii) Five selected enclosures (Model enclosure) not have additional measures to be used as Experimental enclosures (iii) Five selected enclosures to be used as Experimental enclosures (iii) Five selected enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iii) Five enclosures to be used as Experimental enclosures (iiii) Five enclosures to be used as Experimental enclosures (iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii				
(g) Different kind of artefacts (h) Use of water Not mentioned (ii) Non-feeding enrichment includes: Not arrived out (a) Objects to play Carried out (b) Olfactory materials Carried out (c) Training to get immersed in activity Not mentioned (d) Area rotation within enclosures Not mentioned (e) Major exhibit change: Not carried out Shelter structures like caves etc. Not carried out Live vegetation Not mentioned Climbing structures Carried out Direct out Carried out Carried out Not mentioned Climbing structures Carried out Ont mentioned Climbing structures Carried out Ont mentioned Climbing structures Not mentioned Climbing structures Carried out Ont mentioned Climbing structures Not mentioned Climbing structures Carried out Ont mentioned (f) Water sources (g) Loose substrate (digging, resting) Not mentioned (h) Other permanent movable furnishings Not mentioned (i) Other unmovable permanent furnishings Not mentioned (ii) Other unmovable permanent furnishings Not mentioned (iii) Feeding enrichment measures used: (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase search time (e.g. puzzle feeder) (d) Designed to increase capture time (e.g. live prey such as ants and termites) (c) Designed to increase capture time (e.g. puzzle feeder) (d) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day (iv) Preparation of Comprehensive list of enrichment (vi) Amount of food given and consumed and time utilized noted for assessing the acceptance of new items (iv) Preparation of Comprehensive list of enrichment of the various enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears (iv) Preparation of consumes (Model enclosure) not have additional measures of enrichment devices on bear biology and behavior within enclosures without enrichment devices (ii) Five enclosures to be used as Experimental enclosures (Not carried out as per p				
(h) Use of water  Non-feeding enrichment includes: Non-feeding enrichment includes: Not carried out  (a) Objects to play Carried out (b) Olfactory materials Corried out (c) Training to get immersed in activity Not mentioned (d) Area rotation within enclosures Not mentioned (e) Major exhibit change: Shelter structures like caves etc. Not carried out Live vegetation Climbing structures branch Climbing structures Carried out Not mentioned Carried out Not mentioned (i) Other permanent movable furnishings Not mentioned (i) Other permanent movable furnishings Not mentioned (i) Other permanent movable furnishings Not mentioned (i) Other permanent measures used: (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day (iv) Preparation of Comprehensive list of enrichment onted for assessing the acceptance of new items (iv) Preparation of Comprehensive list of enrichment onted for assessing the acceptance of new items (iv) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Not carried out as per proposal  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices  Five enclosures to be used as Experimental enclosures  Not carried out as per proposal				
(a) Objects to play (b) Olfactory materials (c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: Shelter structures like caves etc. Live vegetation Climbing structures Feeding enrichment movable furnishings (i) Other permanent movable furnishings (ii) Other permanent movable furnishings (iii) Designed to increase earch time (e.g. give prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (f) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase extraction time (e.g. puzzle feeder) (r) Designed to increase temporal variability of feeding times (change from feeding at set times (r) Designed to increase temporal variability of feeding times (change from feeding at set times (r) Designed to increase number of feeding times in a day (r) Preparation of Comprehensive list of enrichment (r) Preparation of Comprehensive list of enrichment (r) Volume reviews to the various enrichment techniques on the behavior of the Sloth bears (r) Preference level over enrichment devices on bear biology and behavior within enclosures with enrichment devices (r) Five enclosures to be used as Experimental enclosures (r) Not carrie				
(a) Objects to play (b) Olfactory materials (c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: Shelter structures like caves etc. Live vegetation Climbing structures Carried out Live vegetation Climbing structures Carried out Elevated perches (f) Water sources (g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (i) Other unmovable permanent furnishings (i) Increase in enclosure area/size (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (e) Designed to increase extraction time (e.g. puzzle feeder) (f) Designed to increase extraction time (e.g. puzzle feeder) (g) Preparation of Comprehensive list of enrichment and with of the various enrichment techniques on the behavior of the Sloth bears  Not carried out but not elaborately Not carried out sper proposal  Carried out but not elaborately Not carried out sper proposal  Carried out but not elaborately Not carried out as per proposal  Carried out but not elaborately Not carried out as per proposal  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices  Five enclosures without enrichment devices  Five enclosures to be used as Experimental enclosures Not carried out as per proposal	/:i\			
(b) Olfactory materials (c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: Shelter structures like caves etc. Live vegetation Climbing structures branch Climbing structures Carried out Not mentioned (g) Loose substrate (digging, resting) Not mentioned (g) Loose substrate (digging, resting) Not mentioned (g) Loose substrate (digging, resting) Not mentioned (g) Cher unmovable permanent furnishings Not mentioned (j) Other unmovable permanent furnishings (j) Other unmovable permanent furnishings (j) Other unmovable permanent furnishings (j) Derease in enclosure area/size (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase explure time (e.g. live prey such as ants and termites) (c) Designed to increase explure time (e.g. live prey such as ants and termites) (d) Designed to increase explure time (e.g. live prey such as ants and termites) (e) Designed to increase explure time (e.g. live prey such as ants and termites) (f) Designed to increase explure time (e.g. live prey such as ants and termites) (g) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day  (w) Preparation of Comprehensive list of enrichment  v) Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Not carried out as per proposal biology and behavior within enclosures with enrichment and with those enclosures (Model en	(11)			
(c) Training to get immersed in activity (d) Area rotation within enclosures (e) Major exhibit change: Not carried out Shelter structures like caves etc. Live vegetation Climbing structures branch Elevated perches (g) Loose substrate (digging, resting) (h) Other sources (g) Loose substrate (digging, resting) Not mentioned (h) Other permanent movable furnishings (i) Increase in enclosure area/size (ii) Pesigned to increase search time (e.g. scatter or hide) (b) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase number of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day  iv) Preparation of Comprehensive list of enrichment Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Not carried out as per proposal  Not carried out only for selected item system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Not carried out as per proposal  Not carried out as per proposal				
(d) Area rotation within enclosures (e) Major exhibit change: Shelter structures like caves etc. Live vegetation Climbing structures Dranch Elevated perches (f) Water sources (g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (i) Other unmovable permanent furnishings (ii) Increase in enclosure area/size Feeding enrichment measures used: (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (e) Designed to increase extraction time (e.g. puzzle feeder) (v) Amount of food given and consumed and time utilized noted for assessing the acceptance of new items (vi) Preparation of Comprehensive list of enrichment and vith those enclosures without enrichment devices ii) Five enclosures to be used as Experimental enclosures Not carried out Not mentioned Carried out Not mentioned Carried out as per proposal				
(e) Major exhibit change:  Shelter structures like caves etc.  Live vegetation  Climbing structures  branch  Elevated perches  (f) Water sources  (f) Water sources  (h) Other permanent movable furnishings  (i) Other permanent movable furnishings  (ii) Other permanent movable furnishings  (j) Increase in enclosure area/size  Feeding enrichment measures used:  (a) Designed to increase capture time (e.g. scatter or hidde)  (b) Designed to increase extraction time (e.g. puzzle feeder)  (d) Designed to increase extraction time (e.g. puzzle feeder)  (d) Designed to increase extraction time (e.g. puzzle feeder)  (d) Designed to increase number of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  (v) Preparation of Comprehensive list of enrichment and with of to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Not carried out as per proposal  Not carried out proposal				
Shelter structures like caves etc.  Live vegetation Climbing structures Dranch Elevated perches (f) Water sources (g) Loose substrate (digging, resting) Not mentioned (i) Other permanent movable furnishings (i) Other unmovable permanent furnishings (ii) Increase in enclosure area/size (a) Designed to increase search time (e.g. live prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times (change from feeding at set times (f) Designed to increase of new items (v) Preparation of Comprehensive list of enrichment vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears Not carried out as per proposal Not carried out only for selected item system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears Not carried out as per proposal Five selected enclosures (Model enclosure) not have additional measures of enrichment devices Five enclosures to be used as Experimental enclosures Not carried out as per proposal				
Live vegetation Climbing structures Carried out branch Elevated perches Carried out (f) Water sources (g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (i) Other unmovable permanent furnishings (ii) Other unmovable permanent furnishings (i) Increase in enclosure area/size (j) Increase in enclosure area/size (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase capture time (e.g. live prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day (iv) Preparation of Comprehensive list of enrichment Amount of food given and consumed and time utilized noted for assessing the acceptance of new items (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Not carried out as per proposal				
Climbing structures branch Dranch Elevated perches (f) Water sources (g) Loose substrate (digging, resting) Not mentioned (h) Other permanent movable furnishings Not mentioned (i) Other unmovable permanent furnishings (i) Increase in enclosure area/size (iii) Feeding enrichment measures used: (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase capture time (e.g. live prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day (iv) Preparation of Comprehensive list of enrichment vi) Preference level over enrichment graded into points system of 1 to 4 Impact of the various enrichment techniques on the behavior of the Sloth bears  Not carried out as per proposal Not carried out only for selected item system of 1 to 4 Impact of the various enrichment techniques on the behavior of the Sloth bears  Not carried out as per proposal Five selected enclosures without enrichment devices ii) Five selected enclosures of enrichment devices Five enclosures of be used as Experimental enclosures Not carried out as per proposal			Not carried out	
branch Elevated perches (f) Water sources (g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (i) Other unmovable permanent furnishings (i) Other unmovable permanent furnishings (i) Increase in enclosure area/size (iii) Feeding enrichment measures used: (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase capture time (e.g. live prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day  (iv) Preparation of Comprehensive list of enrichment Amount of food given and consumed and time utilized noted for assessing the acceptance of new items (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Not carried out as per proposal		Live vegetation	Not mentioned	
Elevated perches (f) Water sources (g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (i) Other unmovable permanent furnishings (i) Increase in enclosure area/size (j) Increase in enclosure area/size (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase capture time (e.g. live prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day (v) Preparation of Comprehensive list of enrichment noted for assessing the acceptance of new items (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Not carried out as per proposal of the various enrichment techniques on the behavior of the Sloth bears  Not carried out as per proposal biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) Not carried out as per proposal additional measures of enrichment devices.  Not carried out as per proposal		Climbing structures	Carried out	
(f) Water sources (g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (i) Other unmovable permanent furnishings (j) Increase in enclosure area/size (iii) Feeding enrichment measures used: (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase capture time (e.g. live prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day (iv) Preparation of Comprehensive list of enrichment (vi) Amount of food given and consumed and time utilized noted for assessing the acceptance of new items (vii) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears (i) Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures (Model enclosure) not have additional measures of enrichment devices. (ii) Five selected enclosures (Model enclosures) Not carried out as per proposal		branch	Not mentioned	
(f) Water sources (g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (i) Other unmovable permanent furnishings (j) Increase in enclosure area/size (iii) Feeding enrichment measures used: (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase capture time (e.g. live prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day (iv) Preparation of Comprehensive list of enrichment (vi) Amount of food given and consumed and time utilized noted for assessing the acceptance of new items (vii) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears (i) Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures (Model enclosure) not have additional measures of enrichment devices. (ii) Five selected enclosures (Model enclosures) Not carried out as per proposal		Elevated perches	Carried out	
(g) Loose substrate (digging, resting) (h) Other permanent movable furnishings (i) Other unmovable permanent furnishings (j) Increase in enclosure area/size (iii) Feeding enrichment measures used: (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase capture time (e.g. live prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day (iv) Preparation of Comprehensive list of enrichment and vith food given and consumed and time utilized noted for assessing the acceptance of new items (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears (b) Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices (ii) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Not carried out as per proposal			Not mentioned	
(h) Other permanent movable furnishings (i) Other unmovable permanent furnishings (j) Increase in enclosure area/size (iii) Feeding enrichment measures used: (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase capture time (e.g. live prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day (iv) Preparation of Comprehensive list of enrichment aday (vi) Amount of food given and consumed and time utilized noted for assessing the acceptance of new items (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears (i) Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices (ii) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices. (iii) Five enclosures to be used as Experimental enclosures (Not carried out as per proposal			Not mentioned	
(i) Other unmovable permanent furnishings (j) Increase in enclosure area/size  Feeding enrichment measures used: (a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase capture time (e.g. live prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day (iv) Preparation of Comprehensive list of enrichment Amount of food given and consumed and time utilized noted for assessing the acceptance of new items (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Carried out but not elaborately Not carried out only for selected item system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Five enclosures to be used as Experimental enclosures  Not carried out as per proposal				
(i) Increase in enclosure area/size  (a) Designed to increase search time (e.g. scatter or hide)  (b) Designed to increase capture time (e.g. live prey such as ants and termites)  (c) Designed to increase extraction time (e.g. puzzle feeder)  (d) Designed to increase extraction time (e.g. puzzle feeder)  (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food)  (e) Designed to increase temporal variability of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  (iv) Preparation of Comprehensive list of enrichment  v) Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  (i) Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  ii) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Five enclosures to be used as Experimental enclosures  Not carried out  Not carried out  Not carried out as per proposal				
(a) Designed to increase search time (e.g. scatter or hide) (b) Designed to increase capture time (e.g. live prey such as ants and termites) (c) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase extraction time (e.g. puzzle feeder) (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food) (e) Designed to increase temporal variability of feeding times (change from feeding at set times (f) Designed to increase number of feeding times in a day (iv) Preparation of Comprehensive list of enrichment Amount of food given and consumed and time utilized noted for assessing the acceptance of new items (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures (Model enclosure) not have additional measures of enrichment devices.  Five selected enclosures (Model enclosure) Not carried out as per proposal ii) Five enclosures to be used as Experimental enclosures  Not carried out as per proposal				
(a) Designed to increase search time (e.g. scatter or hide)  (b) Designed to increase capture time (e.g. live prey such as ants and termites)  (c) Designed to increase extraction time (e.g. puzzle feeder)  (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food)  (e) Designed to increase temporal variability of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  (iv) Preparation of Comprehensive list of enrichment  vi) Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  (i) Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  ii) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Not carried out as per proposal	'iii'	1-41	Carried out	
(b) Designed to increase capture time (e.g. live prey such as ants and termites)  (c) Designed to increase extraction time (e.g. puzzle feeder)  (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food)  (e) Designed to increase temporal variability of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  (iv) Preparation of Comprehensive list of enrichment  Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  i) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Not carried out as per proposal	/			
such as ants and termites)  (c) Designed to increase extraction time (e.g. puzzle feeder)  (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food)  (e) Designed to increase temporal variability of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  (iv) Preparation of Comprehensive list of enrichment  V) Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  (i) Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  ii) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Not carried out as per proposal  Not carried out as per proposal		hide)		
(c) Designed to increase extraction time (e.g. puzzle feeder)  (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food)  (e) Designed to increase temporal variability of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  (iv) Preparation of Comprehensive list of enrichment  Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  (b) Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  (ii) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Not carried out as per proposal		(b) Designed to increase capture time (e.g. live prey		
feeder)  (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food)  (e) Designed to increase temporal variability of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  iv) Preparation of Comprehensive list of enrichment  Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Not carried out as per proposal  Not carried out as per proposal		such as ants and termites)		
feeder)  (d) Designed to increase processing time related to handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food)  (e) Designed to increase temporal variability of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  iv) Preparation of Comprehensive list of enrichment  Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Not carried out as per proposal  Not carried out as per proposal		(c) Designed to increase extraction time (e.g. puzzle		
handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food)  (e) Designed to increase temporal variability of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  (v) Preparation of Comprehensive list of enrichment  Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Not carried out as per proposal			Not carried out as per proposal	
handling and mastication (e.g. vegetation/browse, ice blocks with food, whole food)  (e) Designed to increase temporal variability of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  (v) Preparation of Comprehensive list of enrichment  Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  (vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Not carried out as per proposal		(d) Designed to increase processing time related to	1	
blocks with food, whole food)  (e) Designed to increase temporal variability of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  (iv) Preparation of Comprehensive list of enrichment  Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Not carried out as per proposal  Not carried out as per proposal				
(e) Designed to increase temporal variability of feeding times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  iv) Preparation of Comprehensive list of enrichment  Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Not carried out as per proposal  Not carried out as per proposal				
times (change from feeding at set times  (f) Designed to increase number of feeding times in a day  iv) Preparation of Comprehensive list of enrichment  Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Five enclosures to be used as Experimental enclosures  Not carried out as per proposal				
(f) Designed to increase number of feeding times in a day  (iv) Preparation of Comprehensive list of enrichment  (v) Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  (vi) Preference level over enrichment graded into points system of 1 to 4  (c) Impact of the various enrichment techniques on the behavior of the Sloth bears  (d) Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  (ii) Five enclosures to be used as Experimental enclosures  (c) Carried out only for selected item Not carried out as per proposal  (c) Not carried out as per proposal				
day  iv) Preparation of Comprehensive list of enrichment  Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  vi) Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  i) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  ii) Five enclosures to be used as Experimental enclosures  Not carried out only for selected item  Carried out only for selected item  Not carried out as per proposal				
Preparation of Comprehensive list of enrichment  Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Five enclosures to be used as Experimental enclosures  Not carried out but not elaborately Not carried out				
Amount of food given and consumed and time utilized noted for assessing the acceptance of new items  Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Five enclosures to be used as Experimental enclosures  Not carried out only for selected item out only for s	iv)	<del>                                       </del>	Carried out but not elaborately	
noted for assessing the acceptance of new items  Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Five enclosures to be used as Experimental enclosures  Not carried out as per proposal				
Preference level over enrichment graded into points system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Five enclosures to be used as Experimental enclosures  Not carried out only for selected item Carried out as per proposal	٧,		Not builted out	
system of 1 to 4  Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Five enclosures to be used as Experimental enclosures  Not carried out as per proposal	vi)		Carried out only for selected items	
. Impact of the various enrichment techniques on the behavior of the Sloth bears  Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  Five enclosures to be used as Experimental enclosures  Not carried out as per proposal	V 1)		Carried out only for selected items	
Comparing the impact of enrichment devices on bear biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  i) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  ii) Five enclosures to be used as Experimental enclosures Not carried out as per proposal	Imr		or of the Sloth bears	
biology and behavior within enclosures with enrichment and with those enclosures without enrichment devices  i) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  ii) Five enclosures to be used as Experimental enclosures Not carried out as per proposal				
and with those enclosures without enrichment devices  i) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  ii) Five enclosures to be used as Experimental enclosures Not carried out as per proposal	1		I Not carried out as per proposal	
i) Five selected enclosures (Model enclosure) not have additional measures of enrichment devices.  ii) Five enclosures to be used as Experimental enclosures Not carried out as per proposal				
additional measures of enrichment devices.  ii) Five enclosures to be used as Experimental enclosures Not carried out as per proposal	i		Not carried out as per property	
ii) Five enclosures to be used as Experimental enclosures Not carried out as per proposal	1)	,	Not carried out as per proposal	
	***		Notes a suite de suite de la constant de la constan	
for the experiment	H)		Not carried out as per proposal	
		for the experiment		

(iv)	Comparison of Model and experimental enclosures	Not carried out as per proposal
(v)	To record following behavior types and their relation with	1.7
	enrichment measures:	
	resting	
	Playing	
	Fighting	<b></b>
	Repetitive pacing	Not carried out as per proposal
	Climbing	
	Continuous rubbing	
	Drinking	
	Digging	
	Licking its paws, or other body parts	
	Eating	
	Growling etc	
(vi)	Grouping behavior exhibited into desirable and undesirable.	Not carried out as per proposal
(vii)	Regular monitoring of both model and experimental enclosure on alternate day at 5 minutes interval for 2 hours each between 6:00-8:00, 11:00-13:00 and 16:00-18:00	Not carried out as per proposal
(viii)	Analysis done to establish any association between animal's behavior and enrichment provided.	Not carried out as per proposal
4. Hou	using requirement and pattern of housing preference for	r sloth bear in captivity.
(i)	Data gathered in the methodology used to assess the housing requirement of sloth bear in captivity	Not carried out as per proposal
(ii)	Understanding the housing requirement by using the following factors:	Not carried out as per proposal
	(a) Requirement and utilization of night shelter	
	(b) Size of enclosure	
	(c) Food preference	
	(d) Response to enrichment devices	
(iii)	Accessing the night area designs and size, barrier, enrichment devices and basic requisite including landscape.	Not carried out as per proposal

10. The observations of the individual bears has to be collated and based on their sample study, the utilisation pattern for the bears has to be arrived at. This has not been done. The observations of the individuals have only been mentioned.

## 11. Other general observations made are as follows:

- 1) The content page of the report does not mention page number for each heads.
- 2) The report does not have Preface, Conclusion and Recommendation Chapters.
- 3) Many references referred in the text were not quoted in the chapter on reference.
- 4) The photographs used were not given caption and number.
- 5) The pie chart has two circles. But it is not clear in the report what it means.

The observations on the project report alongwith the status of the project was placed before the Technical Committee of the Central Zoo Authority in its 85<sup>th</sup> Meeting held on 23.03.2018 for deliberation and decision.

The Technical committee, CZA noted that the project work has not been carried out as per the objectives of the MoU and decided not to accept the project report. Further, the committee decided to recover the grant released earlier towards the project alongwith the penal interest at the rate of 10% per annum as per provision under Rule No. 258(1) of GFR, 2017 from the Wildlife SOS, New Delhi.

Keeping in view of the above, you are requested to surrender the earlier released grant towards project alongwith penal interest at the rate of 10% per annum against the grant of Rs. 3.00 lakh to this authority. The amount may be deposited to the Central Zoo Authority through RTGS as per the details below:

1	Name of Beneficiary	Member Secretary, Central Zoo Authority	
2	Name of Bank	State Bank of India, Pandit Deendayal Antyodaya Bhawan, CGO Complex, New Delhi 110003	
3	Account no.	35743814303	
4	Branch Code	07837	
5	IFSC Code	SBIN0007837	
6	MICR	110002131	
7	BSR Code	0007837	
8	Shift Code	SBININ BB 382	

As decided by the Technical committee, CZA the above mentioned research project stands closed.

Yours sincerely,

(Dr. D.N. Singh) Member Secretary

## Copy for information and necessary action to:

The Chief Wildlife Warden, Govt. of Uttar Pradesh, 17, Rana Pratap Marg, Lucknow – 226 001, Uttar Pradesh (Email: cwlwup@gmail.com).