

**BEFORE THE NATIONAL GREEN TRIBUNAL SOUTH ZONE AT
CHENNAI MEMORANDUM OF APPLICATION**

(Under Sections 14 read with 18(1) of the National Green Tribunal Act, 2010)

O.A. No. 97 of 2020, dated. 07.07.2020

Bharathiraja M
S/o V. Munusamy,
53 A Bangalore Main Road,
Sriperumbudur 602 105

....Petitioner

.....Vs.....

1) The State of Tamil Nadu,
Rep by its Director, Department of Environment,
No. 1, Jeenis Road, Panagal Building,
Ground Floor, Saidapet, Chennai – 600 015.

2) Arignar Anna Zoological Park,
Rep by its Director,
Vandalur, Chennai – 600 048

... Respondent

COUNTER AFFIDAVIT OF THE RESPONDENT

I, V. Karunapriya, IFS., daughter of Thiru. V. Raghunadha Rao, Hindu aged about 47 years, employed as Additional Principal Chief Conservator of Forests and Director, Arignar Anna Zoological Park, Vandalur, Chennai, do hereby solemnly affirm and sincerely state as follows:-

Introduction

The history of Chennai Zoo (formerly known as Madras Zoo) dates back to the year 1855. This was the first Zoo to be formed in India. The idea of collection of animals and maintaining at one place was mooted in 1855 by Dr. Edward Belford of the Madras Museum. He kept a small collection of animals near the Madras museum. The menagerie was later transferred to the Madras Corporation. The animals were housed in a Zoo over an area of 12.03 acres behind the then Moore Market Complex near Central Station for about 125 years. As the Zoo was quite cramped and did not meet the biological and behavioural needs of the animals, a decision was taken to

shift the zoo to an alternative site where adequate land to develop the required infrastructure for a modern zoo was available. After detailed investigation the Vandalur Reserve Forest was selected for this purpose. This place sprawling over an area of about 510 ha (in its initial stage) provided an environment to establish a zoological park. The present area of the zoo has the requisite natural vegetation for creating a naturalistic environment at the zoo. Arignar Anna Zoological Park is one of the biggest zoo in South East Asia extending over an area of 602 ha. The zoo was opened to public during the year 1985. The zoo area was divided into visitor movement zone and natural forested area. The management activities like constructions of enclosures and avenues were taken up and the layout plan was prepared which is approved by the Central Zoo Authority. Many enclosures were constructed over the years as the animal collection and the animal numbers increased. In the past ten years alone, the number of animal species housed here has increased from **143 species (1390 animals) in 2011-12** to **172 species (2704 animals) in 2019-20**. The animals are exhibited in large open moated island type of immersive enclosure with simulated environment. The entire area was clothed with vegetation using natural and some artificial regeneration since the inception of the zoo. The zoo has been recognized as a Centre of Excellence by the Central Zoo Authority for the scientific management of the zoological Park. Central Zoo Authority also regularly evaluates the performance of the zoo by regular inspections by a recognized expert member. It is done once in three years. Recently the evaluation was completed during February 2020 and the expert member nominated by Central Zoo Authority visited all the facilities of the zoo and appreciated the zoo for various activities and the maintenance of the zoo in scientific manner.

Para No. 1:- It is respectfully submitted that the Cyclone Vardah on 12.12.2016 had damaged and uprooted about 70% of the trees at Arignar Anna Zoological Park. In the following year, 20000 seedlings were planted in the zoo area which has a good survival rate due to the maintenance and care provided to these seedlings. It was observed during the summer of 2019, that the shade has to


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be improved along the roads or avenues to benefit the visitors who visit the zoo. During the Governing Board meeting of Zoo Authority of Tamilnadu conducted in 2018, it was directed to plant tall seedlings along the roads and to maintain the ground vegetation of the zoo like gardens, hedges and lawns at identified locations. Following this, planting of 10000 seedlings was taken up in 2019 since the pre- monsoon season. Planting was proposed to be carried out in the following manner,

1. Gap Planting and Block Planting – This was identified to be carried out at open spaces adjacent to the avenues. Native tree species were preferred for this category. Tree species that were cyclone and drought tolerant was preferred suiting to the soil conditions. Block planting was done adjacent to the animal enclosures which has more open space. As this type of planting will create a congenial micro-climatic environment at that particular site.
2. Avenue Plantation – as the word ‘avenue’ suggests the species opted to be planted under this category should be of ornamental nature i.e flowering and shade trees.
3. Animal Enrichment Planting – This category of planting was proposed to be carried out in the area adjacent to designated animal enclosures and identified animal specific places like butterfly park, open bird park, in front of animal enclosures. Animal specific flora species was selected to be planted here. This is highly recommended by Central Zoo Authority as the flora enriches and supports the animals care and wellbeing.

The planting was done only in the above manner, so the contention of the Petitioner that several species of alien nonnative exotic trees have been planted in the premises of the Zoological park by clearing native shrubs and climbers is not correct. The petitioner also confuse appears to between invasive alien species and exotic species. Planting exotic species that are naturalized to our conditions, along the roads surrounded by animal enclosures and cemented area will not have any allelopathic effect as stated.


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The petitioner's statement that natural forest was cleared to do the planting is absolutely false. Mostly, it was gap planting that was carried out and only at few places ground clearing of weeds was carried out to dig pits and that too is sites adjacent to the animal enclosures. Clearing of bushes around the animal enclosure is a regular zoo activity to keep the area free from snakes and rodents. Hence the claim by the petitioner is absolutely baseless and not backed by any proof / evidence.

Para 2,3,4 :- It is respectfully submitted that Arignar Anna Zoological Park spread over 602 hectares of area, houses more than 2700 animals belonging to 172 species. The zoo has both indigenous as well as exotic animals for the purpose of educating the visitors. However, conservation and breeding programmes are conducted only for the endemic animals like Lion Tailed Macaque and Niligiri Langur. As per the mandate given by the Central Zoo Authority, habitat enrichment specific to the animal species is mandatory so as to provide a near naturalistic environment for the respective animals considering their well-being. Accordingly, the planting of trees, shrubs and the other enrichment activities are carried out based on the animal's requirement and necessity. As a part of this activity, planting of certain tree species has been carried out in limited numbers adjacent to the animal enclosures and in certain designated areas, so as to cater to the need and well being of the animals. Tree species specific to geographical location and animals preference were also planted for this reason only. For example, Sloth Bear – Ziziphus mauritiana, Elephant – Ficus bengalensis, Bambusa spp, Ficus religiosa etc, are the associated preferred trees for these animals. Similarly, birds prefer small berries and butterflies prefer nectar rich flowers. Several factors like animal need and behavior, social grouping, interaction with trees, psychological factors etc., were considered to select the species after detailed discussion and obtaining inputs from a review of like reference and experience of previous years' plantations.

Details of all the species planted during 2018-19 and 2019-20 and their numbers are provided below,

S.No	Name of Tree Species	Tamil names	Planting done in 2018-19	Planting done in 2019-20
1	<i>Aegle marmelos</i>	Vilvam	100	10
2	<i>Aglaiia elaeagnoidea</i> (Juss.) Benth.	Chokkalai	255	0
3	<i>Alangium salvifolium</i> (L.f.) Wang.	Azhingil	85	0
4	<i>Alstonia scholaris</i>	Elillaipaalai	10	217
5	<i>Anthocephalus cadamba</i>	Kadhamba		339
6	<i>Atalantia monophylla</i> (L.) Correa	Kaattu elumitchai	160	0
7	<i>Atrocarpus heterophyllus</i>	Pala	145	0
8	<i>Azadirachta indica</i> (A.Juss)	Vembu	770	160
9	<i>Bambusa balcooa</i>	Mungil		478
10	<i>Bambusa bamboo</i>	Mungil	800	0
11	<i>Barringtonia species</i>	Samuthirapazgham		70
12	<i>Bauhinia alba</i>	Semmantarai		150
13	<i>Bauhinia purpurea</i>	Mandarai	24	103
14	<i>Bauhinia racemosa</i> Lam.	Aathi	55	60
15	<i>Bauhinia tomentosa</i>	Tiruvatti		100
16	<i>Calophyllum inophyllum</i> L.	Punnai	68	540
17	<i>Cassia Fistula</i>	Sarakondrai	120	108
18	<i>Cassine glauca</i> (Rottb.) Kuntze	Kannira, earkoli	46	0
19	<i>Chloroxylon swietenia</i> DC.	Venporasu	100	0
20	<i>Cordia obliqua</i> Willd.	Narvili	185	0
21	<i>Cordia sebestena</i>	Narvili		88
22	<i>Couroptia guianensis</i>	Nagalingam		51
23	<i>Dalbergia latifolia</i>	Eetti	275	0
24	<i>Dalbergia sissoo</i>	Sissoo	400	0
25	<i>Diospyros ebenum</i> Koen.	Karungali	155	0
26	<i>Diospyros montana</i> Roxb.	Vakkanai	200	0
27	<i>Drypetes sepiaria</i> (Wight & Arn.)	Veerai	9	0
28	<i>Erythrina indica</i>	Kalyanamurungai		90
29	<i>Feronia limonia</i>	velan/vila	475	0
30	<i>Ficus benghalensis</i> Linn	Aal	1120	225
31	<i>Ficus microcarpa</i>	Itchi	410	0
32	<i>Ficus racemosa</i> L.	Atthi	55	346
33	<i>Ficus religiosa</i>	Aal	665	390
34	<i>Ficus Virens</i>	vellai aal	360	0
35	<i>Haldina cordifolia</i> (Roxb. Ridsdale	Manjal Kadambu	10	0
36	<i>Holoptelea integrifolia</i>	Aaya		100
37	<i>Ixora pavetta</i> Andr.	Sulundu, Koraan	155	0
38	<i>Khaya senegalensis</i>	Khaya		10
39	<i>Kigelia africana</i>	Sivakundalam	22	0
40	<i>Lagerstoemia speciosa</i>	Poomaram	8	72
41	<i>Lagerstoemia indica</i>	Poomaram		90
42	<i>Lepisanthes tetraphylla</i>	Kugai netthi	65	0

43	<i>Madhuca indica</i>	Illupai		276
44	<i>Madhuca longifolia</i>	Illupai	1670	100
45	<i>Mangifera indica</i>	Maa maram		100
46	<i>Manilkara hexandra</i> (Roxb.)Dubard	Kanuppaala	240	0
47	<i>Markamia lutea</i>	Perudi	55	200
48	<i>Melia dubia</i>	Malai vembu	170	0
49	<i>Michelia champaca</i>	Chempakam	490	11
50	<i>Millingtonia hortensis</i>	Maramalli	33	6
51	<i>Mimusops elengi</i>	Magilam	630	1183
52	<i>Mitragyna parvifolia</i>	Nir kadambai	180	0
53	<i>Mutingia calabura</i>	Thenpazham		100
54	<i>Naringi crenulata</i> (Roxb.)Nicolson	Kurunthai	68	0
55	<i>Nyctanthes arbor-tristis</i>	Pavalamalli		50
56	<i>Ochna gamblei</i> King ex Brandis?	Kalkuruvi, Silanthi	70	0
57	<i>Pamburus missionis</i> (Wight)Swingle	Kaattu narthai	180	0
58	<i>Pithecellobium dulce</i>	Kodukkappuli	51	0
59	<i>Pongamia pinnata</i>	Pungam	1585	267
60	<i>Premna corymbosa</i> (Burm.f.) Rottl	Paai munnai	27	0
61	<i>Prosopis cinerea</i>	Vanni	180	0
62	<i>Psidium guajava</i>	Koia		100
63	<i>Psydrax dicoccos</i> Gaertn.	Irumbarathan, Nakkini	90	0
64	<i>Pterocarpus marsupium</i>	Vengai	555	10
65	<i>Pterocarpus santalinus</i>	Chenchandanam	1450	0
66	<i>Pterospermum canescens</i> Roxb.	Vennaangu, Thada	110	0
67	<i>Salacia chinensis</i> L.	Ponkuranthi	35	0
68	<i>Sapindus emarginatus</i>	Soapnut	475	0
69	<i>Saraca Ashoka</i>	Asogam		331
70	<i>Simarouba glauca</i>	Paradise tree	105	0
71	<i>Spathodea campunolata</i>	Patadi	22	0
72	<i>Sterculia foetida</i>	Peenari		100
73	<i>Strychnos nux-vomica</i> L.	Etti	7	0
74	<i>Swietenia mahogani</i>	Mahogani	260	410
75	<i>Syzygium cumini</i>	Naval	950	611
76	<i>Tabebuia argentea</i>	Manjal Tabubia		44
77	<i>Tabebuia rosea</i>	Vasanta Rani	151	70
78	<i>Tamarindus indica</i>	Puli	470	240
79	<i>Terminalia arjuna</i>	neer marudhu	450	756
80	<i>Terminalia bellerica</i>	Thani	245	0
81	<i>Terminalia catappa</i> L	Badam	440	465
82	<i>Thespesia populnea</i>	Puvarsam	1260	629
83	<i>Vitex leucoxyton</i> L.f.	Neer notchi	91	0
84	<i>Walsura trifoliolata</i> (A. Juss.)Harms	Waalsoora	188	0
85	<i>Ziziphus mauritiana</i>	Elandhai		195
Total			20290	10051
Grand Total			30341	

The tree species were classified based on the tree types like shade, fruit trees, avenue trees etc., and the planting was carried out during 2018-19 and 2019-20. The number of native species in the above table clearly shows the importance given to the native tree species. The applicant has pointed out that planting of exotics species is done in large numbers and it will pose a threat to the forests.

This is baseless and non-scientific because most of these species already existed in the zoo and no uncontrolled regeneration of these species has been found inside the premises all these years. So the petitioner's claim that these species will spread to other forest areas itself, is not sustainable as they are not invasive in character. The zoo is a controlled park, where the planting of hedge plants, lawns etc., is regularly managed by the zoo staff. The weeds are regularly removed in the visitor areas and animal areas.

It is respectfully submitted that the thirteen species mentioned by the petitioner are naturalized to Indian conditions and they are not new to India. These species are commonly planted in temples, parks, avenues, along roads, tree parks, botanical gardens etc., since decades. Many of these trees are closely associated with religions and can be found even in the oldest temple sites in Tamilnadu – for example – Naagalinga tree (*Couroptia guianensis*), Maramalli tree (*Millingtonia hortensis*), Mantharai trees (*Bauhinia* species), Siva kundalam (*Kigelia africana*). The table below furnishes their Tamil names and proves the fact that these are not new invasive species.


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<u>No.</u>	<u>Species Name</u>	<u>Common Names</u>	<u>Tamil names</u>	<u>Status of Invasiveness in India</u>	<u>Planting done in 2018-19</u>	<u>Planting done in 2019-20</u>
1	Spathodea campunolata	Fountain Tree	Patadi	Naturalised, Not Invasive	36	0
2	Tabebuia rosea	Pink trumpet tree	Vasanta Rani	Naturalised, Not Invasive	151	70
3	Tabebuia argentea	Golden trumpet tree	Manjal Tabubia	Naturalised, Not Invasive	-	44
4	Swietenia mahagoni	Mahogany	Thenkani Vidai Mahagani	Naturalised, Not Invasive		
5	Millingtonia hortensis	Indian Cork Tree	Maramalli	Native, Not Invasive	33	6
6	Markamia lutea	Yellow Bell Bean Tree	Perudi	Naturalised, Not Invasive	20	200
7	Cordia sebestena	Scarlet Cordia	Accinayuvili	Naturalised, Not Invasive		88
8	Muntingia calabura	Singapore cherry	Seeni Pala Maram Thenpazham	Naturalised, Not Invasive		100
9	Kigelia africana	Sausage tree	Shiva kundalam,	Naturalised, Not Invasive	22	0
10	Bauhinia variegata	Orchid Tree	Malaiyatti	Not Invasive	-	-
11	Terminalia cadappa	Indian almond, Malabar almond	Badam, Naattu Badam	Naturalised, Not Invasive	400	465
12	Couroptia guianensis	Cannonball tree	Nagalinga maram	Naturalised, Not Invasive		51
13	Simarouba glauca	Lakshmi Taru, Paradise tree	Sourga Maram	Naturalised, Not Invasive	105	
Total					937	1434
Grand total					2371	
Percentage of these species to the total planting done					7.85%	

S.No. 10 Bauhinia species planted inside the zoo consists of Bauhinia purpurea, Bauhinia racemosa, Bauhinia tomentosa and Bauhinia alba – all of which have native range in South Asia and South East Asia and therefore they do not fall under non-native category. The applicant has stated that Bauhinia variegata was planted which itself is a wrong statement. Similarly S.No 5 Millingtonia hortensis which is commonly called as Maramalli in Tamil also has native range including Myanmar and India. The applicant wrongly refers it as exotic species. Similarly, the very fact that all the above listed tree species have their own Tamil names which are very well known even to a common man, indicates that these trees are already available in many places across the state for many years. All of these species listed in the table above have got well adapted and naturalized to our local conditions.

Para 5,6 :- It is respectfully submitted that a detailed study was undertaken by C. SUDHAKAR REDDY, G. BAGYANARAYANA, K.N. REDDY & VATSAVAYA S. RAJU on “INVASIVE ALIEN FLORA OF INDIA” and the results was published by National Biological Information Infrastructure, US Geological Survey, USA in 2008. None of the above mentioned tree species are identified and categorized as Invasive species. Similarly, the ENVIS Centre on Floral Diversity & Botanical Survey of India, Kolkata, West Bengal (Sponsored by Ministry of Environment, Forest & Climate Change, Govt of India) have identified 173 invasive alien species in India, none of the above listed trees are listed as invasive species


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http://www.bsienviis.nic.in/Database/Invasive_Alien_specied_15896.aspx#

B). Therefore, the claim of the applicant that these species will pose threat to the forest and nature due to its invasive property is absolutely baseless and untenable. It is humbly submitted that the flowers and fruits of these trees attract local birds, insects and animals in large numbers. Many among the listed 13 species are preferred tree species to attract birds. For example – Nagalingam tree, Indian almond tree, Thenpazham tree, Scarlet Cordia, Maramalli tree. Similarly, the free ranging deer in the zoo are found commonly foraging the Bauhinia tree. The number of animals these trees support ranges from small ants, squirrels, birds, butterflies and even snakes. Therefore, the applicants claim to state that these trees do not support local animals is absolutely false.

Para 7 :- It is respectfully submitted that the applicants has approached the respondent 2 on several times. Each time a proper explanation was given stating the reasons behind this. It is also submitted that most of the planting was done with the native tree species and only less than 10% of the species (7.85% to be precise) are naturalized non-native species which are not invasive in nature and have many benefits to support the animals. It was also explained in detailed manner that these flowering and evergreen tree species are planted along the roads and near the animal enclosure for the reason that it will create a thematic view for the visitors. Secondly, these trees are planted only along roads as few of these species grow tall and have faster growth which will not only provide shade to the visitors but also their tall nature will not block the visibility to the visitors especially children. Thirdly, the zoo has many exotic animals like Chimpanzee, Savannah baboon, Giraffe, Zebra, Hippopotamus, Ostriches, Emu, Cassowary etc whose displays are spread across the zoo and hence there is a need to create geographical zone based views which will also cater to meet the environmental enrichment requirement specific to that animal. Fourthly, most of these tree species were already existing in the zoo for many years, but none of these species have regenerated in large numbers in an invasive manner within the zoo or even in the adjoining forest areas. Hence, the petitioner's claim about its spread does not have any factual basis.


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Para 8 :- It is respectfully submitted that Zoological parks are mainly focused on education and conservation of wild animals. Arignar Anna Zoological Park, Vandalur is considered as one of the best scientifically managed zoos in India. The zoo has animal species that are native to both Indian and foreign countries. In order to provide comforting environment to the zoo animals, the zoo management takes up several management activities like enclosure enrichment, display enrichment, natural barricading, maintaining vegetation etc., Planting trees are also a part of this. The species are selected based on the animal requirement and display purpose like Flowering or shade tree. There was no violation with respect to the planting carried out by the Arignar Anna Zoological Park and the planting was done to compensate the tree cover loss following the Cyclone Vardhah. There was an immediate need to plant and to choose fast growing trees considering the rise in temperature during 2018 & 2019. Similarly, drought resistant species had to be selected considering the water shortage prevailing due to drought in Chennai during these years. Accordingly, the tree species listed in Para 4 was selected based on the experience of previous year plantings also. It is humbly submitted that people should also learn about different types of tree species. Not all tree species whose origin is outside the Asia continent is dangerous or invasive. There are many benefits that can be drawn from these floral species too. So a tourist place like zoo should have both different types of animals and plants species to serve these purpose.

Hence, in the above circumstances, it is respectfully prayed that the National Green Tribunal South Zone may be pleased to dismiss the above applicant as devoid of merits and pass such further for any other orders that may be deemed fit and proper according to the circumstances of above petition and thus render justice.

Solemnly affirmed at Chennai
On this the day of 10th **November 2021**
And signed his name in my presence

BEFORE ME


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Forests & Director