Padmavati Dwivedi, Compassionate Living

www.compassionateliving.in

The tree census would not have been possible without the involvement & support of:

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Prabhakar Rao, Preeti Bharadwaj, Jasmeet Walia
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Vidya Viswanathan
Sanjay Kumar. Datla Suresh Varma
Lakshmi Viswanathan
Jasmine Arethna
Satyajit Dwivedi

Green Haven

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"He that planteth a tree is a servant of God, he provideth a kindness for many generations, and faces that he hath not seen shall bless him."

– Henry van Dyke

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Sarvodaya Enclave is one of the Tree dense colonies of Delhi, surrounded by vast expanse of greenery on all sides. DDA park towards Adchini, runs the whole length of the colony on the southern side. On the eastern side running the whole breadth is the 46 acre DDA Begumpur park. On the Northern side is the Aurobindo Ashram and the western side is Adchini, extending into Katwaria Serai and NCERT. Inside the colony there is the bigger 2.5 acre Central park in the heart of the colony and three smaller parks making up for 2.5 acres greenery, one in the C block and two in the D Block. There is a also green corridor running the length of B and A blocks parallel to the Four colony gates on the MIS side in front of Rhymes Nursery, Katha and the Waves restaurant. These green corridors have almost a hundred trees standing on open soil.

Sarvodaya Enclave is a haven for tree lovers; it is a peaceful and a very green colony to live in. Perhaps the very reason to protect the trees and make it the pilot colony for promoting the idea of citywide tree census.

The Need

There are 1000 families 1900 voters and 1000 cars in Sarvodaya Enclave. This colony is currently under an onslaught of construction with more than fifteen reconstructions coming up in this 311 building colony with a potential of adding 60 families to the colony by 2013.

Most of the new constructions are being built with basements and four storeys, replacing the former independent single or double floored Kotis. This puts the trees surrounding the new buildings under great threat as the space is cemented and ramped for accommodating the cars. The new constructions are having requirement for eight to 12 cars per plot in place of earlier 2 to 3 cars per plot putting additional pressure on the trees per 1000 vehicles index.

Not only the trees but recharge of ground water reduces with rapid cementing of once brick lined storm drains and the side walk.

Our Journey

Our tree census started in the month of April 2011 and we completed it in May 2012. We had volunteers from different parts of Delhi, there were environmentalists, teachers, homemakers, children, journalists an eclectic group of 20. Some of them were one time volunteers and a few supported till the end of the census. We would do census only when we felt like and didn't set any target date of completion of this journey.

In all it took 45 days of volunteering. Most of all enjoyed the experience of watching nature unfold its beauty. We have counted trees on sidewalks and some, inside homes. The trees inside parks are less vulnerable and therefore we have not included in the count. But approximately they could add 300 to the count of the census.

In the course of our census we managed to intervene and save trees from being lopped, got nails and rods inserted into trees removed and protected open spaces from being cemented.

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At first I thought I was fighting to save rubber trees, then I thought I was fighting to save the Amazon rainforest. Now I realize I am fighting for humanity

- Chico Mendes, Rubber tappers' leader

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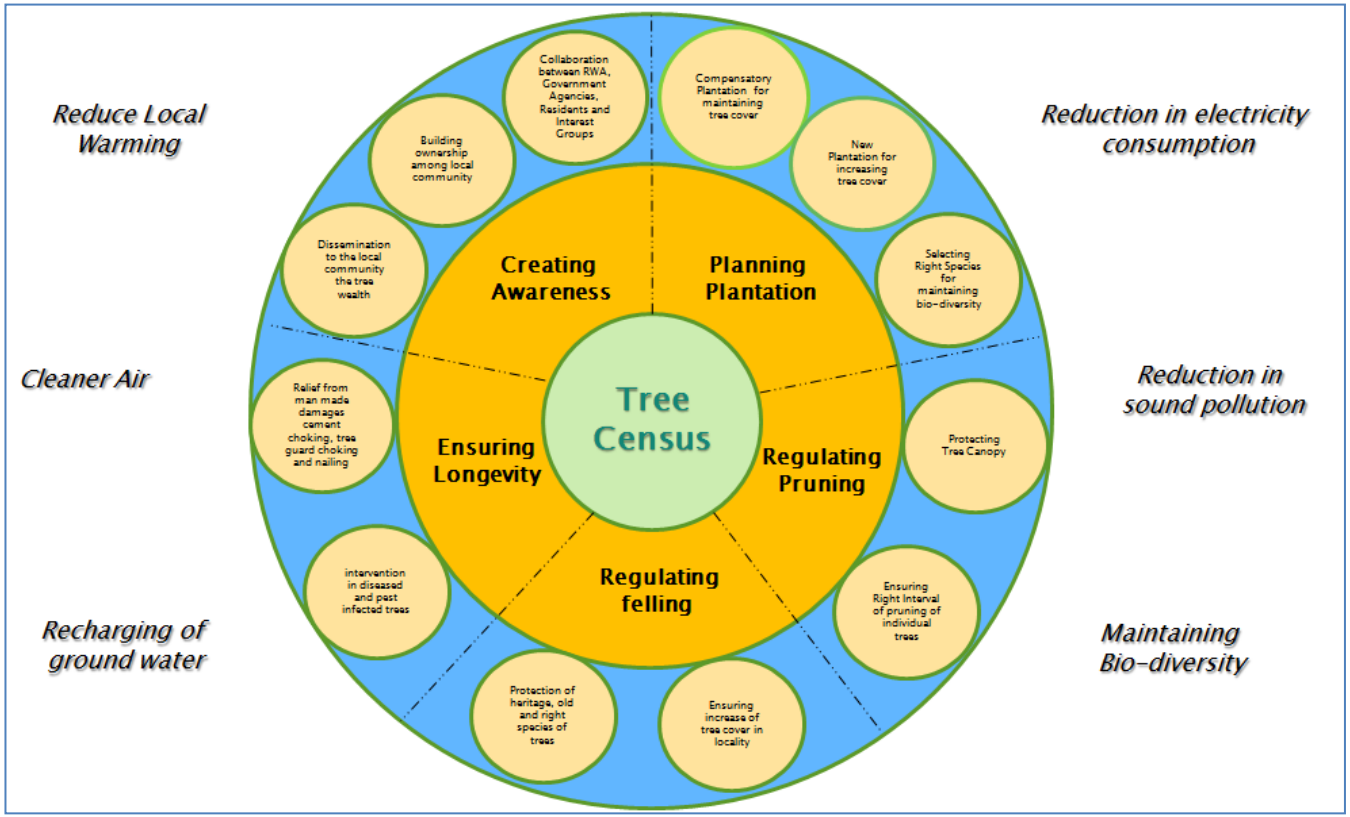
"Tree Census" - The Witness

Objective of Tree Census

Planning plantation, Regulating Pruning, Regulating felling, ensuring longevity of trees and creating community awareness are the five fundamental objectives of tree census. The benefits of tree census are illustrated in the Value Map given below:-



Our methodology

Tree walks preceded tree census t*o* enthuse and educate volunteers. During the tree walks it was observed that the major portion of roadside trees were under stress due to heavy cementing around trunks, lopping and nails in their trunks, in contrast to the trees in the parks. The trees in the colony are vulnerable and therefore need to be protected. It was decided to first study these trees in the colony in front of homes and in the parking areas.

The information to be captured was put into an easy tabular form. It had two distinct areas of data. Tree appreciation data and tree concern data. The first captured data related to the presence of flowers, fruits, nests and burrows, The second aspect captured elements of either human or natural that might damage the tree for example nails, lopping and cement choking.

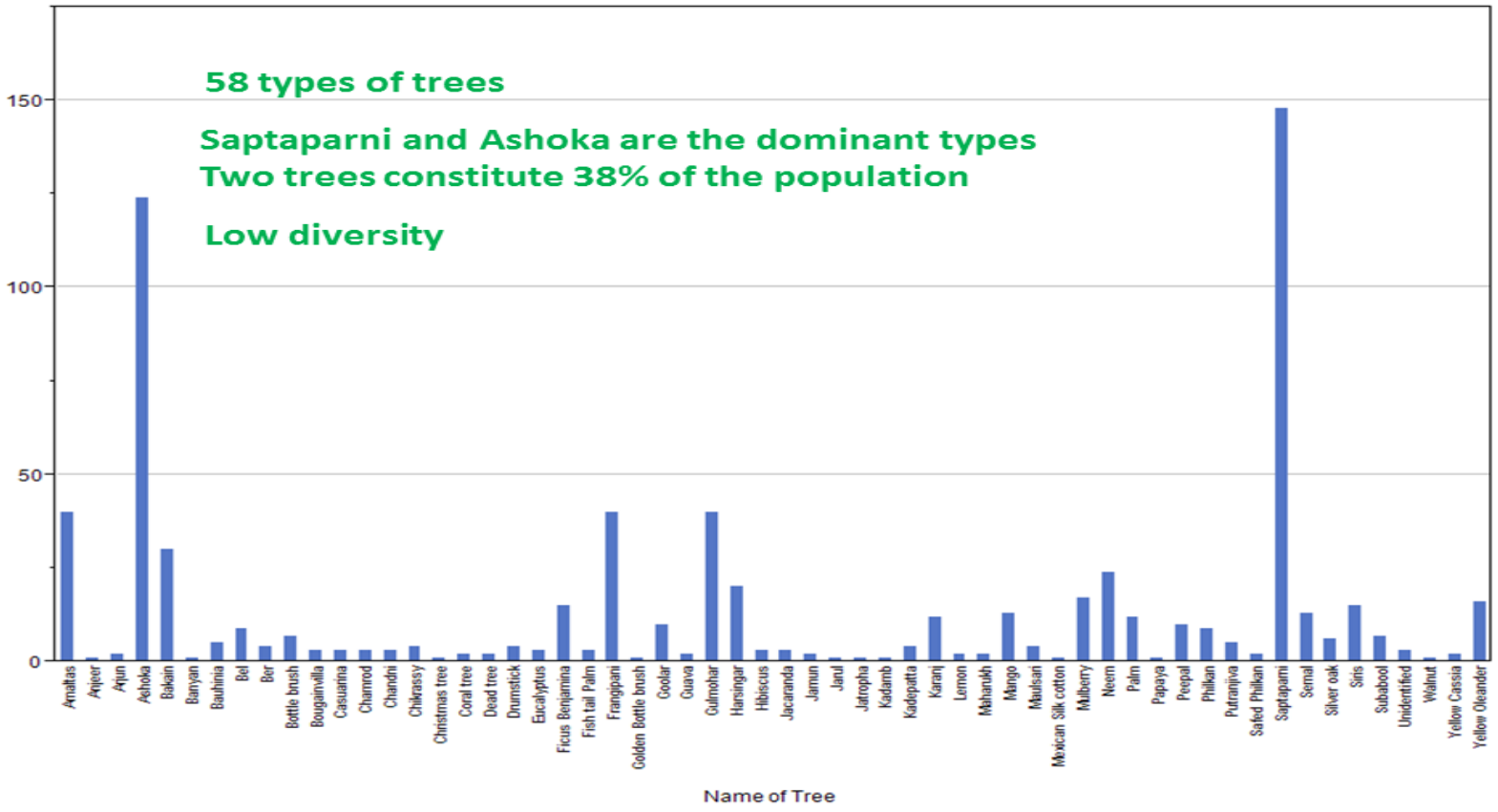
The basic format was shared in a meeting where volunteers from all across Delhi shared ideas. The format then was finalized and final copy with required fields was printed for capturing the data.

Trees were first numbered with a crayon with the house number in front of which the tree can be found as its location. Linking the number of the trees with the plots address gave an easy traceability of trees.

The Volunteers started the Census with A Block and ended with D Block covering a total of 787 trees.

Census Statistics

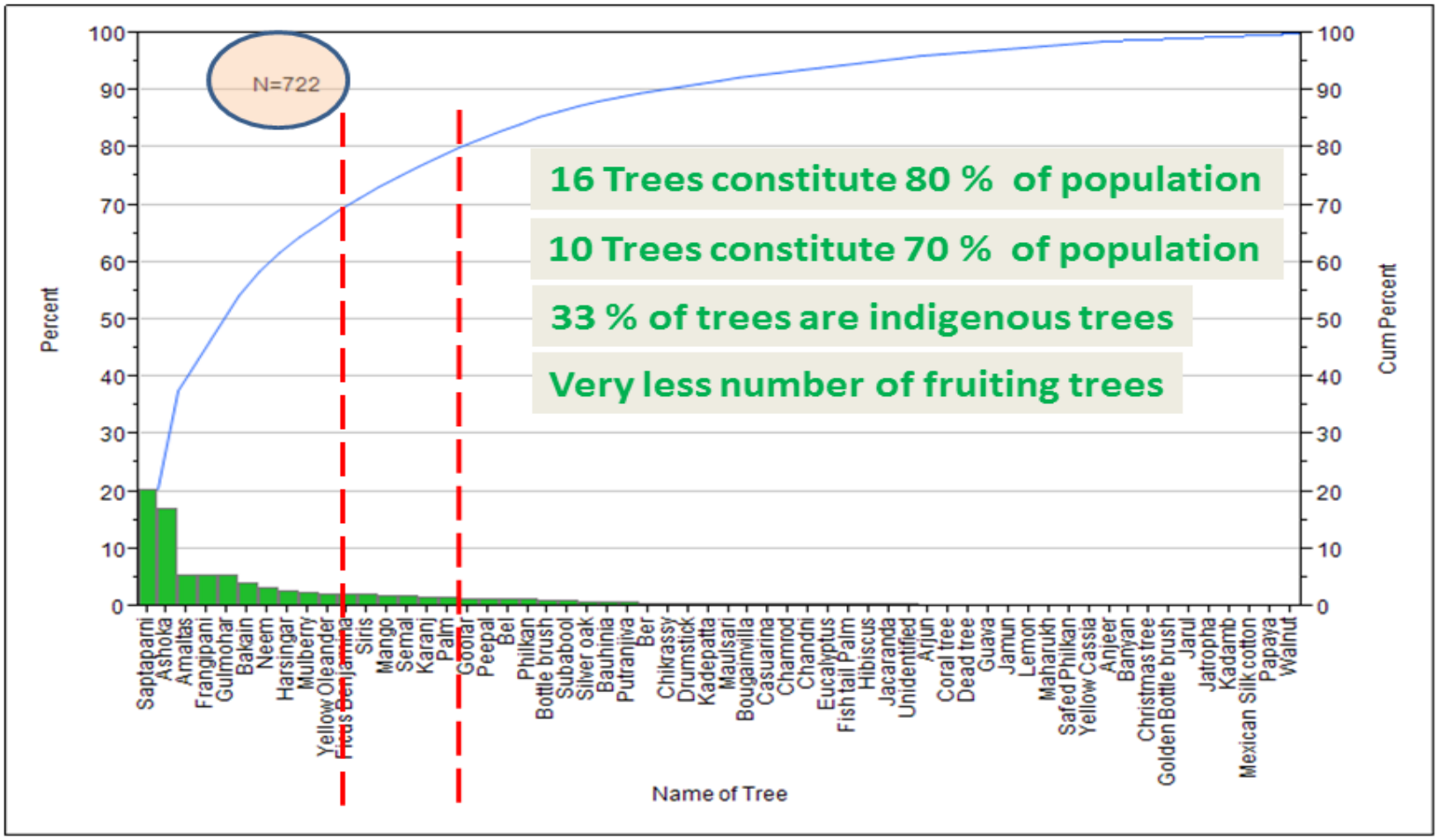
Improving diversity



Stat – SE – 1

Name of Tree	Number of Trees	% of Trees
Saptaparni	148	20.50
Ashoka	124	17.17
Amaltas	40	5.54
Frangipani	40	5.54
Gulmohar	40	5.54
Bakain	30	4.16
Neem	24	3.32
Harsingar	20	2.77
Mulberry	17	2.35
Yellow Oleander	16	2.22

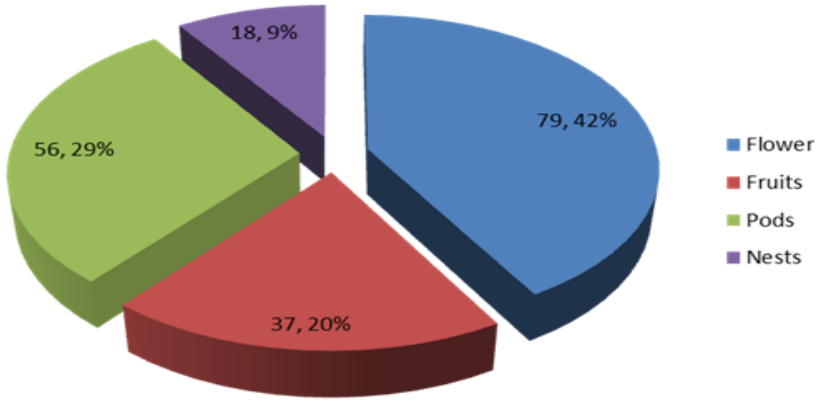
Tab – SE – 1


N=722
16 Trees constitute 80 % of population
10 Trees constitute 70 % of population
33 % of trees are indigenous trees
Very less number of fruiting trees
Percent
Cum Percent
Name of Tree
Saptaparni
Ashoka
Amaltas
Frangipani
Gulmohar
Bakain
Neem
Harsingar
Mulberry
Yellow Oleander
Ficus Benjamina
Siris
Mango
Semal
Karanj
Palm
Gootar
Peepal
Bel
Philkan
Bottle brush
Subabool
Silver oak
Bauhinia
Putranjiva
Ber
Chikrassy
Drumstick
Kadepatta
Maulsari
Bougainvilla
Casuarina
Chamrod
Chandni
Eucalyptus
Fish tail Palm
Hibiscus
Jacaranda
Unidentified
Arjun
Coral tree
Dead tree
Guava
Jamun
Lemon
Maharukh
Safed Phlkan
Yellow Cassia
Anjeer
Banyan
Christmas tree
Golden Bottle brush
Jarul
Jatropha
Kadamb
Mexican Silk cotton
Papaya
Walnut

Stat – SE – 2

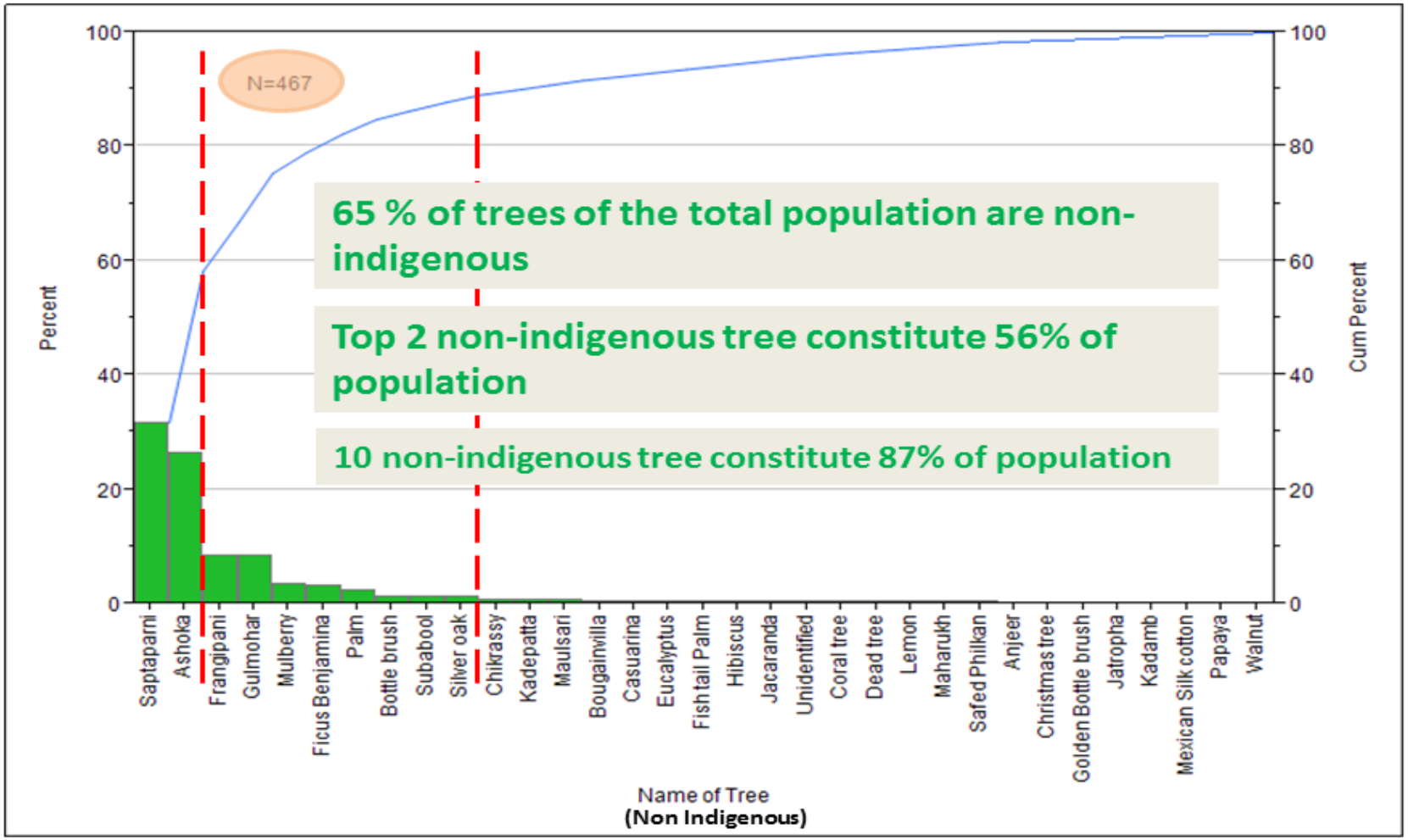
Tree seen with Nests / Flowers / Fruits / Pods

	Details of Trees			
	Flowers	Fruits	Pods	Nests
No of Trees	79	37	56	18



Stat – SE – 3

Improving indigenous / non-indigenous mix



Stat – SE – 4

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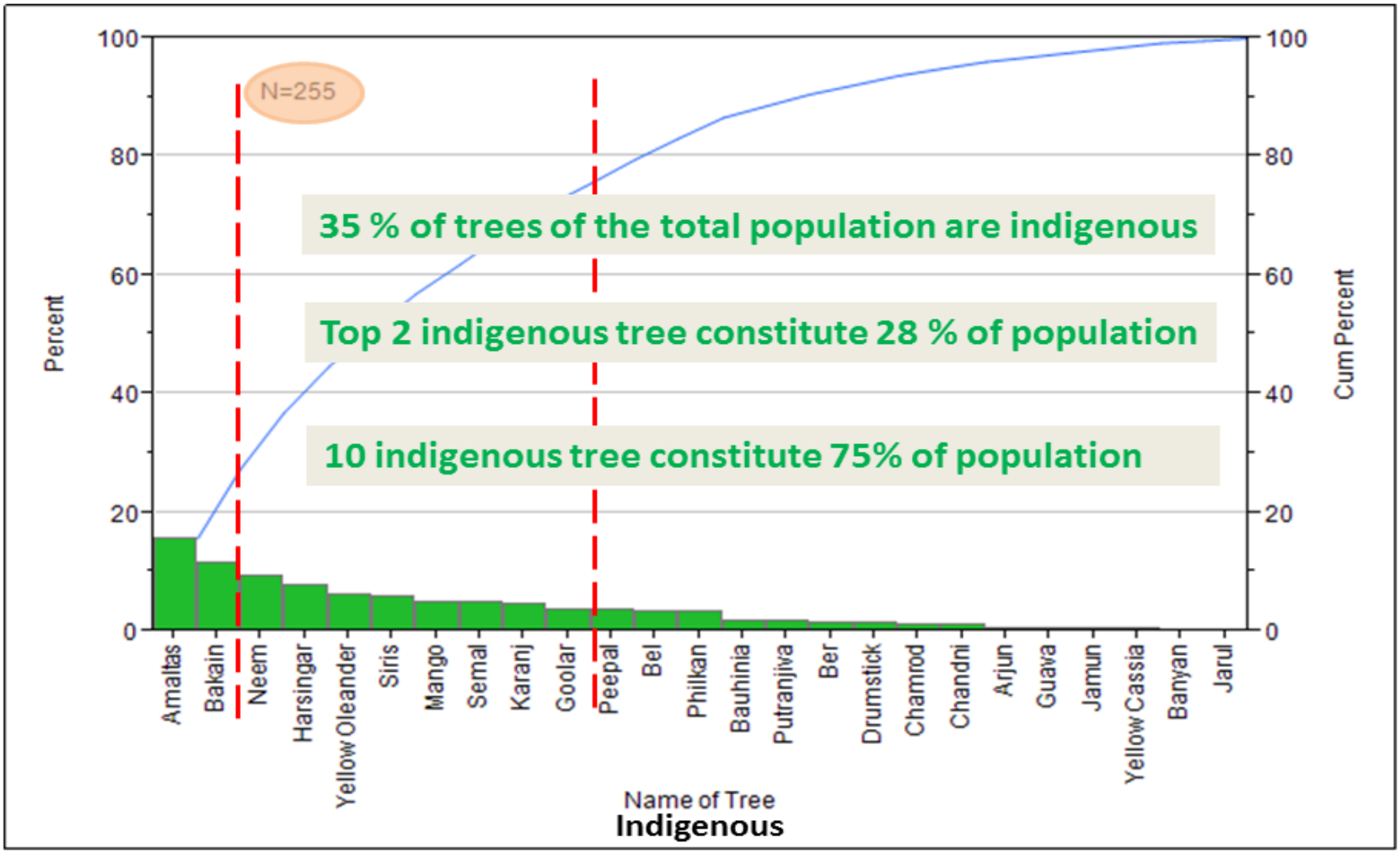
Non Indigenous Trees

Name of Tree	Number of Trees	Avg. Girth (cms)	Avg. Height (ft)
Eucalyptus	3	168	46.66
Anjeer	1	158	25
Gulmohar	40	138.2	29.22
Maharukh	2	123.5	32.5
Fish tail Palm	3	122.66	26.66
Saptaparni	148	121.80	33.29
Mexican Silk cotton	1	117	30
Silver oak	6	105.83	44.16
Palm	12	100.75	18.75
Maulsari	4	86.75	27.5
Bottle brush	7	84.14	24.28
Jacaranda	3	76	21.66
Casuarina	3	74.66	43.33
Ficus Benjamina	15	67.26	25.93
Mulberry	17	66.17	16.35

Non Indigenous Trees

Name of Tree	Number of Trees	Avg. Girth (cms)	Avg. Height (ft)
Coral tree	2	57	22.5
Chikrassy	4	55.5	36.25
Ashoka	124	52.67	20.60
Subabool	7	52.28	28.57
Christmas tree	1	52	20
Frangipani	40	45.65	14.45
Safed Philkan	2	44.5	25
Kadamb	1	42	25
Golden Bottle brush	1	34	20
Unidentified	3	34	10
Kadepatta	4	33.25	13.5
Hibiscus	3	29.33	12.33
Lemon	2	29	10
Papaya	1	29	15
Jatropha	1	27	15
Bougainvilla	3	25.33	8.33
Walnut	1	24	15

Tab – SE – 2 Contd.


N=255
35 % of trees of the total population are indigenous
Top 2 indigenous tree constitute 28 % of population
10 indigenous tree constitute 75% of population
Percent
Cum Percent
100
80
60
40
20
0
Amaltas
Bakain
Neem
Harsingar
Yellow Oleander
Siris
Mango
Semal
Karanj
Goolar
Peepal
Bel
Phillkan
Bauhinia
Putranjiva
Ber
Drumstick
Chamrod
Chandni
Arjun
Guava
Jamun
Yellow Cassia
Banyan
Jarul
Name of Tree
Indigenous

Stat – SE – 5

Indigenous Trees

Name of Tree	Number of Trees	Avg. Girth (cms)	Avg. Height (ft)
Peepal	10	231.3	38.5
Banyan	1	225	35
Philkan	9	185.5	31.33
Neem	24	163.29	36.875
Semal	13	154.23	37.69
Ber	4	148	25
Siris	15	131.13	30.13
Yellow Cassia	2	122	30
Bakain	30	119.9	29.83
Drumstick	4	119.75	29.25
Goolar	10	109.9	27
Amaltas	40	92.02	27.97
Arjun	2	90.5	37.5
Karanj	12	86.08	24
Jamun	2	86	15

Indigenous Trees

Name of Tree	Number of Trees	Avg. Girth (cms)	Avg. Height (ft)
Mango	13	79.53	29.61
Bel	9	79.37	28.33
Jarul	1	79	25
Bauhinia	5	73.4	26.4
Chamrod	3	56	23.33
Harsingar	20	47.35	14.84
Yellow Oleander	16	44.5	15.43
Chandni	3	35.66	9.66
Guava	2	31	16.5
Putranjiva	5	29.2	11.2

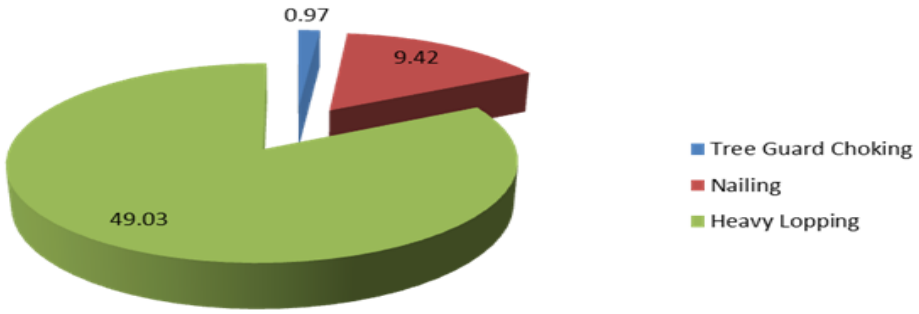
Tab – SE – 3 Contd.

Reducing Tree Damages

Tree Body Damages
(Nailing, Tree Guard choking and lopping)

	Tree Guard Choking	Nailing	Lopping
No of Trees affected	7	69	354

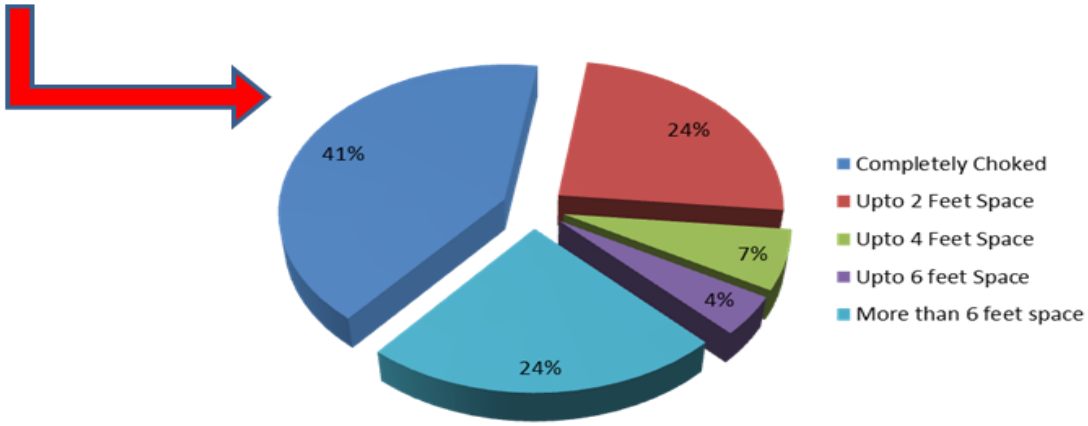
Incase of nailing there are some trees which has nails as high as 22



Stat – SE – 6

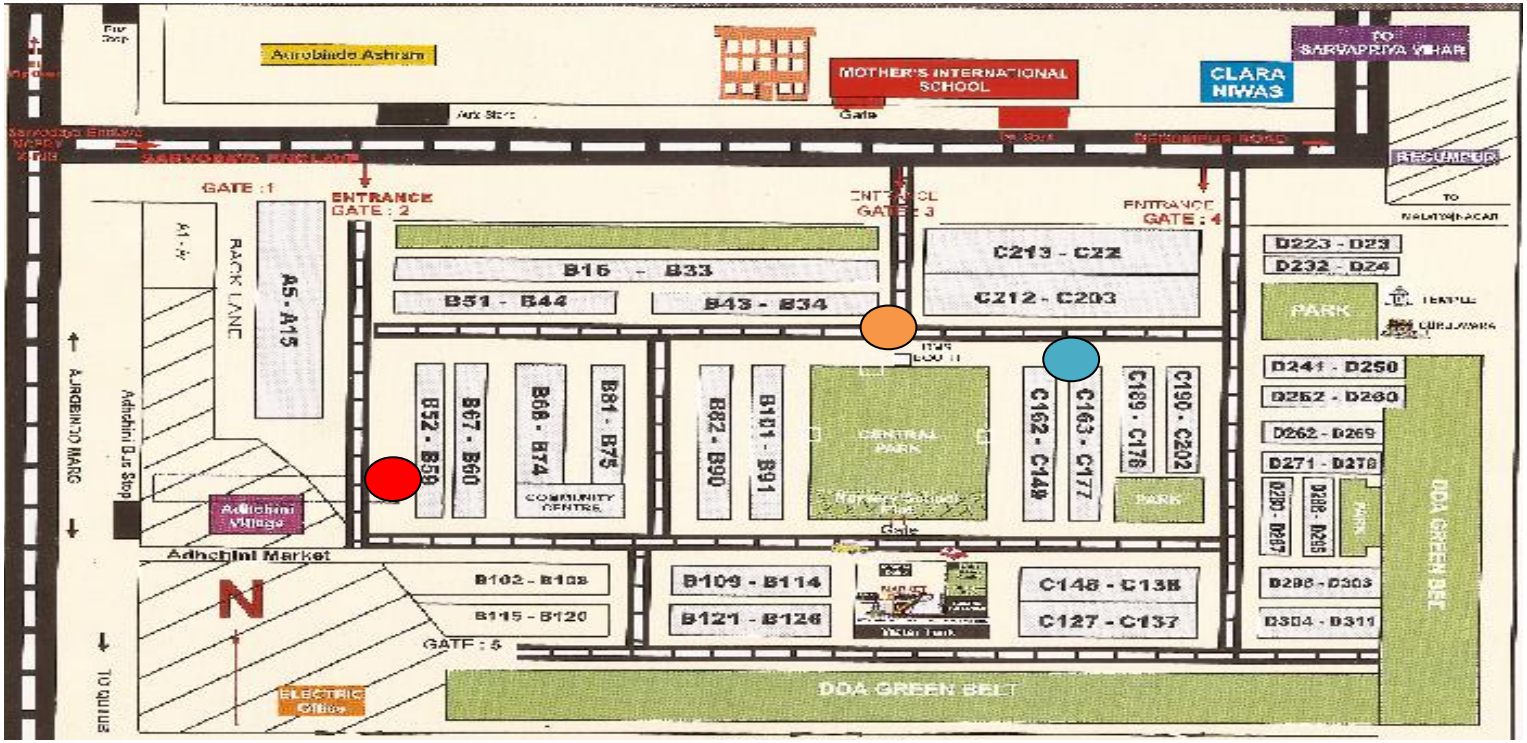
Tree Damages
(Choking of the Tree Trunk)

	Choking of Tree Trunk				
	Completely Choked	Upto 2 Feet Space	Upto 4 Feet Space	Upto 6 feet Space	More than 6 feet space
No of Trees	293	172	47	31	167



Stat – SE – 7

Tallest / Thickest / Not So Common Trees



	Tree 158	Peepal Tree	Thickest Tree
	Tree 497	Eucalyptus	Tallest Tree
	Tree 193	Anjeer	Not so common Tree

Stat – SE – 7

Summary of statistics

Indegenous vs Non Indegenous

In total there are 58 identified types of trees and including the three unidentified the total variety is 61. Dominant trees are Saptaparni, Ashoka, Amaltas, Frangipani and Gulmohar. Saptaparni is the most common tree found in Sarvodaya Enclave. The top five trees are non-fruiting and both Saptaparni and Ashoka comprise more than half the trees found in this colony, preferred perhaps due to narrow canopy cover. The indigenous tree most commonly found is Amaltas followed by Bakain. The tree diversity is very low and the non-indigenous trees are less than 35 percent. Future plantation in this colony must include Indigenous trees only, to improve the ratio.

Interdependency of fauna

The birds we have seen during the census are crows, mynahs, pigeons, bulbuls, doves, Tailor bird, Green pigeon, Sunbirds, Sparrows, wood pecker, Treepie, Oriental white eye, Coppersmith barbet, Pied Robin, Grey Hornbill , parakeets and kites. The total number of trees with nests is very low and 6 of the total trees with nests had wasp nests. Some trees had three to four wasp nests on each.

Damages to the tree body

The biggest damage to tree body is lopping, especially in winters. Some trees got annually lopped. Amaltas variety got lopped annually more than others. The next human induced damages to the body are nailing, iron hooks and rods. We have found a tree riddled with more than 22 nails, this Bakain tree was being used to recharge mobiles and an electric stove burner was connected to the power point nailed into the tree, rods were inserted into trees in front of construction sites and dhobi shacks. Termites are the most common natural pests on trees in Sarvodaya enclave, found frequently on Gulmohar and Harsingar.

Open space around trunk

The ground around tree trunks has little scope for water percolation and even in cases with ample space the soil is highly compacted. The highest space is termed ‘E” which is as per the High Court order of 6x6 feet open space around the trunk. The green corridor comprises close to hundred trees in front of houses A1 to A5. So the other trees in front of homes or parking which have more than 6 feet space could be as less as 67. 65% of the trees have less than 2 feet open space around the tree trunk putting the trees under great stress and threatening ground water recharge.

Recommendations

Planning Plantation

Roadside Trees (Census Count)	722
Park Trees (approx)	300
Trees Inside Houses (approx)	100
Total Trees	1122
Voters	1900
Families (assuming two voters per family)	1056
Children per family	2111
Human Population of Sarvodaya	4011
Trees per 1000 Humans	**280**
Vehicle Population (assuming 1.5 vehicle per family)	1583
Trees per 1000 Vehicle	**709**

2005	**Earth**
Trees	4,00,24,63,00,201
Human	6,45,67,89,877
Trees per 1000 Humans	**61,988**

NASA satellite photos of Earth help biologists calculate the number of trees. An Evergreen State College ecology professor Nalini Nadkarni and her students estimated there are roughly 61 per person worldwide.

Stat – SE - 1

Even to maintain 1 Tree per Person and 1 Tree per Vehicle, Sarvodaya Enclave, most probably the greenest colony in Delhi, needs ~ 1000 trees to be planted immediately and maintained assuming that all the trees planted would survive. The very low ration in the greenest colony also creates the need of identifying the status of other colonies, corporates, office / commercial complexes and undertake tree census followed up with rapid plantation of Indigenous trees for improvement of the situation.

Regulating pruning

Stringent policy on lopping and the frequency of pruning must be decided based on the necessity and the species. Record must be maintained as to which individual trees were pruned. No tree which has less than 6 feet open space must be given permission for pruning. Tree census data can be a useful tool. Awareness campaign must be in place to stop unnecessary pruning.

Regulating felling

Indigenous mature trees must be avoided from felling if there is an alternative while seeking or giving permissions by MCD/Forest department. Record of number of tree lost by calamities, diseases and human intervention can be recorded through tree census submitted by RWA every year.

Ensuring longevity

The tree census data can be used for maintaining the health of the trees, the Horticulture department must educate on interventions for common tree diseases and pests and the data of Tree census can be used to get all the nails , rods and tree guards damaging the trees immediately removed. MCD department has to create a massive campaign to protect open spaces. Recommendation of porous tiling is a big step forward wherever tiling cannot be avoided.

Creating awareness

Tree census provides a great opportunity for collaborators to get into first hand contact with the trees in colonies. Appreciation of trees leads to higher protection. Regular tree walks followed by tree census is recommended to build sense of ownership.

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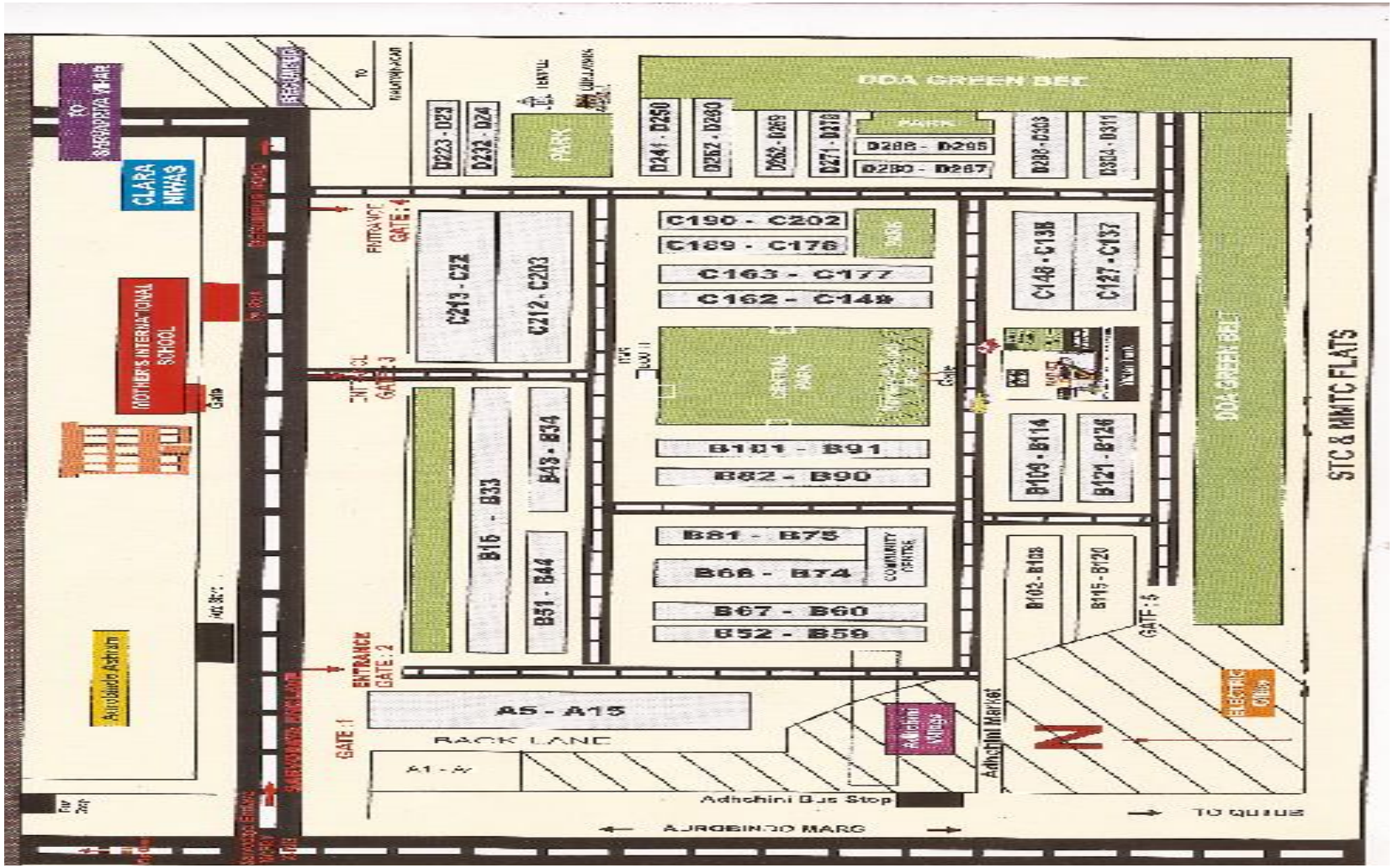
Appendix 1

Sarvodaya Enclave Map



Appendix 2

Tree Census Format

No on Tree	Name of Tree	Location of tree	Girth in Cms	Height In feet	On the Tree					Health of the tree					Ground condn	Open Soil	Other comments
					FL	FR	P	N	B	DS	HLP	NL	TGC	HTH	OS/T/C/CS	A/B/C/D/E	

Legend for Tree Census

On the Tree	Mention **FL** for flowers , **FR** for fruits, **P** for Pods, **N** for nest, **B** for burrows
Health of Tree	Mention **DS** for diseased, **HTH** for healthy, H**LP** for Heavily lopped, **NL** If you find nails, If Tree guard choking mention **TGC**
Ground condition	Mention **OS** for Open Soil, **T** for tiled, **C** for cemented, **CS** for compressed mud
How much of Open soil around trunk	Write **A** if space is Nil, **B** for 0-2 ft, **C** for 2ft>4ft, **D** for 4ft>6ft, **E** for 6 feet and more.

First Tree Census by Volunteers in Delhi

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"Hum iske jad mein jhoolte hain
Batak uske chaav mein sote hain
Ped ke neeche pani talab banjata
Mummy chidiya bacchho ko udna sikati
Rang birang titili bhi ajate
Gilahari dali se dali pe chalang lagati
Raat mein sare chidiya ped mein so jati
Gulel jaisa dali se hum sab cap udate
Ped se beej girta, beej se ped ugta"

– Ishan Dwivedi, 7yrs Mirambika school