



Creating Butterfly Habitats For Boosting Pollinators As Part Of Tree Plantation Initiatives Of Corporate Social Responsibility In India

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Presenter

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Corporate Social Responsibility (CSR) as an idea originated in the United States in 2001 is now widely prominent among most countries in the developed world.

It is defined as commitment of business to contribute to sustainable economic development, working with employees, their families and the local communities.

In 2014, India launched new Company Act that made CSR spend compulsory



CORPORATE SOCIAL RESPONSIBILITY





CSR IN INDIA

- Section 135 of the Act requires 'every company with a net worth of Rs 500 crore or more, or turnover of Rs 1000 crore or more, or a net profit of 5 crore or more to spend 2% of its three years' average profit on CSR activities'.
- It enlisted ten broad areas of investment like education, health, livelihood, rural development and environment are given in the Schedule VII of the Act.

indiacsr

Corporate
Sustainability &
Responsibility





PUBLIC-PRIVATE PARTNERSHIPS (PPPS)

- We followed PPPs Model (Public-Private Partnerships) which is defined to the provision of a public asset and service by a private partner who has been conceded the right for the purpose, for a specified period of time, on the basis of market determined revenue streams, that allow for commercial return on investment
- In our case the public asset and service was provided by the site partner who could be a Govt. body such as Forest Department or Municipal Corporation or an educational institution such as School/College/University. They lend a space for plantation, provided water supply and safety to plantation. The private partner was the donor/sponsor who is a corporate body that provides funding for the project and the project is executed through a non-profit partner or implementing agency who monitors the project throughout the project duration and send project review reports at periodic interval to the corporate partner.
-





Ladybird Environmental Consulting (LEC) came into existence to fill the facilitator gap between non-profit sector and corporations.

LEC wanted to ensure that some CSR funds come to environment sector and was confident to identify problem areas which needed funding.



BIRTH OF LADYBIRD



Ladybird

Environmental Consulting LLP

*Helping People
Help Environment*



WE ARE BUTTERFLY SPECIALISTS

Dr. V.Shubhalaxmi, Entomologist with Ph.D on Insects, Moth specialist: 25 yrs Exp.



Mr. Isaac Kehimkar, Author of Book of Indian Butterflies and Authority on Indian Butterflies: 35 yrs. Exp.



SERVICES LADYBIRD OFFERS

A social enterprise working in the field CSR and nature conservation with corporates and govt.dept. We provide environmental CSR solutions and employee engagement opportunities across India.



Young & Wise Team





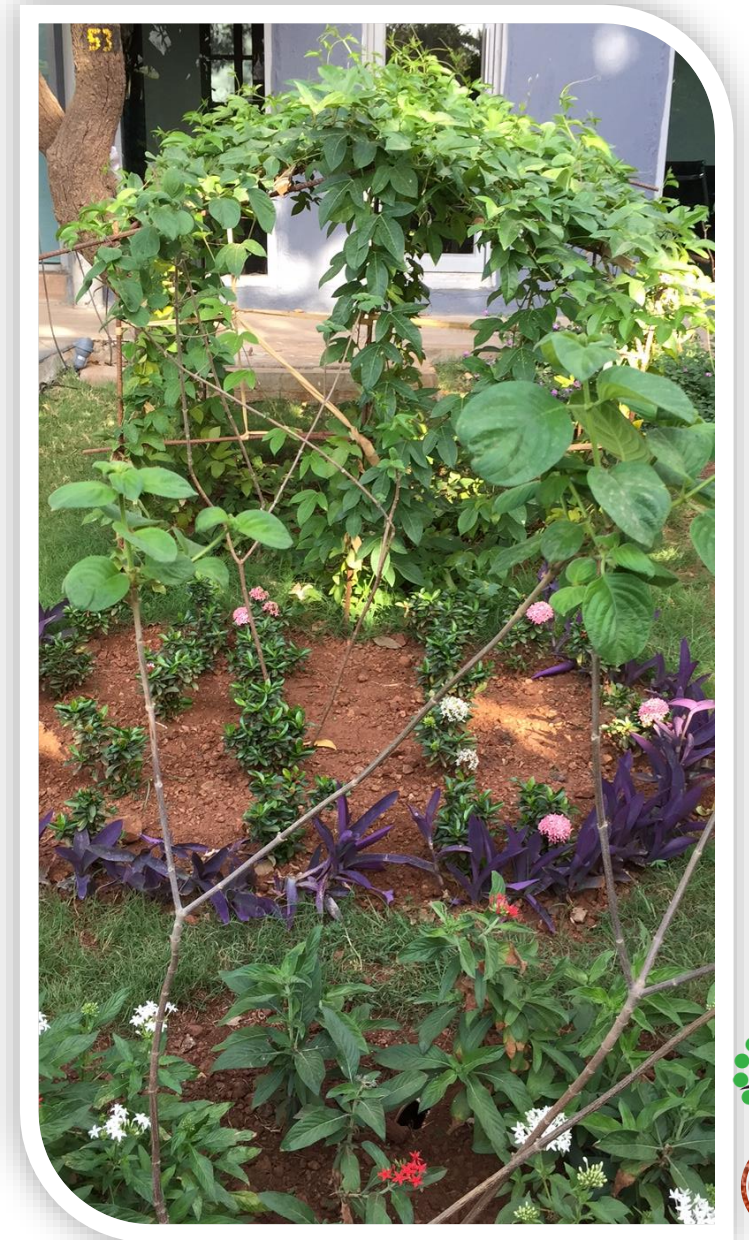
TREE PLANTATION- THE MAGIC WORD

- Corporates have tree plantation drives as part of their CSR projects.
- These projects vary from 1-3 years which includes monitoring and reporting. Most of the tree plantation projects involve planting of commercial fruit or timber trees or avenue trees.
- Commercial crops were used as means of providing livelihood to marginal farmers and avenue trees were used largely for greening highways or for afforestation purpose.



OUR CONCEPT OF ECOSYSTEM PLANTATION

We adopted Miyawaki model for tree plantation projects to create butterfly habitats





WHY BUTTERFLIES?

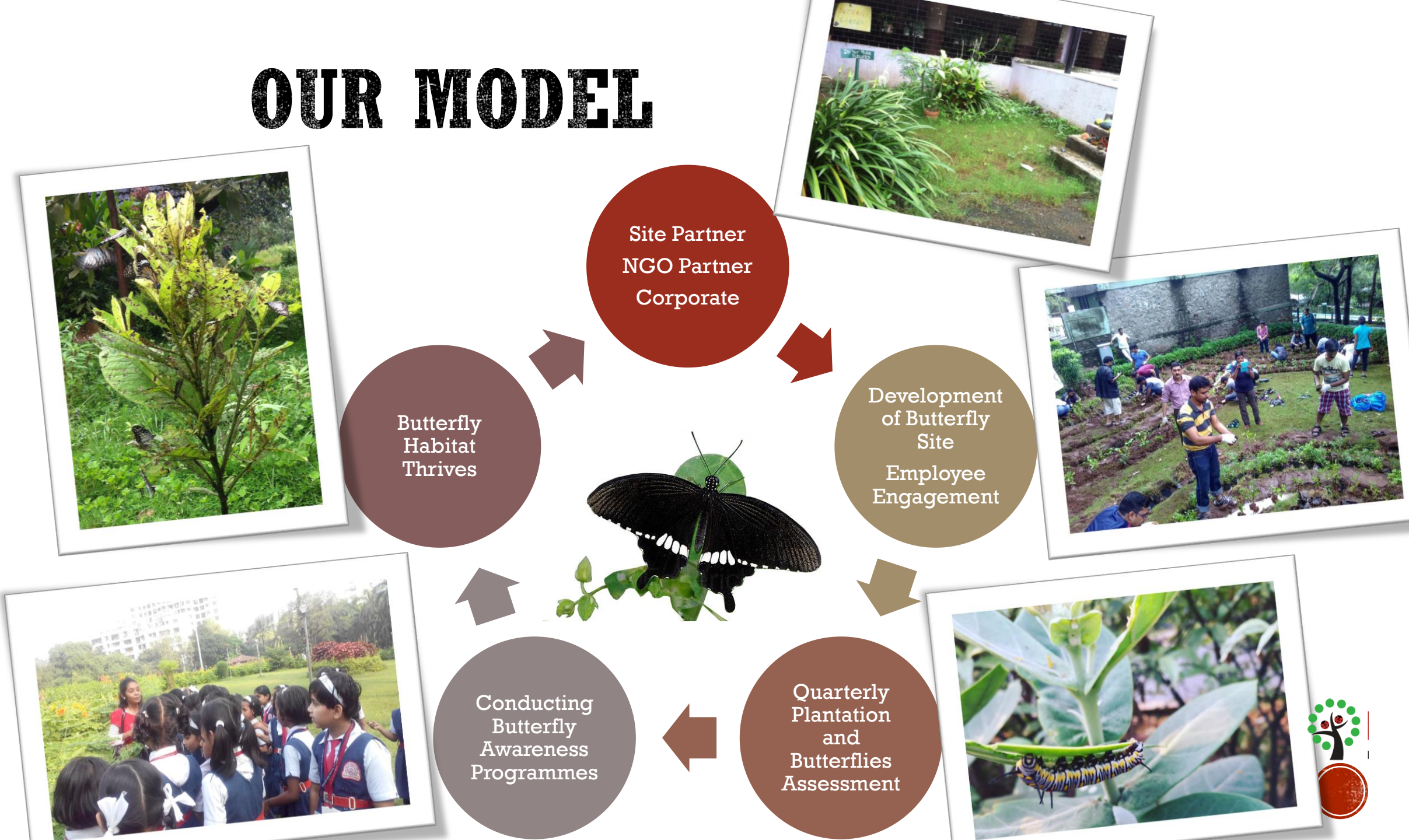
- Pollinators
- Indicators of healthy environment & Climate Change
- Important link in Foodchain
- Ambassadors of natural world
- Symbol of freedom, love, tranquillity and beauty.

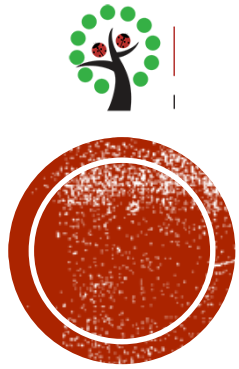


THREE IMPORTANT VALUES OF BUTTERFLIES



OUR MODEL





OUR BUTTERFLY WORKS

**Butterfly Habitats | Butterfly Gardens | Butterfly Parks | Butterfly Field Guide |
Butterfly Mobile App | Butterfly Sticker**



BUTTERFLY ZONES



Requirements	Butterfly Gardens	Butterfly Habitats	Butterfly Parks
Project type	CSR	CSR	Consultancy
Project sites owners	Educational institutions	Govt. & Educational Institutions	Zoos
Saplings	Upto 1000	Above 1000	Above 5000
Area	1000 sq.ft	1- 2 acres	2 acres
Visitor Engagement	Signages	Signages	Signages, Exhibits, Dioramas
Landscaping	No	Optional	Yes
Study materials	No	No	Yes
Establishment Time	1 week	1 month	3 months
Landscaping	No	No	Yes
Increase in Butterfly Diversity	Upto 30 species	Upto 40 species	Upto 60 species
Maintenance Duration	1 year	Upto 3 years	Optional



BUTTERFLY HABITATS



Name	Collaboration	Area	No. of Saplings
1. Sliding Stone Tree Park, Bangalore	<ul style="list-style-type: none">•Karnataka Forest Department•Wells Fargo Ltd•Karnataka State Harijan Girijan Rural Development Organization	1.5 acre	5000
2. Shri Jayeshwar Vidyamandir, Dengachimet, Jawhar, Maharashtra	<ul style="list-style-type: none">•TATA Motors•BAIF-MITTRA•Chatrapati Shikshan Mandal Santha, Kalyan	0.56 acre	11500
3. C.D. Deshmukh Udyan, Mulund, Mumbai	<ul style="list-style-type: none">•TATA Motors• MCGM•OASIS	4.94 acre	8000
4. Maharashtra Nature Park, Sion, Mumbai	<ul style="list-style-type: none">•TATA Motors•OASIS•Maharashtra Nature Park	0.16 acre	7800





BUTTERFLY
HABITAT IN
JAWHAR



Sliding Stone Tree Park in Bangalore

BUTTERFLY GARDENS



Name	Collaboration	Area	No. of Saplings
1. Urban Haat, Navi Mumbai	<ul style="list-style-type: none">• Videojet Technologies Pvt. Ltd• United Way of Mumbai• CIDCO	0.05 acre	1000
2. Urban Haat, Navi Mumbai	<ul style="list-style-type: none">• Videojet Technologies Pvt. Ltd• United Way of Mumbai• CIDCO	0.05 acre	100
3. Sacred Heart High School, Navi Mumbai	<ul style="list-style-type: none">• Videojet Pvt. Ltd• United Way of Mumbai• Sacred Heart School	250 sq.ft.	150
4. NASEOH, Mumbai	<ul style="list-style-type: none">• Deloitte• United Way of Mumbai• NASEOH	500 sq. ft.	150
5. TATA Serein	<ul style="list-style-type: none">• Tata Housing Development Company	1000 sq.ft.	1000





URBAN HAAT, NAVI MUMBAI





BUTTERFLY PARKS

We designed 3 butterfly parks, of which two are functional

Name	Collaboration	Area	No. of Saplings
Hindustan Petroleum Corporation Ltd. (HPCL)	• HPCL	0.77 acre	3000
Nawab Wajid Ali Shah Prani Udyan (Lucknow Zoo)	• Lucknow Zoo	2 acre	5000
Kanpur Prani Udyan (Kanpur Zoo)	• Kanpur Zoo	2 acre	5000







BUTTERFLY EDUCATION



TREE & PLANT SIGNAGE



EXHIBITS

A-Z OF BUTTERFLIES
(पुलपाखरांचे A-Z लेख)

A. Antenna | **B. Bristle** | **C. Chrysalis** | **D. Dispersal**

E. Egg | **F. Flight period** | **G. Grass seed** | **H. Hostplant** | **I. Instar**

Antennae of butterflies are mostly clubbed | B. Butterfly hair was coined from Bristle butterfly which is better coloured | C. Chrysalis is non-feeding and sensitive stage in butterfly lifecycle | D. Dispersal means males and females have different | E. Egg are tiny, beautifully patterned and always laid on specific hostplants | F. Flight period is defined as a season when a butterfly is seen on wing | G. Grass seed is the smallest butterfly of India, measuring 1.4 cm across | H. Hostplant is a plant on which the butterfly chooses to lay her eggs | I. Instar is a phase between two periods of molting in the caterpillars.

A. Antenna after taking eggs they will create more light sensitive eyes | B. Bristle, but the "antenna" is not used for touch "Bristle antenna" is present on tail end | C. Chrysalis is a protective stage where the caterpillar is in a dormant state | D. Dispersal is a process where the caterpillar moves from one hostplant to another | E. Egg are laid on specific hostplants | F. Flight period is defined as a season when a butterfly is seen on wing | G. Grass seed is the smallest butterfly of India, measuring 1.4 cm across | H. Hostplant is a plant on which the butterfly chooses to lay her eggs | I. Instar is a phase between two periods of molting in the caterpillars.

J. Jointed Legs | **K. Mulpoobding** | **L. Lestobaphion** | **M. Nectariophion** | **N. Nectariophion** | **O. Ocularation**

J. Jointed Legs is a feature of insect which is shared by butterflies. They have six legs (3. External) that is one and three-segmented butterfly found in Western and Northern India. | L. Lestobaphion is the person who studies butterflies. It is derived from the Greek word (Lestobaphion). | M. Mulpoobding is a technique of rearing butterflies which was first used in 1930s. | N. Nectariophion is a plant that attracts butterflies to feeding purpose. | O. Ocularation is a technique of painting or drawing on the wings of a butterfly. | Queen Alexandra's Birdwing, a world's largest butterfly from Papua New Guinea, measuring 28 cm.

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P. Redeye | **Q. Southern Birdwing** | **R. Tailed Jay**

S. Underside | **T. Upperside wing**

P. Redeye belongs to group of skipper butterflies having large red eyes. | Q. Southern Birdwing is the largest butterfly of India measuring 19 cm across. | R. Tailed Jay is a city butterfly and never sits still on a flower. | S. Underside and Upperside wing coloration is an important identification tool.

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V. Vein | **W. Wingspan** | **X. X-factor** | **Y. Young of a butterfly** | **Z. Zebra Blue**

V. Vein of butterfly wings provides support as well as nourishment | W. Wingspan is measured between wingtips or from thorax to forewing tip | X. X-factor of butterflies is their beauty and grace which sets them apart from other insects | Y. Young of a butterfly is a caterpillar | Z. Zebra blue is a tiny butterfly with black and white stripes.

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Being a butterfly is nothing close to being human
फुलपाखराचे जीवन मानवासारखे सोपे नसते

Learn how hard butterflies struggle and strategies they use to remain alive
पुलपाखरं किती कठीण संघर्ष करताना आणि कितल प्रयत्नासाठी ते कुठली कुठली यंत्रणा ते बनवून घेता.

Lock Like Anything But A Butterfly
गुलपाखर संघर्ष करताना ते किती कठीण संघर्ष करताना ते बनवून घेता.

Lock Like Your Enemy's Suit
गुलपाखर संघर्ष करताना ते किती कठीण संघर्ष करताना ते बनवून घेता.

Being A Baitwater: मगधे मगधे
गुलपाखर संघर्ष करताना ते किती कठीण संघर्ष करताना ते बनवून घेता.

Chemical Warfare: रासायनिक युद्ध
गुलपाखर संघर्ष करताना ते किती कठीण संघर्ष करताना ते बनवून घेता.

Mixing Security Services: सुरक्षा सेवा मिश्रण
गुलपाखर संघर्ष करताना ते किती कठीण संघर्ष करताना ते बनवून घेता.



FIELD GUIDE & STICKER

Flying Jewels of Govardhan Ecovillage BUTTERFLIES

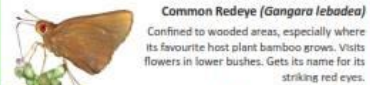
There are more than 60 butterfly species recorded here, we provide information about top 30 most common butterfly species here.

SKIPPERS (8 SPECIES)

Malabar Spotted Flat (*Celaenorrhinus ambareasa*)

This forest dweller is often seen resting on rocks. Comes to flowers for nectar. Fast flier. Caterpillar feeds on *Asystasia* plants, and remains hidden in the rolled leaf.

♂ 45-55 mm ♀ Jan-Dec



Common Redeye (*Gangara lebadea*)

Confined to wooded areas, especially where its favourite host plant bamboo grows. Visits flowers in lower bushes. Gets its name for its striking red eyes.

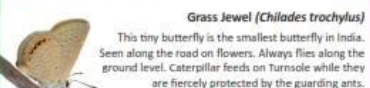
♂ 40-55 mm ♀ Jan-Dec

BLUES (9 SPECIES)

Common Cerulean (*Jamides celeno*)

A false eye dot and a tail is a deception for predators to attack for its head. Most common just after rains. Caterpillars feed on Pongam and are protected by ants.

♂ 27-40 mm ♀ Jan-Dec



Grass Jewel (*Chilades trochylus*)

This tiny butterfly is the smallest butterfly in India. Seen along the road on flowers. Always flies along the ground level. Caterpillar feeds on Tursole while they are fiercely protected by the guarding ants.

♂ 12-18 mm ♀ Sep-May



Red Pierrot (*Talicauda nyseus*)

This butterfly will always be found near its favourite food plant – the fleshy-leaved *Kalanchoe*. Caterpillars survive by remaining hidden inside the fleshy leaves they feed on.

♂ 30-38 mm ♀ Jan-Dec



Wingspan: Flight Period:



YELLOWS & WHITES (11 SPECIES)

Common Emigrant (*Cotoposilla pomona*)

This fast flier is usually seen fleeing from flower to flower. Often known to migrate in large numbers for new pastures. Caterpillars feed on leaves of Indian Laburnum tree.

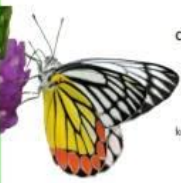
♂ 55-80 mm ♀ Jan-Dec



Common Jezebel (*Delias eucharis*)

Bright colours of this butterfly are actually warning colours to its would-be predators. Flies slow enough for its would-be predator recognize its warning colours and keep off. Caterpillars feed on parasitic Mistletoe plants.

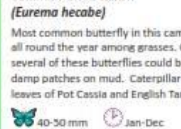
♂ 66-83 mm ♀ Jan-Dec



Common Grass Yellow (*Eurema hecabe*)

Most common butterfly in this campus, seen all round the year among grasses. On hot days, several of these butterflies could be seen on damp patches on mud. Caterpillar feeds on leaves of Pot Cassia and English Tamarind.

♂ 40-50 mm ♀ Jan-Dec



White Orange Tip (*Ixias marianne*)

Confined to forested area, this butterfly is seen more commonly during rains. Flowers are its favourite for nectar. Female is not brightly patterned. Caterpillar feeds on Caper plants.

♂ 50-55 mm ♀ Jan-Dec



Yellow Orange Tip (*Ixias pyrene*)

Bright flier is the male, while female is much duller. More common around forested areas. Like most butterflies, it loves to bask in the sun. Seen on flowers and on damp patches. Caterpillar feeds on Capers.

♂ 30-70 mm ♀ Jan-Dec



BRUSH FOOTED BUTTERFLIES (24 SPECIES)

Plain Tiger (*Danaus chrysippus*)

More local and common butterfly in this area. Its caterpillar feeds on the toxic Giant Milkweed plants, and accumulates plant toxins that make this butterfly distasteful. Birds soon learn to keep off from this distasteful butterfly.

♂ 70-80 mm ♀ Jan-Dec



Striped Tiger (*Danaus genutia*)

Birds soon learn to avoid this brightly patterned butterfly, as it is distasteful. Seen on flowers and on Rattlepod plants. Caterpillar feeds on Flytrap plants.

♂ 72-100 mm ♀ Jan-Dec



Common Crow (*Euploea core*)

Slow sailing flight of this dark butterfly is unmistakable. Distasteful for birds. Seen on flowers and on Rattlepod plants. Caterpillar feeds on leaves of Oleander, Banyan and Peepal trees.

♂ 85-95 mm ♀ Jan-Dec



Common Evening Brown (*Melanitis leda*)

Certainly an exception, as unlike most butterflies this butterfly flies during the early hours at dusk and late in the evening. Eyespots on the wings are seen only during the rains, dry season form has no eyespots, but the drab brown marks make this butterfly invisible among dry leaves.

♂ 80-80 mm ♀ Jan-Dec



Blue Tiger (*Tirumala limniace*)

Commonly seen on flowers and on Rattlepod plants. Birds avoid this distasteful butterfly. Known to migrate along with Striped Tiger. Caterpillar feeds on Green Milkweed Climber.

♂ 90-100 mm ♀ Jan-Dec



Baronet (*Euthalia nais*)

Most active flier during the hottest part of the day. Prefers forested areas. Prefers to feed on overripe fruits and tree sap. Caterpillars feed on Tendu leaves.

♂ 60-70 mm ♀ Sep-Jun



Danaid Egfly (*Hypolimnas misippus*)

This attractive butterfly prefers to fly in drier, open areas. Female could be easily mistaken for distasteful Plain Tiger, she mimics to escape predators.

♂ 70-83 mm ♀



Peacock Pansy (*Junonia almana*)

A marsh loving butterfly, commonly seen where its favourite foodplant, Talimkhana grows in abundance. Eye spots on the wing help in deflecting predator's attention from attacking its head.

♂ 60-65 mm ♀ Jan-Dec



Blue Pansy (*Junonia orithya*)

Open grassy patches and dry stream beds patches are its favourite where it fits at ground level during the hottest time of the day. Undersides are paler resembling leaves.

♂ 45-60 mm ♀ Nov-May

Common Sailer (*Neptis hylas*)

Common butterfly seen sailing along the road, and often settling on flowers. More abundant during rains. Caterpillar feeds on leaves of Red Silk cotton Tree.

♂ 50-60 mm ♀ Jan-Dec



Here we present a sample of common butterflies that could be seen in most of Indian cities. To learn more about butterflies, download our mobile app Butterflies. Photo courtesy: Isaac Kohliankar. A project by Bickering Aesthetes, Bangalore, Karnataka.

(*Graphium dason*)
g flowers, and comes
stream banks. Most tree
ple are its most favoured
o lay eggs on. Caterpillars
remains well camouflaged.

♂ 70-80 mm ♀ Jan-Dec

♂ 70-80 mm ♀ Jan-Dec

♂ 120-150 mm ♀ Jul-Nov

♂ 90-100 mm ♀ Jan-Dec

♂ 90-100 mm ♀ Jan-Dec

Photo Credits: Isaac Kohliankar
To learn more about butterflies download Butterflies mobile app from Android playstore.



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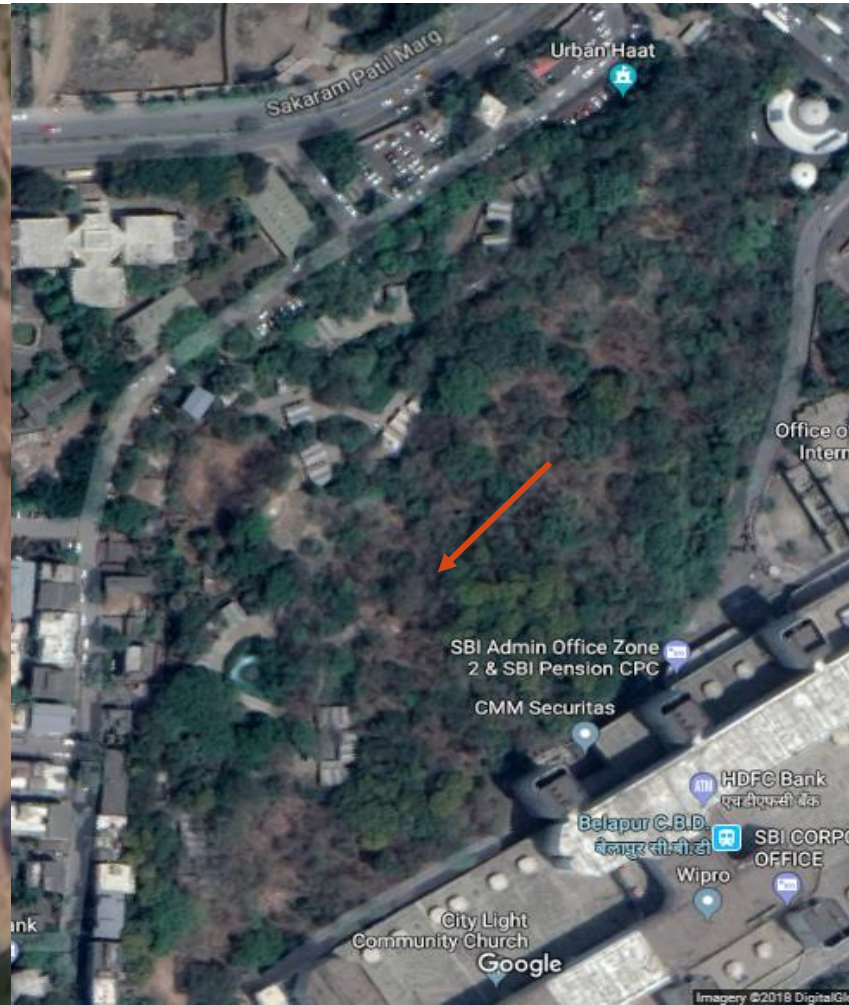


3 BUTTERFLY ZONES IN DISCUSSION

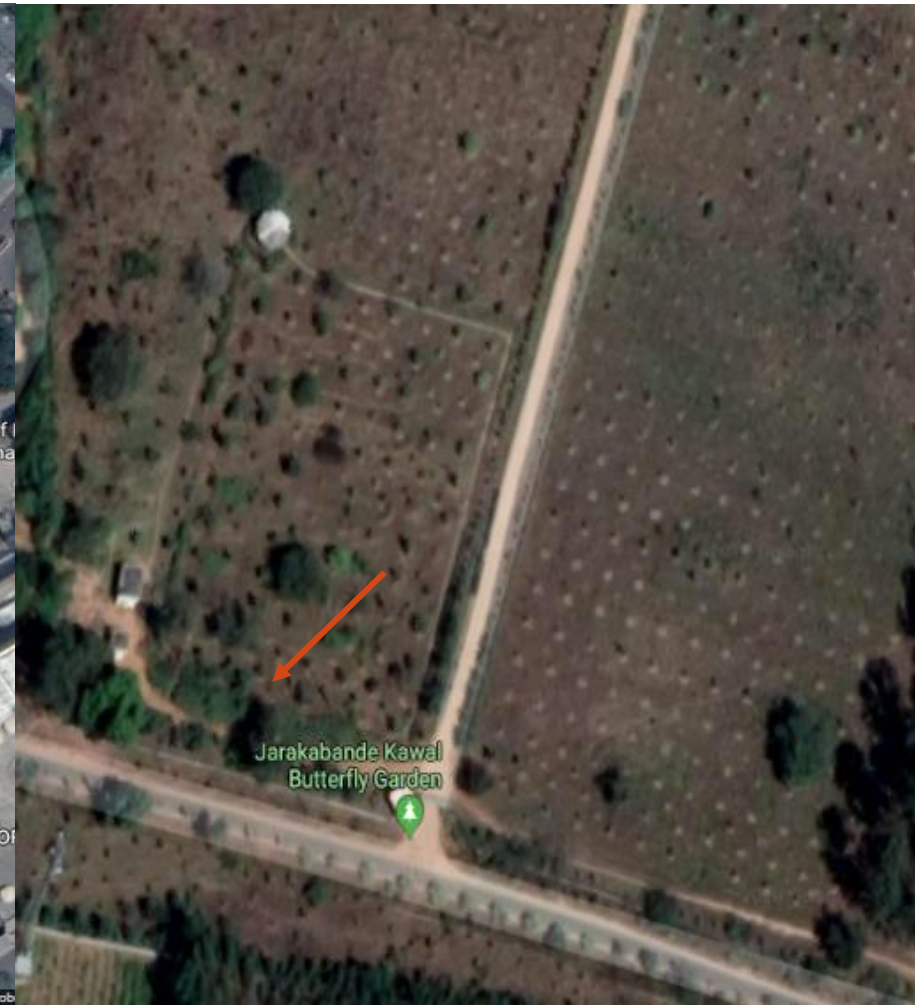
Shri Jayeshwar Vidyalay (Rural school site, Jawhar, Maharashtra)



CIDCO Urban Haat (Urban site, Navi Mumbai, Maharashtra)



Jarakbande Kaval Tree Park (Forest site, Bangalore, Karnataka)





CIDCO URBAN HAAT (URBAN SITE)

Location: CIDCO Urban Haat,
Sector 29, Belapur Railway
Station Road, Mumbai,
Maharashtra, India

No. of Saplings: 1150

Approx. area: 1000 sq.m.

Project Duration: Three years
(2015-2018)

Partners: Mahindra Susten Pvt.
Ltd, United Way Mumbai (on
behalf of Videojet Technologies
Pvt. Ltd)





SHRI JAYESHWAR VIDYAMANDIR (RURAL SITE)

Location: Village
Dengachiment, Jawhar
Road, Jawhar, Maharashtra,
India

No. of Saplings: 10000
Approx. area: 4000 sq.m.

Project Duration: Three
years (2015-2018)

Partners: Tata Motors Ltd,
BAIF-MITTRA, Chatrapati
Shikshan Mandal Sanstha



JARAKBANDE KAVAL TREE PARK (FOREST SITE)

Location: Jarakabande Kaval,
Via Attur Post,
Yelahanka, Bangalore,
Karnataka, India

No. of Saplings: 5000

Approx. area: 8000 sq.m.

Project Duration: Three years
(2016-2019)

Partners: Wells Fargo India
Solutions Ltd, Karnataka State
Forest Department, Karnataka
State Harijan Girijan Rural
Development Organization



THE PROCESS



Before

- *Need Assessment*
- *Writing Project Proposal*
- *Developing Project Execution Plan*
- *Site selection*
- *Seeking permissions*

After

- *Preliminary site survey*
- *Selection of plants as per the site*
- *Ground Preparation*
- *Developing Plantation Layout*
- *Execution of plantation work*
- *Development of Educational Materials*
- *Review of Plant Survival*
- *Butterfly Diversity Assessment Survey*
- *Butterfly Awareness Programmes for Local Communities*
- *Conducting Employee Engagement Programmes*



SITE SELECTION CRITERIA



Parameters for Site

Parameters	Compulsory	Desired
1. Ground	Arable ground with good soil	No ground vegetation growing
2. Habitat	Open sunny patch with partly shaded areas	Wilderness area near the site
3. Water	Availability of water supply	Presence of water body, presence of nearest water connection
4. Ease	Accessible for visitors and maintenance is convenient	





PRELIMINARY SURVEY

- Survey of wild nectar and hostplants at the site
- Survey of butterfly sightings at the site
- This data helps in creating before and after impact.



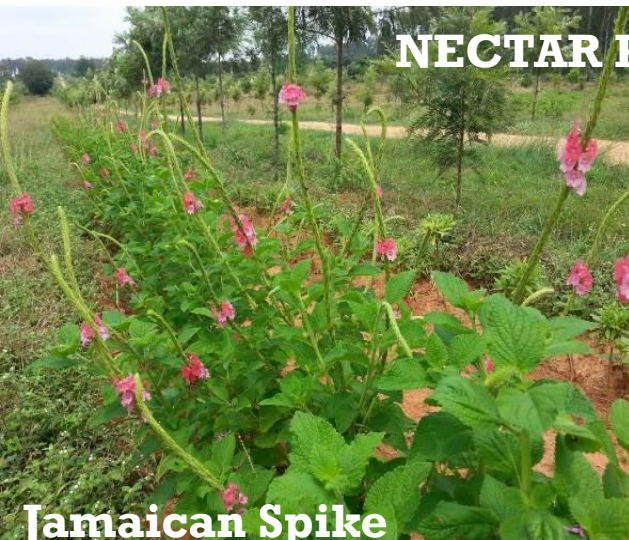
CRITERIA FOR SELECTION OF PLANTS

- W selected 25-35 plant species which included native, wild and ornamental varieties of plants.

Criteria for Plants.	
Criteria	Details
1. Category	Host plants, Nectar Plants & Alkaloid Plants
2. Hardiness	Drought resistant, higher regeneration rate, easy to maintain
3. Type	Perennial and non-invasive species of small trees, shrubs, herbs, climbers and creepers
4. Propagation	Regeneration from seeds, roots and cuttings
5. Availability	Easily available in local nurseries or wild
6. Size	Small trees (1-2 m), Shrubs (upto 1 m), Herbs (upto 15 cm)



NECTAR PLANTS



Jamaican Spike



Butterfly Bush

NECTAR-HOST PLANTS



Blood flower

HOST PLANTS



Castor plant



Garden Lantana



Pentas



Peacock flower



Giant Milkweed



Red Ixora



Kufia



Blue Plumbago



Fan Palm

GROUND PREPARATION

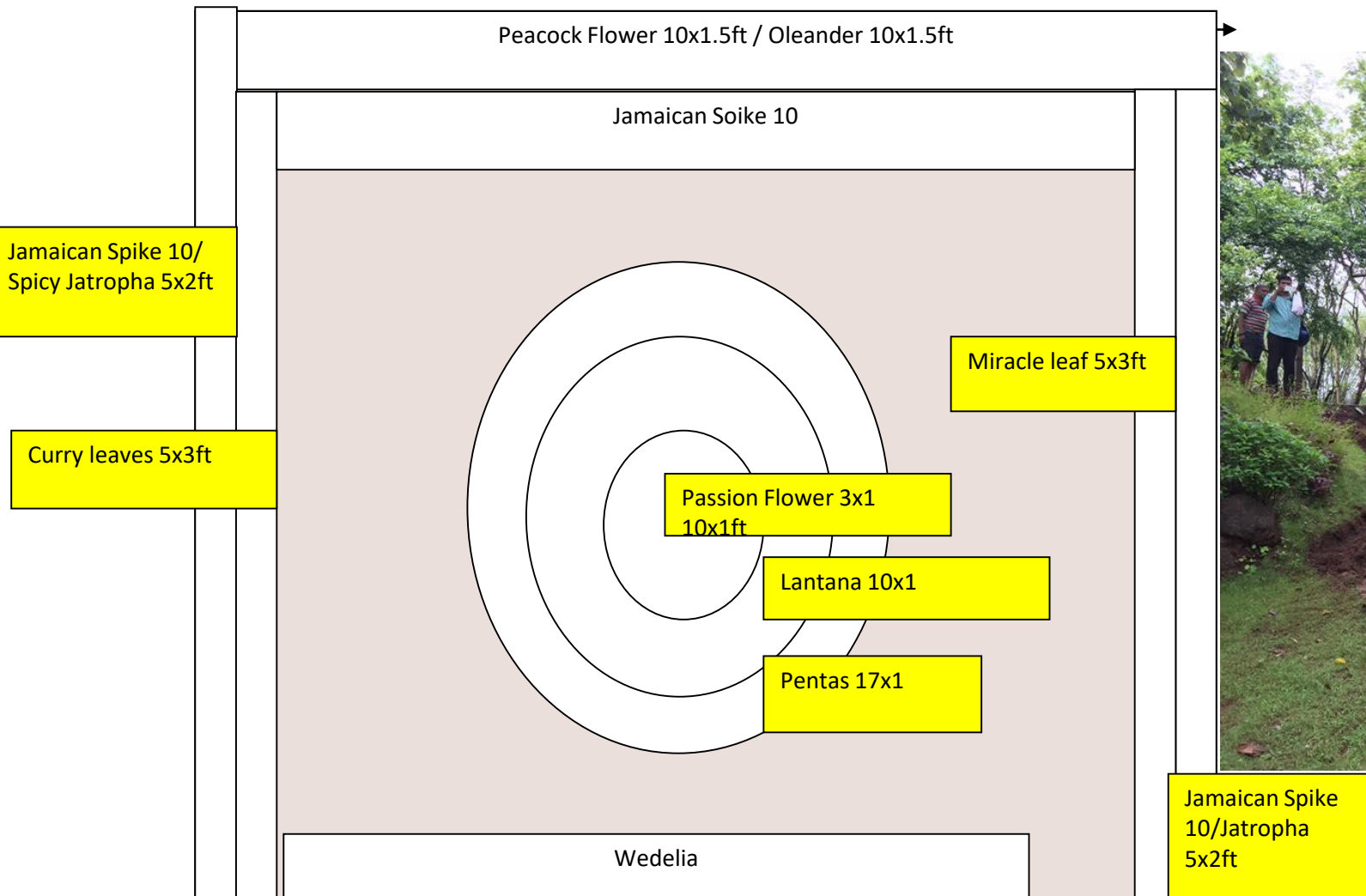
- As the plantation is more of cluster style therefore trenches were dug and wherever the ground was not arable, and the soil quality is not good, we used pit-digging method.
- The soil was enriched with manure and mulch. Casual labourers were hired to prepare the ground

Specifications for trench/pit digging

Type of plants	Measurements	Distance
1. Trees	80x80 cm	80 cm
2. Shrubs	60x60 cm	30 cm
3. Herbs	30x30 cm	15 cm



DEVELOPING PLANTATION LAYOUT





EXECUTION OF PLANTATION WORK

- Corporate employees volunteer their time for plantation
- Usually 1000 saplings are planted by a group 30 to 40 individuals in a single day
- We do a demonstration prior to the plantation.





PLANT QUANTITIES

- Quantities were based on as per the space availability and requirement corporate partner.
- Urban site (1000 sq.m) we planted 1100 saplings (1 sapling/0.9 sq.m))
- Rural site (4000 sq.m) where we planted 10000 saplings (1 sapling/ 2.5 sq.m)
- Forest site (8000 sq.m.) where we planted 5000 sapling (1 sapling/1.6 sq.m).

Summary of Plantation

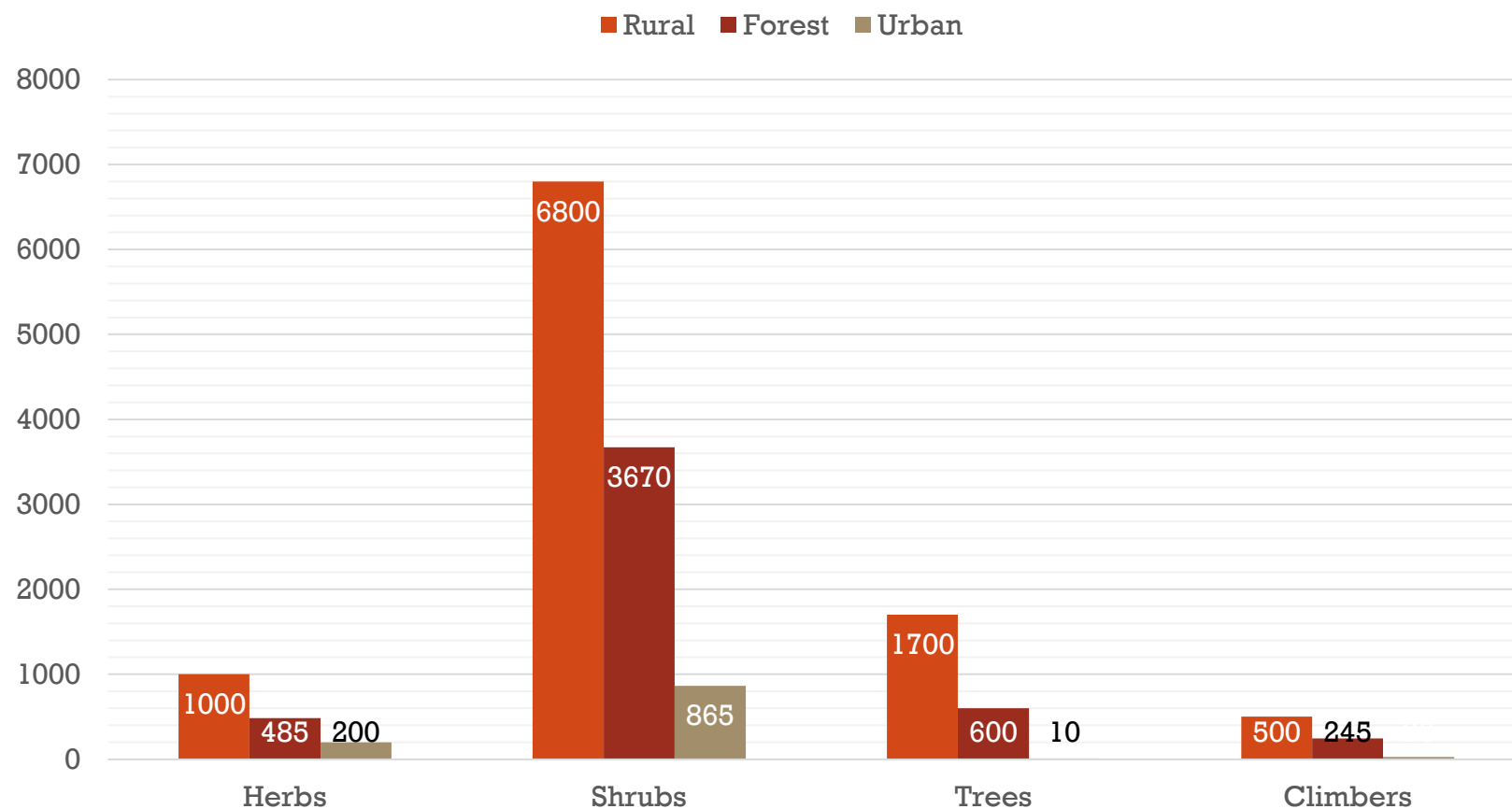
Site	Area(sq.m)	Saplings	Per sapling area(sq.m)				Climbers
				Herbs	Shrubs	Trees	
1. Urban	1000	1100	0.9	200	865	10	25
2. Rural	4000	10000	2.5	1000	6800	1700	500
3. Forest	8000	5000	2.6	485	3670	600	245
Total		16100		1685	11335	2310	770
%				10.47	70.40	14.35	4.78



PLANT COMPOSITION



Category-wise Plant Composition



- Total of 16100 saplings were planted.
- The ratio of nectar and hostplants were maintained to 50:30 (including <20% nectar cum hostplants).
- These ratios were considered in order to add more colours to the plantation as most of the hostplants do not bear attractive flowers
- Except species which fall under the category or nectar & hostplant had showy flowers.



SPECIES COMPOSITION

- 49 plant species were used
- Plant selection was based on the seasonality of the species, we chose perennial species over seasonal.
- Most were perennial except seasonal herb such as *Verbena* sp. and shrub *Crotolaria retusa* were used for specific purpose
- *Verbena* sp. is a beautiful herb which comes in several colours thus they add colour to the site
- *Crotolaria retusa* is an alkaloid plant which is used by milkweed butterflies who feed on the plant sap to increase their distastefulness.





PLANT ORIGIN

- Rural and urban sites had >70% exotic species in comparison to forest site where it was <50%.
- Native/wild species are not easily available in local nurseries, we chose only those species that are easily available.

We have included two types of exotic species;

- (i) non-invasive and non-regenerative e.g. Lantana. The hybrid varieties available in nurseries do not form fruits thus there is no danger of spreading.
- (ii) dispersive and regenerative e.g. Jamaican Spike which is regenerative as well as spreads but the saplings do not grow into mature individuals if the seeds happen to spread away from the mother tree.
- Seedlings germinated next to the mother plant grow in mature plants thus adding to the thicket effect.



Details of Plantation

Site	Numbers		Numbers (%)			Seasonality (%)		Origin (%)	
	Saplings	Species	Hostplants	Nectar plants	Mix	Perennial	Seasonal	Native	Exotic
Rural	10000	27	27.00	58.5	14.50	100	0	28	72
Forest	5000	31	23.22	57.3	19.48	96	4	50.7	49
Urban	1100	20	19.09	69.1	11.82	91	9	22	76



This Biodiversity Plantation Project is developed by Tata Motors Ltd. under its Corporate Social Responsibility (CSR) Programme - Vasundhara in collaboration with Maharashtra Nature Park Society, OASIS & Ladybird Environmental Consulting LLP

Year: 2014-15 | Plantation: 7000 No.

TATA MOTORS

OASIS

Ladybird Environmental Consulting LLP

DEVELOPMENT OF EDUCATIONAL MATERIALS

- Title signage
- Plant signage
- Butterfly activity sheet
- Butterfly sticker
- Facebook group



REVIEW OF PLANT SURVIVAL



- Post plantation, a review of plant survival is conducted either quarterly or six-monthly depending on the requirement of the corporate partner.
- We usually recommend quarterly reviews as it helps in documenting seasonal changes in the habitat.
- During the review, we manually count the number of saplings and estimate survival rates.
- Based on the requirement of replantation, additional saplings may be planted to compensate for the mortality.





SURVIVAL RATES

Survival Rates of Plantation								
Site	Category	No. of Saplings (Y1)	Re-plantation (Y2)	Re-generation (Y3)	Plants planted/regenerated (Y1+Y2+Y3)	No. of plants survived	No. of Plants affected	% Mortality rates
Rural		10000	1665	5093	16758	10022	6736	40.20
	Herbs	1000	0	1577	2577	2301	276	1.65
	Shrubs	6800	972	3516	11288	6231	5057	30.18
	Trees	1700	484	0	2184	1073	1111	6.63
	Climbers	500	209	0	709	417	292	1.74
Forest		5000	672	0	5672	3150	2522	44.07
	Herbs	485	545	0	1030	935	95	1.69
	Shrubs	3670	76	0	3746	1976	1770	31.43
	Trees	600	0	0	600	211	389	6.91
	Climbers	245	11	0	256	28	228	4.05
Urban		1100	104	30	1234	1056	178	14.42
	Herbs	200	0	0	200	153	47	3.81
	Shrubs	865	22	30	917	790	127	10.29
	Trees	10	0	0	10	1	9	0.73
	Climbers	25	102	0	127	112	15	1.22

- Periodic review upto three years.
- Plants were physically counted sometimes approximation method was applied
- Mortality rates were high in the Year 1 (Y1) however by the Year 3 (Y3) most of the habitats got established.
- Affecting factors were lack of water supply, extreme weather and lack of proper maintenance.
- Selective replantation of affected species was done.





BUTTERFLY DIVERSITY ASSESSMENT SURVEY





Blue Tiger



Common Castor



Cerulean



Common Crow



Common Emigrant



Grass Yellow



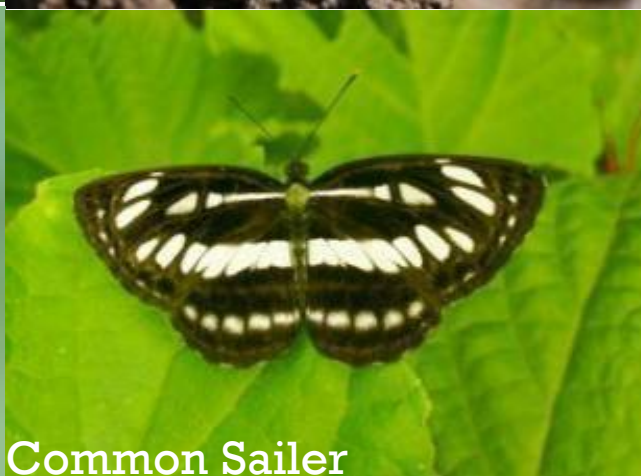
Common Mormon (female)



Common Gull



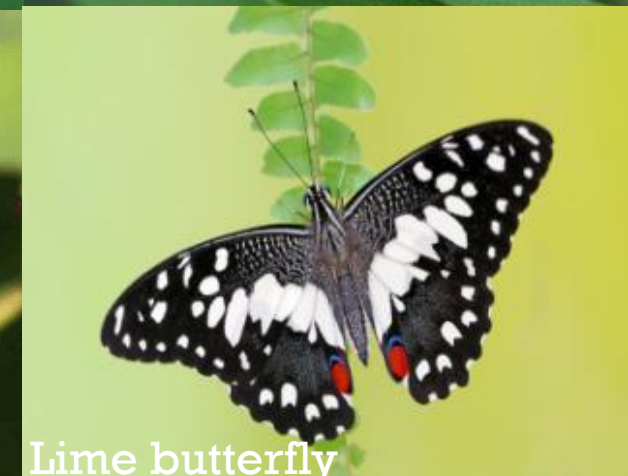
Common Rose



Common Sailer



Danaid Eggfly (male)



Lime butterfly

BUTTERFLIES FROM BUTTERFLY ZONES





Plain tiger egg



Common Emigrant



Lime caterpillar



Common Mormon



Common Emigrant egg



Plain Tiger



Blue Tiger



Common Castor



Tiger moth caterpillar



Death's head hawkmoth

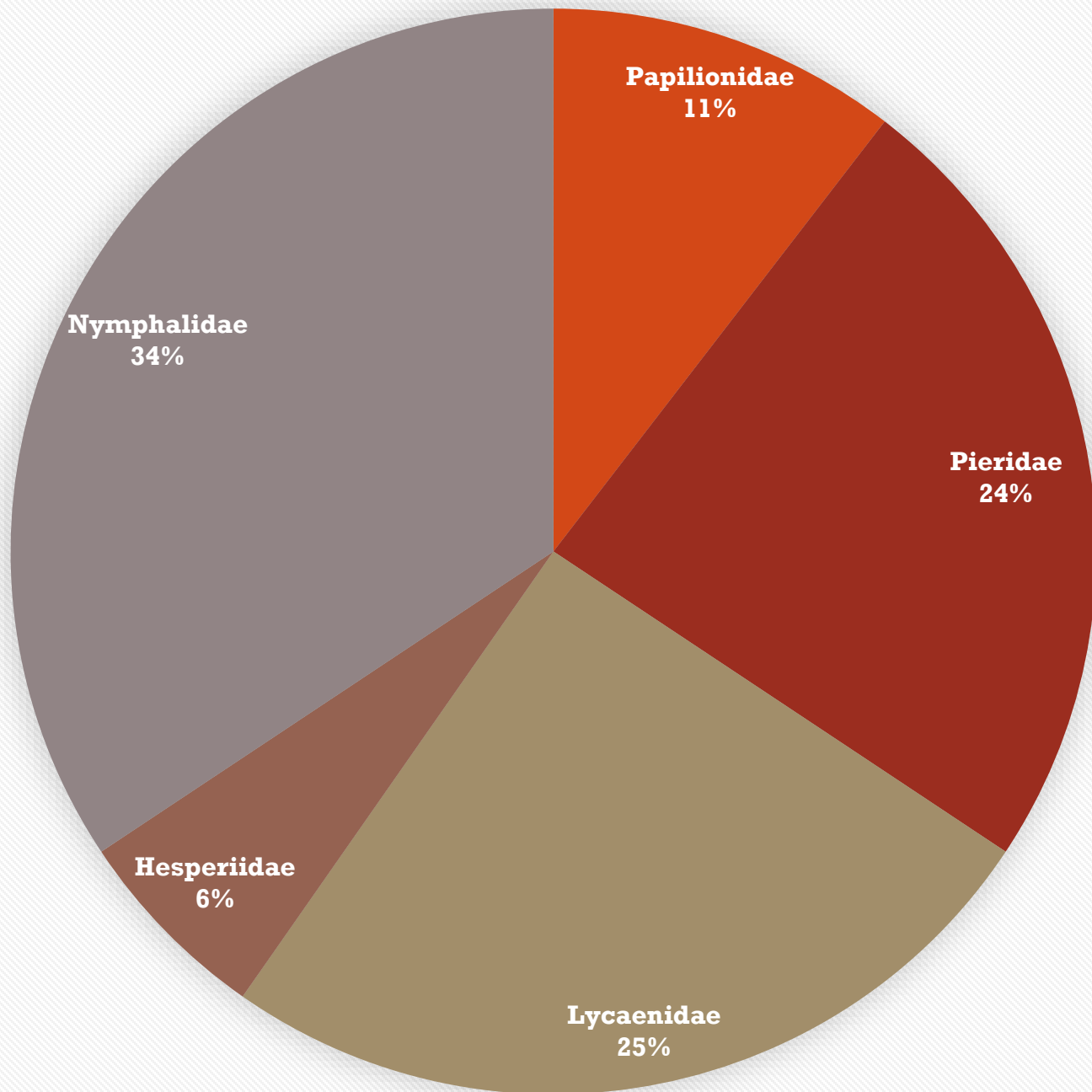


Tiger moth caterpillar



Oleander hawkmoth

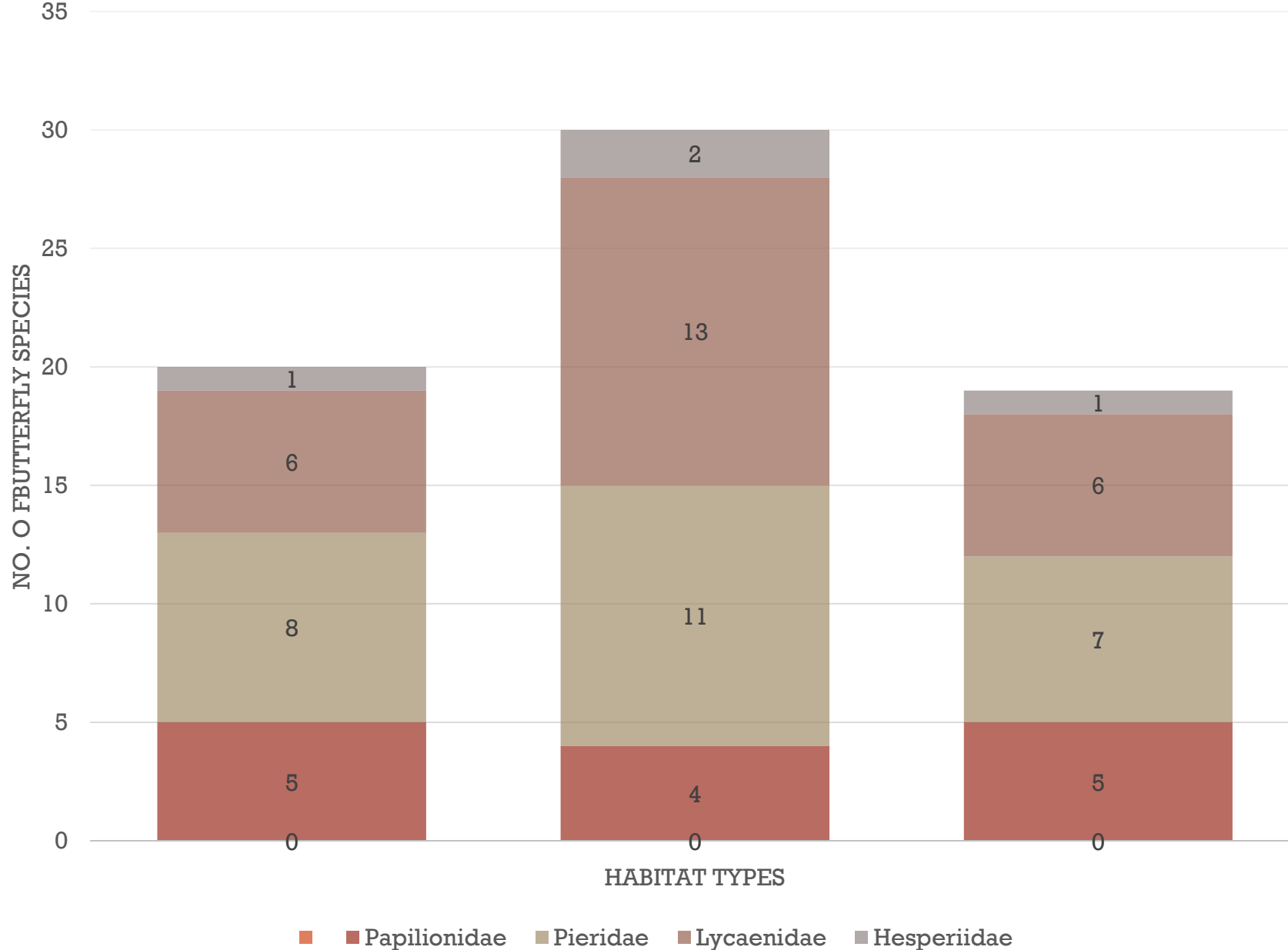
Figure 2. Butterfly Diversity Familywise



BUTTERFLY DIVERSITY

- Altogether 67 species of butterflies were recorded from all three sites
- Highest butterfly diversity was recorded at Forest site (46 spp), followed by Rural site (37 spp) and Urban site (30 spp).
- The dominant butterfly family is Nymphalidae (23 spp), followed by Lycaenidae (17 spp), Pieridae (16 spp), Papilionidae (7 spp), and Hesperiiidae (4 spp).

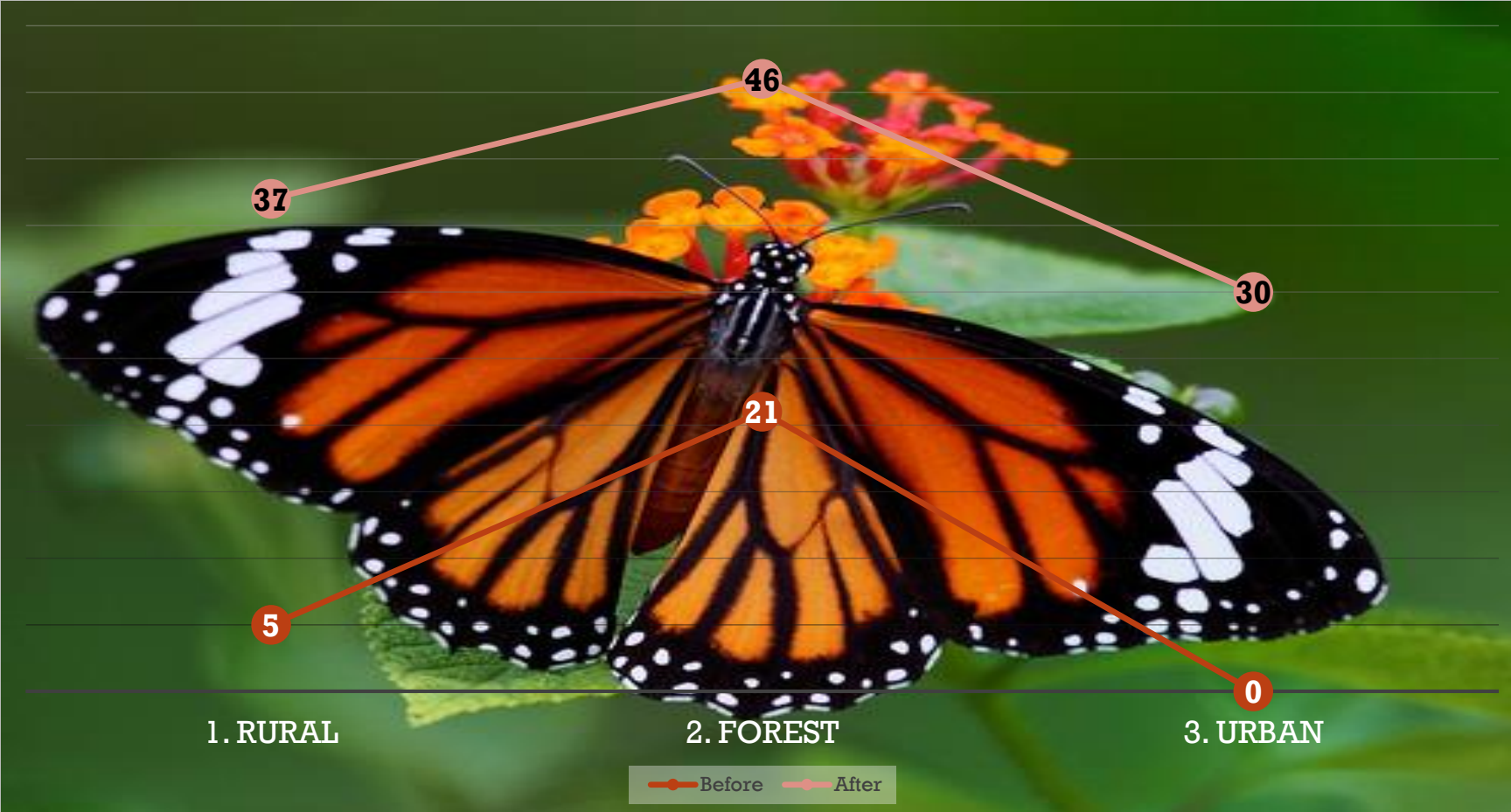
COMPARISON OF BUTTERFLY DIVERSITY SITEWISE



BUTTERFLY DIVERSITY SITEWISE

All five families represented in all sites however Forest site had highest diversity of Pieridae (11 spp) and Lycaenidae (13 spp) butterflies followed by Rural site (7 spp, 6 spp).





INCREASE IN BUTTERFLY DIVERSITY

- Highest increase in species diversity was recorded at Urban site (n=30 spp) followed by Rural site (n=32 spp) and Forest site (n=25 spp).
- Sighting of 30 butterfly species in Urban Site is highest increase recorded among all three sites.

Site	No. Species		Butterfly Families					Increase in species
	Before	After	Papilionidae	Pieridae	Lycaenidae	Hesperiidae	Nymphalidae	
Rural	5	37	5	8	6	1	17	32
Forest	21	46	4	11	12	2	16	25
Urban	0	30	5	7	6	1	11	30

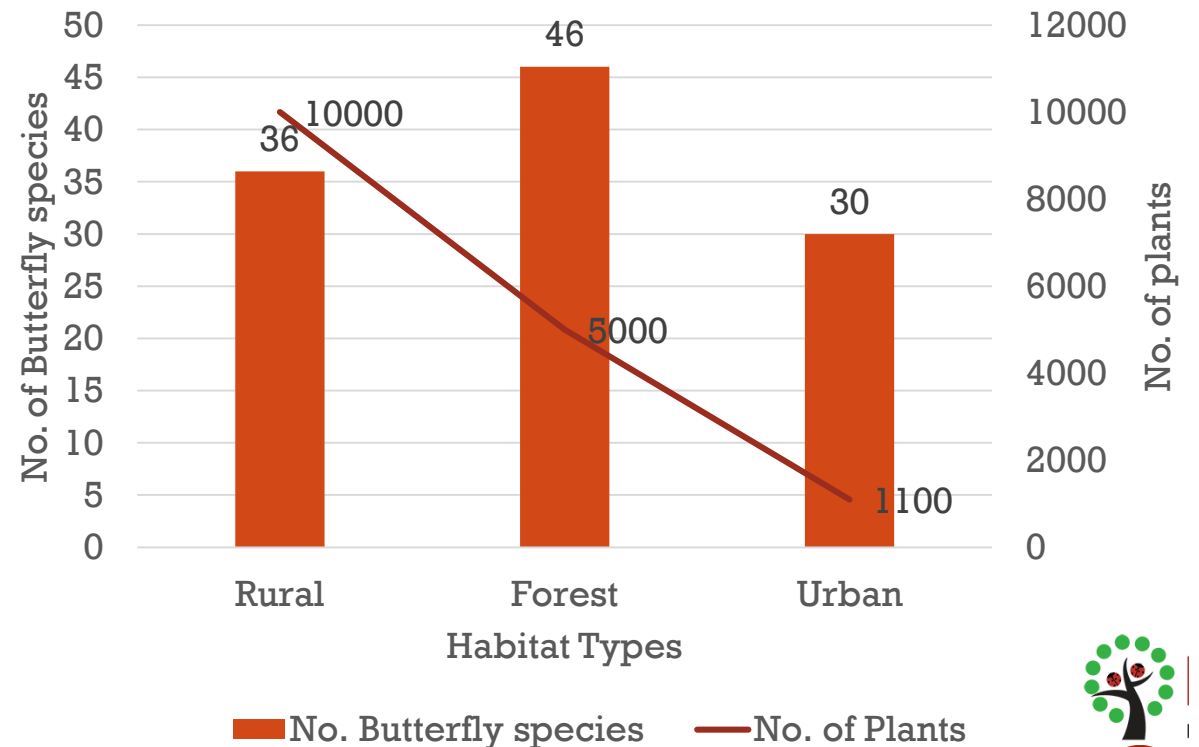


BUTTERFLY DIVERSITY AND SITE PREFERENCES

The highest species were recorded at Forest site (46 spp) which was having highest plant species diversity of 31 species followed by Rural site (37 spp) having plant diversity of 27 species and lowest recorded for Urban site (30 spp) with plant diversity of 20 species.

This proves butterfly diversity is not directly dependent on the plant quantities but on the site location.

Comparison between quantities of plants and butterfly species





BUTTERFLY AWARENESS PROGRAMMES

Altogether we conducted 32 programmes in span of three years and a total 1396 participants were engaged.

Butterfly Awareness Programme

Participants/Site	No. of Programmes	Forest	Rural	Urban	Total
Schools Students	18	247	625	64	936
Employees	14	92	8	260	462
Total	32	439	633	324	1396





EMPLOYEE ENGAGEMENT PROGRAMMES

We conducted such 18 programmes wherein 599 volunteers were engaged who clocked 3594 volunteering hours. (avg.6 hrs/volunteer)





OUTCOMES



For plantations | For Butterflies | For Community | Fulfilment Aichi Targets
and UN Sustainable Goals





PLANTATION

- The plant quantities played an important role in influencing the attractiveness of the site to the butterflies. However species diversity was not dependent on plant quantities
- The ratio of 50:50 of nectar and host plants is most suitable composition as these are effective in terms of helping the butterflies in conserving energy which they spend on flying from nectar plant to host plant and thus avoiding predation.
- The plants are planted too close to each other, they grow up into thickets which provide spaces for butterflies to roost and for birds to nest.
- Among the plant categories trees and shrubs are hardy and most economical compare to herbs. Perennial species are more successful than seasonal plants.
- It is rather difficult choice to avoid exotic plants as most of the ornamental plants that have showy flowers are exotic.





BUTTERFLIES

- It takes three to six months for a habitat to get matured before butterflies start visiting them. It was also observed that one monsoon season is a must for a habitat to get matured.
- The before and after species count is a measure to evaluate the success of the project.
- The sighting of 30 butterfly species in Urban Site is a hallmark of all the projects because this site with minimum investment derived 30 times benefit in terms of butterfly diversity. This makes it a strong case study on how urban habitats could be still made conducive for butterflies thus improving the city environment.
- This also proves a plantation as small as of 1000 saplings within urban settings is a good investment for building butterfly habitats.
- It is observed that Hesperiiidae, Lycaenidae and Pieridae butterfly species were less in Rural and Urban sites indicating their likely preference to less disturbed habitats compare to Papilionidae and Nymphalidae species.





- Engaging school students into the plantation care work has two outcomes;
- (i) butterfly study becomes part of outdoor classroom studies which students enjoy,
- (ii) regular care of the plants fits provides opportunities for students to work in nature and conserve it.
- Most of the schools have gardening class as well butterfly lifecycle is part of the syllabus, thus they are better custodians of a butterfly habitat. The Rural site demonstrated this.
- Improved attendance rates in the Rural school.

COMMUNITY ENGAGEMENT



AICHI BIODIVERSITY TARGETS

CBD AICHI BIODIVERSITY TARGETS 2020

Target no. 1 :Creating biodiversity awareness

Target 7: Sustainable Agriculture and forestry management for biodiversity

Target 15: Restoration of degraded habitats.





SUSTAINABLE DEVELOPMENT GOALS



UN SUSTAINABLE DEVELOPMENT GOALS 2030

Goal 3: Good health and well-being

Goal 4: Quality Education

Goal 9 : Industry Innovation and Infrastructure

Goal 11: Sustainable cities and communities

Goal 13: Climate action

Goal 15: Life on Land

Goal 17: Partnerships for the goals





THANK YOU

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