BUTTERFLY GARDEN AT CATERPILLAR INDIA PVT. LTD., THIRUVALLUR, TAMIL NADU IN COLLABORATION WITH TROPICAL INSTITUTE OF ECOLOGICAL SCIENCES (TIES): FINAL ACTIVITY REPORT

Supported by:

Caterpillar India Pvt. Ltd., Thiruvallur

Implemented by:

Tropical Institute of Ecological Sciences (TIES)

www.ties.org.in

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CATERPILLAR INDIA PRIVATE LIMITED

Project Implemented by:

TROPICAL INSTITUTE OF ECOLOGICAL SCIENCES (TIES)

Ecological Research Campus, K.K. Road, Velloor P. O.,

Kottayam, Kerala, India- 686 501

Tel - +481 2957050; 09497290339; 9633723305

E-mail info@ties.org.in

www.ties.org.in

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1. INTRODUCTION

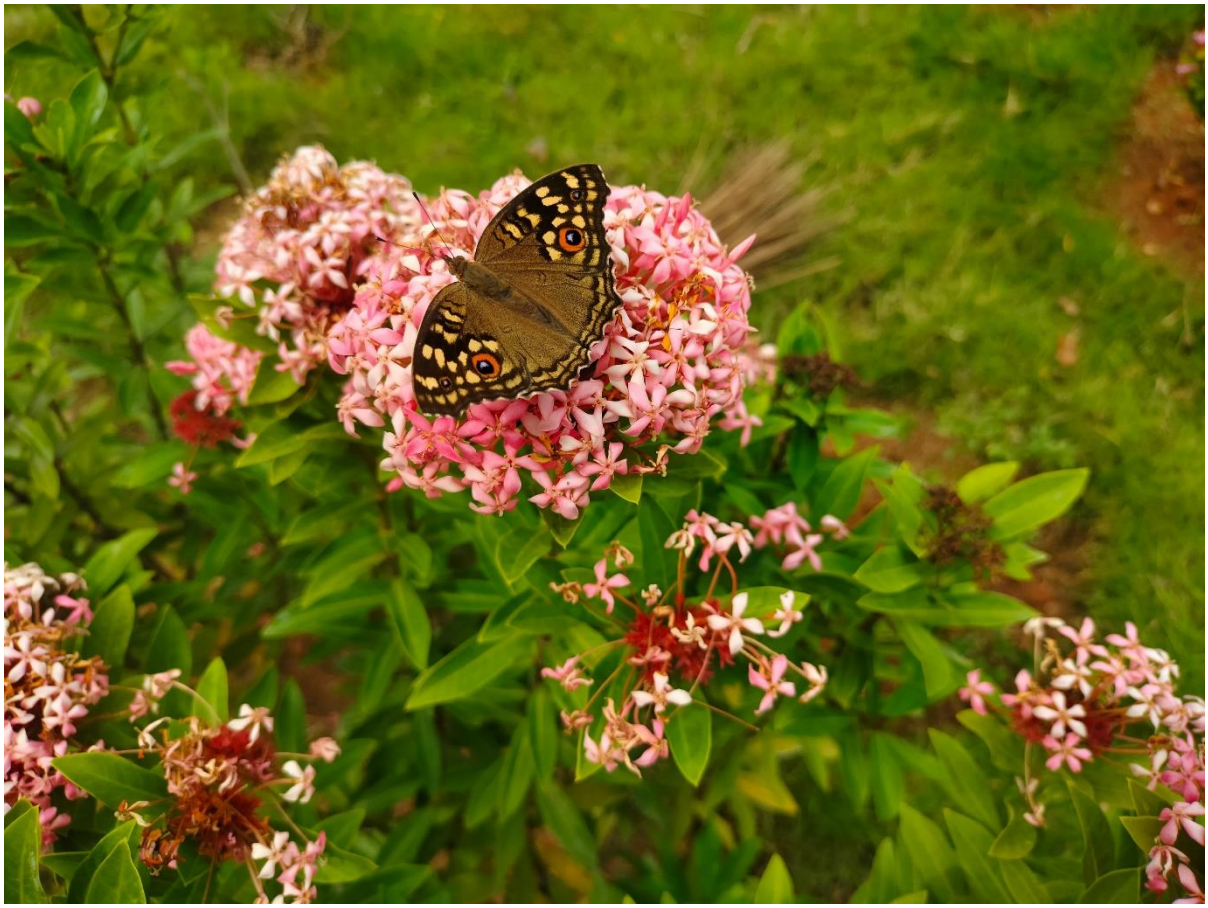


Fig. 1 Peacock pansy

Caterpillar India Pvt. Ltd., Thiruvallur, in collaboration with the **Tropical Institute of Ecological Sciences (TIES)**, initiated a biodiversity enhancement initiative by establishing a Butterfly Garden within its campus. The primary goal of the project was to create a thriving and sustainable ecosystem that supports native butterfly populations while engaging employees in environmental stewardship and fostering awareness about biodiversity conservation. The garden also serves as a focal point for education, outreach, and corporate sustainability efforts.

The Concept of a Butterfly Garden

A butterfly garden in company like Caterpillar supports local biodiversity by providing food and shelter for butterflies and other pollinators, many of which are losing habitats. The core idea of a *butterfly garden* is to plant specific **host plants** for caterpillars to feed on and **nectar plants** for adult butterflies, supporting their entire life cycle. The mix of these plants attracts butterflies naturally, encouraging breeding and helping populations grow. Blooming plants release scents that draw butterflies even from far away, creating a lively ecosystem. Such gardens also improve air quality, create cooler microclimates, and offer employees a peaceful, green space—showing the company's commitment to sustainability and conservation.

Making a Butterfly Garden: Key Considerations

Establishing a butterfly garden is a simple yet highly effective way to enhance the ecological value of the Caterpillar India campus while making use of underutilized spaces. These areas can be transformed into vibrant, biodiverse habitats that enrich both the environment and the visual appeal of the workplace.

To attract and sustain a thriving butterfly population, it is important to plant a diverse selection of **25–35 species** of nectar-rich and host plants, giving priority to native species that are preferred by indigenous butterflies. This approach ensures that both caterpillars and adult butterflies have adequate food sources, encouraging breeding and life cycle completion within the garden. Common larval host plants such as **Citrus, Cinnamon** and **Milkweeds** help attract a variety of butterfly species, while nectar plants like **Ixora, Lantana**, and **Clerodendrum** provide essential sustenance for adult butterflies. Beyond their ecological role, butterfly gardens bring multiple benefits to an industrial campus.

Fig. 2 Mini ixoras in Garden

Benefits of Butterfly Garden

Establishing a butterfly garden within an industrial campus offers a multitude of benefits, encompassing environmental, educational, health, and aesthetic aspects:

i. Environmental and Ecological Benefits

- **Biodiversity Enhancement:** The garden supports local biodiversity by offering essential habitat and food resources for butterflies and other pollinators, which play a crucial role in maintaining ecological balance.
- **Pollination Support:** Butterflies aid in the pollination of various plant species, helping them grow, reproduce, and sustain the overall health of the campus ecosystem.
- **Environmental Education:** Serving as a "living classroom," the garden provides employees and visitors with opportunities to learn about pollinators and their importance in ecosystem functioning.

ii. Educational and Recreational Benefits

- **Interactive Learning:** The garden offers engaging learning experiences for employees, school groups, and visitors, fostering awareness of environmental conservation.
- **Nature Appreciation:** It encourages direct interaction with nature, promoting a sense of stewardship and respect for the natural world.

Fig. 3 Different types of plants in Garden

- **Recreational Space:** With its calm and green setting, the garden serves as a relaxing space for reflection, observation, and quiet breaks, improving the workplace experience.

iii. Health and Well-being Benefits

- **Mental Health:** Time spent in the garden can reduce stress, promote relaxation, and enhance overall mental well-being.
- **Physical Activity:** It encourages light outdoor activity, such as walking or exploring, contributing to physical health.
- **Sensory Stimulation:** The vivid colours, floral scents, and gentle sounds of a butterfly garden create a refreshing and restorative sensory environment.

iv. Practical and Aesthetic Benefits

- **Beautification:** The garden adds significant visual appeal to the campus, creating a welcoming and vibrant atmosphere.
- **Educational Signage:** Informative boards on butterfly species and plants enhance learning while complementing the garden's aesthetic value.
- **Low Maintenance:** Once established with native species, the garden requires minimal upkeep, as these plants are well adapted to local climatic conditions.

Fig. 4 Common emigrant

Project Background

In collaboration with **Caterpillar India Pvt. Ltd., Thiruvallur**, **Tropical Institute of Ecological Sciences** initiated the butterfly garden project on 09 May 2024 under the supervision of a Project Manager. As part of the setup, interpretive boards were installed, including a main board explaining the butterfly life cycle, food plants, and common species found in Tamil Nadu, along with 12 smaller species-specific boards. These served to promote conservation awareness, provide informal learning opportunities for employees, and highlight the diversity of butterflies within the campus.

For the first six months, plant health and butterfly activity were closely monitored to ensure the garden remained vibrant and ecologically functional. At the request of Caterpillar India, the work was extended by an additional three months and again six months to focus on garden maintenance. Organic inputs such as vermicompost and nimbecidine were applied every two weeks, watering was carried out regularly, and maintenance tasks included replanting dried plants, removing weeds, and applying soil amendments as needed.

2. OBJECTIVES OF THE PROJECT

- To enhance biodiversity within the corporate environment
- To transform underutilized spaces into ecologically vibrant green zones
- To provide ecological benefits such as pollinator support and habitat enrichment
- To promote awareness and informal education among employees and visitors
- To demonstrate Caterpillar India's commitment to environmental sustainability and corporate social responsibility

3. PROJECT IMPLEMENTATION: KEY STEPS

The butterfly garden at Caterpillar India Pvt. Ltd., Thiruvallur, was developed through a series of carefully planned and executed steps to ensure its ecological effectiveness and long-term sustainability.

i. Assessment, Planning, and Design

The first stage involved evaluating available spaces within the campus to identify the most suitable site for establishing the butterfly garden. Key factors such as sunlight exposure, soil quality, drainage, and existing vegetation were taken into account. A detailed layout plan was prepared, incorporating a diverse selection of native **host plants** for caterpillars and **nectar-rich plants** for adult butterflies, along with space for interpretive signage to educate employees about local butterfly diversity. The final garden covered an area of **4 cents** and was designed to provide an aesthetically pleasing yet functional habitat that supports the full butterfly life cycle.

Fig. 5 Model of the Garden

ii. Site Preparation

The selected site was thoroughly prepared to create optimal conditions for plant growth. This included clearing unwanted vegetation, removing debris such as ston es and roots, and levelling the area. Additional nutrient-rich soil was incorporated to improve fertility and enhance drainage, providing a strong foundation for establishing a variety of butterfly-attracting plant species.

Fig. 6 Site preparation for the Garden

iii. Planting Host and Nectar Plants

Following site preparation, planting was carried out in line with the garden design. Host plants were strategically placed to serve as breeding and feeding sites for butterfly larvae, while a diverse mix of nectar plants was added to provide essential food for adult butterflies. This combination ensures that the garden supports every stage of the butterfly life cycle, encouraging both visitation and breeding. To promote healthy establishment, organic fertilizers and natural growth enhancers were applied during planting. organic fertilizers, rich in natural nutrients nourish the soil and foster robust root development, ensuring the plants establish themselves firmly. Growth promoters, derived from natural sources, will further stimulate healthy growth, helping the plants quickly mature into attractive and bountiful resources for our winged visitors. This careful attention to initial nourishment is key to establishing a vibrant and productive butterfly habitat that will consistently attract and support a wide variety of butterfly species.

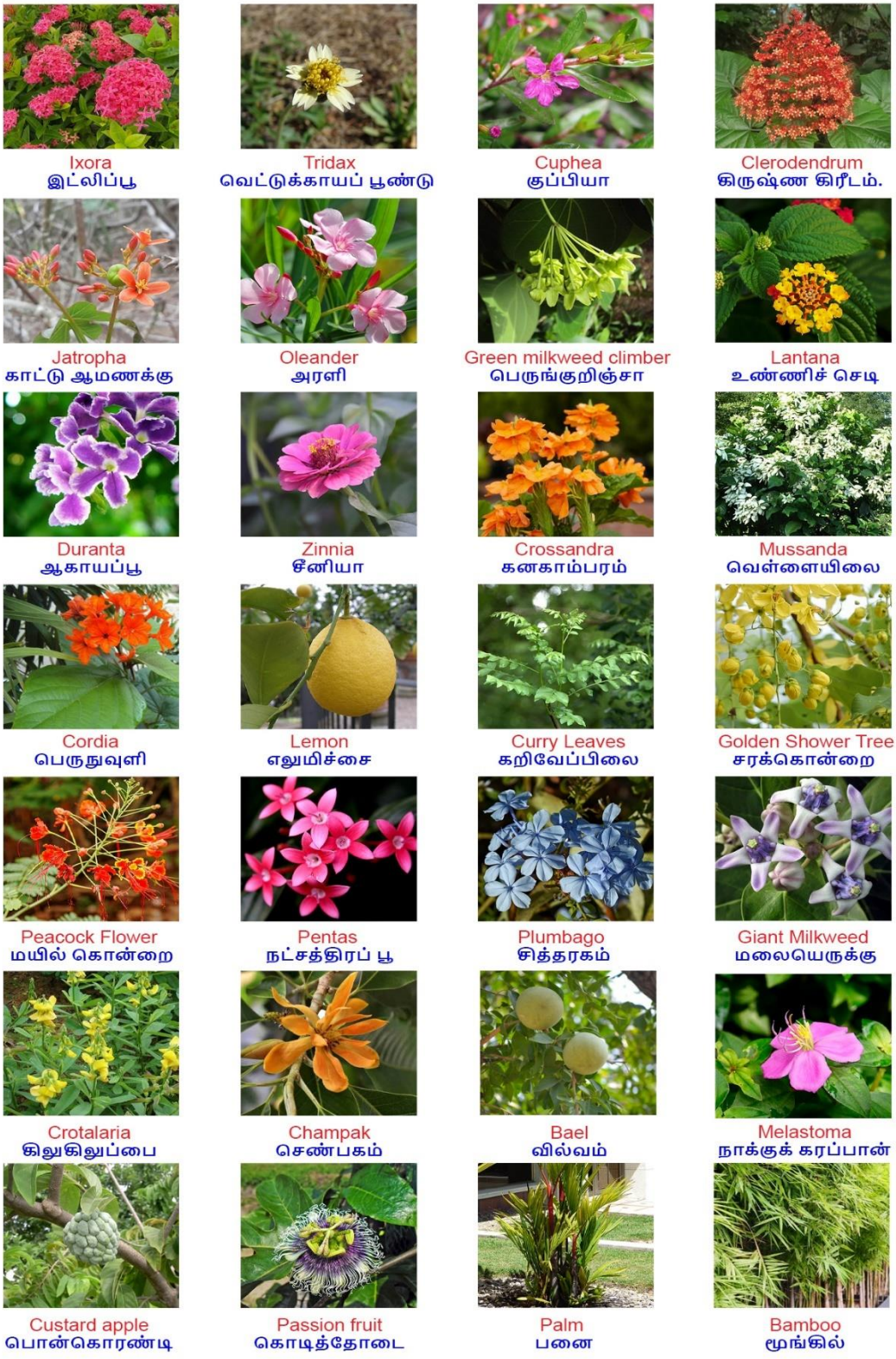
Fig. 7 Caterpillar employees planting in selected sites

Plant Species list and information boards

Si no.	Scientific name	Local name	Type
1	Ixora chinensis	Ixora miniature	N
2	Tabermontana	Nandhiyarvattam	N
3	Ixora casei	Big/Gaint ixora	N
4	Nerium oleander	Arali	H
5	Hibiscus rosa-sinensis	Hibiscus	N
6	Duranta	Duranta	N
7	Caesalpinia pulcherrima	Peacock flower	N
8	Annona squamosa	Sugar apple	H
9	Aegle marmelos	Indian Bael	H
10	Zinnia linnearis	Zinnia	N
11	Murraya koenigii	Curry leaf	H
12	Cuphea hyssopifolia	Cuphea	N
13	Pentas lanceolata	Pentas	N
14	Citrus spp	Lime	H
15	Tecoma stans	Tecoma	N
16	Plumbago zeylanica	Plumbago	N
17	Crossandra infundibuliformis	Crossandra	N
18	Passiflora spp	Passion Fruit	H
19	Thumberia grandiflora	Sky Vine	N
20	Jatropa	Jatropa	N
21	Melastoma malabathricum	Melastoma	N
22	Lantana camara	Lantana	N
23	Bamboo spp	Bamboo	H
24	Alamanda cathartica	Alamanda	N
25	Palmacea	Palm	H
26	Calotropis gigantea	Eruku	H
27	Magnolia champaca	Champak Tree	H
28	Cassia fistula	Golden Shower Tree	H

- The red coloured plants are presently not in gardens.
- **N** – Nectar & **H** – Host plant

BUTTERFLY FOOD PLANTS



BUTTERFLY GARDEN

தமிழகத்தின் பட்டாம்பூச்சிகள்

COMMON BUTTERFLIES SEEN HERE

COMMON MIME
Papilio clytia
வேஷக்காரன்
(காக்கை அழகி)

COMMON MIME
Papilio dissimilis
வேஷக்காரன்
(காக்கை அழகி)

COMMON EMIGRANT
Captopsilia pomona
கொள்ளை வெள்ளையன்
(கொன்னை வெள்ளையன்)

COMMON EVENING BROWN
Melanites leda
அந்தி சிறகன்

COMMON LEOPARD
Phalanta phalantha
சிறுத்தை

LIME BUTTERFLY
Papilio demoleus
எலுமிச்சை அழகி

COMMON MORMON
Papilio polytes
கறிவேப்பிலை அழகன்
(கறிவேப்பிலை அழகி)

COMMON MORMON
Papilio polytes
கறிவேப்பிலை அழகன்
(கறிவேப்பிலை அழகி)

GREY PANSY
Junonia alites
சாம்பல் வசீகரன்

CRIMSON ROSE
Pachliopta hector
சிவப்புடல் அழகி

COMMON ROSE
Pachliopta aristolochiae
உரோசா அழகி.

BLUE MORMON
Papilio polymnestor
கருநீல வண்ணன்
(நீல அழகி)

BLUE TIGER
Tirumala limniace
நீலப்புலி

CHOCOLATE PANSY
Junonia iphita
சாக்லேட் வசீகரன்

COMMON INDIAN CROW
Euploea core
அரளிவிரும்பி

PEACOCK PANSY
Junonia almana
மயில் வசீகரன்

COMMON SAILER
Neptis hylas
வெண் கறுப்புச் சிறகன்

MOTTLED EMIGRANT
Catopsilia pyranthe
திட்டு வெள்ளையன்
(அவரை வெள்ளையன்)

PLAIN TIGER
Danaus chrysippus
மஞ்சள் புலி

STRIPED TIGER
Danaus genutia
வரி புலி

TAILED JAY
Graphium agamemnon
மரகத அழகி

COMMON GRASS YELLOW
Eurema hecabe
மஞ்சளாத்தி

COMMON BLUE BOTTLE
Graphium sarpedon
நெட்டிலி அழகி

TAWNY COSTER
Acraea terpsicore
செவ்வந்தி சிறகன்


LIFECYCLE OF BUTTERFLY
வண்ணத்துப்பூச்சியின் வாழ்க்கை சுழற்சி
Egg
முட்டை
Larva
கம்பளிப்பூச்சி(குடம்பி)
Pupa
கூட்டுப் புழு (பியூபா)
Butterfly emerging from pupa
(பட்டாம்பூச்சி - பூச்சிநிலையை அடைந்த பட்டாம்பூச்சி)
Butterfly
பட்டாம்பூச்சி

iv. Maintenance of the Butterfly Garden

Routine garden management activities were undertaken to maintain plant health and ensure a sustained butterfly presence. These included regular watering and weed removal, the application of nimbecidine twice a week on infected plants as part of an organic pest management strategy, and the monthly addition of a soil enrichment mix comprising vermicompost, cocopeat, and red soil to improve soil quality and support vigorous plant growth. Dried or damaged plants were systematically replaced with suitable alternatives. These tasks were carried out by hired labourers under the supervision of the Project Manager from TIES.

At the request of Caterpillar India, the project was extended until 31 July 2024, enabling continued maintenance and restoration during challenging periods. The garden experienced a number of climatic and ecological stresses. The torrential monsoon rains of November and December 2023 caused waterlogging in Garden 1, which severely impacted the Lantana plants. A moth infestation led to heavy damage of Nandhyarvattam plants in both Gardens 1 and 2, while Jatropha plants in Garden 3 also suffered pest infestations that required repeated treatment with nimbecidine. In Garden 2, soil quality declined due to prolonged saturation, necessitating mulching to restore soil health.

Fig. 8 Flowered lantana plants

Following the monsoon, the summer heat during April and May 2024 posed further stress. Despite consistent watering, the Cuphea plants in all three gardens dried out completely. In July, these and other affected plants were replaced with healthy new species, helping to restore ecological balance, resilience, and the overall visual appeal of the gardens.

To ensure the long-term sustainability and ecological health of the butterfly gardens, the following maintenance protocols should be followed regularly:

1. **Water Management**: Water plants based on soil moisture condition; avoid overwatering. Ensure required moisture content regularly

Fig. 9 Watering plants

2. **Chemical-Free Practices**: Maintain a chemical-free environment to support butterfly-friendly habitats. Avoid the use of chemical fertilizers and pesticides. Use only bio pesticide and organic fertilizers.

Fig. 10. Jatropha with infection and after applying natural pesticide

3. **Pruning and Weeding**: Conduct regular pruning to encourage healthy new growth and maintain plant form. Remove weeds frequently to prevent competition for nutrients and space.

4. **Plants**: Avoid planting of repellent or insect – avoided plants. Replanting only the host and nectarine plants currently in the garden.

5. **Caterpillar Protection**: Protect butterfly caterpillars from predators (especially birds) by covering host plants or twigs with nylon mesh when caterpillars are detected. 6. Avoid waste dumbing

Fig. 11 Maintenance work

V. Inauguration

The butterfly garden project at Caterpillar India Pvt. Ltd., Thiruvallur, was initiated on 09 May 2024 under the guidance of a Project Manager from TIES. Plantation work commenced on 25 May 2024, with active participation from employees and senior officials. A total of three garden plots were established, and the project was formally inaugurated on June 5 2024 in the presence of Dr. Punnen Kurien.

The butterfly garden at Caterpillar India Pvt. Ltd. features a diverse mix of nectar and host plants, including *Cuphea hyssopifolia, Jatropha, Plumbago, Ixora, Bamboo, Cassia, Nerium, Murraya, Lantana, Citrus, Pentas, Hibiscus, Allamanda, Crossandra, Calotropis, Caesalpinia, Aegle, Passiflora,* and *Duranta*. Organic fertilizers such as vermicompost and nimbecidine were applied regularly, along with watering, replanting, and weeding, while plant health and butterfly activity were monitored for six months. Three garden plots were created: Garden 1 (24 species) benefits from neem shade and supports butterflies like the Common Grass Yellow, Common Mormon, Plain Tiger, and Striped Tiger; Garden 2 (20 species) requires more care due to poor soil and uneven sunlight but attracts species like the Lime Butterfly, Peacock Pansy, Lemon Pansy, Common Emigrant, and Grass Yellow; and Garden 3 (6 nectar plants), located in front of the admin block, initially struggled with heat stress but stabilized after coir pits were added, and now supports species such as Plains Cupid, Common Emigrant, and Grass Yellow.

Fig. 12 Image of Garden

4. BUTTERFLIES OBSERVED FROM THE GARDEN

Si. No.	Common Name	Scientific Name
1	Common crow	*Euploea core*
2	Common mormon	*Papilio polytes*
3	Common grass yellow	*Eurema hecabe*
4	Common leopard	*Phalanta phalantha*
5	Common emigrant	*Catopsilia pomona*
6	Mottled emigrant	*Catopsilia pyranthe*
7	Sunbeam	*Curetis thetis*
8	Plains cupid	*Luthrodes pandava*
9	Plain tiger	*Danaus chrysppus*
10	Striped tiger	*Danaus genutia*
11	Blue tiger	*Tirumala limniace*
12	Lime butterfly	*Papilio demoleus*
13	Lemon pansy	*Junonia lemonias*
14	Peacock pansy	*Junonia almanac*
15	Chocolate pansy	*Junonia iphita*
16	Grey pansy	*Junonia atlitis*
17	Crimson rose	*Pachliopta hector*
18	Great eggfly	*Hypolimnas bolena*
19	Daniad eggfly	*Hypolimnas misippus*
20	Rice swift	*Barbo cinnara*
21	Common banded awl	*Hasora chromus*
22	Tawny coster	*Acraea terpsicore*
23	Common cerulean	*Jamides celeno*
24	Common evening brown	*Melanitis leda*
25	Common bush Brown	*Mycalesis perseus*
26	Common palmfly	*Elymnias hypermnestra*

27	Tailed jay	*Graphium agamemnon*
28	Tailless line blue	*Prosotas dubiosa*
29	Indian palm bob	*Suastus gremius*
30	Dark grass blue	*Zizeeria karsandra*
31	Lang's short tailed blue	*Leptotes pirithous*
32	Pea blue	*Lampides boeticus*
33	Common Castor	*Ariadne merione*
34	Lesser grass blue	*Zizina otis*
35	Straight swift	*Parnara guttatta*
36	Opaque six-line blue	*Nacaduba beroe*
37	Common sailor	*Neptis hylas*
38	Large oak blue	*Arhopala amantes*
39	Common jay	*Graphium doson*
40	Pioneer white	*Belenois aurota*

5. IMAGES OF BUTTERFLIES

Common grass yellow

Common bush brown

Common leopard

Mottled emigrant

Common evening brown

Common Mormon

Common crow

Common cerulean

Common sailor

Common castor

Common jay

Tailed jay

Great eggfly

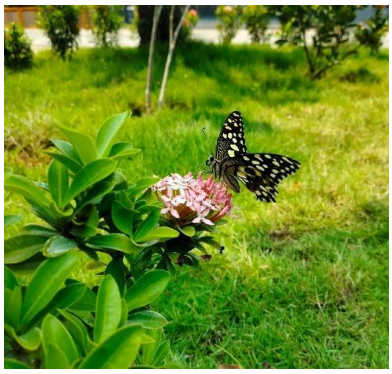
Lemon pansy

Peacock pansy

Chocolate pansy

Gray pansy

Common emigrant



Lime swallowtail

Tawny cost er

Dark grass blue

Lesser grass blue

Pea blue

Lang's short tailed blue

Tailless line blue

Opaque six-line blue

Large oak blue

Rice swift

Straight swift

Palm bob

Plains cupid

Banded awl

Palm fly

Blue tiger

Striped tiger

Plain tiger

Sun beam

Pioneer white

Lyfe cycle of Common grass yellow

Egg

Caterpillar (hatched)

Caterpillar (final stage)

Pupa

Butterfly coming out

6. CONCLUSION

The butterfly garden project at the Caterpillar India campus has emerged as a model ecological initiative, transforming underutilized industrial spaces into vibrant green zones that actively support biodiversity. Spread across three plots, the garden integrates a wide variety of carefully chosen host and nectar plants, creating a self-sustaining habitat that supports the full butterfly life cycle. With over **40 species of butterflies recorded**, including Common Grass Yellow, Lime Butterfly, Plains Cupid, and Striped Tiger, the project demonstrates the effectiveness of strategic planting in attracting and sustaining pollinators. Despite challenges such as torrential monsoon rains, soil deterioration, pest infestations, and the extreme summer heat that caused significant plant loss, consistent maintenance—including organic soil enrichment, mulching, pest control using nimbecidine, and replacement planting—ensured the resilience and recovery of the garden.

Beyond its ecological benefits, the garden has had a strong **educational and social impact**, engaging employees and visitors through interactive signage, hands-on plantation activities, and opportunities to observe the butterfly life cycle in real time. It has provided employees with a space for relaxation and nature appreciation while instilling awareness about the importance of pollinators and ecological balance. The initiative also highlights Caterpillar India's commitment to corporate social responsibility by promoting environmental stewardship within an industrial setting. Overall, the butterfly garden stands as a **living demonstration of sustainability in practice**, enhancing biodiversity, inspiring conservation values, and creating a green legacy within the corporate landscape.