

# URBAN GREENING INITIATIVE BASELINE SURVEY INCLUDING RAPID BIODIVERSITY SURVEY



## REPORT

**Submitted to: WRI**

**Project Duration:** July 2022 – May 2023

**Project Reporting Date:** 27<sup>th</sup> October 2022

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## **URBAN GREENING INITIATIVE BASELINE SURVEY INCLUDING RAPID BIODIVERSITY SURVEY**

### **1. INTRODUCTION**

'Urban greening' is a part of actioning the 'Climate Action Plan' of WRI, India under which it has initiated two projects Mumbai Green Yodha and Greening in Vulnerable Communities.

Under 'Greening in Vulnerable Communities' WRI, India is working in partnership with Tata Institute of Social Science (TISS) and Youth for Unity and Voluntary Action (YUVA) on a project that aims to pilot greening projects with nature-based solutions through participatory and community-led processes, addressing the most environmentally and socially vulnerable wards of Mumbai.

For the same WRI, India approached and appointed Ladybird Environmental Consulting as a consultant to provide technical support and expertise for species selection, the process of planting and maintenance based on its broader ecological context. This included Baseline Survey for two sites in Mumbai including the Rapid Biodiversity Survey.

It is also not possible to make a fair assessment of the total biodiversity of even a small area for the simple reason that not all organisms will be found to be present together during one visit. Some are nocturnal, some live in burrows, some are seasonal migrants, and many have a short life span of few weeks or months. As a result, a few periodic visits (often monthly), by a team of several experts, are required during at least one year to assess the biodiversity of an area. Yet, the large inter-annual climatic variability – such as drought events – may affect the assessment seriously.

The time required for a satisfactory assessment depends upon the purpose, the expertise, the resources, and the group of organisms and the level at which taxa (order, family, genus or species) are required to be identified. To meet the variety of assessment needs, methods have been developed for rapid assessments of biodiversity. As the term implies, the assessment is made quickly over a shorter period that may still vary from a few days to a year.

CBD and Ramsar Convention (2006) in their jointly published guidelines defined rapid assessment "as a synoptic assessment, which is often undertaken as a matter of urgency, in the shortest timeframe possible to produce reliable and applicable results for its designed purpose".

A rapid biodiversity assessment is not an exhaustive inventory and does not record every species in an area. Rapid biodiversity assessments report only the species which could be observed during the survey but do not show that which species are definitely absent. Certain groups of biota, particularly the bacteria, fungi and other microscopic organisms, are not amenable to rapid assessments and similarly, the genetic diversity cannot be assessed rapidly.

**2. PROJECT DURATION:** July 2022 – May 2023

**3. PROJECT OBJECTIVES:** The objective is to conduct Baseline Survey including the Rapid Biodiversity Survey and generate the following lists

- List of biodiversity
- List of plants for plantation
- List of plant combinations

**4. PROJECT LOCATION:** Two sites in Mumbai were selected for the implementation of the pilot greening project with nature-based solutions through participatory and community-led processes, addressing the most environmentally and socially vulnerable wards of Mumbai. One site is in Mankhurd, eastern suburb of Mumbai and the other is in Malad, western suburb of Mumbai. Following are the details of both the sites.

**4.1 Site 1: Lal Maidan**

**Address:** Lal Maidan, Off DP Road, Behind bldg 22, Lallubhai compound, Mankhurd, Mumbai-400043.

**Ward:** M/East Ward

**Google coordinates:** 19°03'00.7"N / 72°55'34.4"E

**Area:** 1960 sq.m



#### 4.2. Site 2: Ambojwadi

**Address:** Plot in front of Dr. Babasaheb Ambedkar Samajik Vikas Kendra, Malwani Road, Ambojwadi, Malad West, Mumbai - 400095

**Ward:** P/North Ward

**Google Coordinates:** 19 10'39"N / 7248'40"E

**Area:** 108 sq.m



#### 5. METHOD

The rapid biodiversity survey for the 2 sites was conducted in the month of September and October 2022. On 29 September and 7 October 2022 the survey team visited the Lal Maidan to conduct the rapid biodiversity survey. Whereas the Ambojwadi site was visited on 30 September and 7 October 2022. The survey was carried out during morning and evening hours, to cover the different activity phases.

During fieldwork visual observations for plants, mammals, birds, reptiles, amphibians, and insects was done. Birds were also identified by their calls. Photo documentation was also carried out at the site. Plant records were made based on field observation and species identification was done based on the reference materials and also by examining the morphological characteristics and reproductive materials i.e. flowers, fruits and seeds. The plants which were not identified on field were later identified using photographs by experts in the field. The faunal elements (animal species) were identified by direct sightings.

The team included experts as follows

- Dr. V Shubhalaxmi, Entomologist
- Dr. Santosh Yadav, Botanist
- Mr. Isaac Kehimkar, Butterfly Expert
- Ms. Priti Choghale, Naturalist
- Ms. Bharati Desai, Environment Officer

## 6. RESULT

### 6.1 Site 1: Lal Maidan

- **Vegetation:** It is an open ground surrounded by buildings on all four sides and there is a road on one side. The vegetation present on the ground is on the three boundaries which are mostly ornamental and fruit plants planted by the residents. A wild patch of herbs can be seen on the broader end of the ground on one side. This patch mostly contains grasses and herbs. And, few species which grow in waterlogged areas.



Wild plant patch

Planted by residents

- **Flora:** The present surveys recorded 73 plant species, including 31 tree, 22 herbs, 16 shrubs, and 4 climbers. The detail list is given as Annexure 1 and photographs as Annexure 2.

Among the flora recorded, there are few species like *Hygrophila schulli* which grows in waterlogged areas.

There was no threatened species of flora recorded at the site, neither a species of conservation importance.

- **Fauna:** 12 species of insects, 6 species of birds and 3 species of mammals. Following is list of insects, birds and mammals observed at site.

**Table 1: List of Insects**

Sr.No.	Insect	Scientific Name	Number
1	Bird dropping caterpillar of swallowtail butterfly on Ramphal		1
2	Blue bottle fly		1
3	Brown-banded hunter hawkmoth caterpillar	<i>Theretra silhetensis</i>	3
4	Chocolate Pansy	<i>Junonia iphita</i>	1
5	Common grass yellow	<i>Eurema hecabe</i>	4
6	Common Jezebel	<i>Delias eucharis</i>	1
7	Danaid eggfly	<i>Hypolimnas misippus</i>	1
8	Dragonfly		2
9	Grass moth		2
10	Grasshopper		1
11	Honey bee		2
12	Paper wasp		1

**Table 2: List of Birds**

Sr.No.	Birds	Scientific Name	Number
1	Black kite	<i>Milvus migrans</i>	11
2	Blue rock pigeon	<i>Columba livia</i>	55
3	Domestic duck	<i>Anas sp.</i>	2
4	House Crow	<i>Corvus splendens</i>	14
5	House sparrow	<i>Passer domesticus</i>	28
6	White Pigeon		15

**Table 3: List of Birds**

Sr.No.	Mammals	Scientific Name	Number
1	Bandicoot	<i>Bandicota sp.</i>	1
2	Dog	<i>Canis lupus familiaris</i>	3
3	Rabbit		2

## 6.2 Site 2: Ambojwadi

- **Vegetation:** It is an open ground surrounded by construction on three sides and there is a parking area on one side. There is only one mango tree saplings growing near the Toilet block. Apart from this there was no vegetation present on the ground. On one side few plants are grown in pots by locals.
- **Flora:** The survey recorded 4 plant species, including 1 tree sapling, 2 herbs, and 1 climber. The detail list is given below in Table 4.

There was no threatened species of flora recorded at the site, neither a species of conservation importance.

**Table 4: List of Plants**

Sr. No.	Common English Name	Botanical Name	Number	Type
1	Mango	<i>Mangifera indica</i>	1	Tree
2	Periwinkle	<i>Catharanthus roseus</i>	2	Herb

3	Mogra	<i>Jasminum sambac</i>	1	Climber
4	Aloe vera	<i>Aloe vera</i>	2	Herb

- **Fauna:** 3 species of animals were observed at the site during the survey. 1 species of insect (common Mormon), 1 species of bird (crow) and 1 species of mammals (feral dog).

## 7. PROBLEMS AT SITE

### 7.1 Site1: Lal Maidan

- **Soil:** The ground is covered with a concrete base on which some amount of soil is added on one side of the ground in an attempt to develop a garden. Paver blocks are installed along the edges on all sides. The soil quality is poor and contains concrete.
- **Water logging:** Site faces rain water drainage issues and hence gets water logged during monsoon. Also as there is a concert platform below the ground the water cannot percolate. The water from the terrace is also released in the ground as the pipes from the terrace are just left open at the building base.
- **Garbage:** Garbage is a big issue at the site. Residents throw garbage at the site.
- **Rats:** Rats were seen at the site feeding on the garbage thrown by the residents.
- **Pigeon feeding area:** Residents feed pigeons in the area at one side.



Water Logging during the monsoon



Rain drainage on paved pathway on edges

Rain drainage pipes from terrace



Garbage thrown by local residents on the ground

## 7.2 Site 2: Malad Plot

- **Small Area:** It is a very small area for tree plantation.
- **Way for rain water run off:** Rain water flows down from the site and get collected in the parking area which gets water logged during monsoon.
- **Soil Quality:** The area is a reclaimed area and has been dumped with garbage and concert rubbles. Hence there is no proper soil. Ground is a mix of concert, soil and garbage.
- **Play ground:** The site is used by local children for playing.
- **Parking:** It is used as parking area by locals to park auto-rikshas, bikes and Thela Gadi (push cart).
- **Other Activities:** There is a water connection in one corner of the site from where locals fill drinking water. Also there is Toilet block on one side.
- **Garbage:** Some amount of garbage is dumped at the site by locals.
- **Salty Air:** The air is salty as the area is next to the creek/marsh land which lies behind office building of YUVA on one side.



All the water from the huts area flows through the ground

Drinking water tap



Auto-rickshas and thela gadi and motor bikes parked at the site

## 8. SUGGESTIONS

### 8.1 Site1: Lal Maidan

Mankhrud site is good for plantation provided it is developed as an elevated garden and soil and manure are added to the site. Trees, herbs and shrubs can be planted.

### 8.2 Site2: Ambojwadi

Malad site is not suitable for plantation as the area is very small and it is used by residents for parking and children's use it for playing.

## Annexure 1: List of plants observed at Site 1. Lal Maidan

Sr. No.	Type	Common English Name	Botanical Name	Number
1	Climber	Mogra	<i>Jasminum sambac</i>	1
2	Climber	Malabar spinach	<i>Basella alba</i>	1
3	Climber	Air potato	<i>Dioscorea bulbifera</i>	1
4	Climber	Bitter gourd	<i>Momordica charantia</i>	1
5	Herb	Durva grass	<i>Cynodon dactylon</i>	patch
6	Herb	Chinese Lovegrass	<i>Eragrostis unioides</i>	ground cover
7	Herb	Chocolate weed	<i>Melochia corchorifolia</i>	25
8	herb	False Daisy	<i>Eclipta prostrata</i>	30
9	Herb	Four o'clock flower	<i>Mirabilis jalapa</i>	2
10	Herb	Gale of the wind/ Bhumi Amla	<i>Phyllanthus niruri</i>	37
11	Herb	Ginger	<i>Zingiber officinale</i>	1
12	Herb	Jungli Badam	<i>Sterculia foetida</i>	1
13	Herb	Lindernia oppositifolia	<i>Lindernia oppositifolia</i>	patch
14	Herb	Little Gooseberry	<i>Physalis minima</i>	3
15	Herb	Little ironweed	<i>Cyanthillium cinereum</i>	6
16	Herb	Monarch redstem	<i>Ammannia baccifera</i>	ground cover
17	Herb	Oyster plant	<i>Tradescantia spathacea</i>	1
18	Herb	Perennial Water Primrose	<i>Ludwigia perennis</i>	35
19	Herb	Periwinkle	<i>Catharanthus roseus</i>	2
20	Herb	Prickly Amaranth	<i>Amaranthus spinosus</i>	1
21	Herb	Silver Queen	<i>Aglaonema sp.</i>	1
22	Herb	Sissoo spinach	<i>Alternanthera sessilis</i>	patch
23	Herb	Smooth Joyweed	<i>Alternanthera paronychioides</i>	patch
24	Herb	Song of India	<i>Dracaena reflexa</i>	2
25	Herb	Taro	<i>Colocasia sp.</i>	6
26	Herb	Variable Flatsedge	<i>Cyperus difformis</i>	ground cover
27	Shrub	Adulsa	<i>Justicia adhatoda</i>	1
28	Shrub	Barbados Cherry	<i>Malpighia glabra</i>	1
29	Shrub	Blue porterweed	<i>Stachytarpheta jamaicensis</i>	1
30	Shrub	Crepe Jasmine	<i>Tabernaemontana Divaricata</i>	1
31	Shrub	Crepe Jasmine double	<i>Tabernaemontana Divaricata</i>	1
32	Shrub	Crepe Jasmine drawf	<i>Tabernaemontana Divaricata</i>	1
33	Shrub	Croton	<i>Codiaeum variegatum</i>	3
34	Shrub	Devil's backbone	<i>Pedilanthus Tithymaloides</i>	7
35	Shrub	Dracaena	<i>Dracaena mahatma</i>	2
36	Shrub	Golden dewdrop	<i>Duranta erecta</i>	2
37	Shrub	Henna	<i>Lawsonia inermis</i>	1
38	Shrub	Hibiscus	<i>Hibiscus rosa-sinensis</i>	3
39	Shrub	Marsh Barbel	<i>Hygrophila schulli</i>	15
40	Shrub	Night Blooming Jasmine	<i>Cestrum nocturnum</i>	1
41	Shrub	Pomegranate	<i>Punica granatum</i>	1

42	Shrub	Purple False Eranthemum	<i>Pseuderanthemum artopurpureum</i>	1
43	Tree	Allspice	<i>Pimenta dioica</i>	1
44	Tree	Banyan	<i>Ficus benghalensis</i>	1
45	Tree	Beef wood/ Whistling pine	<i>Casuarina equisetifolia</i>	1
46	Tree	<i>Citrus sp.</i>	<i>Citrus sp.</i>	1
47	Tree	Cluster fig	<i>Ficus racemosa</i>	1
48	Tree	Coconut	<i>Cocos nucifera</i>	6
49	Tree	Custard apple	<i>Annona squamosa</i>	11
50	Tree	Desi Badam	<i>Terminalia catappa</i>	9
51	Tree	Guava	<i>Psidium guajava</i>	4
52	Tree	Gulmohar	<i>Delonix regia</i>	1
53	Tree	Holy basil	<i>Ocimum tenuiflorum</i>	1
54	Tree	Indian jujube	<i>Ziziphus mauritiana</i>	2
55	Tree	Jackfruit	<i>Artocarpus heterophyllus</i>	1
56	Tree	Jamun	<i>Syzygium cumini</i>	7
57	Tree	Kadam	<i>Neolamarckia cadamba</i>	1
58	Tree	Lemon	<i>Citrus limon</i>	7
59	Tree	Mango	<i>Mangifera indica</i>	14
60	Tree	Manila tamarind	<i>Pithecellobium dulce</i>	1
61	Tree	Mast Tree	<i>Polyalthia longifolia</i>	2
62	Tree	Mulberry	<i>Morus alba</i>	1
63	Tree	Neem	<i>Azadirachta indica</i>	4
64	Tree	Papaya	<i>Carica papaya</i>	1
65	Tree	Peepal	<i>Ficus religiosa</i>	2
66	Tree	Plumeria	<i>Plumeria pudica</i>	4
67	Tree	Pride of India	<i>Lagerstroemia speciosa</i>	1
68	Tree	Ramphal	<i>Annona reticulata</i>	1
69	Tree	Sapodilla	<i>Manilkara zapota</i>	1
70	Tree	Scholar Tree	<i>Alstonia scholaris</i>	3
71	Tree	Singapore Cherry	<i>Muntingia calabura</i>	1
72	Tree	Weeping fig	<i>Ficus benjamina</i>	3
73	Tree	Wild date palm	<i>Phoenix sylvestris</i>	1

Annexure 2: Photographs of plants observed at Site1 Lal Maidan



*Codiaeum variegatum*



*Dracaena mahatama*



*Tabernaemontana Divaricata*



*Pseuderanthemum artopurpureum*



Golden dewdrop



*Dracaena reflexa*



*Plumeria pudica*



*Ficus benjamina*



Four o'clock flower



Aglaonema Silver Queen



*Pedilanthus tithymaloides*



*Malphigia glabra*



Malabar spinach



Air potato



*Tradescantia spathacea*



Periwinkle



Custard apple



Hibiscus



Mango



Night Blooming Jasmine



Jamun



Coconut



Desi Badam



*Stachytarpheta jamaicensis*



Beef wood/ Whistling pine



Neem



Peepal



Cluster fig



Ramphal



Allspice



Indian jujube



Singapore Cherry



False daisy



Little ironweed



*Lindernia oppositifolia*



*Alternanthera sessilis*



Little Gooseberry



Gale of the wind/ Bhumi Amla



Prickly Amaranth



*Cyperus difformis*



*Alternanthera paronychioides*



*Ammania baccifera*



Marsh Barbel



Adulsa



Colocasia sp.



*Eragrostis uniloides*



Chocolate weed



Perennial Water Primrose

**Annexure 3: Baseline Survey Report for Site 1-Lal Maidan**  
Ladybird Environmental Consulting LLP  
Project 2022 – 23

**GENERAL**

**Name of the Project Site 1:** Lal Maidan, Off DP Road, Behind bldg 22, Lallubhai compound, Mankhrud, Mumbai-400043. Maharashtra State, India  
**Ward:** M/East Ward  
**Geographical Coordinates:** 19°03'00.7"N / 72°55'34.4"E  
**Area -** 1960 sq.m  
**Current status of Site:** Open ground with pavement around the edge on all four side  
**Project Duration:** 1 year

**HYDROLOGY**

**Source of water (inflow):** Rainfall Runoff, Over flowing Drain, Rain water from the terrace of buildings.  
**Outflow. if any (describe):** Storm drain  
**Annual rainfall (cm):** 242.2 cm (average precipitation of Mumbai)  
**Does the area dry out completely:** Dry during summer and winter season

**CATCHMENT (WATERSHED)**

**Area, sq. km:** 1960 sq.m  
**Nature:** Open ground surrounded by buildings on all four sided and road on side.  
**Land use:** Play ground for kids, gardening on edge in small patches by residents, dumping garbage by residents.  
**Solid waste disposal:** Non-biodegradable and biodegradable waste disposal  
**Describe any prominent / special note:** The land (Buildings) belongs to MMRDA however the ground is taken care by BMC. YUVA NGO along with the local Federation and some residents has been carrying out tree plantation activities in the area. Few local community members have planted fruit and ornamental plants on the edge of the ground.

**Pollution Status Sources:** Residents throwing garbage

**Level:**  Very high  High  Medium  Low  Negligible  
**Pollution status:**  Air pollution  Water pollution  Soil contamination

**BIODIVERSITY** (Give number of species if known)

**Floral diversity (Plants):**  Grasses  Herbs  Shrubs  Trees  Climbers  
**Faunal diversity:**  Amphibia  Reptiles  Birds  Mammals  Insects  Arachnids  
**Floral Survey (Species):** Plants 73: Herbs: 22; Shrubs: 16; Trees: 31; Climber: 4  
**Faunal Survey (Species):** Birds: 6; Insects: 12; Reptiles: 0; Amphibia: 0; Mammals:3  
**Name important/rare/endemic/exotic species:**

- **Plants:** None
- **Birds:** None
- **Reptiles:** None
- **Insects:** None

**Functions and Values**

**Use of Biological Resources:** None

**Functions of the Ground:** Used for plantation by few, Used to feed pigeons, Used to keep pets, Used for playing by children, Used to throw garbage.

**Major Problems:** Concrete base of the ground, Poor quality of soil, Water logging during rainy season, Garbage thrown by residents.

**Scientific Knowledge:**

Scientific studies  No study  Only one study  Several studies

**Has the site been monitored and planted previously?**

Yes  No

**Sources of Information:** WRI, YUVA, Residents

**Public Awareness:**

**Are residents aware of the problems concerning the site?**

Very few seems to be aware of the problems.

**Are residents interested in the plantation at site?**

A group of residents is very much interested in the plantation at site.

**Is the BMC/Garden Department interested in the plantation at site?**

Yes (as per information from WRI)

## Baseline Survey Report for Site 2- Ambojwadi

Ladybird Environmental Consulting LLP

Project 2022 – 23

### GENERAL

#### Name of the project site 2:

**Location:** Plot in front of Dr. Babasaheb Ambedkar Samajik Vikas Kendra, Malwani Road, Ambojwadi, Malad West, Mumbai - 400095

**Ward:** P/North Ward

**Geographical Coordinates:** 19 10'39"N / 7248'40"E

**Area:** 108 sq.m

**Current status of Site:** Open ground with construction on three sides

**Project Duration:** 1 year

### HYDROLOGY

**Source of water (inflow):** Rainfall Runoff, Over flowing Drain, Rain water from the hut area.

**Outflow, if any (describe):** Storm drain

**Annual rainfall (cm):** 242.2 cm (average precipitation of Mumbai)

**Does the area dry out completely:** Dry during summer and winter season

### CATCHMENT (WATERSHED)

**Area, sq. km:** 108 sq.m

**Nature:**  Hilly  Plain  Coastal

**Land use:**  Urban  Agriculture  Forest  Mining  Grazing  Fallow

**Solid waste disposal on site (if any):** Non-biodegradable and biodegradable waste disposal

**Describe any prominent / special note:** The land belongs to the collector.

### POLLUTION STATUS

**Sources:**  Domestic sewage  Industrial Effluents  In-Lake human activity  Cattle wading  Other (specify): Garbage

**Level:**  Very high  High (in monsoon)  Medium  Low  Negligible

**Pollution status:**  Air pollution  Water pollution  Soil contamination

### BIODIVERSITY (GIVE NUMBER OF SPECIES IF KNOWN)

**Floral diversity (Plants):** Grasses  Herbs  Shrubs  Trees  Climber

**Faunal diversity:**  Amphibia  Reptiles  Birds  Mammals  Insects  Arachnids

**Floral Survey (Species):** Plants: Herbs: 2; Shrubs: 0; Trees: 1; Climber: 1

**Faunal Survey (Species):** Birds: 1; Insects: 1; Reptiles: 0; Amphibia: 0; Mammal: 1

**Name important/rare/endemic/exotic species:**

— **Plants:** None

— **Birds:** None

— **Reptiles:** None

— **Insects:** None

### FUNCTIONS AND VALUES

**Use of Biological Resources:** None

**Functions of the Site:** Used for parking auto rikshaw, motor bike and thela gadi, Used for playing by children, Used to throw garbage.

**Major Problems:** Concrete rubbles in ground, Poor quality of soil, Water logging during rainy season, Garbage thrown by residents.

**SCIENTIFIC KNOWLEDGE:**

Scientific studies  No study  Only one study  Several studies

**Has the site been monitored and planted previously?**

Yes  No

**Sources of Information:** WRI, YUVA, Residents

**Public Awareness:**

**Are residents aware of the problems concerning the site?**

Very few seems to be aware of the problems.

**Are residents interested in the plantation at site?**

Yes

**Is the BMC/Garden Department interested in the plantation at site?**

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