3.1) **SELECTION OF AREA: - AHMEDABAD**

Gujarat's principal city is Ahmedabad (also known as Amdavad) and is one of the major industrial cities in India. It has been called the ‘Manchester of the East’ due to its many textile industries and its smokestacks. Visitors in the hot season should bear in mind the derisive title given to Ahmedabad by the Mogul emperor, Jahangir: Gardabad, ‘the City of Dust’\(^{[11]}\).

3.2) **IMPORTANT FACTS**

**Area:** The city spans an area of 205 sq km (79.15 sq miles)

**Geographic Location:** Ahmedabad is located at 23° N and 72.58° E.

**Altitude:** 55m above sea level.

**Population:** Over 6 million.

**Climate:** There are typically three main seasons – summer, monsoon and winter. Summer (March to June), Winter (November-February), Monsoon (July-September).

**Mercury Level:** Maximum Temperature: 47° centigrade.

- Minimum Temperature: 5° centigrade.
- Rainfall: 93.2cm (36.7 inches).

3.3) **DESCRIPTION OF SITES SELECTED FOR STUDY IN AHMEDABAD**

Ahmedabad, a mega city of Gujarat, is continuously losing its grace and beauty under the growing pressure of densification of activities (Singh, 2004). The air is being continuously polluted in urban areas through heavy traffic, industry, domestic fuel combustion; coal based thermal power plants and various agricultural activities from the adjoining areas. Table 3.3 gives the brief description of sites selected for the present study.
Table 3.3: Description of sites selected

<table>
<thead>
<tr>
<th>Name of the site</th>
<th>Location in the city</th>
<th>Characteristics of site</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site-1 Power house</td>
<td>Northern region</td>
<td>Coal based thermal power emission region, light and heavy vehicles, vehicle density is less.</td>
<td>Plate-1</td>
</tr>
<tr>
<td>Site-2 Paldi</td>
<td>Western region</td>
<td>Heavy and light vehicles, frequent traffic jams, vehicle density is more.</td>
<td>Plate-2</td>
</tr>
<tr>
<td>Site-3 Lal-darwaja</td>
<td>Central region</td>
<td>Market area, frequent congestion, traffic jams, light vehicles density is more.</td>
<td>Plate-3</td>
</tr>
<tr>
<td>Site-4 S.T bus stand</td>
<td>Central region</td>
<td>Heavy and light vehicles, frequent traffic jams, vehicle density is more.</td>
<td>Plate-4</td>
</tr>
<tr>
<td>Site-5 Naroda</td>
<td>Northeastern region</td>
<td>Industrial area, Heavy and light vehicles, density is more.</td>
<td>Plate-5</td>
</tr>
<tr>
<td>Site-6 Railway station</td>
<td>Central region</td>
<td>Railway tract, light vehicles, vehicle density is more.</td>
<td>Plate-6</td>
</tr>
<tr>
<td>Site-7 Residential area</td>
<td>Northern region</td>
<td>Light vehicles, no traffic jams, vehicle density is less, open area.</td>
<td>Plate-7</td>
</tr>
<tr>
<td>Site-8 Control</td>
<td>Western region</td>
<td>Light vehicles, low- polluted area, open area.</td>
<td>Plate-8</td>
</tr>
</tbody>
</table>
Plate-3.1: Map of India & Gujarat
Plate-3.2: Map of Ahmedabad
Plate-3.3: POWER HOUSE

PLATE-3.4: PALDI
PLATE-3.5: LAL DARWAJA

PLATE-3.6: S.T BUS STAND
PLATE-3.9: RESIDENTIAL AREA

PLATE-3.10: UNIVERSITY AREA (CONTROL)

SOURCE: www.googleearth.com
3.4) DESCRIPTION OF PLANTS SELECTED FOR STUDY

*Ficus religiosa L:*

Peepal is one of the best known trees of India. It is also known as Bodhi tree and sacred tree. The peepal is considered very sacred and venerated by the Hindus & the Buddhists. It is found and cultivated throughout India \[12\].

**Scientific classification:**
- Kingdom: Plantae
- Division: Magnoliophyta
- Class: Magnoliopsida
- Order: Urticales
- Family: Moraceae
- Genus: Ficus
- Species: *F. religiosa*

(A fruiting twig)

**Common Indian names:**
- Gujarati (Jari, Pipers, Pipal), Hindi (Pipal, Pipali), Kanarese (Arani, Ashwatha mara, Pippala, Ragi), Marath (Pimpal), Sanskrit (Ashvatha, Yajnika, Bodhidruma, Pippala, Shuchidruma, Vrikshraj).

**Morphology:**
- Trees, 10-16 m tall, with grey or grayish-black, rough bark, Leaves 6.5-30 X 5-19 cm, glabrous, subcoriaceous, and ovate to ovate-rhomboid. Receptacles 0.6-0.8 cm across, spherical, reddish-purple, axillary or on leafless branches, geminate or clustered towards ends of branches.

**Uses:**
- Fruits, bark, seeds, leaves and latex are used to cure diseases.
**Ficus benghalensis L:**

Locally it is known as Bengal fig, Indian fig, and East Indian fig, Indian Banyan or simply Banyan. It can grow into a giant tree covering several hectares. The Great Banyan in the Indian Botanic Garden, Howrah, is considered to be one of the largest trees in the world in terms of area covered.

The biggest of Banyan (peral in Malayalam and Bo in Sinhalese) can be located at Sri Lanka, south of India. This particular banyan tree has 350 large auxiliary trunks and 3,000 small ones. Another one (named Pillala Marri), aged above 700 years is also located at Manhub Nagar, 100 km from Hyderabad, Andhra Pradesh in India. The tree covers an area of 3 acres\(^{[13]}\).

**Scientific classification:**

- **Kingdom:** Plantae
- **Division:** Magnoliophyta
- **Class:** Magnoliopsida
- **Order:** Urticales
- **Family:** Moraceae
- **Genus:** Ficus
- **Species:** *F. benghalensis*

![A fruiting twig (central), Female flower (upper), Male flower (lower left), Section of Hypanthodium (lower right).](image)

**Common Indian names:**

- Gujarati (Vad, Vadlo), Hindi (Bar, Bargad, Bargat), Kanarese (Ala, Alada, Goli, Vata, Nyagrodha), Marathi (Vad), Sanskrit (Avaroha, Bahupada, Bhringi, Jatalo, Vat).
Morphology:

Ever green trees, 12-18 m tall, with straight trunk and grayish-brown, rough bark. Leaves 7.5 - 24.5 X 5 - 16 cm, broadly ovate, ovate-oblong or elliptic. Receptacles 1.5 - 2 cm across, axillary, geminate, deep-orange-red, puberulous, ovoid, glabrous. *Ficus benghalensis* produces prop roots which grow downwards as slender vine. Once these roots reach the ground, they take root and grow into woody trunks that can become indistinguishable from the main trunk. The figs are eaten by birds and mammals.

USES:

Bark, root-fibers, leaves, seeds, milky juice (i.e. latex) is used medicinally. It is planted for soil conservation. Timber is used for well-curbs, furniture etc. Suitable for paper pulp. Leaf (Crude protein 9.63%) lopped for fodder. Fruits are used to prepare, Sherbet traditionally[^14]. The latex is also used for polishing copper, brass and bronze (Vihari, 1995).
**Ficus glomerata (Roxb):**

*Ficus racemosa* (syn. *Ficus glomerata* Roxb.) is popularly known as the Cluster Fig Tree or Goolar (Gular). It is unusual in that its figs grow on or close to the tree trunk. In India, the tree and its fruit are called *gular* in the north and *atti* in the south. The fruits are a favorite staple of the common Indian macaque.[15]

**Scientific classification:**

- **Kingdom:** Plantae
- **Division:** Magnoliophyta
- **Class:** Magnoliopsida
- **Order:** Urticales
- **Family:** Moraceae
- **Genus:** Ficus
- **Species:** *F. glomerata*

![A twig, Fruit, Section of Hypanthodium](image)

**Common Indian names:**

- Gujarati (Gular, Umardo), Hindi (Ambar, Doomar, Domoor, Gular, Udumbara, Umr, Umbar), Kanarese (Alhi, Atti, Attimara), Marathi (Audumbar, Umbar), Sanskrit (Gular, Hemadugdhaka, Jantuphala, Sadaphalah, Udumbar, Udumbarah, Yajnanga).

**Morphology:**

An evergreen tree, 10-15m tall, with greyish or blackish-brown, rough, shallowly fissured bark. Leaves 5-15 X 2.5-6.5 cm, ovate to ovate-oblong or elliptic-lanceolate, glabrous at length. Receptacles 1.6-3.5 cm across, ovoid, subglobose or subturbinate, red, tomentose. Achenes reddish-brown, obovoid, minutely tuberculate.

**USES:**

Root, stem, leaves, fruit, milky-juice and galls are used to cure various diseases. Latex is used as adhesive (Dangol, 2002).
Azadirachta indica A. Juss.

Azadirachta indica is an important tree belonging to family Meliaceae and found in almost all the parts of India as a pious and sacred tree. It is said that planting Neem tree in the house is an ensured passage to heaven.

Scientific classification:

- **Kingdom:** Plantae
- **Division:** Magnoliophyta
- **Class:** Magnoliopsida
- **Order:** Sapindales
- **Family:** Meliaceae
- **Genus:** Azadirachta
- **Species:** A. indica

Common Indian names:

- Hindi (Neem), Gujarati (Limdo), Kannada (Bevo), Marathi (Kadu-Limba), Sanskrit (Nimba).

Morphology:

It is a tall evergreen tree with the small bright green leaves. It is up to 100 feet tall. It blossoms in spring with the small white flowers. It has a straight trunk. Its bark is hard rough and scaly, fissured even in small trees. The colour of the bark is brown grayish. The leaves are alternate and consist of several leaflets with serrated edges. Its flowers are small and white in colour. The olive like edible fruit is oval, round and thin skinned.

USES:

Leaves, twigs, seeds, and bark are used to cure various diseases.
**Polyalthia longifolia (Sonner) Thaw:**

Asopalav, a tree with aesthetic values and importance depicts growth, gradual evolution along with freshness. The leaves are used as temple decorations in India. Commonly planted due to its effectiveness in alleviating noise pollution.

**Scientific classification:**

- **Kingdom:** Plantae
- **Division:** Angiosperms
- **Class:** Magnoliids
- **Order:** Magnoliales
- **Family:** Annonaceae
- **Genus:** Polyalthia
- **Species:** *P. longifolia*

**Common names:**

- *Ashoka* or *Devadaru* (Sanskrit), *Debdaru* (Bengali and Hindi),
- *Asopalav* (Gujarati), *Nettilinkam* (Tamil).

**Morphology:**

Evergreen tree. Leaves lanceolate, 21.5-30.0 x 3.7-5.6 cm, tapering to a fine point, margins undulate, glossy above, glabrous on both sides (juvenile leaves tomentose). 6-many flowered, usually pendant. Fruit of 10-15 baccate monocarps on up to 37 mm long woody stalk [16].

**Uses:**

Plant is used in curing inflammation, fever, skin disease, diabetes, and Hypertension and worm infestation [17]. Bark is a good source of fiber [18].