

# Observing the ground in the city

Summer observations

No:4 ; 2010

Landscape Environment Advancement Foundation, LEAF

# Contents

Introduction	02
<b>Base maps</b>	
01. City map: Ahmedabad	05
02. Elevation map	06
03. Ground water map	07
04. Soil map	08
05. Land use map	09
<b>Grounds observed in the city</b>	10
01. Ravines, Hansol	11
02. Woodland, Thaltej	19
03. Flower market, Jamalpur	27
04. Calico mill, Jamalpur	35
05. Chandola lake, Dani Limda road	43
06. Dumping ground, Pirana	51
07. Agriculture, Pirana	59
08. Industries, Vatva	67
<b>Appendix</b>	
01. List of plants	75
02. Soil Observations	79
<b>Bibliography</b>	81

## Idea of a ground in the city:

The ground is a surface that we traverse on everyday.

As city dwellers, we usually tend to pave it, clean it for walking and sitting, or cover it with grass and pretty shrubs if it's part of homes. We usually don't look at it closely to observe the various life forms it supports and the daily transformation it undergoes due to the way it gets occupied by people, animals and plants.





The most important part of this surface is the top layer called 'top soil'. Top soil is the uppermost layer of the soil which is usually 2 to 8 inches thick. This layer is rich in organic matter and minerals. This is the layer that we see when we look down.

For my study, I decided to look down, at the ground, in various parts of Ahmedabad city. The surface of Ahmedabad is a combination of a stratum of alluvial deposits and stabilised sand dunes. The city is also bifurcated by the Sabarmati river. On closer inspection of topography of the area, one can observe the river bed, ravines towards the north and '*tekras*', which are actually the stabilised sand dunes. The city also has a varied land use: industry to agriculture which renders the ground differently in different areas. Based on these facts, I looked at the ground in eight locations:

01. Ravines in the north where the Sabarmati enters the city.
02. Woodland of the Sardar Patel Institute, where a closed, secure, campus keeps the ground below the trees undisturbed.
03. Flower market in Jamalpur, where there is a daily disposal of flowers and leaves on the bank of the river.
04. Calico mill, which is abandoned and the ground has been left to itself; as abandoned as the textile mill itself.
05. Chandola lake, which is a dried up lake in the southern part of the city.
06. Dumping ground at Pirana, where the city has been accumulating its waste since the last fourteen years.
07. Agriculture on the eastern fringes of Ahmedabad, where the city has not yet taken over completely.
08. Industrial area, Vatva; which discharges effluent continuously in both soil and water.

As a method, for each of these locations, I took photographs of the surface of the ground. I have also attempted to look at the underside of this surface, through sections of the top soil. All observations were made in the summer months of May and June. A few early monsoon showers, allowed me to observe the transformation of the ground due to the rains.

**Legend -**

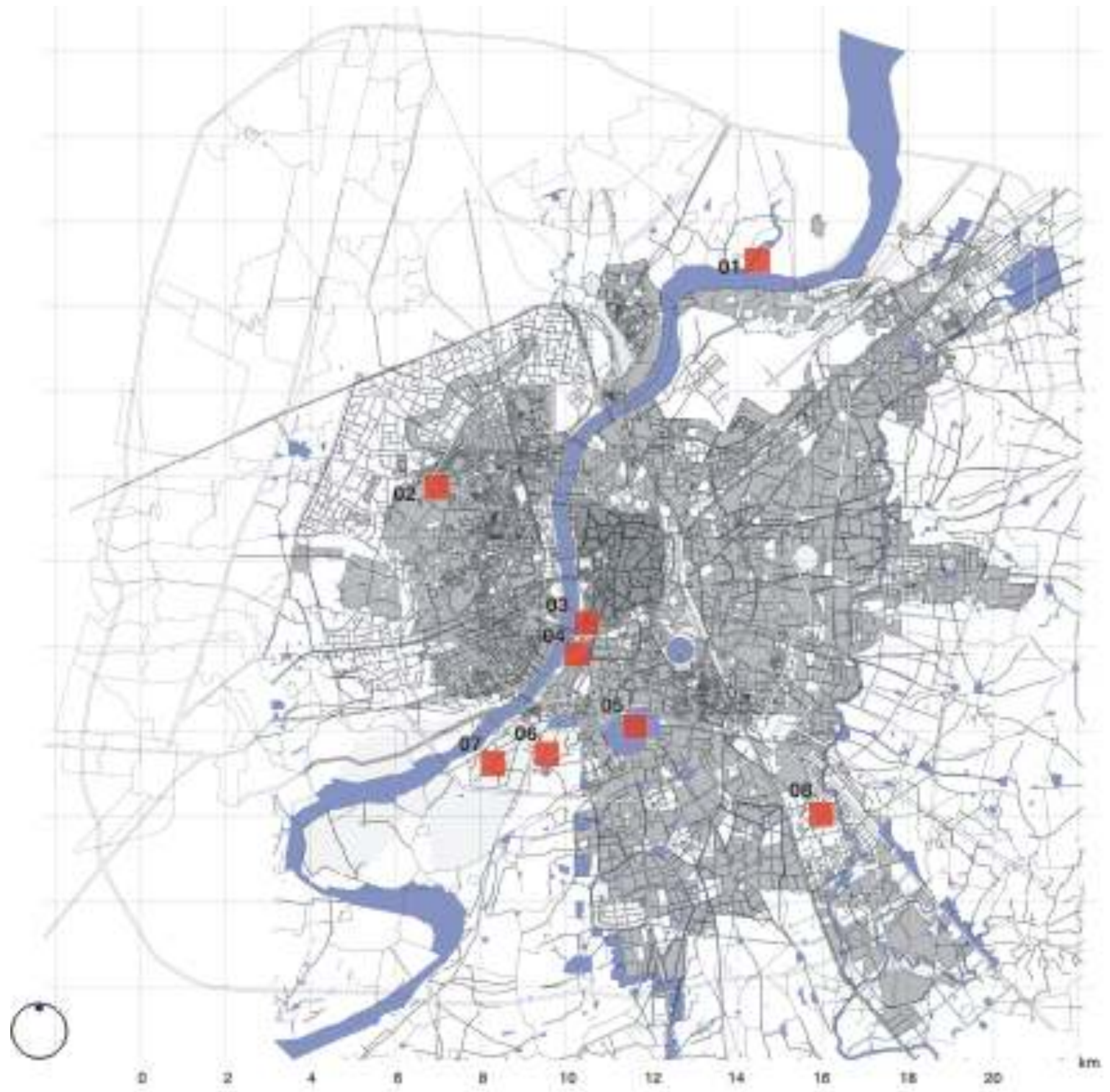
-  90 - 120m
-  70 - 90m
-  50 - 70m
-  < 50m

Ground water levels

Water quality:  
Industrial development and extensive use of fertilizers in agriculture affect the quality of percolating rainwater. As a result aquifers are found to be contaminated with nitrate in several parts of the city.

**Ground water level**





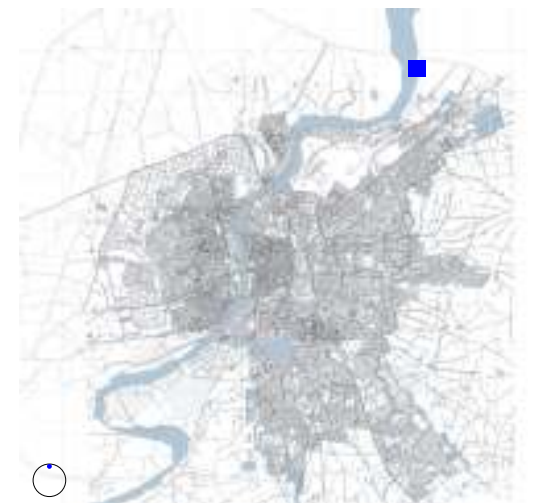
**Grounds observed:**

- 01. Ravines, Hansol
- 02. Woodland, Thaltej
- 03. Flower market, Jamalpur
- 04. Calico mill, Jamalpur
- 05. Chandola lake, Dani Limda road
- 06. Dumping ground, Pirana
- 07. Agriculture, Pirana
- 08. Industries, Vatva

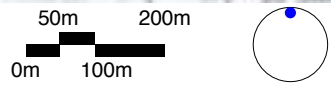
# 01. Ravines, River bed, Depression, Fishing , Sabarmati river



View of the ravines on the bank of the river. The ravines are deepest at this point.



N.T.S.





Location of the site

### Location:

These ravines are located in the northern part of the city along the Sabarmati river.

### Description:

The ravines and their immediate areas on the river bank are untouched by human activities. Ravines are formed due to soil erosion caused by surface water run off. This process of erosion degrades the land next to the river bed by washing away the top soil. While walking towards the river through a ravine, there are exposed soil sections on the either side. These sections are highly eroded. The area is dominated by plant species like *Prosopis julifera*, *Azadirachta indica*, *Euphorbia antiquorum*, *Capparis decidua*.

### Human intervention:

People live along the banks, but away from the ravines. The bank of the river is used for cremation. People fish in the river and grow crops like *Solanum lycopersicum* (tomato), *Solanum tuberosum* (potato) and *Citrullus lanatus* (watermelon) on the river bed. The soil from the river bed is also excavated for construction.



**Ravines** are found along the river bank. They are formed due to soil erosion.



**River bed** is used for agriculture. The edge of the river bed is covered by the growth of grass.



**Depressions** are formed along the river bed due to movement of surface water towards the river.



**Fauna** *Casmerodius albus* which is commonly called as Great Egret. It is a resident bird. They are carnivores and feed on fish and frog.

\* **Ravine** is a small channel which is a result of stream cutting. It is larger in scale than gullies.

# Topography



## Observations



1. These are green algae in combination with *Mollugo* plant. The algae has dried because of decrease in water level.



2. The edge between the river and land. These plants have been washed ashore and have remained on the bank while the water has receded.



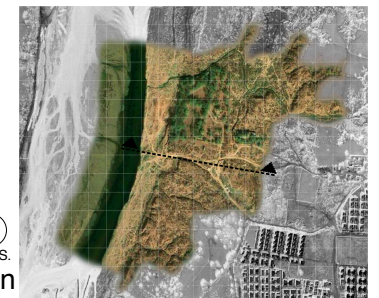
3. The river edge shows the presence of *Cynodon dactylon* grass and *Mollugo*.



4. This irregular edge has been formed due to surface water movement during monsoon. Water moves towards the river due to which soft edges get eroded. Over a period of time this edge will become deeper.



5. Crevices are formed due to soil erosion. These are occupied by fauna like spiders.



N.T.S.  
Key plan





6. The depression is covered with *Solanum surattense* which grows in wastelands. It is a thorny, shade loving, green perennial under shrub with a woody base. It is covered with sharp yellowish white prickles. It has high medicinal value.



7. These are marks made by the JCB trucks while excavating the soil. The excavation of the soil has led to the exposure of soft soil surface which will lead to further soil erosion.



8. Cremations are performed on the river bank. Ashes are disposed off into the river.



9. These are exposed soil surfaces due to soil erosion. The black holes are nests of birds like Parrots (*Psittacines*).

## On the ground

10. Ravines are formed due to soil erosion. In this case, a deep depression is formed due to surface water movement.





One can see dried algae at the edge where water meets the ground. This particular algae is a type of submerged algae. As mentioned before, it has dried up because the water level of the river has receded in summer. The green colour is due to the presence of chlorophyll. They grow up to photic zone i.e. till the sunlight reaches.



The river edge is covered by *Cyperus rotundus* grass. It is a perennial grass. Leaves are numerous, narrowly linear and finely tapered.



These exposed soil surfaces show the dry flowers of grass. The flowers, have probably retained the seeds within. These will germinate in the monsoon.



The holes seen on the soil surface are birds' nests. These nests are not very deep. Birds live in nests to hide themselves from predators. The bottom edge can be seen eroded due to movement of water. Since the soil in this area is sandy soil, it easily gets washed away.

## Seasonal transformation



1. Growth of green algae and *Sida spinosa* on moist soil.



2. *Launea procumbens* - perennial plant



3. *Alysicarpus* creeper which covers the ground during monsoon.



4. *Mollugo*



Landscape Environment Advancement Foundation  
INDIA