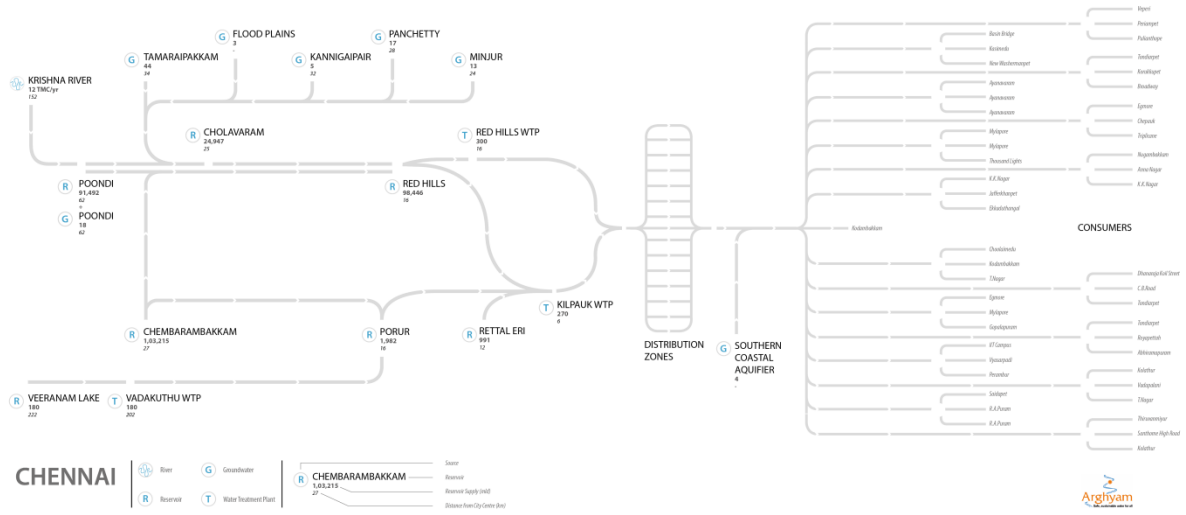
Chennai Water Quality Map

The Visualization

The representation of the dataset needed to bring together the water quality of the city, mapped over its existing infrastructure. It needed to present relationships of the various stages of water flowing from source to the taps inside your home. Such a visualization of data would require it to be laid onto a system map, so that it would be easy to plot the movement of water from one stage to another. While a map of the water supply system was found with relative ease, it was also surprisingly illegible and filled with details of little relevance. Also, since these maps do not carry a time stamp, it is often difficult to verify the information they present.

Chennai Base Map

This made it necessary to create a good reference map over which the data for water quality could be traced. Excessive details such as the road network of the city, or landmarks such as parks and important buildings that help orient the reader, needed to be weeded out as they make it harder for the water infrastructure to be mapped with desired clarity. However, since the data was closely-linked with different locations around the city, it was necessary for the visualisation to some retain geographical relevance. The maps produced consisted of various water bodies that make up the water supply infrastructure of the city - reservoirs, lakes, treatment plants, tanks, and so on.

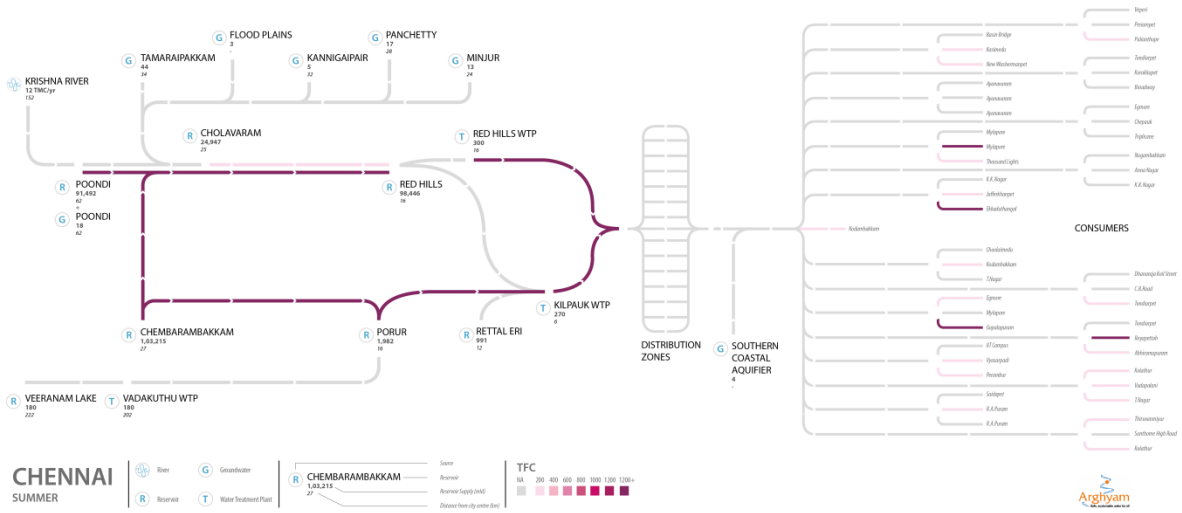


Each body was connected to the successive one in the supply chain by a line. This line represented the quality of water flowing from the former body to the latter, using a coloured key. The darker the colour, the higher the contamination. Arrows in white, running along the lines, helped trace the flow of the water. If a line was found grey in colour, data for that section was not available. The source of water, which was predominantly surface or ground, was denoted alongside the name of every reservoir. Also, under the name of the name of the reservoir, its capacity (volume) and its distance from the centre of the city was labelled.

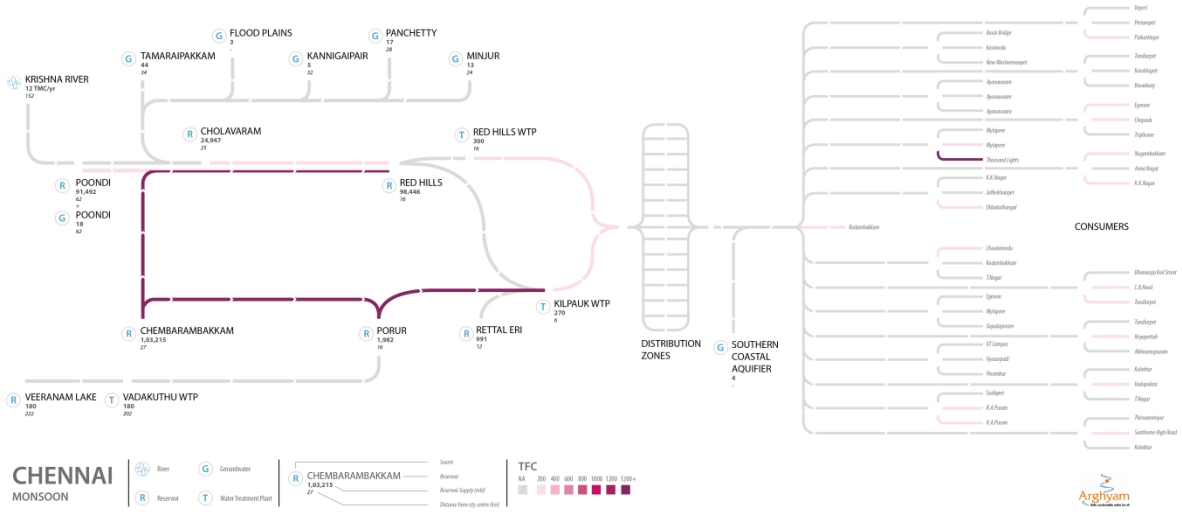
Chennai Data

The NEERI report for Chennai was thorough and sufficed to produce the map. The network of channels and pipelines was corroborated with the CDP produced for JnNURM. Extensions to the existing service was also added to the network map. However, there were recurring issues with the manner in which names had been spelled, causing some difficulty in locating them on a geographical map. A certain number of revisions also needed to be made to keep visual simplicity without compromising representation of water flows. Chennai was also unique insofar as the report clearly listed surface and ground sources of water distinctly.

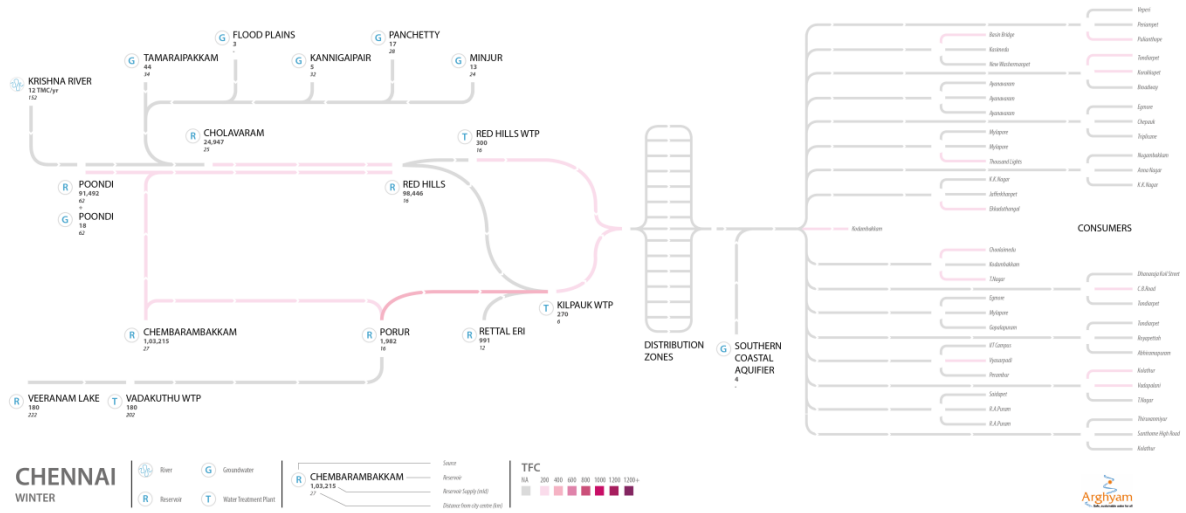
Chennai Summer



Chennai Monsoon



Chennai Winter



From the Map

We can clearly see that Total Feacal Coliform is a problem in Chennai and that people should boil their water. What is really interesting is that contamination is still there after leaving water treatement plants.

Methodology

The visualizations were produced using information primarily from the reports produced by NEERI (National Environmental Engineering Research Institute) and a sense of relative proximity in representation of the various elements that make up the water systems of the chosen cities. The information provided by the reports was further corroborated with additional sources such as water governance boards and government reports, and changes were made accordingly. The maps also needed to incorporate information on distances and the paths traced between various bodies of infrastructure. The details have been expanded upon in the text below.

NEERI Reports

The reports produced by NEERI served as a point of departure for the visualizations. The structure of the report generally followed as noted below:

•Introduction to the city

•sources of its raw water, path to the treatment facilities, and distribution of treated water

•water treatment plants, the processes they deploy, and staffing composition

•sewage treatment as well as dry waste management.

The information from across the report provided the base with which to build the framework for the visualization. Every water body and treatment facility was identified before connecting the appropriate units to each other. This also included mapping out the unique distribution system for every city.

Additional Sources

The research undertaken by NEERI for the reports predated the projects proposed and implemented with funds from the JnNURM (Jawaharlal Nehru Urban Renewal Mission). CDP's (Comprehensive Development Plan) were produced for the same. The CDP's, thus, formed another source of information to supplement the original NEERI reports with. Many water treatment and distribution boards also had some information relevant on their website – mostly in the form maps – that were found quite useful, as well. In some instances, academic papers, too, were referred to.

Goole Maps-based distance calculators

Once the basic structure was constructed, the relative distances were mapped approximately on the diagram. However, certain liberties were necessitated to communicate scale and the intricacies of the systems. A large number of reservoirs/treatment plans/dams had been mentioned in the report without making clear how far they were from the city. Distance calculators were used to approximate distances from the city's centre.

Inconsistencies

While the set of NEERI reports covered extensive ground in most cases, it also revealed inadequacies in information provided when corroborated with other/recently updated sources. More importantly, although the reports followed a structure in presenting their findings, the level of information within each section varied from city to city. This made it difficult, at times, to work with the report.

The maps were designed to be very simple so that they may invite the reader to have a conversation about the data and its revelations, be it the state of the water one consumes or the data that evaluates it. For instance, the glaring lack of data became increasingly apparent once the mapping began. Putting together such a map was riddled with problems of availability and accuracy of data.

*Maps done by Tejas Panda, Consultant with IWP