



# Long Term Capacity Planning (LCP)

## Understanding of the problem

**Water management** is a problem that has always been tackled with a singular approach of trying to increase the water supply with authorities only restricting demand when we've almost run out of water. With the **ever-increasing rise** in trends of urbanization, we must understand the fact that water is a finite resource and there's only so much that can be done to increase the supply. Creating new institutions within a larger framework, new structure and approach is imperative. It is crucial to approach the problem by looking at the consumption and **demand** of water along with the factors that affect them.

## Most challenging aspect of this problem

The Predictions (which our algorithm will give) in our approach are heavily influenced by the data which we get, **inaccuracy** in data can lead to incorrect predictions which will eventually lead to failure when decisions will be made.

Coming up with a rational way to avoid crisis may include some water management changes which include to bring supply of water close to the equilibrium point where demand is met.

## Reasons for choosing this problem

This problem contains **Demography** of Mumbai (the city we reside in). This Demography can not only be used here but also for **Economic means**, i.e. we can know the *population growth, socio-economic factors leading to growth*, type of people living in a particular region, etc. then this data can be further **utilized** in **Predictive Researches** for **businesses** and for **market research**.

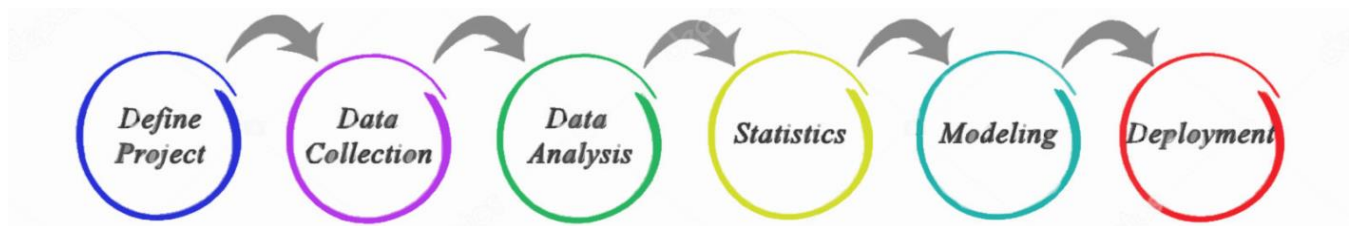
# Our Approach to the problem:

## Our plan for solving the problem

We will use **Predictive Analysis** to make future predictions and **Prescriptive Analysis** to offer the solution to the problem.

In order to perform **Predictive Analysis**, data of the change in demography, water supply system, etc. will be **collected**, using **APIs** supported by government websites and services such as *data.gov.in*.

The APIs will interact via JavaScript. Our **algorithm**, after **analyzing** will help us to prescribe necessary steps to be taken. Using **this algorithm**, analyzed data will be used to create a **Model** which can be **deployed** for further use.



## Approach to solve the problem

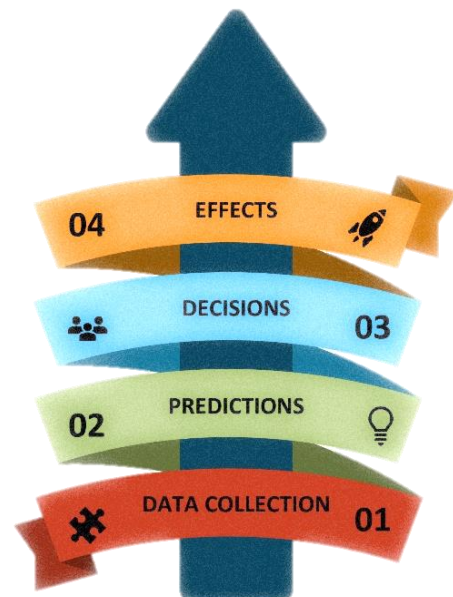
We will be creating a **custom-algorithm** using python and R language to *analyze, segregate* and provide results from the data fed to it.

This algorithm will first **segregate** the data according to different *sections, sectors, regions, class, need* etc.

This algorithm will **analyze** the water requirement to different sections, sectors of the city and *minimize the water supply demand by maximizing the proper consumption pattern*.

It will analyze **today's data** with **previous records** and learn to **predict** the **future growth rate** considering governments plan to urbanize the taluka area and their water needs.

This algorithm after analyzing all the data will suggest the *equity* of water supply to be given to different section, regions etc. to ensure **long term capacity planning**.





## Platforms, Coding Language and Framework to use

**Database** will be stored on **SQL Server** and on **Googlesheets** for offline use.

**JavaScript** will be used to interact between **APIs** fetched from the government websites such as *data.gov.in*

**Data Analysis** will be carried out using languages such as **Python, R and MATLAB**.

The **statistical data** will be stored in **SQL Servers**.

**Java** will be used for **front-end development**.

## Phasing of the implementation

Work will be distributed according to one's **domain**, and we will work and discuss after **college hours**, and on weekends, we will set **smaller goals** and set **deadlines**.

In some situations we will have to learn some new tools and languages. We will set goals such that it does not **collide** with our **curriculum** based exams.



# Why our team can provide a winning solution.

## Team Experience:

We all have a vast amount of experience when it comes to taking up projects. One of us has **interned** with a **stock market data analysis company** (K Chart software) and also Magitek Business Solutions. The other one has ardently **created** 2 websites namely ***updateyourpass.com*** and ***workomusic.com***. One of us has **written** 2 books on an online platform- **Wattpad**.

## Team Strengths:

Although we have different interests, but we all have same **passion**. From having long discussions on technology based topics to even understand each other's views and take them into consideration, we have come a long way and are a force to reckon.

## Team Achievements:

We haven't worked together before, but we've worked in a group of two. One team having reached the **semifinals** of the **Semicode Event**, whereas the other having come close to winning a **quiz competition** in college. Individually, the person who created the website has also received laurels over the internet and over **25 articles** have been published. The one having written the book achieved a highest ranking of 11th all over the world and his book has been viewed by over 10K people from around the world.

## Personal Motivations

Since we are a team, it's vital to be in sync with each other. After having done our research we realized water is going to be a problem in the future and if we don't step up for our city or the planet, we will be punishing the future generations. So we are really looking forward to the challenges which lie ahead of us, but nonetheless we want to enroll as many people as possible in our vision.