



**Final Year Project Showcase Batch 2019
Year 2023**

Department: Architecture and Planning Programme: <i>Development Studies</i>	
1	<p>Project Idea</p> <p>“To Solve Problem of Contaminations in KW&SB’s water pipelines infrastructure through using Internet of Things (IoT) technology”.</p> <p>The project was proposed on the basis of the FYDP research. The research was about the potable water in the city of Karachi. It looked at the quality potable water supplied by the public utility agency in Karachi, by conducting testing of water samples across the city. In this connection, they also looked into the growing trend of using bottled water</p>
2	<p>Process</p> <p>Two Water Filtration Plants of Karachi City were marked on the Map that are NEK-II and COD Filtration Plants, selection was done as per their locations and time of construction. In which multiple areas were identified, where the water is supplied from these filtration Plants. Precisely, three areas from each filtration plant were selected to get the samples of water for testing. Samples were taken from different levels starting from the filtration plant to the storage tanks of the houses.</p> <p>The project follows the following Stages:</p> <ol style="list-style-type: none"> 1. Project Initiation, where the project would lay its foundation by setting clear goals, forming a capable team, and meticulously planning resource allocation and schedules. 2. Development of Mobile Application/Website would center on the creation of a user-friendly mobile application and website, designed to facilitate the monitoring of water quality. These platforms would be carefully crafted to empower users to report issues, access real-time data, and receive timely notifications, with the involvement of technological experts to ensure their effectiveness. 3. Rollout of Monitoring System, sensors would be deployed at multiple points in surface and underground water sources across Karachi, enabling continuous monitoring of water quality. A robust data transmission and storage system would be established to facilitate real-time data analysis, and essential training would be provided to personnel responsible for the monitoring system's management. 4. Identification of Contamination Sources would mark the phase where data collected from the monitoring system would be meticulously analyzed to pinpoint contamination sites and sources. Collaborations with water quality professionals and researchers would be vital for precise identification, with the results documented and transformed into a geospatial map highlighting contaminated areas. 5. Identification of Contamination Sources would mark the phase where data collected from the monitoring system would be meticulously analyzed to pinpoint contamination sites and sources. Collaborations with water quality professionals and researchers would be vital for precise identification, with the results documented and transformed into a geospatial map highlighting contaminated areas. 6. The project would emphasize collaboration, remedial measures, enhancement through technical support, and rigorous evaluation of the contamination points identified in the infrastructure.



3	<p>Outcome</p> <p>In this connection with the mentioned idea the research project also looked into the growing trend of using bottled water and concluded that the piped water provided does get contaminated while going through various infrastructural installations. Hence, the research project suggests that KW&SB's infrastructure will be upgraded and success in achieving the goal of providing safe drinking water to communities will be achieved under this project</p>
4	<p>Evidence (Theoretical Basis)</p> <p>The research did not involve any theoretical framework. It encompassed both primary and secondary research. The secondary research findings revealed that KW&SB's water has been contaminated for the past twenty years, with the most recent research conducted in 1998. Consequently, the bottled water market also began to thrive gradually.</p> <p>The primary research had two main objectives:</p> <ol style="list-style-type: none"> 1. To determine why people are shifting from tap water to bottled water for drinking. 2. To assess the quality of KW&SB's water at various stages of the distribution system to pinpoint where contamination occurs. <p>As per the results, most households are switching from tap water to bottled water primarily due to quality concerns and convenience. Convenience, in this context, refers to people finding the purification methods for tap water time-consuming.</p> <p>The primary research findings also indicated that total coliform bacteria is present when the water leaves the filtration plant. However, E. coli bacteria is introduced into the water as it travels through the pipeline infrastructure, indicating significant leaks in the infrastructure that allow sewage water to mix with the water supply pipelines.</p>
5	<p>Impact on Sustainability of Urban Regions or SDG-11 "Sustainable Cities and Communities"</p> <p>Ensuring clean and safe water supply within urban areas, as per the project aims to do, supports SDG 11, which focuses on making cities inclusive, safe, resilient, and sustainable.</p>
6	<p>Competitive Advantage or Unique Selling Proposition (Cost Reduction, Process improvement, Attainment of any SDG (Sustainable Development Goal), increase of market share or capturing new market or having superior performance over a competitor. In summary, any striking aspect of the project that compels the industry to invest in FYP or purchase it. Some detailed description is required in terms of how, why when what. You can select one or more from the following dropdown and delete the rest of them). Please keep relevant options, delete the rest of them, and correct the sequence</p>
a	<p>Attainment of any SDG (e.g. How it is achieved and why it is necessary for the region)</p> <p>SDG#06; Clean Water and Sanitation : By addressing contamination issues in the water supply infrastructure, your project contributes directly to SDG 6, which aims to ensure the availability and sustainable management of water and sanitation for all.</p> <p>SDG#11: Sustainable Cities and Communities : As mentioned above</p>
b	<p>Any Environmental Aspect</p> <p>The presence of contamination in KW&SB's water infrastructure is contributing to the growth of the bottled water market economy. The bottled water market largely relies on the bulk extraction of groundwater, which is causing significant harm to the environment.</p>
c	<p>Cost Reduction of Existing Product</p> <p>The growing dependence on the bottled water market for safe drinking water is increasing monthly expenses for people. In the past, access to safe drinking water in the city was</p>



	neither an issue nor an added cost for residents. However, today, people are spending money to secure safe drinking water. Therefore, the project under the research aims to reduce the monthly expenses of residents by providing them with safe drinking water through their taps.	
	Process Improvement which Leads to Superior Product or Cost Reduction, Efficiency Improvement of the Whole Process (e.g. What is the issue is current process and what improvement you suggests)	
d	Changing the entire infrastructure of KW&SB is not feasible due to various constraints. This project aims to identify points of contamination in the system by using water quality sensors at various locations and then improving those points.	
	Expanding of Market share (e.g. how it expands and what is the problem with the current market)	
e	This project is actually against the market intervention in getting access to very basic human rights i.e safe drinking water. The market, identifying the gap, is filling it currently but bottled water is not a permanent and sustainable solution.	
8	Team Members (Names along with email address)	Manal Mateen (DS-025) - manalmateen7@gmail.com Syed Minhaj Ali Rizvi (DS-005) - minhajali915@gmail.com Rumaisa Patel (DS-032) - rumaisa.inqilab@gmail.com Javeria Faiz (DS-004) - javeria4206922@cloud.neduet.edu.pk
9	Supervisor Name (along with email address)	Dr. Saeud Ud Din Ahmad - architectsaeed@yahoo.com