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Using Machine Learning and Neural Networks Technologies, a Bottom-Up Water Process Is Being Used To Reduce All Water Pollution Diseases

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Abstract: ***Without water, we can't do anything, and water plays the most important role in our regular life. Actually, the initial stage of water provides excellent water quality; it's very healthy for the human body. The water continues to flow, but gradually the water becomes polluted and affects human health. Water pollution is one of the major problems on earth nowadays. Some people do some activities; animals, underground water, and industries release wastewater, so gradually the water becomes polluted. We studied a number of papers and searched for water pollution diseases and changes in water quality and the drinking water problem, which causes almost 250 children to die each day, is one of the worldwide risks listed by the World Economic Forum. Every year, almost 4 million people die as a result of drinking contaminated water. Despite technological developments, there aren't enough quality measures available to assess drinking water quality. So, we proposed the bottom-up process of water to reduce all water pollution diseases using hybrid technologies and to decrease all water pollution problems. Machine learning has been widely employed as a potent tool to address issues in the water environment since it can be used to forecast water quality, allocate resources more effectively, handle shortages of resources, etc. We will discuss several methods of machine learning, including classification, regression, and neural network-based techniques. Using data from the last 10 years, it's easy to figure out who is polluting and hurting the water. When implement a use this hybrid technologies gradually reduce all water related issues. In future definitely we get excellent water quality and peoples, animals get healthy water.***

Keywords: ***Water, Water Pollution diseases, Machine Learning, Neural Networks, Back Propagation.***

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1. INTRODUCTION

The water in the first stage is very good. It has no colour, taste, or smell, and it is clear and reflects light. Sugar and salt that dissolve in water make it a good solvent. But the water quality gets worse over time because of things like people, animals, chemicals, underground water, and industries that let their waste water (grey and black water) out through pumps and into canals and rivers. Sometimes, factories dump their chemical waste into rivers, lakes, or right into the ground. When pesticides, which are chemicals that kill insects, are used on farmland, they often end up in large amounts in both surface water and groundwater. Leaks from underground tanks that store liquids like gas go straight into the groundwater. So we drink water that hasn't been treated, and your body will react to it right away. At the very least, you will get a stomachache. About 3,575,000 people die every year from diseases that are spread by water. That's like a jumbo jet going down every hour, and most of those killed are children. Diseases that are easy to catch can be spread through unclean water. Some of these diseases are typhoid, cholera, paratyphoid fever, dysentery, jaundice, amoebiasis, malaria, and There are also chemicals in the water that are bad for our health. Pesticides contain carbonates and organophosphates, which can hurt the nervous system and cause cancer. Chlorides can cause reproductive and endocrine damage. Nitrates are dangerous for babies, especially those who drink formula milk. It cuts down on the amount of oxygen that gets to the brain, causing "blue baby" syndrome. Lead can accumulate in the body and harm the nervous system. Arsenic hurts the liver, causes skin cancer, and makes blood vessels sick. Too much fluoride can cause your teeth to turn yellow and hurt your spinal cord. Even a very small amount of petrochemicals can cause cancer. Let's do our part. Humans are at risk from water pollution, and we can all do our part to keep our waters clean. Do not put trash in the ocean. Don't put chemicals or paint down drains or water pipes. If you see someone throwing trash into a body of water, you should tell the police about it. Help raise awareness by teaching your children and making your community more aware. Campaigns are being run to get people to plant trees along canals and revegetations as a way to reduce water pollution and diseases. All water pollution concerns, including those connected to agriculture, health, and bone disorders, will be solved using machine learning and blockchain technologies. Water Quality Analysis Using Machine Learning Algorithms Data analysis is one of the most essential ways that natural science research, such as environmental science, advances. Machine learning algorithms are an example of a ubiquitous and advanced data analysis tool made possible by the ongoing advancement and development of technology. The purpose of the research that went into this thesis is to show environmental engineers and scientists how these models can be used to help with environmental tasks. The data used for the study is regarding the water quality. It was gathered as part of the Streames (Stream Reach Management, an Expert System) project, which aimed to improve river quality throughout Europe. There are examples of tasks that can be accomplished using machine learning methods such as random forests, support vector machines, neural networks, k-nearest neighbours, and k-means clustering in this paper. Data imputation, regression, classification, clustering, and feature selection are examples of these activities. Classification, regression, water quality, machine learning, random forest, neural network, SVM, feature selection, and imputation are the subject headings.

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2. Related Work

Existing Water Quality Prediction based on hybrid models

We all know that water is one of the most important things for people to survive. But as our population grows, we waste more water and treat it with toxic chemicals, making it unsafe for people to drink. Because of this, it is very important to know how good the water is. The prediction of water quality is the core of this kernel. This kernel predicts the water quality index (WQI) and the status of the water quality based on a few factors that affect water quality. I have cleaned up the data in this system and done some exploratory data analysis. Since the data didn't have a column that could be used to make a prediction, I did some math. I then made three models for making predictions. The first model is a non-deep learning linear regression model. The second model uses deep learning, and the last model is based on logistic regression.

Figure1: Non-Deep Learning based linear regression model

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Initially top down stage2 water waste and water pollution is very less we are calculated water quality based existing data using non-deep learning based linear regression model in this model water quality prediction 97% but gradually some factories, peoples, animals polluted water and slowly water quality reduce and peoples getting health related issues.

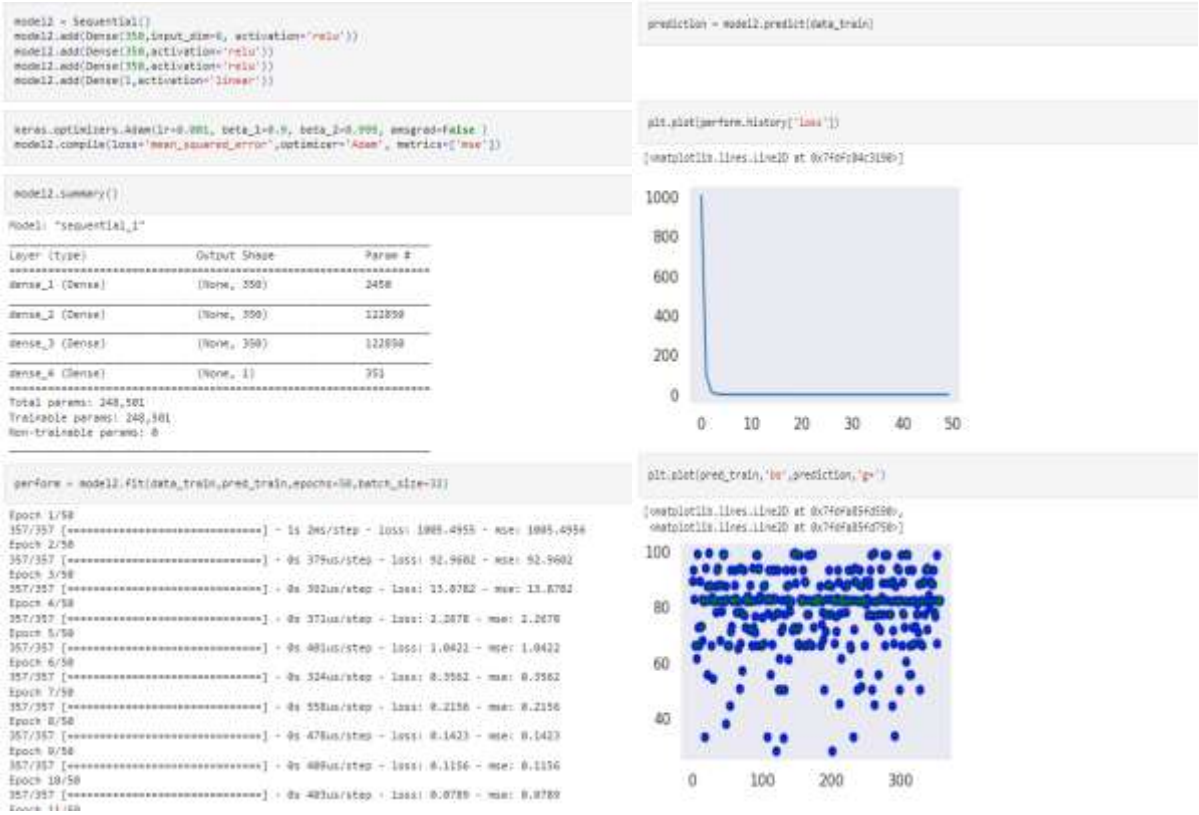

Figure2: Deep Learning Based Linear Regression Model

Next top-down stage 3 compare previous model and water quality is very less, here we are also calculated water quality based on existing data using deep learning based linear regression model, in this low water quality water affected on human, animals, agriculture sectors etc, when you drink and use in this low-quality water facing lot disease for peoples, animals etc. so, that we must solve this all water related issues otherwise we can't imagine future problem.

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Figure3: Logistic Regression

Next top-down stage 4 here we are also calculated water quality in this model result is very very low quality this way of process similar to next top down and next top-down process and to step down the water quality gradually. So, definitely we must save water, protect water in every stage.

2.1 Top-down water process

A. Initially we get excellent water quality

Excellent-quality water that has been naturally purified to meet very strict standards By definition, it only contains balanced H2O, H+, and OH- ions. So, the conductivity of high-quality water is about 0.055 uS/cm at 25 oC, which is also written as 18.2 MOhm. A natural way to speed up your metabolism would be to drink more water. It would also help you feel calm and give your brain the energy it needs to work well. If you drank clean, fresh water every day, your skin would look more healthy and glowing. It will make your skin feel more alive by getting rid of the oxidants and toxins in your body. It makes the kidneys less stressed and helps them work better by letting them get rid of waste from the body. You can say in one word that it makes the kidneys work better. When you talk about how drinking water is good for your health, you can also mention how quickly you can lose weight. If you drink a lot of water every

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day, you won't feel tired and will be more active. It would help keep your body's pH level stable. Aside from these, drinking more water would also help your body stay healthy by giving your cells more oxygen and nutrients. It also helps get rid of waste and keeps the body's temperature pretty stable. You would also find that drinking 100% pure and safe water would help you get rid of constipation and keep your muscles in good shape. People depend on 100% pure and filtered water to drink because of these reasons. In fact, you could say that drinking clean water would help you live a happy, healthy, and productive life.

B. Peoples spoil natural water and ground waste water

Groundwater supplies drinking water to more than half the population in all 50 states. Groundwater is another major source of water for agriculture. Pollutants can enter groundwater, which is unfortunate. Groundwater contamination occurs when man-made substances such as gasoline, oil, road salts, and chemicals enter the groundwater and render it unsafe and unfit for human consumption. Surface material from the land can move through the soil and end up in groundwater. Pesticides and fertilizers, for example, can eventually end up in groundwater. Road salt, hazardous mine chemicals, and used motor oil can all contaminate groundwater. Untreated septic waste, toxic chemicals from underground storage tanks, and leaky landfills can also pollute groundwater.

C. Industrial waste water release through pumps

There are numerous factors that contribute to the contamination of water. The most polluting substances are municipal sewage and industrial waste dumped into rivers. Industrial waste is waste generated during the manufacturing of goods or other industrial activities. Cafeteria waste, dirt and gravel, masonry and concrete, scrap metals, trash, oil, solvents, chemicals, weeds, grass, and trees, wood and scrap lumber, and other similar wastes are examples of industrial waste. Industrial solid waste is classified as hazardous or nonhazardous based on whether it is solid, liquid, or gas in containers. Manufacturing and other industrial operations can generate hazardous waste. Some commercial products, such as cleaning fluids, paints, and pesticides, that are discarded by businesses or individuals are classified as "hazardous waste." Non-hazardous industrial wastes are those that do not meet the EPA's hazardous waste definition and are not municipal waste.

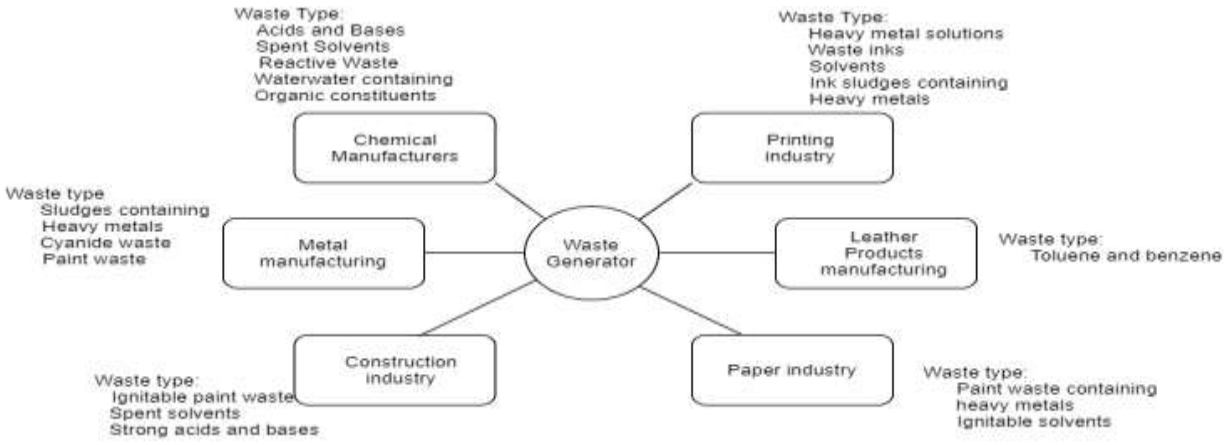

Figure: Industrial waste water generator and type

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D. Finally get water pollution diseases

Gradually in the final stage of water 95% polluted, when you drink and use this water you get health diseases issues and this water very dangers to use and is not suitable for agriculture related, home related and animal use related this one very risk and use regular life. So, we must save water in future other wise we face lot of problems, we are not estimate and predict the future lose. So, that definitely we are approach new technologies for health water quality.

Stage 1. Benefits to drinking excellent water quality

Stage 2. Peoples spoil natural water and gro waste water

Stage 3. Industrial waste water release through pumps

Final stage water pollution diseases

Figure: Top-down water process

3. PROPOSED WORK

Bottom-up water process using machine learning, Block chain and Neural Networks

A. Classify waste water pollution to identify diseases and solve it using machine learning, Neural Networks

First of all, we need to find out which areas polluted water so we approach machine learning algorithm and, in this algorithm, give most effective best accurate result. Machine learning ability to learn from past experience and combines data with statistical tools to predict an best accuracy. Firstly we take one large water pollution diseases dataset to learn machine and in this dataset have set of attributes, set of features and class label. I give one input to model and input is which areas facing water pollution diseases then we use supervised learning model. In supervised learning to solve classification problem so we classify water pollution diseases year

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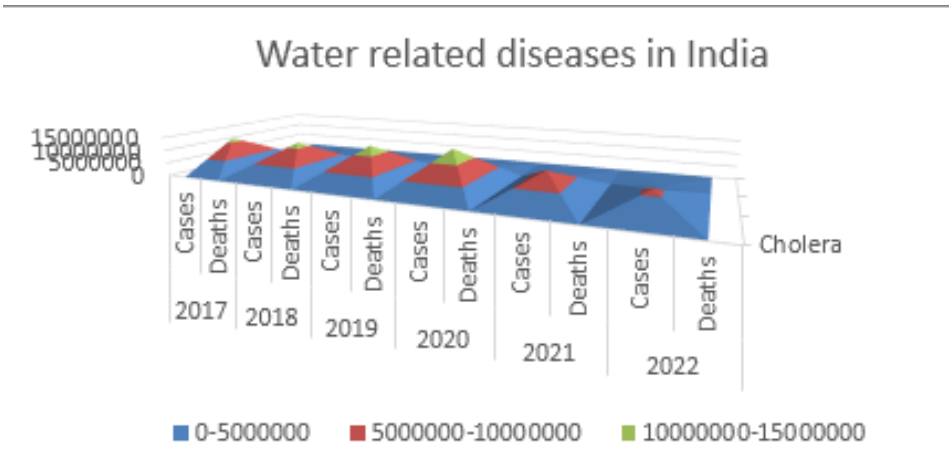
wise and cases, deaths from training data. After that we solve all water pollution problem and provide security using blockchain technology.

Water borne diseases in India												
Disease	**2017**		**2018**		**2019**		**2020**		**2021**		**2022**	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Cholera	1130	5	844	5	913	4	718	3	385	3	250	1
Acute Diarrhoeal Diseases	1141361 0	1629	1174863 1	1137	1291360 6	1353	1416657 4	1555	9230572	840	6137028	500
Typhoid	1650145	387	1736687	425	1937413	452	2215805	511	1493050	286	1047237	105
Viral Hepatitis	110125	574	138554	400	140861	435	145970	451	98086	283	76482	104



B. Industrial waste water release through pumps by the end we connect water storage.
In order to treat industrial effluent, you need tools to measure the quality of the water. Before it can be used again in manufacturing or put into sewage systems, treated water must meet local and federal rules about water quality. Inline water quality devices are put into wastewater treatment vessels so that readings can be taken continuously at different stages of the treatment process. The type of metre needed at each treatment phase is based on the testing environment and the system being examined. For example, an inline metre installed in a reverse osmosis system should be able to measure total dissolved solids (TDS), since these systems are made to remove TDS from water.

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Figure: Industrial waste water treatment

C. Peoples spoil natural water and underground waste water

The process of eliminating pollutants from wastewater using physical, chemical, and biological processes before releasing it into a body of water is known as wastewater treatment. India has had approximately 16,000 public-owned wastewater treatment plants since the adoption of the Clean Water Act in 1972. A treatment plant cleans the water through a succession of treatment steps (primary and secondary) before it is returned to a lake, river, or stream. The first treatment process removes around 60% of the suspended particles in the wastewater. The wastewater is additionally aerated (stirred up) as part of this treatment to introduce oxygen. The primary treatment process includes screening, pumping, aerating, removing sludge and scum, eliminating bacteria, and dealing with wastewater residues (solids). The second treatment removes more than 90% of the suspended particles.

D. Finally we get excellent water quality compare bottom-up water process stage one.

We finally get high-quality water when we use a bottom-up process to get rid of things one by one and a reverse engineering calculation. First, we take the water from the last stage, which is usually of low quality. Then, we figure out how to turn it into high-quality water. The first step is to use a bottom-up process to scan the water and get rid of unnecessary raw waste materials.

Inv stage 4 .Scanning water pollution

Inv Stage3. Industrial waste water release through pumps by the end we connect water storage.

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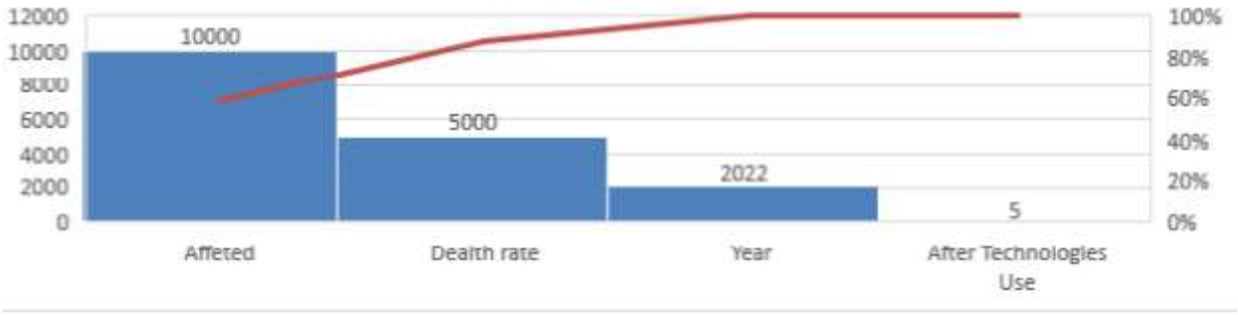
Inv Stage 2. **Inv Stage 1.**

Figure: Bottom-up water process

4. EXPERIMENTAL RESULT

We take last 5 years data in before use technologies follow the below statistics most of the people affected 130000 in the year of 2017 and death rate 78000, and this impact and polluted water gradually increase affected peoples count and also increase death rate. In the year 2022 we are proposed and use hydride technologies this one get very tremendous results and gradually reduce all the water related issues.

Year	Affected	Death rate	After Technologies Use
2017	130000	78000	-
2018	150000	81000	-
2019	154000	85000	-
2020	165000	89000	-
2021	168000	90000	-
2022	10000	5000	5



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5. CONCLUSION

In this work we proposed to reduce water pollution diseases using bottom-up process of water we take pollution water and first we identify the diseases using machine learning and block chain technologies and awareness plantation trees beside canal and rivers as possible place. Once plant tree beside canal, river place it's very helpful to reduce water pollution diseases. In future who pollute water specific person identification based on face recognition, reduce the cost of use water storage equipment's, IoT sensors and improve water quality, control the entire water storage places and agriculture problems.

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