

# **WATER CONTAMINATION IN INDIAN STATES AND FUND UTILIZATION EFFICIENCY OF STATE**

## **INTRODUCTION**

### **1.1 Overview**

The project deals with the habitations that face problem in water quality which is a critical issue to be addressed by the Ministry of Jal Shakti. The department of drinking water and sanitation have a major role in ensuring that the public gets the quality water to drink. The study included two data sets under water and sanitation: water quality affected habitations (one year dataset) and state-wise allocation, release and expenditure of National Rural Drinking Water Programme (NRDWP) fund (corresponding one year dataset). The project focuses to identify the states and districts that face the problem of water contamination. Also the study examines the funding allocated, released and utilized toward NRDWP.

### **1.2 Purpose**

The purpose of this project work is to identify the habitations, villages, blocks, districts and states that are facing the problem of water contamination such as fluoride, arsenic, iron, salinity and nitrate. Moreover, the project will identify the risky areas that have to addressed immediately. This will also help the health department in i) identifying the people who are at health risk because of consuming contaminated water, ii) framing action plan to mitigate the future health risk, iii) frame action to treat the patients. In addition, the agriculture in the water contaminated regions will be highly affected. This study is of value as it would address the agriculture issues and health issues.

## **2 LITERATURE SURVEY**

### **2.1 Existing problem**

The Sunderbans region face the threat of arsenic contamination and salinity and the mitigation strategies to combat the problem include the use of locally available water and adoption of organic farming (Nath et al, 2021). The industrial discharge is an important reason for the water pollution. Specifically in the Hindon River, the Nemerow pollution index value indicates the high level of contamination in the river water with a value of more than three. Iron is one of the critical contaminant of the Hindon River (Mishra et al, 2021). Same has been reported in the Ganges that has been polluted by presence of heavy metal waste in addition to other forms of waste (Shukla et al, 2021). Previous studies have clearly reported the contamination of water due to metal waste and this requires to study the locations across the nation about the seriousness of the issue.

The key questions that are addressed in the project:

1. Which states and districts are suffering the problem of water contamination due to the presence of substances such as fluoride, arsenic, iron and nitrate and presence of salinity?

2. Which is the most affected states and districts by the selected contaminants of the study?

3. What is the funding utilisation in states towards water and sanitation?

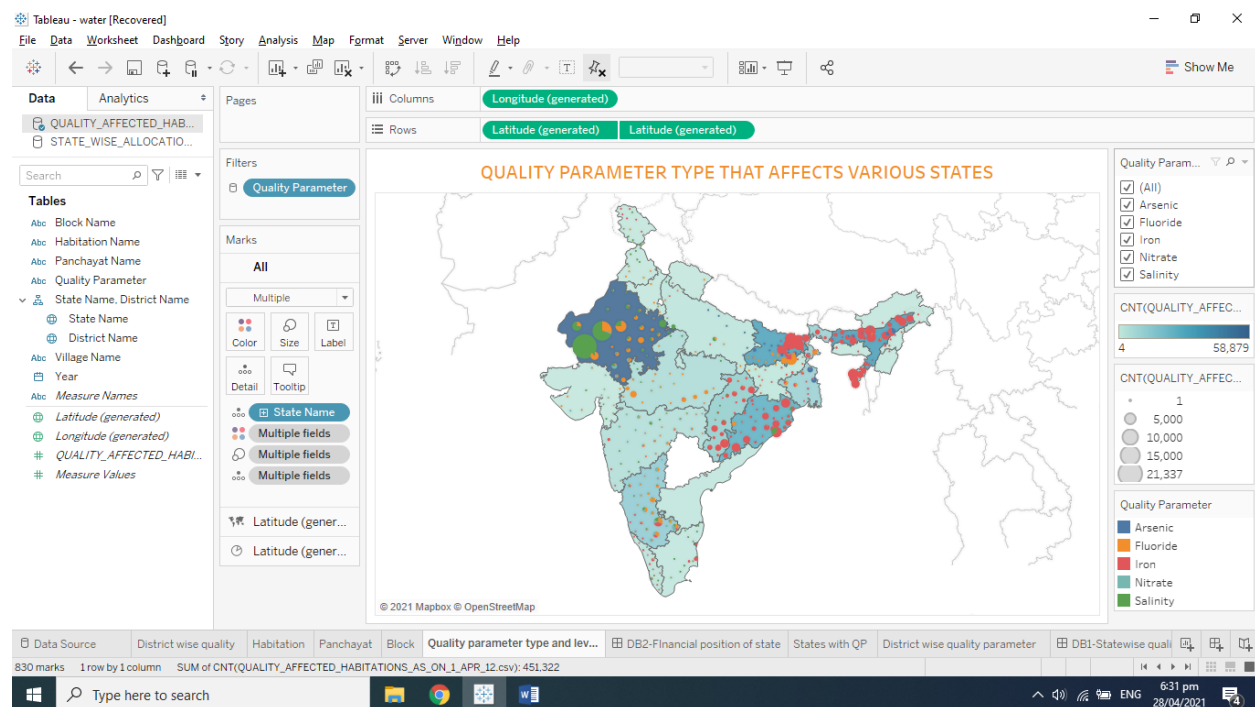
## 2.2 Proposed solution

The funding allocated by both Central and State government need to be utilised to the fullest extent. In addition, the funds generated through sources can also be utilised to keep water resources safe and free from mixing with various substances that pollutes water.

## 3 VISUAL ANALYSIS

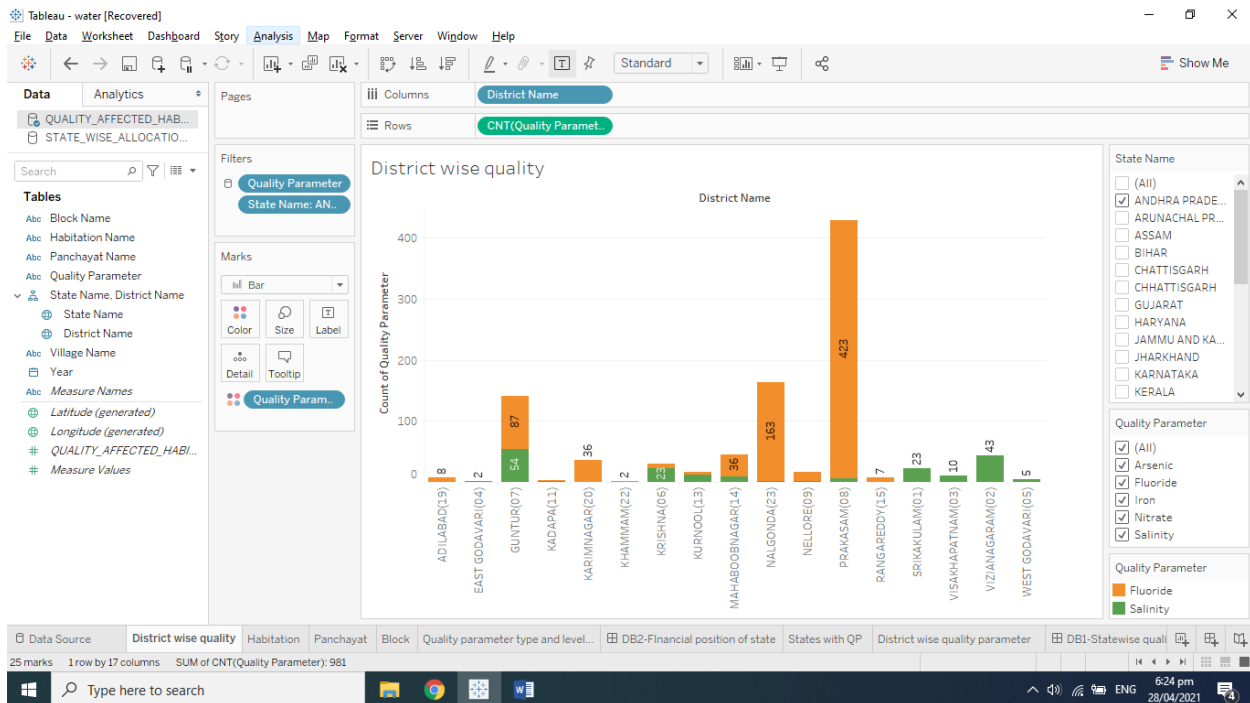
### 1. Quality parameter affecting various states

Dark blue indicates the state that is mostly affected by water contaminants. Rajasthan is the state showing more habitants affected. Moreover, salinity is the contaminant affecting the habitations.



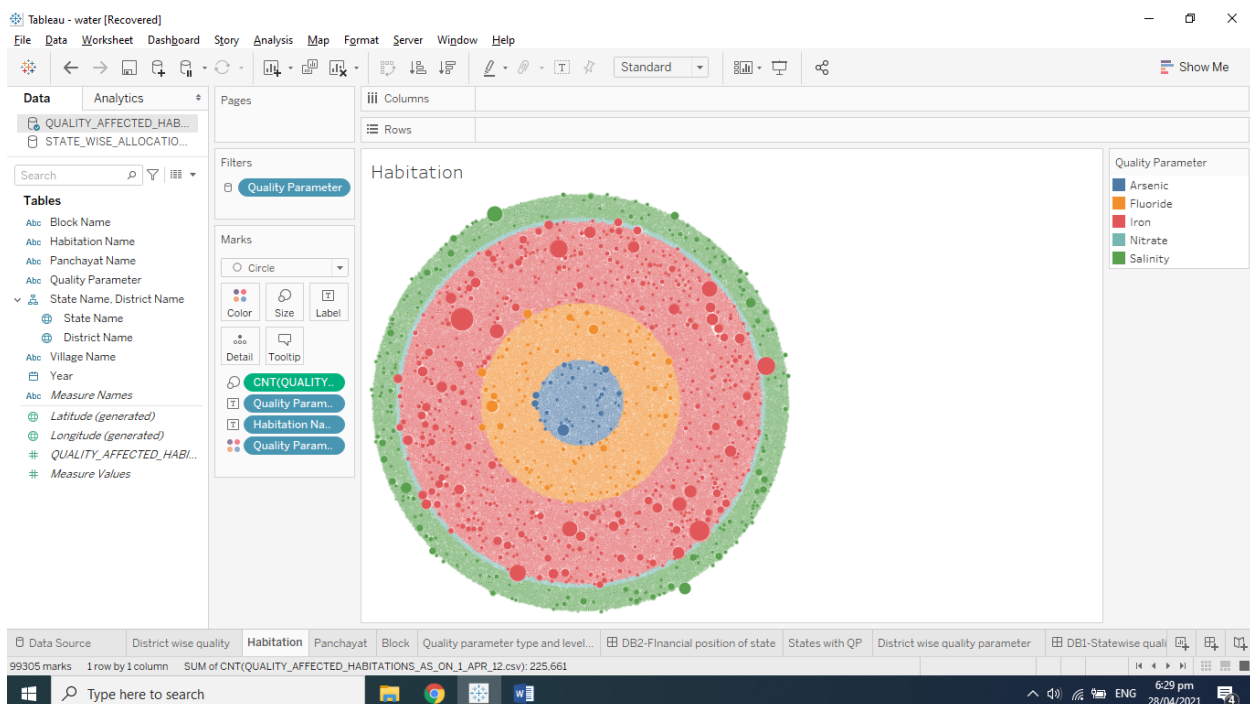
2. For every state, the corresponding districts that are affected by water contamination is shown.

Filter is provided for the quality parameter. In Andrapradesh, 17 districts are affected and the colour coding indicates the type of contaminant. Prakasam district with highly affected with Flouride contaminant in water.



3.Parameter that is affecting the most habitations in the country

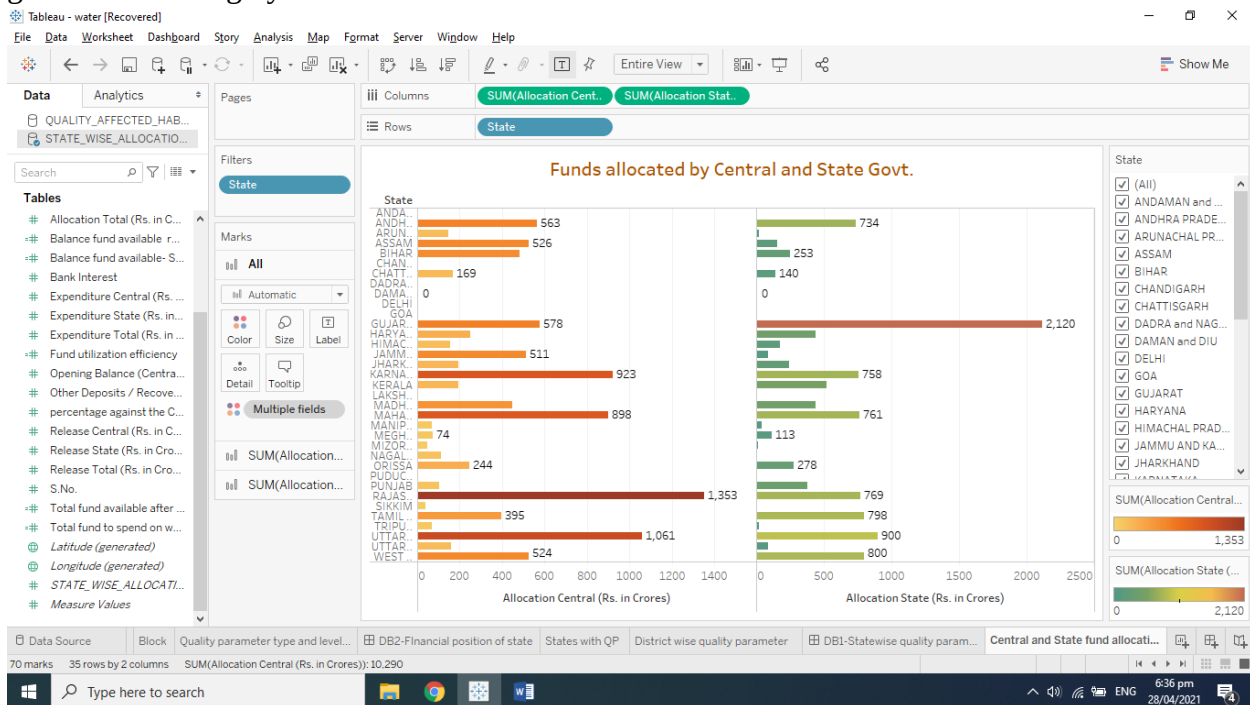
Iron is the contaminant that is affecting most of the habitations.



4.Fund allocated by Central and State Govt.

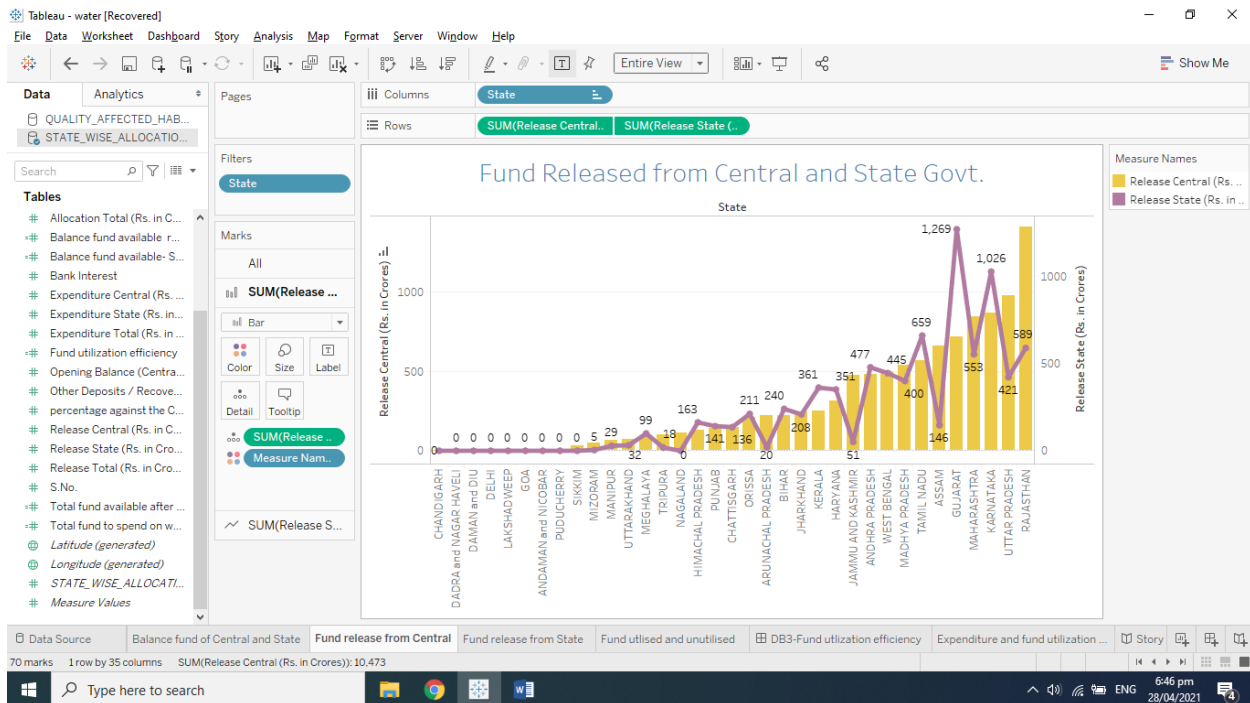
Filter is set for the states, so the comparison between the fund allotted by Central and state government can be done here. Central govt. has allotted the highest fund to Rajasthan state while state government has allotted the highest fund to Gujarat state. This clearly indicates which

government is highly concerned with fund allocation towards the control of water contamination.



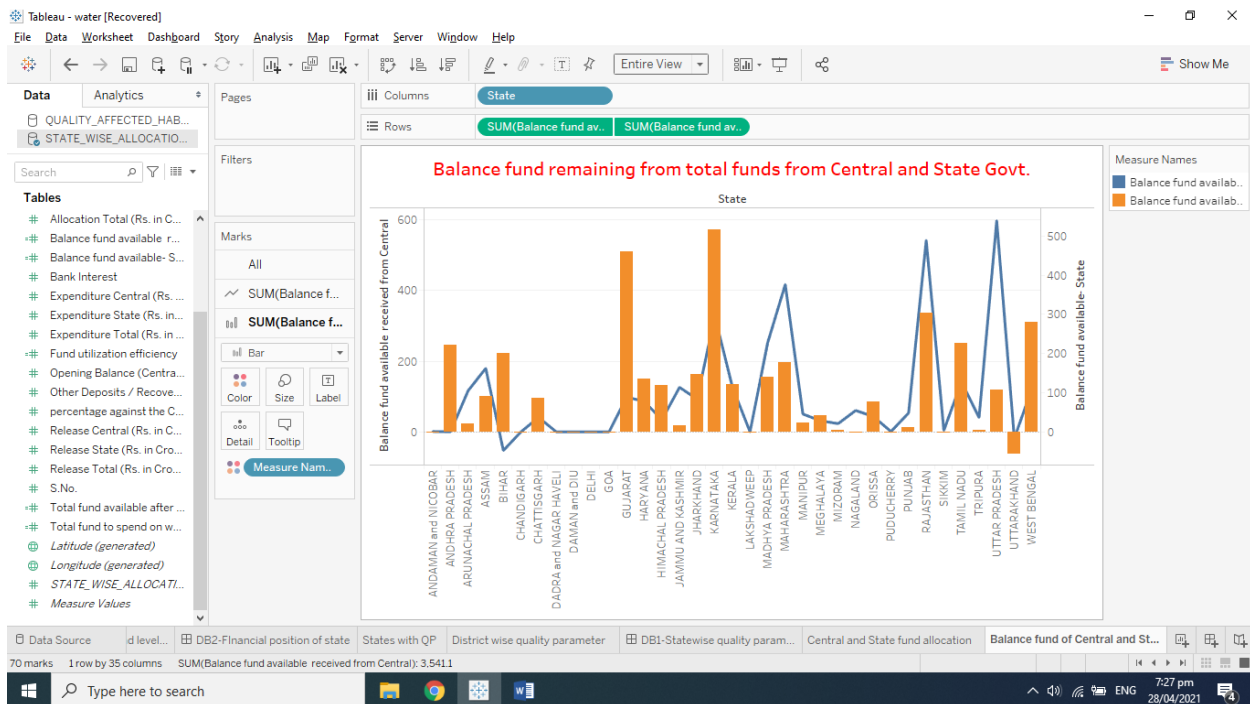
## 5.Fund released from Central and State Govt.

Next level to fund allocation is the release of funds. Rajasthan has received the highest amount from Central govt., and Gujarat from State govt although the funding amount released is less than the allotted amount.



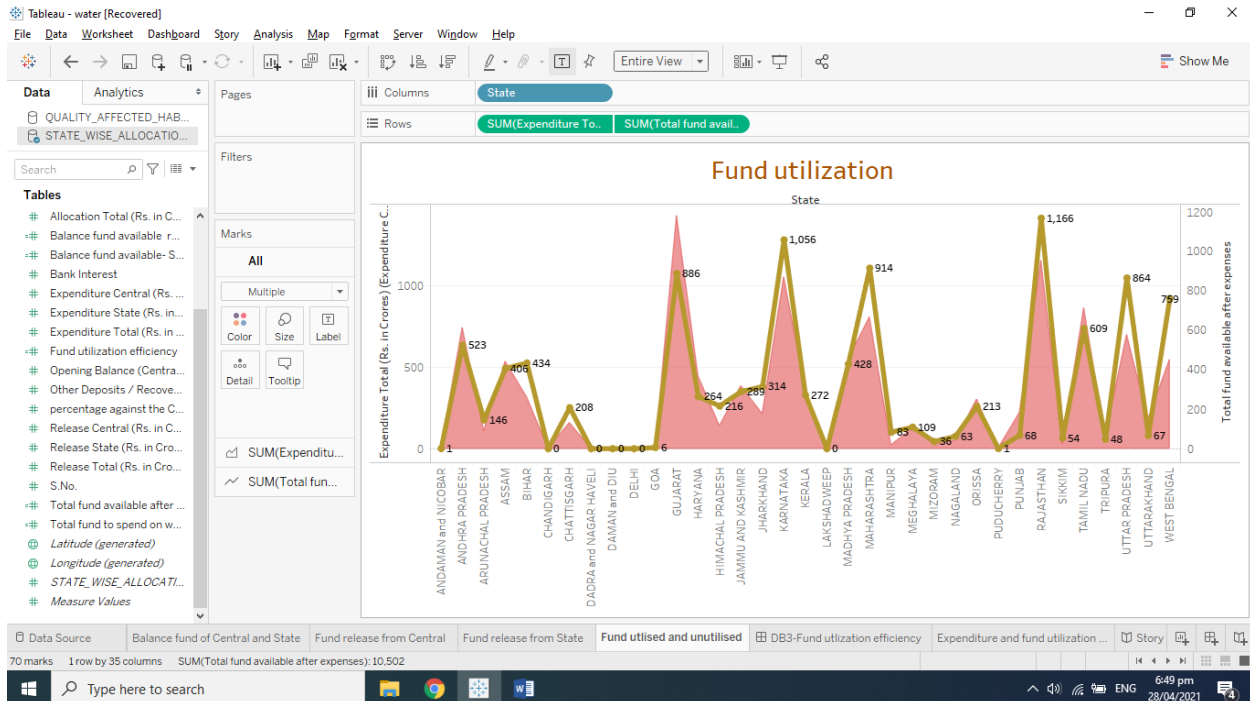
## 6. Funds available as balance from the fund released from Central and State government

After spending the funds received from Central and State govt, the state still has balance amount. Uttarpradesh has the highest fund as balance received from Central govt. while Gujarat has the highest fund available as balance from the state government. Uttarkhand shows negative fund balance received from both the governments.



## 7. Fund utilization

The funds utilized and the funds remaining as balance (from the central and state release, opening balance and other deposits) indicates clearly that funds are not utilized to the fullest extent.



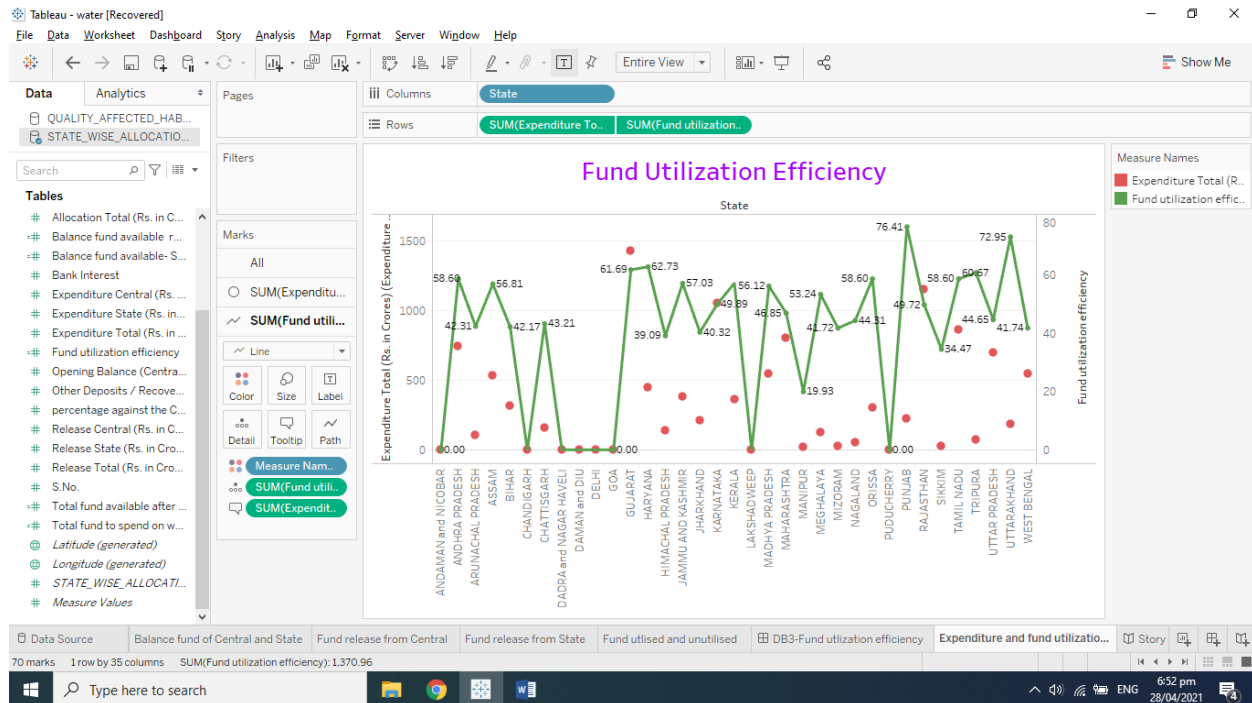
## 8. Fund utilization efficiency

Fund utilization efficiency is calculated.

$$\text{Fund utilization efficiency} = (\text{Expenditure incurred} / \text{Funds available}) * 100$$

Funds available included the funds from Central, State, opening balance and other deposits

Punjab (76.4%) shows the highest fund utilization efficiency followed by Uttarkhand (72.3%). Uttarkhand has received highest fund from the central govt. Gujarat that received highest fund from State govt, still have half of its total fund as balance.



## 4. RESULT

The major results of the study are as follows:

1. Rajasthan, Assam and Bihar are the top 3 states that has habitations that are affected due to water contamination. The dominant parameter that affects Rajasathan is salinity while iron contamination is high in Assam and Bihar.

Barmer district in Rajasthan is affected by salinity. Supaul district in Bihar and Sonitpur district in Assam are affected by iron contamination in water.

2. With respect to various quality parameters, different states and districts that are affected are given as follows:

- Arsenic is high in Jorhat district of Assam.
- Flouride is high in Banka district of Bihar.
- Iron is high in Begusara district of Bihar.
- Nitrate is high in Gulbarga district of Karnataka.
- Salinity is high in Barmer district of Rajasthan.

3. Rajasthan received Rs.1411 Cr from Central govt. and Gujarat received Rs.1269 Cr from State govt. These are the highest level of funding released to the states. From the total available funds available with the state (that includes funds from central, state, opening balance, deposits), state shows expenditure. Even after spending Rs.1154 cr, Rajasthan still has Rs.1166 as balance. The fund utilization percentage of the state is 49.3%. Correspondingly, we could see this state has most habitations affected by salinity. Punjab shows the highest fund utilization percentage of 76.41% and the number of habitations affected is less. This cannot be generalized that when fund utilization is more, the number of habitations affection is less.

The visual analysis considering one factor of fund utilization on number of habitations affected gives this inference. But for generalization, the data has to run through causal analysis.

## 5 ADVANTAGES & DISADVANTAGES

ADVANTAGES	DISADVANTAGES
The states that are in critical situation of heavy metal contamination is identified.	Only underutilization of funding is identified as reason for the problem.
The expenditure made towards avoidance of water contamination is calculated.	Industry related factors, agriculture related factors and employment generation factors are not considered in the study.
Efficiency of fund utilization of states is calculated.	
Better action plan to use funds to save habitations affected may be prepared.	

## 6. APPLICATIONS

The solution can be applied to the problem areas where under-utilization of funding is a key concern. The areas where the solution can be applied includes health and education in tribal region, governmental health coverage, employment generation through Pradhan Mandri schemes etc.

## 7. CONCLUSION

The study examines various states and districts affected by water contamination. It also examines the various levels of funding. The study results indicates that Rajasthan, Assam and Bihar are the top 3 states that has habitations that are affected due to water contamination. The fund utilization



percentage ranges from 19.93% to 76.41% across different states.

## **8. FUTURE SCOPE**

The future can consider other factors that lead to water contamination. Moreover, metrics on livelihood damage, health degradation, agriculture idleness etc can be included in the study.

## **9. BIBLIOGRAPHY**

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## **APPENDIX A.**

Tableau public link

[https://public.tableau.com/profile/sumathi.g.n#!/vizhome/water\\_16196235244140/DB1-Statewisegualityparameterlevel](https://public.tableau.com/profile/sumathi.g.n#!/vizhome/water_16196235244140/DB1-Statewisegualityparameterlevel)

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