Smart Tech Solution Pvt. Ltd.
Thapagaun, New Baneshwor
Kathmandu, Nepal
+977 - 01 - 5245027

User Manual

For

Asset Management Dashboard (Web)

1. Background

The asset management tools comprising a mobile app, a web dashboard, and a configuration panel are developed to support the management of assets and making asset management plans for water systems. To completely understand the concepts of asset management and the use of these tools, there is an entire e-learning platform that can be accessed at the following URL. https://elearning.assetmgmttool.com/

Following is a brief introduction to important concepts of asset management to help users understand different features of the tools while going through this manual.

1.1 Assets

An asset is a useful object or one of its components that is expected to provide benefits to the user, a person, or a company. For water systems, assets are the physical components of the system that allow for reliable, and safe water supply to the users. For example, wells, filtration units such as chlorination tanks, sedimentation tanks, roughing filters, hydrants, pipes, valves, bolts, overhead tanks, pumps, and household taps with meters.

1.2 Maintenance

Maintenance is the activity to ensure that assets keep on fulfilling their intended function during their full lifetime. Maintenance is important to reduce the risk of failure, ensure the system is reliable, and (in the case of water systems) provide clean water continuously to end-users.

1.3 Service level

The service level (SL) of a water system is the agreed quantity and quality of water supply during a certain time.

1.4 Asset Management

Asset management is the activity of maintaining the agreed service level during a sustained period of time at a certain cost.

2. Asset Management Plan

An Asset Management Plan is developed by applying a community-led approach and supports stakeholders to ensure the required service level during a period of time. It includes:

1. An asset inventory
2. A risk assessment

3. A maintenance plan

4. An income and optimization analysis: A financial projection of what income (= water tariff and extra-governmental or charity contributions) is required to cover the costs for the agreed SL.

An Asset Management plan needs to be updated regularly since financial projections might not match reality, or some maintenance might be unforeseen and not included in the plan and cost estimates.

3. Introduction

Asset management tools for individual water system includes the following,

1. A mobile app

2. A web dashboard

3. A configuration panel

The mobile app is a password-protected application that allows operational staff members of the water system to view and add information into the water system. The web dashboard is a publicly accessible web link that presents information about the water system. The configuration panel in the password-protected data management area for the entire system. Data and settings for the water system can be managed from the configuration area.

When a new water system is added, a web dashboard link and a user for configuration panel is created. Users for mobile applications can be then created from the configuration panel.

The entire tool set focuses on 3 major areas of asset management for water systems, finance, maintenance, and service.

The configuration panel is used to manage general information about the water system, expected and actual income and expenditure, asset components with lifespan, risks and costs, and quality test parameters. The mobile app lets staff members fill in actual monthly transactions, view lists of asset components for maintenance and fill in maintenance logs, add water supply records and add water test results. The web dashboard combines data from both the configuration panel and the mobile app to present a visualization of finance, maintenance and service of the water system.

4. The Web Dashboard

This manual guides users to use the web dashboard of the asset management tools. The web dashboard is a publicly accessible web link that is unique for each water system. The unique URL for the web dashboard will be generated when a scheme is created in the system. The scheme-name in the following URL will have the name of the scheme created. The web dashboard is available to all the people. No authentication/login is required to view the web dashboard for any schemes. Water scheme community can share the unique URL to anyone.
Web dashboard URL example:
https://assetmanagementsystem.netlify.app/#/scheme/scheme-name/home

From where the data in the Web Dashboard is coming?

As explained, the web dashboard is just a visualization of financial, maintenance, and services offered by the water supply system. The data available in the web dashboard are the actual and the predicted numbers that have occurred and might occur during the operation of the water supply system. Each water scheme has its own configuration panel and mobile app to input the data operated by the stakeholder of the scheme.

Data References:

- Beneficiary:
  Beneficiaries are the users of the water.
- Finance:
  Finance relates to income and expenditure in terms of monetary transactions . Data in Income and Expenditure are on the basis that it has occurred(Actual) during operation and might occur (Expected) during/in a certain period of time.
- Maintenance:
  Maintenance refers to the terms that the assets owned by the water scheme need to be in working state. Maintenance plan is created on the basis of the asset components available in the water scheme with a prediction that it will occur in the future. Maintenance costs are divided into unsegregated (in total) and segregated (Consumable, Labour, and Replacement). Expected unsegregated and segregated costs are the costs that were predicted during the creation of the maintenance cycle. Actual unsegregated and segregated costs are the costs that have occurred during the maintenance.
- Service:
  Supply Visualization includes the data of water supplied from the water scheme. Revenue water is the revenue generated from the sales of water collected from its beneficiaries. Non-revenue water is the water loss during the transmission of the water: calculated on the basis of water distributed from the system and the revenue generated from the sales.

Quality Test Result has the data of water tested in a certain period of time for the quality assurance of water according to National Drinking Water Quality (NDWQ) Standards.

Note: All the data in Data References are the input by the operational stakeholders of the water scheme through special Configuration Panel and Mobile Application.

The web dashboard has four major sections, home, finance, maintenance, and service. A detailed explanation of each function under each section is present in the corresponding section of this manual. A basic overview of functions under each section is as follows:

a. Home

i. Presents a summary of the water system (Summary of all the information about the water system that is entered in the configuration panel) . This includes general information about the system, financial balance, beneficiary information, and supply information that are entered in the configuration panel.

ii. It also presents a summary visualization of income and expenditure that can be viewed for all times or for the present year.

iii. It also presents a summary visualization of executed and expected maintenance costs (summary of all the data entered from mobile app and configuration panel) for all times and for the present year.

b. Finance

i. Finance has two sub-sections, visualization, and cashbook.

ii. Visualization presents a visualization of financial parameters which includes expected and actual income, actual expenditure, and actual cumulative cash flow (actual income-actual expenditure). The same applies for expected income, expected expenditure, and expected cumulative cash flow. Users can select/unselect parameters of their choice to view and compare. The distribution of actual income and expenditure is also presented.

iii. Cashbook is the record of actual transactions as entered from a mobile application (can also be managed from the configuration panel). By default, the cashbook for the current month is visible. Users can switch to a different month or view transactions for a date range of their choice.

c. Maintenance

i. Maintenance has two sub-sections, data visualization and expected risk, activities & cost..

ii. Cost Visualization presents a visualization of maintenance costs(the maintenance cost can be entered through the configuration panel under the maintenance section.) which includes expected and actual maintenance costs, added as a whole or separated under different maintenance cost categories. Users can select/deselect parameters of their choice to view and compare. The distribution of costs under different categories is also presented.

iii. Expected risk, activities & cost, presents the asset components lists with its risk evaluation, maintenance costs, and mitigation measures information (all the data can be entered through configuration panel).

d. Service

i. Service has two sub-sections: supply visualization and quality test results.

ii. Supply visualization presents a visualization of actual water supplied and water sold. These data can be added from the service supply tab or the cash book tab of the mobile application (can also be managed from the service tab in the configuration panel) respectively. The visualization also presents an estimation of non-revenue water(non revenue water is the difference between total water supplied and revenue water).

iii. Quality test results present a visualization of actual quality test results as added from the mobile application. The test parameters are configurable from the configuration panel.

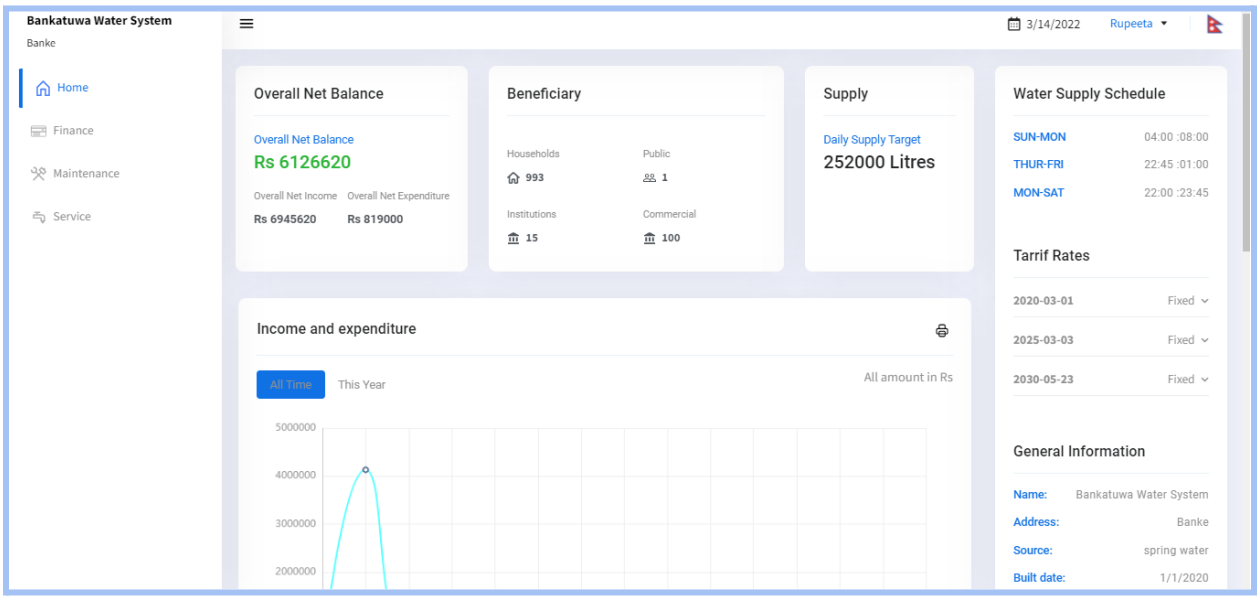
In addition to these features, users can switch between English and Nepali language from the title bar.

5. Using Web Dashboard

When a Water System's User logs into the web application, the Dashboard is the first screen he/she will see.

5.1 Home

In the Dashboard's Home tab, users can view the Overall Net Balance, General Information, Beneficiary details, Supply Schedule, Tariff rates, and Graph visualization of Income and Expenditures of the Water System.



5.1.1 Income & Expenditure Visualization

In the Visualization Graph of Income & Expenditure, users can view the Income and Expenditure of different years with respective months of the water system. There is a visualization graph for:

1. All Time
2. This Year

5.1.1.1 All Time

In the All-time visualization graph, users can view the income and expenditure for the different years only. If the user clicks on the graph for Year 1, then he/she will be able to see the total income and expenses for that year. Likewise, to view other Years' income and expenditure, users can click on the graph of different years.

5.1.1.2 This year

In This year's visualization graph, users can view the income and expenditure for the current year with respective months.

5.1.2 Maintenance Cost Visualization

In the Visualization Graph of Maintenance Cost, users can view the maintenance cost for different years with respective months of the water system. There is a visualization graph for:

1. All Time
2. This year

5.1.2.1 All Time

In the All-time visualization graph, users can view the maintenance cost like Expected unsegregated, expected consumable, expected labor, expected replacement, Actual unsegregated, actual consumable, actual labor, and actual replacement cost. If the user clicks on the graph for Year 1, then they will be able to see the maintenance cost for that year. Likewise, to view other years' maintenance costs, users can click on the graph of different years.

Note: *If you add the cost separately, it comes under the specific headings you have selected (Expected consumable, Expected Labour, Expected Replacement). But, if you add cost without separating, it comes under Expected unsegregated cost.*
Basically, expected Unsegregated cost= Expected consumable + Expected Labour + Expected Replacement

5.1.2.2 This year

In This year's visualization graph, users can view the Expected & Actual maintenance cost (Segregated and Unsegregated) for the current year with their respective months.

5.2 Finance

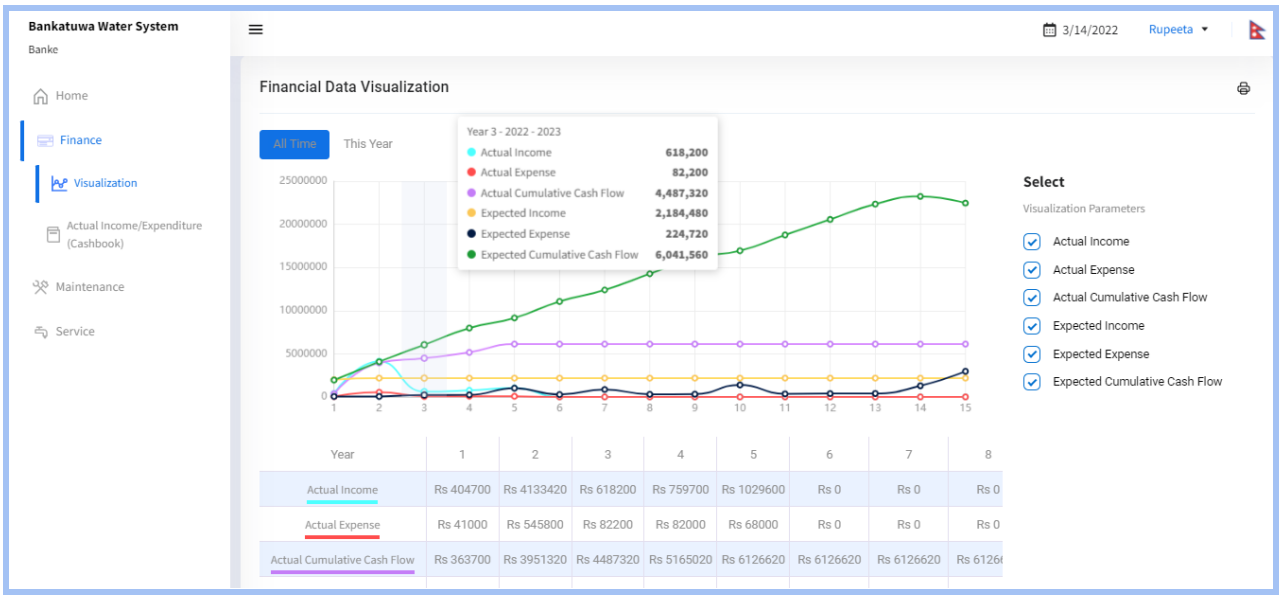
In the Finance tab, there are mainly two tabs. They are Visualization and Actual Income/Expenditure (Cashbook).

5.2.1 Visualization

In the Financial data visualization graph, there is a visualization graph for All Time & This Year.

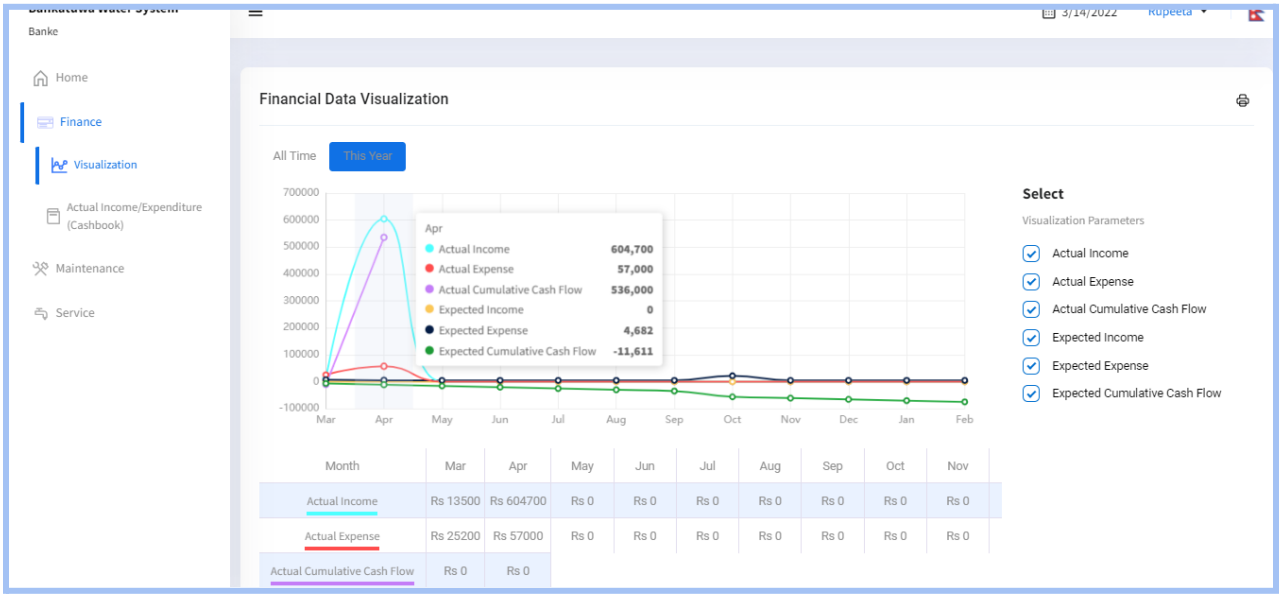
5.2.1.1 All Time

In the All-time Financial visualization graph, users can view the financial data for the different years. On the right side of the tab, there is a visualization parameter that needs to be selected by the user in order to see the financial records in a graph for different years. Users can see Actual Income, Actual Expenses, Actual Cumulative Cash Flow, Expected Income, Expected Expenses, and Expected Cumulative Cash Flow.



5.2.1.2 This Year

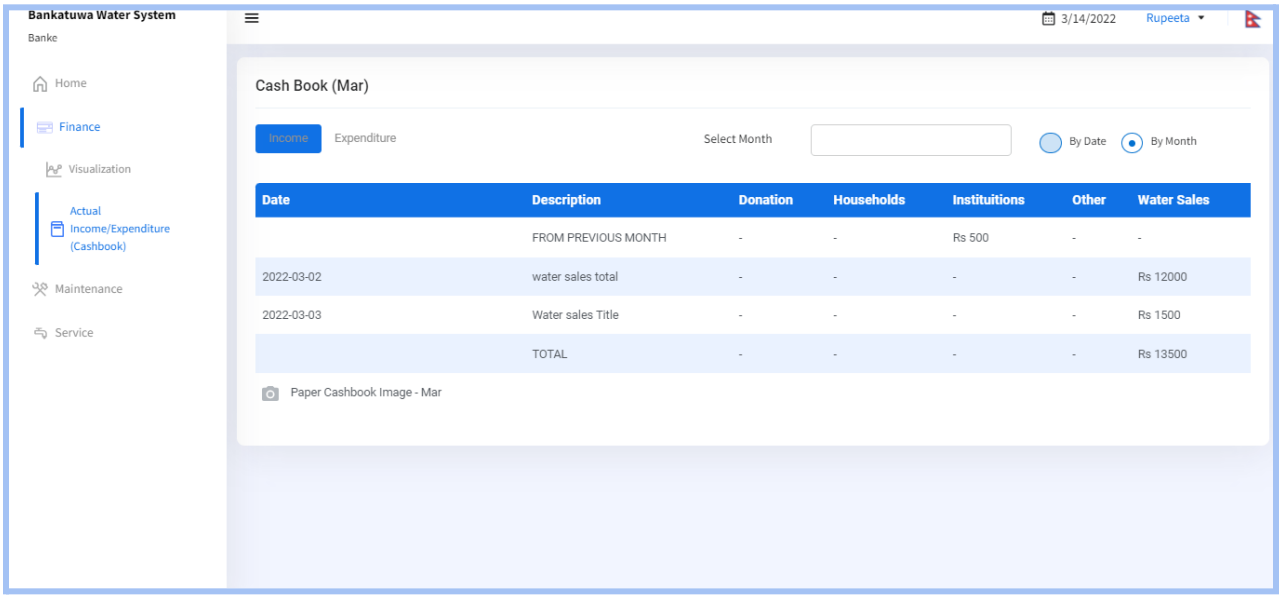
In This year's financial data visualization graph, users can view the financial data for the current year with their respective months. On the right side of the tab, there is a visualization parameter that needs to be selected by the user in order to see the financial records in a graph for different months of the current year. Users can see Actual Income, Actual Expenses, Actual Cumulative Cash Flow, Expected Income, Expected Expenses, and Expected Cumulative Cash Flow.



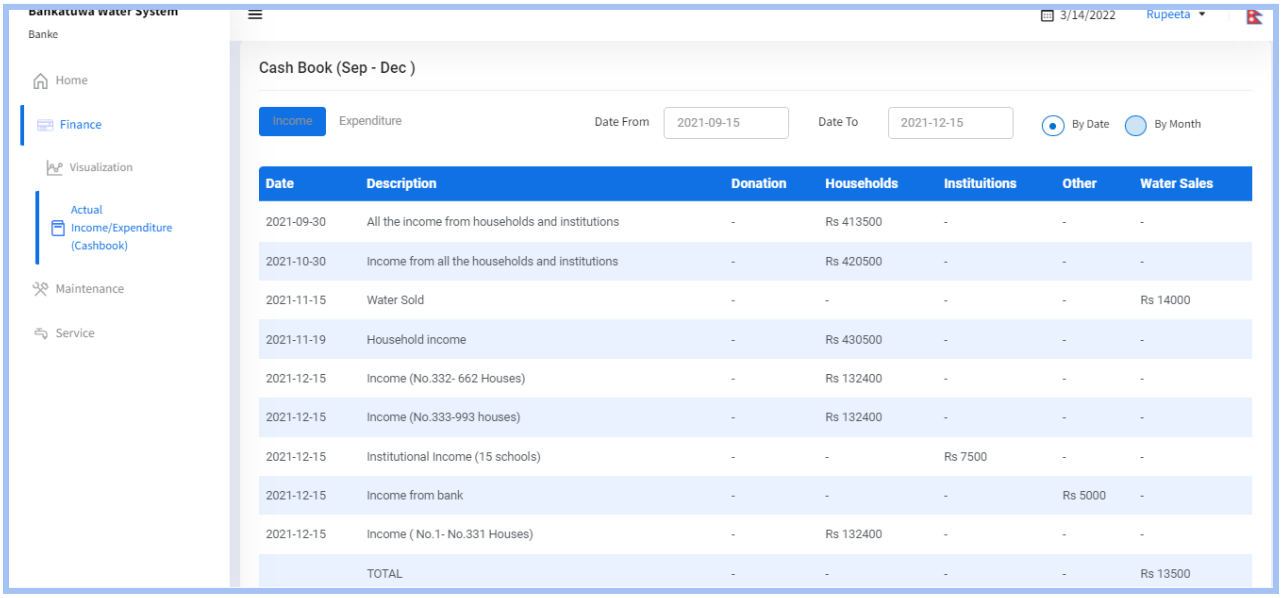
5.2.2 Actual Income/Expenditure (Cashbook)

In the cashbook tab, users can see the cash book record regarding income and expenses by Month & by dates for different year dates. This cashbook record shows the total amount and the previous month's total as per the different income and expenses headings.

By Month



By Date



5.3 Maintenance

In the Maintenance tab, there are mainly two sub-tabs. They are Cost Visualization and Expected risks, activities & cost of Asset Components.

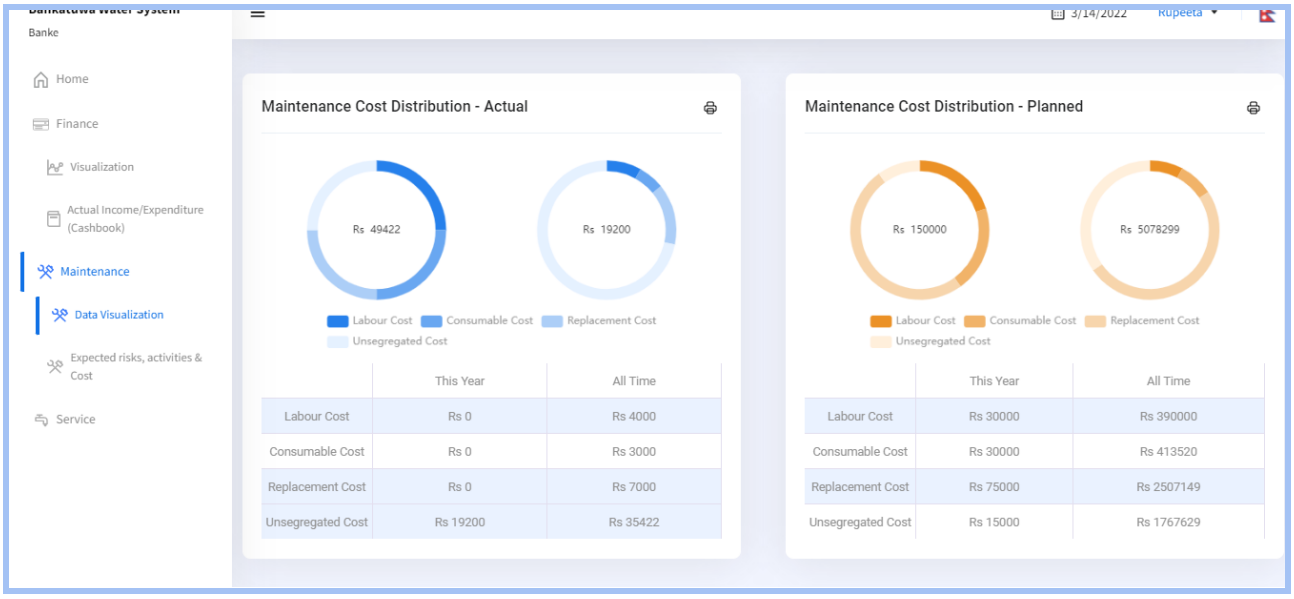
5.3.1 Cost Visualization

In the Maintenance Cost Visualization graph, there is a visualization graph for All Time & This Year.

5.3.1.1 All Time

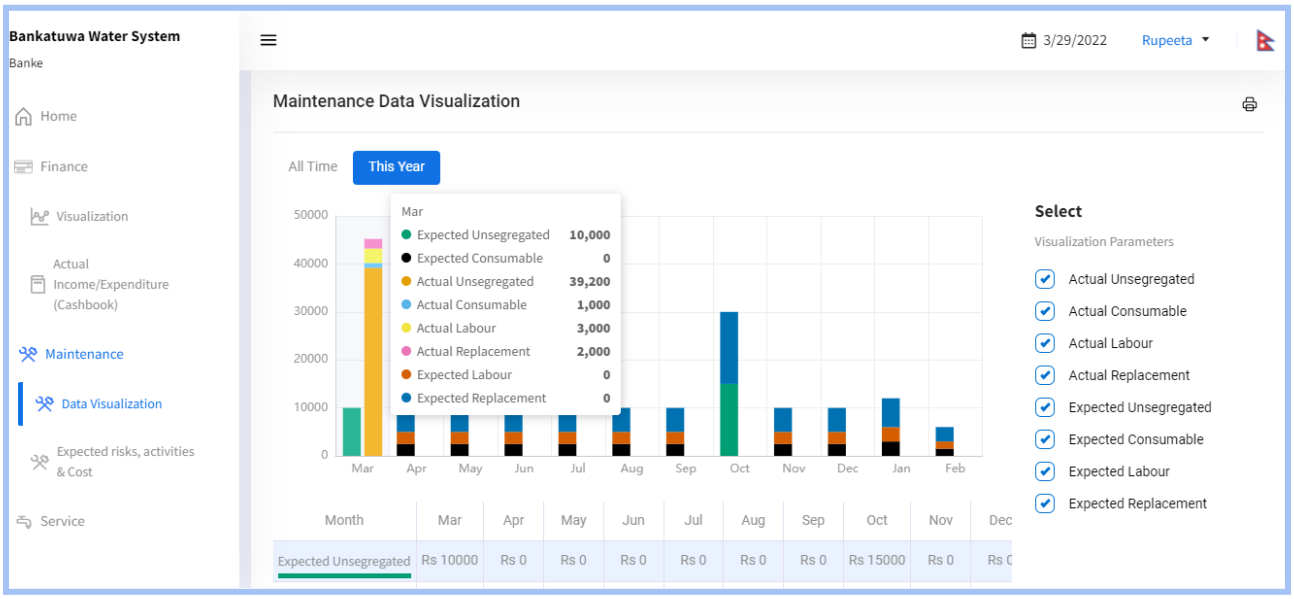
In the All-time maintenance visualization graph, users can view the maintenance record data for different years. On the right side of the tab, there is a visualization parameter that needs to be selected by the user in order to see the maintenance records in a graph for different years. Users can see Actual unsegregated, Actual consumable, Actual labor, Actual replacement, Expected unsegregated, Expected consumable, Expected labor, and Expected Replacement.

Maintenance Cost Distribution- Actual & Maintenance Cost Distribution- Planned data can be seen in the table below the maintenance cost visualization graph.



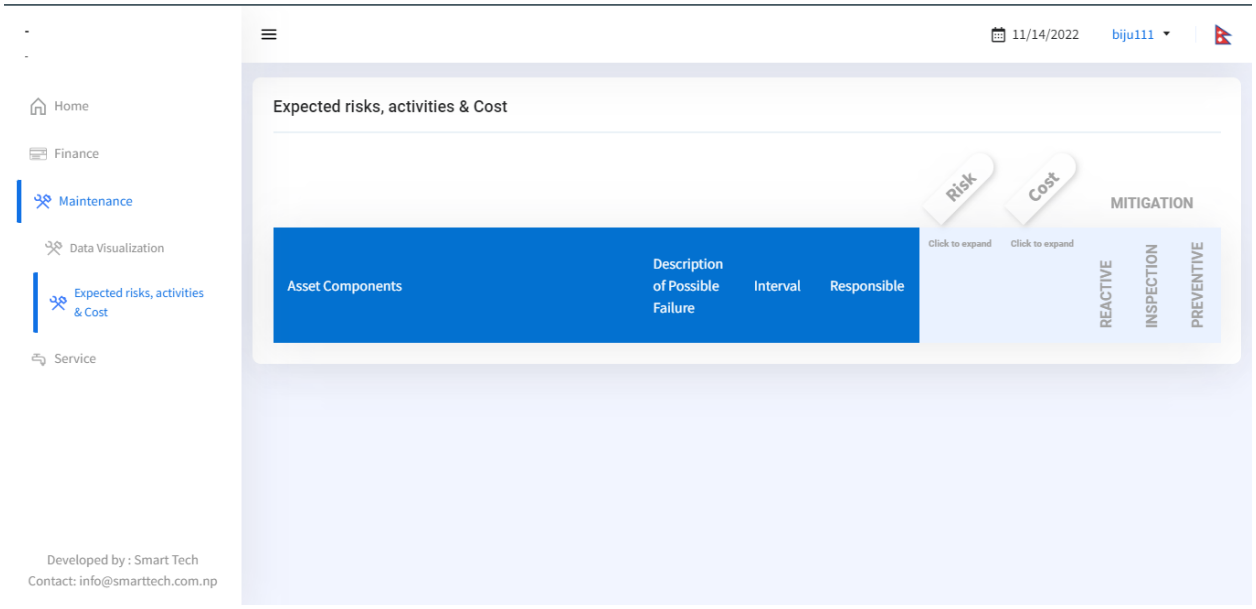
5.3.1.2 This Year

In this year's Financial data visualization graph, users can view the financial data for the current year with the respective months. On the right side of the tab, there is a visualization parameter that needs to be selected by the user in order to see the maintenance records in a graph for different months of the current year. Users can see Actual unsegregated, Actual consumable, Actual labor, Actual replacement, Expected unsegregated, Expected consumable, Expected labor, and Expected Replacement.

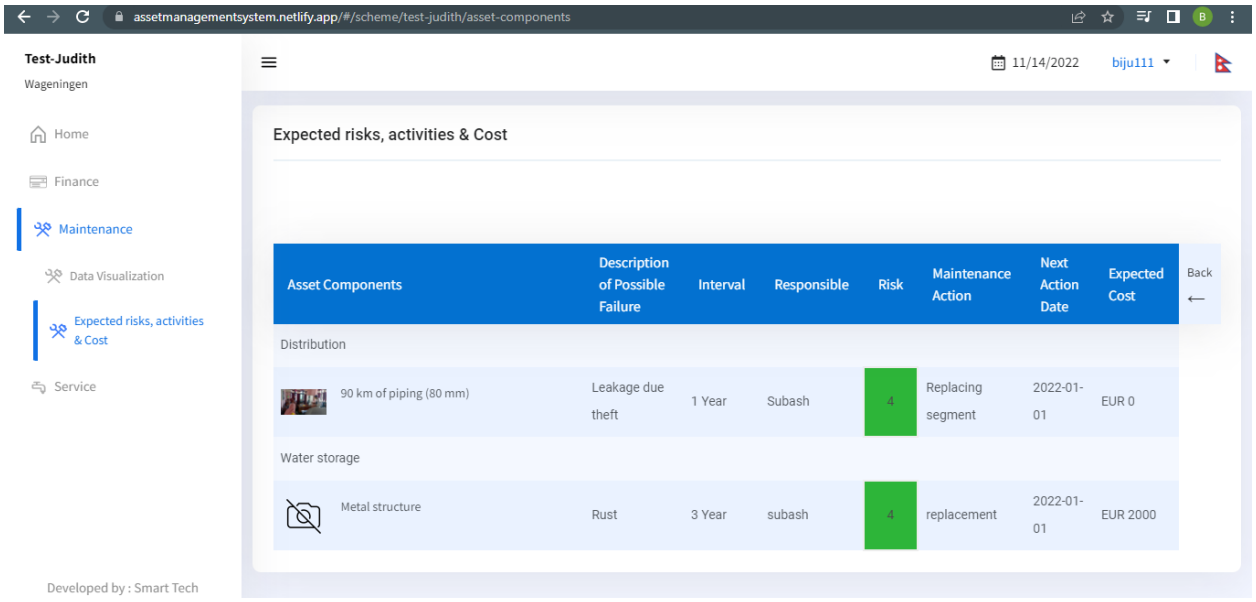


5.3.2 Expected risks, activities & Cost

In the Expected risks, activities & Cost, users can see the list of Asset Components with the description of Possible Failure, Mitigation, Responsible, Risk, Life span, and Cost. If the users click on the Risk button, they will be able to see the brief descriptions of asset failures with a risk score for each respective asset component with a component picture.



Similarly, if the users click on the Cost button, they will be able to see the required maintenance cost of an asset component.



5.4 Service

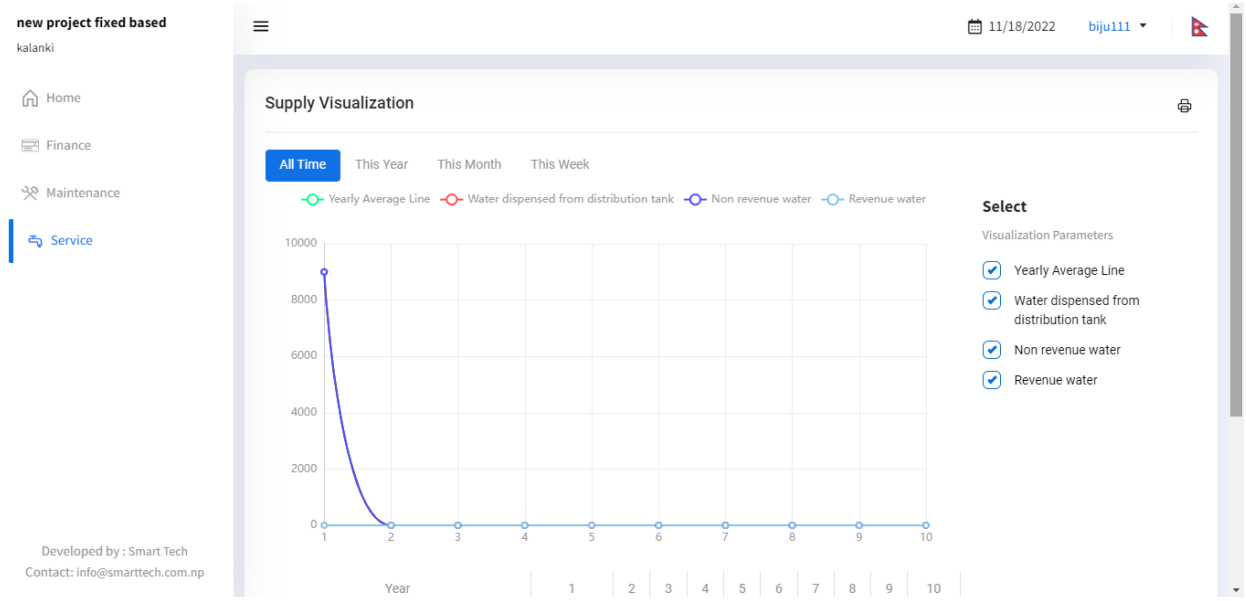
In the Service Tab, there are mainly two sub-tabs. They are Supply Visualization and Quality Test Results.

5.4.1 Supply Visualization

In the supply visualization graph, users can view the water supply for All time, This Year, This Month & for This week. By selecting the visualization parameters, users will be able to see the Daily Average Line, Total Supply & Non-revenue Water. By selecting different dates of the year, users can view water supply data.

Factors included in the supply visualization graph.

I. The total amount of water that will be dispensed from the system.
II. Sales record recorded with cash book income transactions.
III. Non-revenue water is calculated on the basis of Total Water Dispensed from the system and the total amount of income generated by the sales of the water under a particular date of the year (currently it shows by week, month, year, and all time) data. It is the difference between water supplied and the real-time cash book income collection of the water.

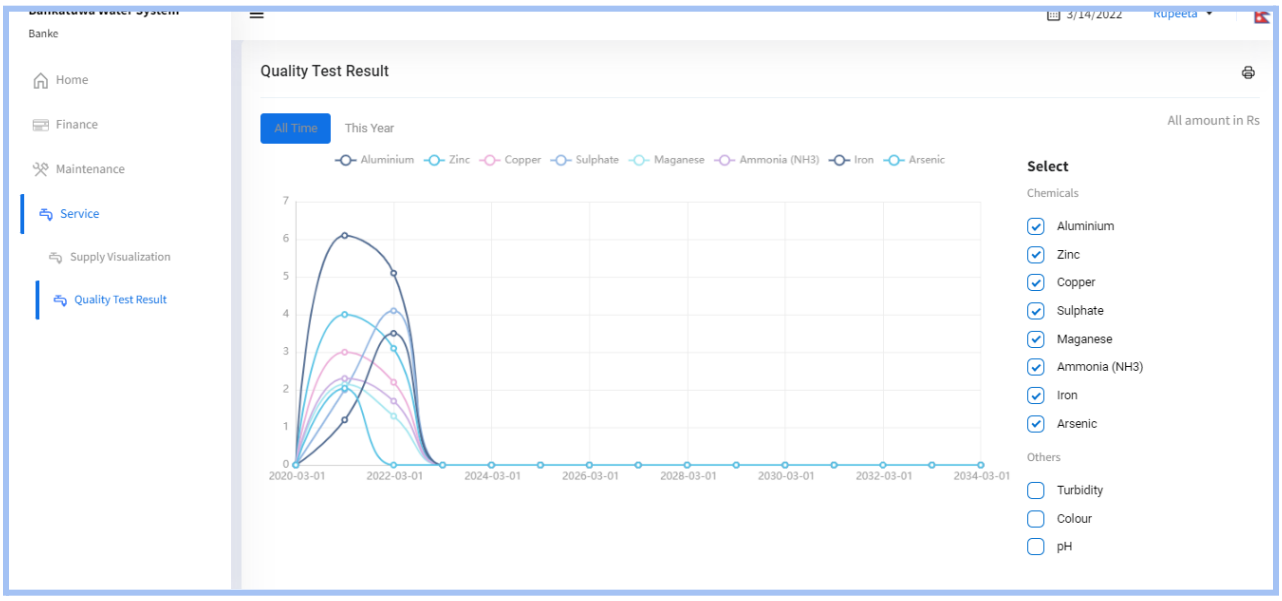


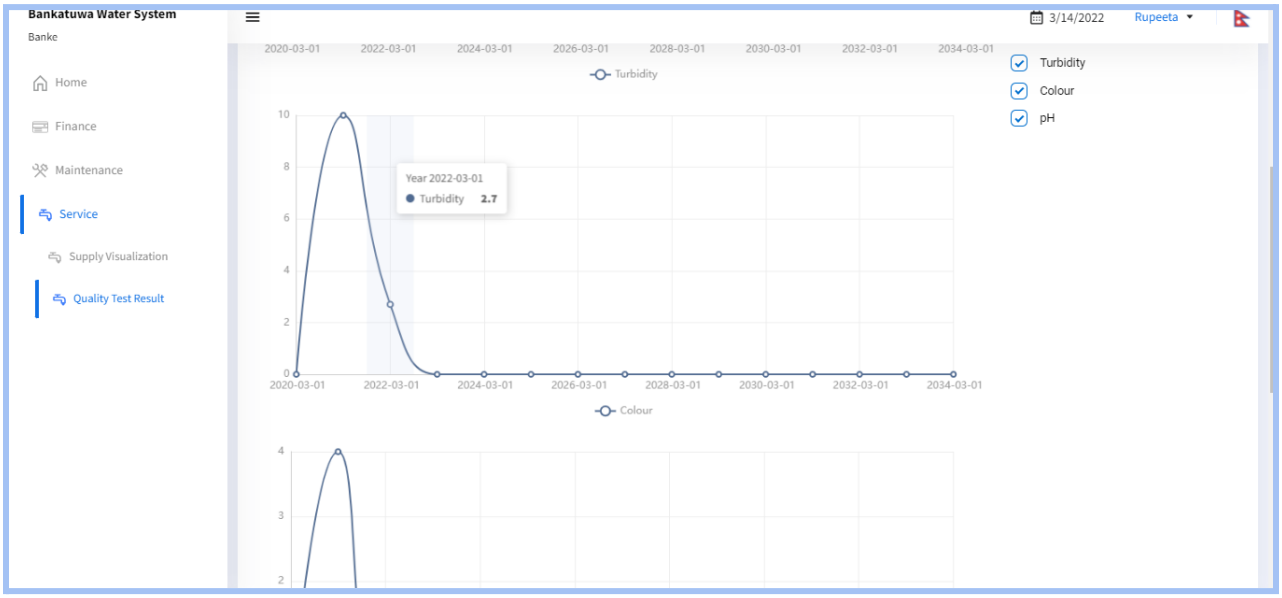
The term “water dispensed from distribution tank” is the amount of water that has been supplied from the water system.

5.4.2 Quality Test Result

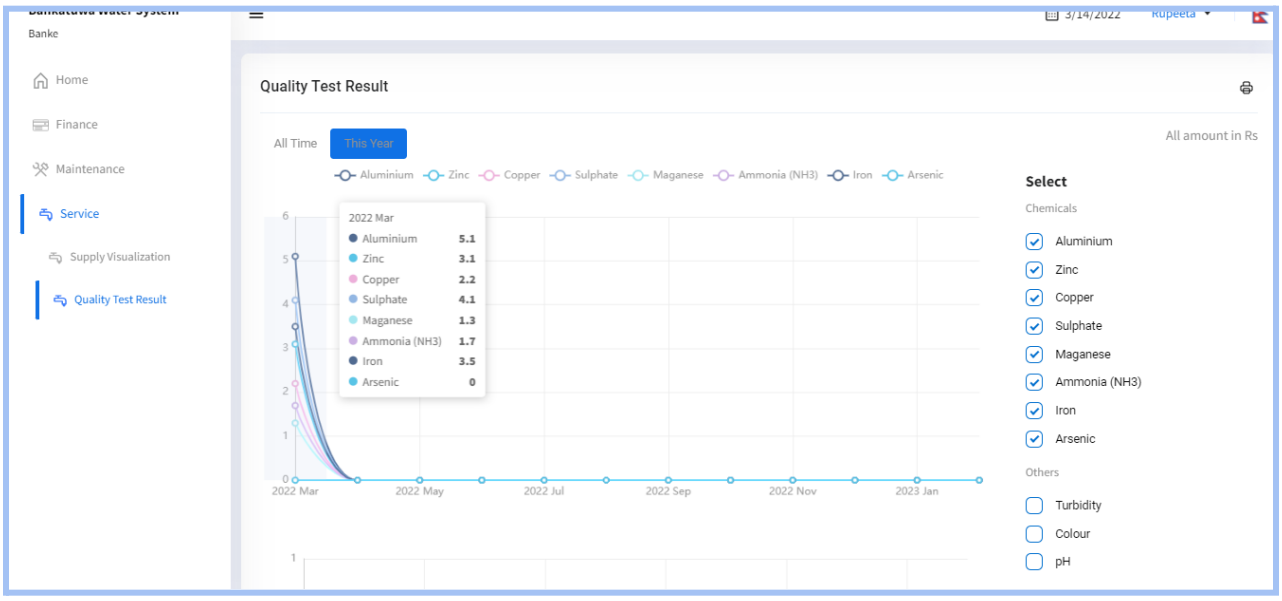
In the Quality Test Result, users can view the Quality test result of Water for All Time & This Year. By selecting the different water parameters, users can see the quality test result.

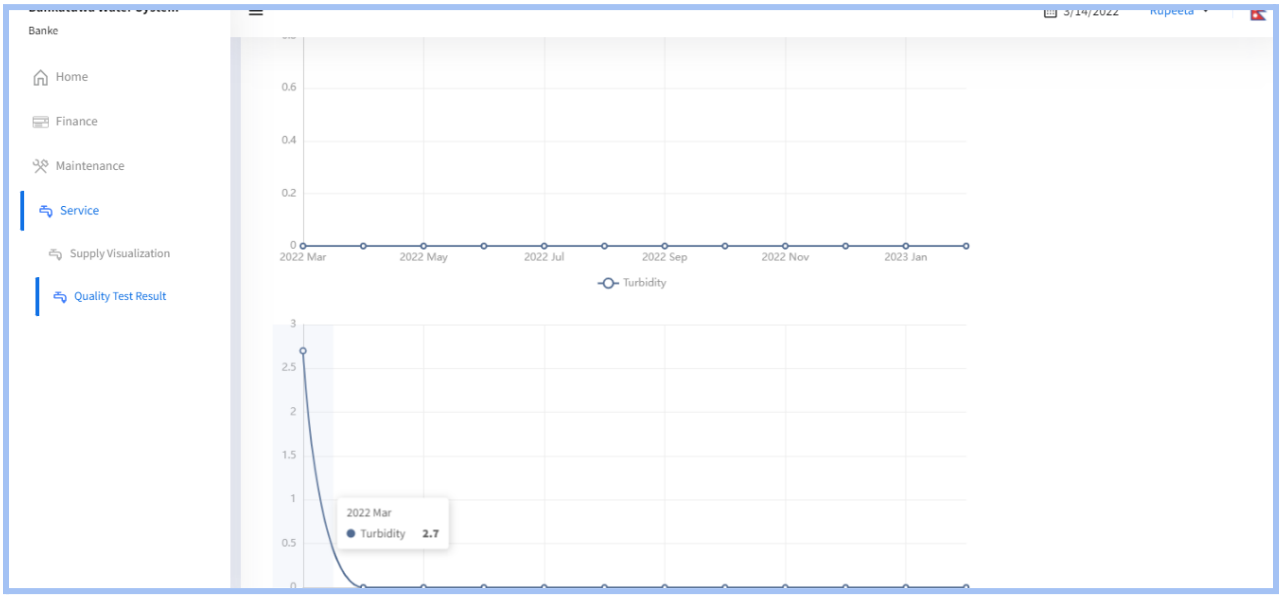
5.4.2.1 Quality Test Result For All Time





5.4.2.2Quality Test Result For This Year





5.5 Change Language

There is an availability of two languages: English and Nepali in the configuration web utility. Users can select the language by:

- Clicking on the top of the right corner where there is an icon of Flag in the configuration panel.

5.6 Logout

Users can logout from the web configuration by:

- Clicking on the name of the User placed on the right side of the panel near the language selection and clicking on the Logout displayed text.

Thank you