

# Water Benefits Calculator for Ethiopia

## User Manual Version 2.0



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faith.  
action.  
results.



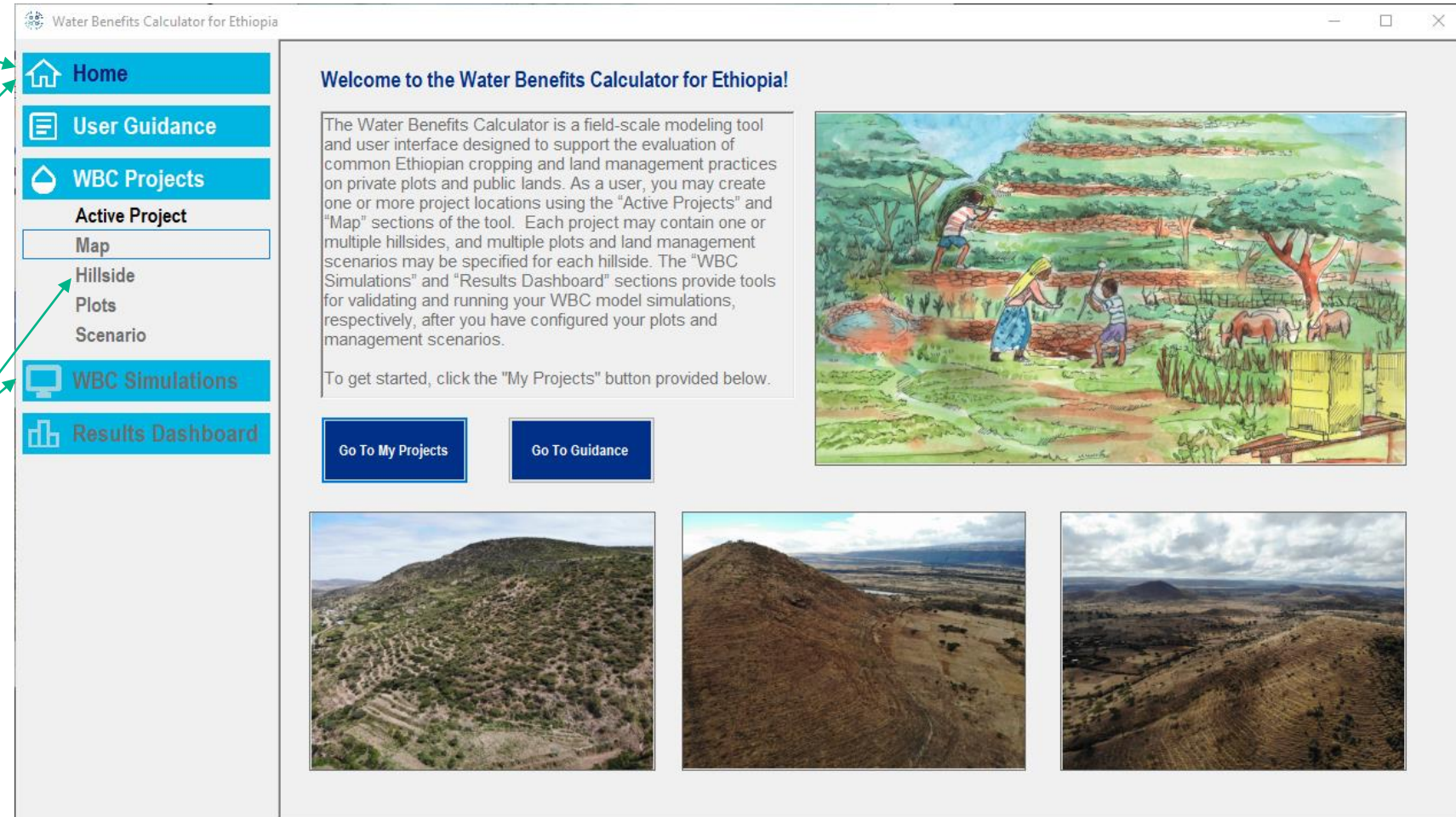


# Navigating Between Forms

Click a button on the left navigation menu to change to the corresponding form.

The text corresponding to the form which is currently will be highlighted in a different color on the navigation menu

When the tool first loads some pages will be 'greyed out' and are inaccessible. These pages will become accessible as you select the required information. For example selecting an active project will enable the 'Map' and 'Hillside' forms.



# User Guidance Form

The screenshot displays the 'Water Benefits Calculator for Ethiopia' interface. On the left is a sidebar with navigation links: Home, User Guidance, WBC Projects (with sub-links: Active Project, Map, Hillside, Plots, Scenario), WBC Simulations, and Results Dashboard. The main content area is titled 'Glossary' and features a search bar labeled 'Search for term:'. Below the search bar is a list of terms: 'Soil Depth', 'Bulk Density' (highlighted), and 'Organic Matter Content'. A callout box explains that entering text in the search bar filters the terms. A second callout points to the 'Bulk Density' term, stating that clicking it opens a popup. This popup, titled 'Bulk Density', contains an information icon and text explaining that bulk density is the weight of dry soil per unit of volume in g/cm³ or g/ml, and that selecting a soil texture from a menu will automatically populate this field. An 'OK' button is at the bottom of the popup. Below the glossary is a section titled 'Additional Resources' containing a link for 'User Manual (PDF)'. A final callout points to this link, stating it provides a PDF version of the guidance document.

Entering text here will filter the terms displayed in the term selection list.

Clicking on a term in the term selection list will open a popup with additional information

Additional Resources

[User Manual \(PDF\)](#)

Links for additional resources which will provide you with a pdf version of this guidance document.

# Project Overview

Below is an outline of the general steps for define a project through generating models results.

Creating a new project begins on the 'Active Project' form.

After populating the project level information, work through the other forms in the order listed.

Once all the project data forms have been populated, user can run the simulation and then view the results.

The next few slides will walk you through the feature on each of the forms.

The screenshot displays the 'Water Benefits Calculator for Ethiopia' application interface. On the left is a sidebar menu with the following items: 'Home' (house icon), 'User Guidance' (list icon), 'WBC Projects' (water drop icon), 'Active Project' (highlighted with a green arrow), 'Map' (map icon), 'Hillside' (hillside icon), 'Plots' (plot icon), 'Scenario' (scenario icon), 'WBC Simulations' (monitor icon), and 'Results Dashboard' (bar chart icon). The main content area is titled 'Active Project' and contains a 'Select Active Project' dropdown menu with 'new project' selected. To the right of the dropdown are two buttons: 'Create New Project' and 'Delete Selected Project'. Below these is a note: 'Note: The project selected on this page will determine which hillsides, plots, etc will be available on the next pages.' Further down is a section titled 'Project Information (edit/add)' with two input fields: 'Project Name' (containing 'new project') and 'Project Description' (a larger text area).

# Active Project Form

Select the 'Active Project' using this dropdown. The Active Project will determine which Hillside, and subsequently Plots and Scenarios, will be available of later pages.

You can delete a project using this button. Note: deleting a project will also delete any related Hillside, Plots, model results, etc.

Once entry of project information is complete move to the 'Map' form.

Create a new project by clicking the "Create New Project" button.

Inputs for the project name and an optional description.

Any changes are made on forms are automatically saved to the database in real time. No work will be lost if you close the tool.

The screenshot shows the 'Active Project' form in the 'Water Benefits Calculator for Ethiopia' application. The left sidebar contains navigation links: Home, User Guidance, WBC Projects (with sub-links for Active Project, Map, Hillside, Plots, and Scenario), WBC Simulations, and Results Dashboard. The main content area is titled 'Active Project' and includes a 'Select Active Project' dropdown menu currently set to 'new project'. To the right of the dropdown are two buttons: 'Create New Project' and 'Delete Selected Project'. A note below the dropdown states: 'Note: The project selected on this page will determine which hillside, plots, etc will be available on the next pages.' Below this is the 'Project Information (edit/add)' section, which contains a 'Project Name' input field (pre-filled with 'new project') and a 'Project Description' text area. Red callout boxes with arrows point to various elements: one points to the 'Select Active Project' dropdown, another to the 'Delete Selected Project' button, a third to the 'Create New Project' button, a fourth to the 'Project Name' and 'Project Description' inputs, and a fifth to the 'Map' link in the sidebar. A sixth callout box points to the entire form area, stating that changes are automatically saved.



# Map Form

Click the “Locate WBC Project” and then click the map to add/edit the location of your project. Specifying the project location is optional, but this will assign default weather stations and soil texture for hillsides you create under this project.

Map toolbar controls support panning, zooming, and identifying features on the map

“WBC Data Layers” include the project location and available weather stations.

Woreda layers can be toggled on/off and you may zoom to a specific woreda.

Ethiopia government boundary layers are provided at the country, region, zone, and woreda scales.

Optionally, a coarse-resolution basemap for Ethiopia and medium-resolution imagery for individual woredas can be added to the WBC. Local images will be added to the map when zooming to a particular woreda.

The screenshot displays the 'Water Benefits Calculator for Ethiopia' web application. On the left is a sidebar with navigation links: Home, User Guidance, WBC Projects (with sub-links for Active Project, Map, Hillside, Plots, and Scenarios), WBC Simulations, and Results Dashboard. The main panel contains several configuration sections: 'Map Layers' with 'Locate WBC Project' and 'Zoom to Project' buttons; 'WBC Data Layers' with checkboxes for 'WBC Project' and 'Weather Stations'; 'Woredas' with a 'Zoom to' dropdown and a list of woredas (Arsi Negele, Babile, Deder, Dire Dawa, Heben Arsi); 'Ethiopia Boundaries' with checkboxes for Level 0 (Country), Level 1 (Region), Level 2 (Zone), and Level 3 (Woreda); and 'Basemap Imagery' with checkboxes for Ethiopia basemap, Babile basemap, Heben Arsi basemap, and Shalla basemap. On the right is a map of Ethiopia showing administrative boundaries and a satellite basemap. A blue icon with a crosshair represents a weather station location, and a yellow star represents the project location. Arrows from the text boxes point to these elements and the configuration sections.

**Weather station location (blue icon)**

**Project location (star icon)**

*Note: Imagery layers are not required for using the map and are provided via separate installation (\*.msi) files*

# Hillside Form

Start by selecting an active Hillside

Once complete move to the 'Plots' form.

Some options require a selection instead of a text or numeric input

Certain values will prepopulate based on selections made in other fields. However users may optionally override the default value.

Some inputs allow for multiple selections by checking each option.

The screenshot shows the 'Hillside Selection' form in the 'Water Benefits Calculator for Ethiopia' application. The left sidebar contains navigation links: Home, User Guidance, WBC Projects (with sub-links for Active Project, Map, Hillside, Plots, and Scenario), WBC Simulations, and Results Dashboard. The main form area is divided into several sections: 'Hillside Selection' with 'Active Project' (My New Project) and 'Select Hillside' (New Hillside) dropdowns, and buttons for 'Create New Hillside' and 'Delete Selected Hillside'; 'Hillside Information (add/edit)' with fields for 'Hillside Name' (New Hillside), 'Latitude', 'Longitude', and a large 'Hillside Description' text area; 'Hillside Soils Data (add/edit)' with a 'Determine From Location' button, 'Required Inputs' (Soil Texture: Sandy Clay, Dry Bulk Density: 1.6, Soil Depth), and 'Optional Inputs' (Infiltration Rate, Organic matter content); and 'Hillside Weather Data (add/edit)' with a 'Determine From Location' button, 'Precipitation Location' (Dire Dawa), 'Select Simulation Years' (a list of years 2000-2007 with checkboxes), and 'Select All'/'Clear' buttons. Green callout boxes with arrows point to specific form elements: 'Start by selecting an active Hillside' points to the 'Select Hillside' dropdown; 'Once complete move to the 'Plots' form.' points to the 'Plots' link in the sidebar; 'Some options require a selection instead of a text or numeric input' points to the 'Soil Texture' dropdown; 'Certain values will prepopulate based on selections made in other fields. However users may optionally override the default value.' points to the 'Dry Bulk Density' input field; and 'Some inputs allow for multiple selections by checking each option.' points to the year selection checkboxes.

# Plots Form

Start by selecting an active Plot

Once complete move to the 'Scenario' form.

The screenshot displays the 'Plots Form' within the 'Water Benefits Calculator for Ethiopia' application. The interface is divided into a left sidebar and a main content area. The sidebar contains navigation links: Home, User Guidance, WBC Projects (with sub-links for Active Project, Map, Hillside, Plots, and Scenario), WBC Simulations, and Results Dashboard. The 'Plots' link is highlighted in green. The main content area is titled 'Plot Selection' and includes a dropdown for 'Active Hillside' (set to 'New Hillside') and a dropdown for 'Select Plot' (set to 'New Plot'). There are two buttons: 'Create New Plot' and 'Delete Selected Plot'. Below this is the 'Plot Information' section, which contains input fields for 'Plot Name' (set to 'New Plot'), 'Slope' (set to '20'), 'Cross Plot Width' (set to '1'), 'Downslope Length' (set to '1'), and 'Residue' (a dropdown set to 'Low'). A 'Description' text area is also present. The bottom section is 'Practice Information', featuring four input fields for 'Planting Pit Height (m)', 'Fanya Juu Height (m)', 'Rock/Soil Bund Height (m)', and 'Vegetative Bund Height (m)'. Green callout boxes with arrows provide instructions: one points to the 'Select Plot' dropdown; another points to the 'Slope', 'Cross Plot Width', and 'Downslope Length' fields; a third points to the 'Residue' dropdown; and a fourth points to the 'Practice Information' section.

**Plot Selection**

Active Hillside: New Hillside

Select Plot: New Plot

Create New Plot Delete Selected Plot

**Plot Information**

Plot Name: New Plot

Slope: 20

Cross Plot Width: 1

Downslope Length: 1

Residue: Low

Description:

**Practice Information**

Planting Pit Height (m):

Fanya Juu Height (m):

Rock/Soil Bund Height (m):

Vegetative Bund Height (m):

Set Plot dimensions using these fields

Option to select residue level, which represents the amount of vegetative material left on the plot area after harvests

Optional inputs for users to specify the heights for any types of infiltration practices.



# Scenario Form

Start by selecting a Scenario

Option to add new Segment cell

Clicking on a Land Cover tile will set that as the active Land Cover type.

Once complete you can run scenarios using the 'WBC Simulations' form.

Select a Transect from this list, which will update the transect editing panel in the middle of the form.

Note: Any changes made are saved to the database in real time.

Options to add or delete a transect

Clicking a cell will assign the active Land Cover type to that segment

The bottom Segment can be removed by click here

Additional Land Cover tiles available by scrolling

The screenshot displays the 'Water Benefits Calculator for Ethiopia' interface. On the left is a sidebar with navigation links: Home, User Guidance, WBC Projects (with sub-links for Map, Hillside, Plots, and Scenario), WBC Simulations, and Results Dashboard. The main area is divided into three panels. The 'Manage Scenarios' panel on the left includes fields for 'Active Plot' (set to 'New Plot'), 'Select Scenario' (a dropdown menu showing 'Scenario 1 - Pre Conditions'), 'Add New', 'Delete Selected', 'Name' (set to 'Scenario 1 - Pre Conditions'), 'Description', 'Last edited' (8/14/2020 16:30:11), 'Last simulated', and a list of 'Transects' with 'Transect #1' selected. Below this are 'Add Transect' and 'Delete Transect' buttons. The 'Edit Transect Layout' panel in the center shows a table with two segments. Segment 1 has a 'Bare Soil' icon and a length of 5.0. Segment 2 is 'Unassigned' with a length of 1.0 and a 'Remove Cell' link. An 'Add Cell' button is at the top right of this panel. The 'Land Cover Palette' on the right shows a grid of 14 tiles. The first tile, 'Bare Soil', is highlighted with a red border. Other tiles include 'Hillslope (<10%)' and various 'Hillslope' categories with percentage ranges. A scroll bar on the right indicates more tiles are available.

#	Land Cover	Length (m)	Delete
1	Bare Soil	5.0	
2	Unassigned	1.0	<a href="#">Remove Cell</a>

Land Cover Palette	
Bare Soil	Hillslope (<10%)
Hillslope (10-20%)	Hillslope (20-30%)
Hillslope (30-40%)	Hillslope (40-50%)
Hillslope (50-60%)	Hillslope (60-70%)
Hillslope (70-80%)	Hillslope (80-90%)

# WBC Simulations Form

A run can be started by clicking the run button. You'll be notified when runs are complete.

Prior to running, clicking on a scenario will queue that scenario for the run.

Results for completed runs can be viewed on the 'Results Dashboard' form

The screenshot displays the 'Water Benefits Calculator for Ethiopia' web application. On the left is a sidebar with navigation links: Home, User Guidance, WBC Projects (with sub-links for Active Project, Map, Hillside, Plots, and Scenario), WBC Simulations, and Results Dashboard. The main content area shows a list of simulation scenarios: 'baseline - pre | Run Complete' (green), 'post | Run Complete' (green), and 'Invalid parameters demo | Failed Validation - Click to view errors' (red). At the top right of the main area are buttons for 'Deselect All', 'Select All', and 'Run'. A 'Validation Report' dialog box is open, displaying an information icon and the following text: 'The transect's down slope length must be equal to the plot's down slope length. Transect #1 down slope=1 & Plot down slope=69. No land cover has been selected for Segment #1 in Transect #1.' An 'OK' button is at the bottom right of the dialog. Arrows from external text boxes point to the 'Run' button, the green and red scenario bars, the 'Invalid parameters demo' bar, and the 'Validation Report' dialog.

Click a Scenario to add to run queue and press run to begin

baseline - pre | Run Complete

post | Run Complete

Invalid parameters demo | Failed Validation - Click to view errors

Validation Report

The transect's down slope length must be equal to the plot's down slope length. Transect #1 down slope=1 & Plot down slope=69. No land cover has been selected for Segment #1 in Transect #1.

OK

Once a run is complete scenarios will either display in green which indicates the run completed successfully, or red which indicates the scenario's input failed validation and some corrections need to be made

Clicking on a scenario which failed validation (red cells) will open up a validation report that indicates what input need to be corrected.

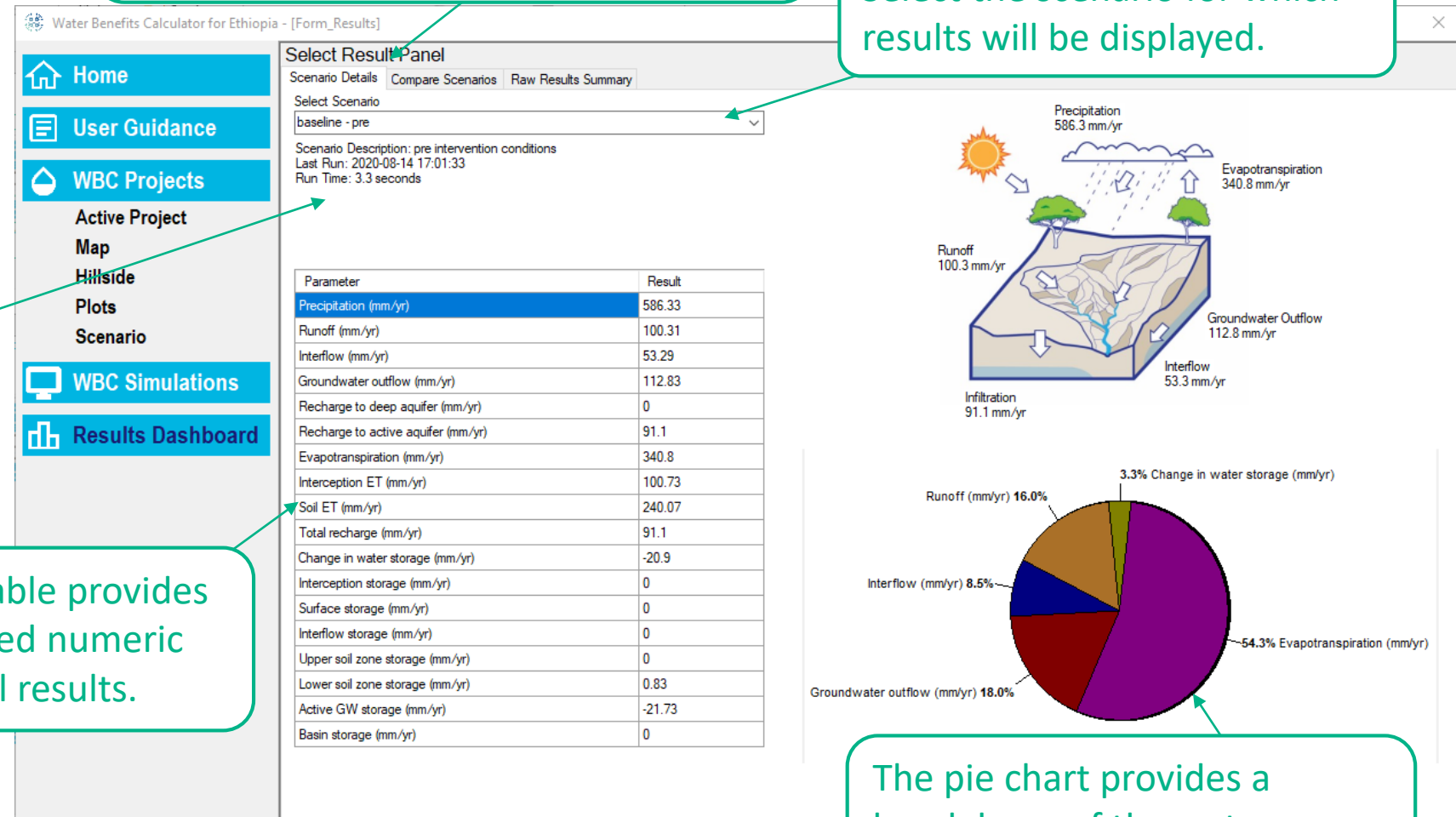
# Results Dashboard Form - Detail Tab

Selecting a tab will toggle between the results tabs which each provide a different level of information.

Select the scenario for which results will be displayed.

The model run metadata will display here

The table provides detailed numeric model results.



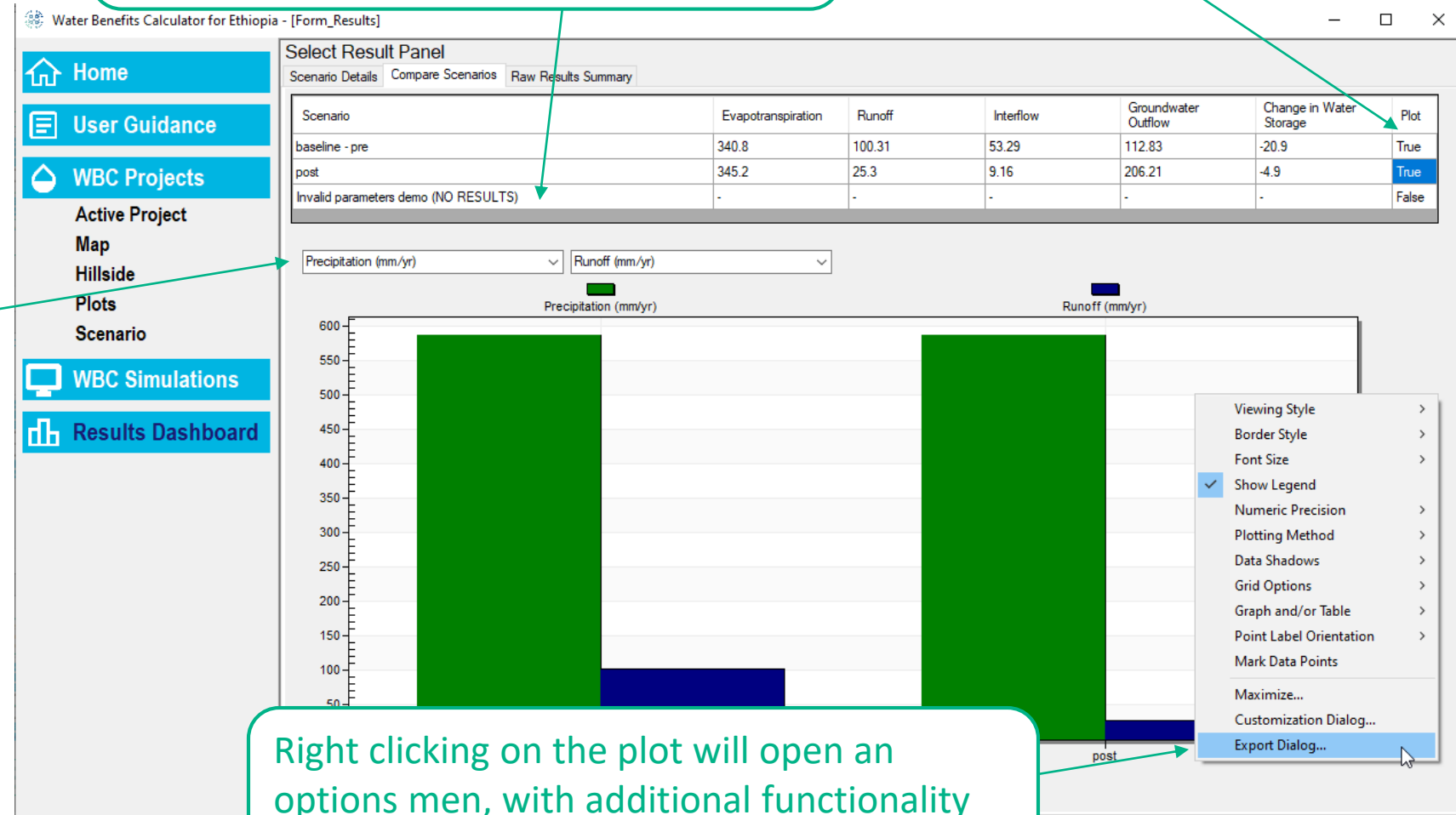
The pie chart provides a breakdown of the water budget for scenario.

# Results Dashboard Form - Comparison Tab

Any scenarios without model results will be flagged with '(NO RESULTS)' appended to the scenario name.

Click to toggle if scenario should be included in plot.

Options to select which parameters to compare



Right clicking on the plot will open an options menu, with additional functionality including configuring or export the plot



# Results Dashboard Form - Raw Results

Click will display a list to customize which parameters to include in the table

Option to export table as an excel spreadsheet (.xlsx file).

Water Benefits Calculator for Ethiopia - Raw Results Summary

Select Result Panel

Scenario Details Compare Scenarios Raw Results Summary

Set Export Parameters Select All Deselect All Export to Excel (xlsx)

	Scenario Id	Scenario Id	Precipitation (mm/yr)	Runoff (mm/yr)	Interflow (mm/yr)	Groundwater outflow (mm/yr)	Recharge to deep aquifer (mm/yr)	Recharge to active aquifer (mm/yr)	Evapotranspiration (mm/yr)	Interception ET (mm/yr)
▶	1	baseline - pre	586.33	100.31	53.29	112.83	0	91.1	340.8	100.73
	2	post	586.32	25.3	9.16	206.21	0	196.96	345.2	98.4
	4	Invalid parameter...								

Any scenarios without model results will appear as blank cells