S-1 and S-2: Average Annual Growth Rate

Equation S-1 and Equation S-2 are used to calculate the Average Annual Growth Rate (*AAGR - %*).

$$AAGR = \frac{WCGR_A + WCGR_B + \cdots + WCGR_n}{N} \quad \text{(S-1)}$$

$$WCGR_n = \frac{Previous\ yearly\ freshwater\ consumption}{Current\ yearly\ freshwater\ consumption} - 1 \quad \text{(S-2)}$$

Where, $WCGR_N$ is the water consumption growth rate for period n (n is between the previous and following year), and N the number of years.

S3: Potential industry freshwater requirements

The potential industry freshwater requirements (*PIFWR* – m^3) is calculated with Equation S-3.

$$PIFWR = PYC \times (1 + AAGR) \quad \text{(S-3)}$$

Where, *PYC* is the previous year consumption (m^3) and *AAGR* the Average Annual Growth Rate (%). It is possible to cap the maximum freshwater consumption rate by considering that if the PIFWR > maximum freshwater requirements of the industry, then the maximum value is considered and not the newly calculated one.

S-4 and S-5: Potential rainwater harvested

The volume of potential rainwater that can be harvested can be calculated using Equation S-4.

$$Q = (RRC \times R \times A \times TE \times 0.001) - (N \times FF) \quad \text{(S-4)}$$

where Q is the potential volume of harvested rainwater (m^3 / year), *RRC* is the harvest area runoff coefficient (- or %), R is the total rainfall (mm / time), and A is the catchment area (m^2), TE is the treatment efficiency (%), FF is the first-flush volume (m^3) and N the number of first-flushes performed in a year.

The First-flush can be calculated using Equation S-5.

$$FF = A \times FF_V / 1000 \quad \text{(S-5)}$$

where *FF* is the total volume of the first flush (m^3) A is the catchment area (m^2) and FF_V is the volume of water discharged per area (0.41 l / m^2 – Texas Water Development Board, 2005).

S-6: Potential harvest area

Equation S-6 is used to calculate the potential harvest area required for the scenarios. This is based on the prospective volumes of water that can be harvested against the potential freshwater requirements.

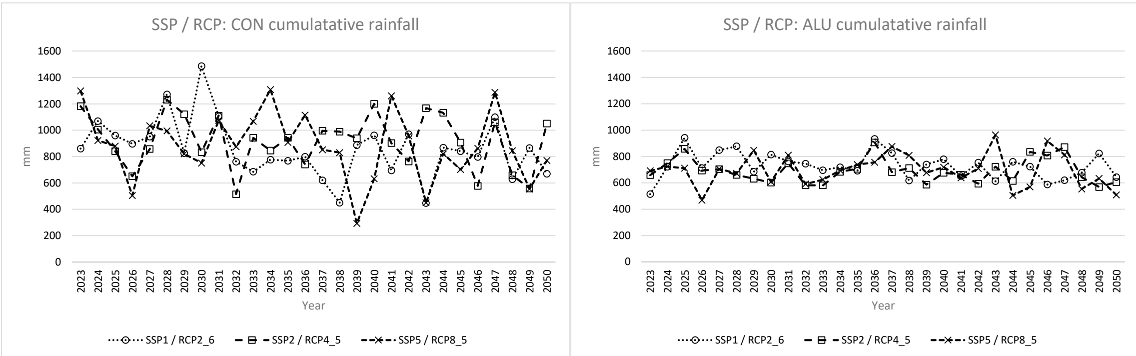
$$HA_{RCP} = \max\left(PYHA; \left((area \times PIFWR_{RCP} / VHRA) \times FWR\right)\right) \quad \text{(S-6)}$$

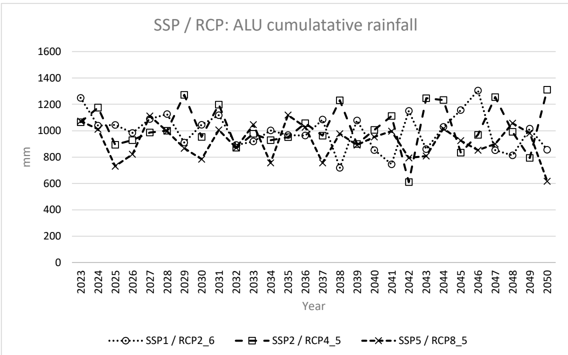
Where the Harvest Area for an RCP scenario (HA_{RCP} – m^2) is the required harvest area to recover the volume of rainwater to substitute freshwater, stipulated by the decision maker, and compares two conditions where the maximum satisfies the output requirements. The first condition is the previous year's harvest area (*PYHA* – m^2). This is compared with the second condition of the equation, which calculates the potential harvesting area required to cover the freshwater needs. It considers the initial catchment area (*Area* – m^2), the potential industry freshwater requirements for the selected scenario

($PIFWR_{RCP} – m^3$), the volume of rainwater harvested with the initial area ($VRWA – m^3$), and percentage of freshwater requirements covered by the RWH solution (*FWR - %*).

To calculate the volume of harvestable water (Equation S-4) with the new HA, the decision-maker should consider the area that was calculated in Equation S-6.

S-7: Projected rainfall simulation considering the Representative Concentration Pathway (RCP)





SSP	RCP	Description
1	2.6	Characterised by its sustainable development-oriented paradigm, often referred to as the "Green Society".
2	4.5	Considered the current path or trajectory the world is taking / Business as Usual (BAU) trajectory.
5	8.5	Emblematic of a development pathway heavily reliant on fossil fuels, eliminating "green" technologies.

Figure S1. Projected rainfall considering the SSP1 / RCP2.6, SSP2 / RCP4.5 and SSP5 / RCP8.5 scenarios for CON, ALU and TTI.

The WWR can be calculated following Equation S-7.

$$WWR(\%) = (TWC - TFC)/TWC \quad \text{(S-7)}$$

Where, *TWC* (m^3/year) is the observed or projected total water consumption, and *TFC* (m^3/year) is the observed or projected total freshwater consumption.

S-8: rainfall: SSP / RCP scenarios

Site	Scenario	Average % water covered by RWH solution 2030			Average % water covered by RWH solution between 2030 and 2040			Average % water covered by RWH solution 2040 and 2050		
		SSP1 / RCP2.6	SSP2 / RCP4.5	SSP5 / RCP8.5	SSP1 / RCP2.6	SSP2 / RCP4.5	SSP5 / RCP8.5	SSP1 / RCP2.6	SSP2 / RCP4.5	SSP5 / RCP8.5
CON	1	*117%*	*123%*	*134%*	*125%*	*155%*	*158%*	*160%*	*137%*	*247%*
	2	*82%*	*86%*	*94%*	*87%*	*109%*	*111%*	*112%*	*96%*	*173%*
	3	*82%*	*86%*	*94%*	*89%*	*114%*	*113%*	*123%*	*110%*	*204%*
	4	*86%*	*89%*	*97%*	*90%*	*122%*	*134%*	*123%*	*119%*	*204%*
	5	*61%*	*64%*	*71%*	*64%*	*87%*	*96%*	*88%*	*85%*	*146%*
ALU	1	*133%*	*104%*	*120%*	*110%*	*111%*	*117%*	*108%*	*111%*	*119%*
	2	*93%*	*73%*	*84%*	*77%*	*78%*	*82%*	*76%*	*78%*	*83%*
	3	*93%*	*73%*	*84%*	*79%*	*80%*	*85%*	*80%*	*83%*	*89%*
	4	*104%*	*75%*	*89%*	*102%*	*82%*	*109%*	*93%*	*84%*	*102%*
	5	*74%*	*54%*	*63%*	*73%*	*59%*	*78%*	*67%*	*60%*	*73%*
TTI	1	*104%*	*106%*	*111%*	*110%*	*108%*	*119%*	*121%*	*150%*	*108%*
	2	*73%*	*74%*	*78%*	*77%*	*76%*	*83%*	*85%*	*105%*	*76%*
	3	*73%*	*74%*	*78%*	*78%*	*77%*	*84%*	*95%*	*115%*	*84%*
	4	*74%*	*78%*	*81%*	*80%*	*81%*	*90%*	*95%*	*115%*	*87%*
	5	*55%*	*56%*	*59%*	*57%*	*58%*	*64%*	*68%*	*82%*	*62%*

Scenario	Site	Harvest area 2030 (m^2)			Harvest area 2040 (m^2)			Harvest area 2050 (m^2)		
		SSP1 / RCP2.6	SSP2 / RCP4.5	SSP5 / RCP8.5	SSP1 / RCP2.6	SSP2 / RCP4.5	SSP5 / RCP8.5	SSP1 / RCP2.6	SSP2 / RCP4.5	SSP5 / RCP8.5
CON	1	*148 911 (136%)*	*174 447 (177%)*	*225 011 (257%)*	*349 903 (135%)*	*259 407 (49%)*	*552 672 (146%)*	*402 634 (15%)*	*379 536 (46%)*	*552 672 (0%)*
	2	*186 283 (196%)*	*218 274 (246%)*	*281 622 (347%)*	*438 004 (135%)*	*324 664 (49%)*	*692 360 (146%)*	*504 015 (15%)*	*474 967 (46%)*	*692 360 (0%)*
	3	*186 283 (196%)*	*218 274 (246%)*	*281 622 (347%)*	*403 797 (117%)*	*324 664 (49%)*	*621 220 (121%)*	*405 760 (0%)*	*324 981 (0%)*	*621 220 (0%)*
	4	*154 089 (145%)*	*195 846 (211%)*	*252 685 (301%)*	*283 877 (84%)*	*247 580 (26%)*	*436 729 (73%)*	*285 257 (0%)*	*247 580 (0%)*	*436 729 (0%)*
	5	*85 689 (36%)*	*108 939 (73%)*	*140 606 (123%)*	*157 995 (84%)*	*137 761 (26%)*	*243 303 (73%)*	*158 764 (0%)*	*137 761 (0%)*	*243 303 (0%)*
ALU	1	*359 469 (6607%)*	*382 438 (7035%)*	*433 662 (7991%)*	*479 668 (33%)*	*520 878 (36%)*	*450 760 (4%)*	*670 781 (40%)*	*737 385 (42%)*	*850 137 (89%)*
	2	*449 898 (8 294%)*	*478 557 (8 828%)*	*542 822 (10 027%)*	*600 209 (33%)*	*651 811 (36%)*	*563 984 (4%)*	*839 931 (40%)*	*922 774 (42%)*	*1 064 015 (89%)*
	3	*449 898 (8294%)*	*478 557 (8828%)*	*542 822 (10 027%)*	*546 157 (21%)*	*574 745 (20%)*	*542 822 (0%)*	*574 137 (5%)*	*594 066 (3%)*	*669 024 (23%)*
	4	*435 966 (8 034%)*	*372 085 (6 842%)*	*478 643 (8 830%)*	*435 966 (0%)*	*385 181 (4%)*	*478 643 (0%)*	*435 966 (0%)*	*394 671 (2%)*	*478 643 (0%)*
	5	*242 586 (4426%)*	*206 993 (3762%)*	*266 374 (4870%)*	*242 586 (0%)*	*214 288 (4%)*	*266 374 (0%)*	*242 586 (0%)*	*219 575 (2%)*	*266 374 (0%)*
TTI	1	*133 100 (84%)*	*129 950 (80%)*	*157 893 (119%)*	*207 446 (56%)*	*169 474 (30%)*	*192 452 (22%)*	*230 754 (11%)*	*267 950 (58%)*	*318 722 (66%)*
	2	*166 493 (131%)*	*162 547 (125%)*	*197 527 (174%)*	*259 539 (56%)*	*211 994 (30%)*	*240 769 (22%)*	*288 670 (11%)*	*335 290 (58%)*	*398 817 (66%)*
	3	*166 493 (131%)*	*162 547 (125%)*	*197 527 (174%)*	*242 208 (45%)*	*193 332 (19%)*	*229 928 (16%)*	*242 208 (0%)*	*285 357 (48%)*	*282 295 (23%)*
	4	*141 698 (96%)*	*144 201 (100%)*	*176 280 (144%)*	*179 526 (27%)*	*148 080 (3%)*	*176 280 (0%)*	*179 526 (0%)*	*211 508 (43%)*	*209 239 (19%)*
	5	*78 791 (9%)*	*80 184 (11%)*	*98 042 (36%)*	*99 849 (27%)*	*82 344 (3%)*	*98 042 (0%)*	*99 849 (0%)*	*117 661 (43%)*	*116 397 (19%)*