Assessment of the Effects of COVID-19 Pandemic Stay-at-Home Measures on Potable Water Consumption Patterns, Location, and Financial Impacts for Water Utilities in Colombian Cities

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Significance level of the Explanatory Variables

- Domestic water consumption

Domestic water demand regression models were computed with explanatory variables for seasonality, precipitation, maximum temperature, fixed tariff, incoming and outgoing commuting population, and the number of users. The regression models were performed independently for each of the socioeconomic strata. Different answers to the predictor variables would be expected since income levels relate to common water use practices usually performed by domestic customers, where the main difference between socioeconomic strata is household income. The following tables summarize the regression results with an adopted significance level of 5%. Corresponding p-Values inferior to 1% and 0.1% are also shown.

Table S1. Regression model explanatory variables' results for domestic water consumption (Strata 1). Notation: Estimate (Standard Error), p-Value < 0.05 (*), < 0.01 (**), <0.001 (***).

Parameter	*CITY A*	*CITY B*	*CITY C*	*CITY D*
Jan	-425565.55	169152.85 (88320.98)	-1168255.92 (487581.04) *	34679.53 (28397.99)
Feb	(427769.54)	188535.84 (88917.31) *	-1180916.99 (497848.43) *	38532.32 (28372.46)
Mar	-524548.84	158732.04 (89001.03)	-1153512.98 (493010.74) *	34656.4 (28690.78)
Apr	(431844.46)	162493.16 (88883.57)	-1147034.46 (502993.16) *	32223.06 (28808.57)
May	-493854	165565.58 (90642.49)	-1128971.86 (510729.84) *	36324.35 (28660.04)
Jun	(431868.75)	147058.72 (90103.29)	-1170741.24 (509801.26) *	30831.93 (28475.82)
Jul	-413455.03	203765.42 (94504.12) *	-1171887.04 (509457.99) *	32852.61 (28269.41)
Aug	(418106.86)	179230.86 (91681.86)	-1162704.67 (514120.68) *	34612.99 (28432.52)
Sep	-421243.88	177452.26 (91235.09)	-1150759.77 (513037.01) *	34937.69 (28631.14)
Oct	(416765.11)	188871.94 (90372.86) *	-1163564.83 (508364.94) *	34592.75 (28659.97)
Nov		168608.53 (88414.29)	-1159299.07 (505342.13) *	35665.6 (28807.07)

Dec	-414391.56 (438933.84)	197699.81 (88436.25) *	-1186788.31 (492875.09) *	30315.94 (28459.14)
Precipitation	647.69 (841.23)	3.49 (35.25)	9.95 (98.35)	-14.67 (7.35)
Maximum Temperature	23258.96 (14598.55)	8430.38 (2362.64) ***	27221.55 (14885.83)	-244.02 (484.4)
Fixed Tariff	26.78 (31.51)	-2.9 (7.22)	-0.72 (11.23)	0.96 (1.71)
Incoming Population	-1.05 (1.53)	-2.54 (2.39)	3.86 (7.41)	-
Outgoing Population	0.49 (1.33)	3.3 (2.13)	0.58 (6.97)	-
Users	21.86 (0.74) ***	5.96 (0.51) ***	15.93 (0.89) ***	8.17 (2.47) **

As Table S1 presents, the only predictor variable that resulted statistically significant for Strata 1 domestic water demand in all the cities was the number of users. Noteworthy, since the models are fitted for every two months in City A, an increase of 10.93 cubic meters of domestic water demand is expected for each Strata 1 customer in one month (21.86 m^3 in two months). The results suggest that the city with the highest consumption per Strata 1 customer is City C. Additionally, a relationship between water usage and seasonality can be established with City B and C results. Moreover, for City B also the maximum temperature was significant, possibly due to the highly variable weather, so water usage at households seems to increase when the temperature rises. The magnitude of the estimate might seem exaggerated, yet it includes the total volume for all the Strata 1 domestic users.

Table S2. Regression model explanatory variables' results for domestic water consumption (Strata 2). Notation: Estimate (Standard Error), p-Value < 0.05 (*), < 0.01 (**), <0.001 (***).

Parameter	*CITY A*	*CITY B*	*CITY C*	*CITY D*
Jan	-4037253.84	2016505.57 (541111.68) ***	-109285.51 (235981.19)	220025.48 (75764.94) **
Feb	(1903564.89) *	1985413.64 (571054.65) ***	-163117.15 (241005.14)	229272.32 (75875.32) **
Mar	-4447943.04	1894750.24 (560658.02) **	-112744.33 (238617.18)	221524.26 (76274.59) **
Apr	(1905639.93) *	1890740.41 (559104.92) **	-114224.41 (243458.29)	211176 (76479) **
May	-5002896.18	1891954.93 (558881.88) **	-99968.11 (247176.35)	221004.66 (76367.54) **
Jun	(1939009.93) *	1927269.57 (545275.78) ***	-100404.2 (246775.02)	213799.71 (75783) **
Jul	-4123605	2092955.58 (561458.65) ***	-109472.78 (246693.59)	214245.15 (74974.47) **
Aug	(1881284.06) *	1995368.57 (564303.24) ***	-93776.69 (248898.78)	219901.14 (75250.65) **
Sep	-4321569.55	1979092.24 (565620.08) ***	-87798.26 (248366.13)	221248.48 (75487.02) **
Oct	(1857394.8) *	2005272.74 (556664.61) ***	-79231.47 (246039.99)	214361.43 (75400.69) **
Nov	-4205991.08	1921227.16 (556629.69) **	-97612.35 (244602.71)	220091.27 (75765.32) **
Dec	(1969827.74) *	2086962.62 (539584.42) ***	-95293.96 (238600.38)	211431.5 (75455.81) **

Precipitation	6398.88 (3592.64)	33.12 (135.05)	-67.21 (47.03)	-14.42 (14.58)
Maximum Temperature	-43224.76 (58577.19)	18548.64 (9195.06) *	9424.83 (7198.65)	-876.19 (956.44)
Fixed Tariff	122.59 (67.98)	8.36 (19)	-16.94 (4.58) ***	-7.17 (4.05)
Incoming Population	-5.31 (5.77)	-12.16 (9.1)	2.91 (3.55)	-
Outgoing Population	8.08 (5.1)	8.93 (8.19)	-5.81 (3.33)	-
Users	24.14 (1.16) ***	4.94 (1.35) ***	12.9 (0.42) ***	4.38 (2.72)

Seasonality impacts Strata 2 domestic water demand in Cities A, B, and D. For City B, higher consumption is expected in January, July, and December, coinciding with the holiday seasons when most people prefer to stay at home. Moreover, according to the regression results, a decrease of 16.94 ± 4.58 m^3 is anticipated for every Colombian peso that the fixed tariff increases in City C. Finally, for every Strata 2 user, domestic water demand is expected to rise in all cities. Nonetheless, the number of users in City D does not significantly explain Strata 2 water demand.

Table S3. Regression model explanatory variables' results for domestic water consumption (Strata 3). Notation: Estimate (Standard Error), p-Value < 0.05 (*), < 0.01 (**), <0.001 (***).

Parameter	*CITY A*	*CITY B*	*CITY C*	*CITY D*
Jan	-820213.93	524335.91 (425367.21)	199579.36 (173585.17)	252827.61 (80607.16) **
Feb	(1056779.13)	513362.81 (446065.12)	152364.77 (177149.4)	261531.66 (80788.26) **
Mar	-671010.18	463507.04 (440098.87)	190064.28 (175425.01)	257157.36 (81427.41) **
Apr	(1057346.05)	395520.89 (436753.59)	188282.85 (179029.7)	242531.88 (81837.79) **
May	-749714.2	407803.72 (438839.18)	188236.81 (181771.14)	250392.63 (81898.74) **
Jun	(1055233.67)	501577.73 (429849.53)	203842.08 (181522.64)	241153.97 (80870.21) **
Jul	-540807.17	578220.39 (445531.97)	198180.94 (181531.61)	249657.53 (79629.21) **
Aug	(1017690.76)	538844.41 (444142.01)	205557.07 (183080.26)	242522.64 (79987.2) **
Sep	-574855.22	503903.13 (445176.43)	202468.55 (182629.15)	255010.01 (80301.68) **
Oct	(1020917.71)	548807.81 (437272.09)	210005.96 (180986.28)	256300.27 (80194.76) **
Nov	-596571.82	494753.16 (434929.75)	203367.51 (179909.47)	249339.5 (80802.2) **
Dec	(1063853.32)	620746.83 (424321.39)	221674.78 (175582.44)	244160.11 (80192.32) **
Precipitation	314.63 (1743.28)	123.01 (131.71)	-44.37 (34.74)	-31.52 (22.26)
Maximum Temperature	46560.22 (30887.22)	18605 (9067.53) *	-1020.09 (5338.2)	117.23 (1438.42)
Fixed Tariff	-33.41 (23.61)	12.3 (12.12)	-8.39 (2.46) **	-4.06 (4.03)
Incoming Population	-2.59 (2.88)	-9 (8.89)	-0.12 (2.61)	-
Outgoing Population	1.97 (2.54)	4.15 (7.96)	-4.4 (2.47)	-
Users	17.31 (0.52) ***	9.29 (0.82) ***	13.41 (0.35) ***	6.16 (1.47) ***

According to Table S3 results, the number of users is a statistically significant parameter for explaining Strata 3 domestic water demand patterns in the four case studies. Hence, the users' estimates indicate that water consumption volumes increase for every Strata 3 user and, again, the city with the highest rises per user is City C. Furthermore, seasonality in City D seems to influence strata 3 water demand, with similar levels of consumption in each month. Once more, maximum temperature affects water consumption in City B. Finally, as was seen for Strata 2 users, the fixed tariff estimate for City C suggests a decrease of 8.39 cubic meters per every Colombian peso that the tariff increases.

Table S4. Regression model explanatory variables' results for domestic water consumption (Strata 4). Notation: Estimate (Standard Error), p-Value < 0.05 (*), < 0.01 (**), <0.001 (***).

Parameter	*CITY A*	*CITY B*	*CITY C*	*CITY D*
Jan	260889.44	-49962.04 (147052.67)	-2590.39 (60218.42)	62087.09 (29364.32) *
Feb	(650628.45)	-94829.46 (149452.57)	-15034.72 (61513.7)	65979.1 (29401.75) *
Mar	289330.38	-49897.84 (149325.34)	-4631.87 (60886.41)	65070.18 (29671) *
Apr	(625269.4)	-95510.74 (148596.44)	-8120.49 (62118.28)	59206.53 (29769.02)
May	357402.15	-99328.3 (151118.28)	-11461.1 (63046.88)	61792.9 (29776.2) *
Jun	(601672.15)	-70248.61 (149593.5)	-13201.15 (62942.35)	62516.59 (29496.22) *
Jul	404402.5	7382.55 (156850.68)	-17453.07 (62960.86)	66249.52 (29013.98) *
Aug	(613889.66)	-58464.29 (153042.96)	-12456.08 (63498.13)	62649.34 (29122.36) *
Sep	373642.85	-80217.93 (152003.24)	-13834.3 (63364.62)	66855.64 (29205.85) *
Oct	(613032.86)	-8405.3 (150713.93)	-13132.17 (62745.1)	67930.42 (29135.37) *
Nov	449798.55	-20900.79 (148032.71)	-17387.77 (62393.64)	63527.52 (29340.42) *
Dec	(631332.34)	6560.21 (147317.01)	-13011.16 (60896.9)	62935.26 (29171.34) *
Precipitation	-299.39 (1046.98)	92.36 (56.52)	-7.6 (11.88)	12.98 (8.65)
Maximum Temperature	25302.81 (19598.89)	10237.92 (3877.12) *	3301.46 (1824.05)	562.97 (576.59)
Fixed Tariff	-22.02 (10.98)	7.43 (4.51)	-2.03 (0.72) **	0.06 (1.35)
Incoming Population	-1.11 (1.62)	-5.93 (3.82)	0.7 (0.89)	-
Outgoing Population	0.93 (1.42)	3.8 (3.42)	-1.62 (0.84)	-
Users	15.79 (1.43) ***	10.08 (0.59) ***	11.33 (0.6) ***	6.45 (1.19) ***

As Table S4 shows, the only predictor variable that is statistically significant for Strata 4 domestic water demand estimation in all cities is the number of users. For every Strata 4 user, the monthly water consumption volumes rise by 8.94 cubic meters on average for every case study, with the lowest increases

in City D and A, and the highest in City C and D. Moreover, also maximum temperature in City B, fixed tariff in City C, and seasonality in City D have an impact on the water consumption patterns.

Table S5. Regression model explanatory variables' results for domestic water consumption (Strata 5). Notation: Estimate (Standard Error), p-Value < 0.05 (*), < 0.01 (**), <0.001 (***).

Parameter	*CITY A*	*CITY B*	*CITY C*	*CITY D*
Jan	-168975.87	71942.74 (161203.06)	64177.1 (34861.13)	18133.88 (17171.16)
Feb	(176397.28)	-17939.97 (165663.02)	59845.27 (35338.9)	19823.74 (17201.56)
Mar	-113019.03	61918.27 (164771.88)	57615.24 (35107.06)	20307.59 (17402.36)
Apr	(173146.09)	23870.99 (163889.32)	55614.64 (35827.6)	20086.65 (17449.15)
May	-70740.5	10069.28 (165616.39)	54242.7 (36354.29)	19037.31 (17449.07)
Jun	(171607.23)	57747.64 (163246.18)	53925.66 (36415.94)	19084.83 (17252.68)
Jul	-146638.05	86967.88 (170397.28)	57489.83 (36382)	18969.45 (17026.49)
Aug	(170936.83)	61731.56 (167420.54)	55742.3 (36631.6)	18715.77 (17057.91)
Sep	-99264.74	21381.62 (166316.71)	55285.08 (36471.15)	20331.53 (17157.79)
Oct	(169904.12)	87857.63 (165242.19)	54135.14 (36274.57)	21678.11 (17131.4)
Nov	-116911.91	75648.1 (163285.01)	52337.42 (36046.24)	20347.04 (17249.01)
Dec	(178273.81)	111209.41 (161139.43)	55688.02 (35324.26)	18905.37 (17097.53)
Precipitation	-62.15 (327.51)	102.15 (55.62)	-1.55 (7.1)	0.84 (4.74)
Maximum Temperature	14466.19 (5818.16) *	5768.24 (3736.94)	459.86 (1105.89)	476.58 (312.27)
Fixed Tariff	-4.17 (1.59) *	5.09 (2.92)	-0.31 (0.15) *	0.51 (0.44)
Incoming Population	0.65 (0.55)	-4.67 (3.74)	-0.13 (0.54)	-
Outgoing Population	-0.81 (0.48)	2.19 (3.37)	-0.18 (0.49)	-
Users	19.78 (0.66) ***	10.31 (1.36) ***	7.58 (0.92) ***	4.23 (2.2)

Results for Strata 5 domestic water demand evidence that the number of users parameter is statistically significant for explaining the variations of water usage in Cities A, B, and C, as Table 5 presents. In this case, the largest increase in consumption per user is in City B. Also, fixed tariff in Cities A and C, and maximum temperature in City A are useful explanatory variables. Moreover, results indicate that none of the variables resulted statistically significant for explaining Strata 5 domestic water demand in City D.

Table S6. Regression model explanatory variables' results for domestic water consumption (Strata 6). Notation: Estimate (Standard Error), p-Value < 0.05 (*), < 0.01 (**), <0.001 (***).

Parameter	*CITY A*	*CITY B*	*CITY C*	*CITY D*
Jan		118150.73 (124737.55)	20460.65 (63323.46)	37178.58 (32123.04)

Feb	767727.84 (200588.13) ***	22661.54 (127799.85)	19945.57 (64767.43)	44614.63 (32313.64)
Mar	931348.55	114267.45 (127231.71)	6693.1 (63956.11)	40244.86 (32542.67)
Apr	(196412.6) ***	94804.74 (126235.52)	549.23 (65237.08)	40420.23 (32676.79)
May	1000310.25	69019.58 (127613.4)	-4232.91 (66164.11)	38121.18 (32675.02)
Jun	(197443.68) ***	109167.89 (126558.06)	-7437.19 (65837.64)	40136.21 (32388.22)
Jul	558109.58	114885.58 (130903.71)	-3828.83 (65884.98)	38325.38 (31706.16)
Aug	(197363.43) **	92018.83 (129586.67)	-999.16 (66491.45)	38777.08 (31894.62)
Sep	812765.89	78653.06 (128966.67)	-3080.47 (66375.08)	42091.8 (32033.9)
Oct	(194006.6) ***	122222.94 (127326.09)	-10776.37 (65664.22)	42366.89 (31891.34)
Nov	686402.11	102467.48 (125784.6)	-12086.28 (65346.45)	40814.76 (32116.12)
Dec	(206400.73) **	124109.83 (124234.92)	-10958.5 (63674.54)	37353.06 (31881.92)
Precipitation	-238.23 (399.73)	66.58 (42.38)	7.97 (12.62)	1.6 (10.28)
Maximum Temperature	-13979.94 (6861.15)	2886.4 (2941.55)	1756.12 (1903.5)	448.06 (685.33)
Fixed Tariff	-7.09 (1.59) ***	3.09 (2.08)	-0.21 (0.17)	0.33 (1.08)
Incoming Population	4.54 (0.68) ***	-1.13 (2.86)	2.17 (0.96) *	-
Outgoing Population	-4.38 (0.6) ***	-0.89 (2.55)	-2.72 (0.88) **	-
Users	19.61 (0.65) ***	11.69 (2.03) ***	10.92 (2.36) ***	5.97 (1.95) **

Finally, Table S6 shows that seasonality, fixed tariff, commuting population, and the number of users are statistically significant variables for defining Strata 6 domestic water consumption levels in City A. For every Colombian peso that the tariff increases, a reduction of 7.09 ± 1.59 cubic meters in water usage is observed every two months. Also, the results suggest that for every incoming commuter, water demand would increase by 4.54 m^3, while for every outgoing commuter, the consumption decreases 4.38 m^3, these results in a two-month period. Likewise, in City C, which is a touristic city, the Strata 6 domestic consumption increases 2.17 and decreases 2.72 cubic meters for every person entering and leaving the town, respectively. Regarding the number of users, all cities evidence that one Strata 6 user generates an increment on the domestic water consumption, with the major rises in City B, then City C, City A, and, lastly, City D.

- Commercial water consumption

The commercial water demand regression model was computed with the same explanatory variables used for the domestic demand: seasonality, precipitation, maximum temperature, fixed tariff, incoming

and outgoing commuting population, and the number of users. The next table summarizes the regression model results for commercial water demand where, as before, a 5% significance level was adopted.

Table S7. Regression model explanatory variables' results for commercial water consumption. Notation: Estimate (Standard Error), p-Value < 0.05 (*), < 0.01 (**), <0.001 (***).

Parameter	*CITY A*	*CITY B*	*CITY C*	*CITY D*
Jan	-730194.38	-95871.26 (261616.42)	-289108.45 (276510.53)	102666.59 (49303.84) *
Feb	(1131076.07)	-101223.18 (273974.57)	-300416.74 (282644.3)	104484.55 (48485.09) *
Mar	-843919.31	-73842.27 (270029.51)	-278821.19 (279756.31)	100326.13 (49096.47) *
Apr	(1120676.8)	-111577.1 (268732.97)	-319047.33 (285046.09)	96483.3 (48993.44)
May	-1041818.43	-163441.18 (269423.38)	-339451.44 (289227.81)	96745.92 (48846.55)
Jun	(1110538.8)	-131123.71 (265403.74)	-355343.84 (288813.74)	95316.79 (49011.72)
Jul	-558649.81	-152449.24 (270219.51)	-367159.33 (288904.34)	99556.25 (49142.81) *
Aug	(1086327.21)	-98545.29 (272611.55)	-346266.35 (291458.14)	100007.12 (49139.18) *
Sep	-646387.77	-125606.8 (271947.45)	-337192.31 (290965.01)	102012.54 (49166) *
Oct	(1085361.8)	-90677.8 (268110.32)	-342487.34 (288177.26)	104369.6 (49236.9) *
Nov	-682819.29	-99078.79 (267359.78)	-355971.91 (286517.91)	103531.26 (49177.15) *
Dec	(1134502.99)	-113326.9 (260835.38)	-335152.87 (279553.33)	99757.21 (49154.85) *
Precipitation	1228.51 (2115.26)	127.23 (71.31)	1.19 (52.85)	0.92 (9.3)
Maximum Temperature	26172.58 (38082.39)	8232.81 (4846.14)	12363.21 (8095.54)	563.59 (617.69)
Fixed Tariff	15.98 (15.46)	-1.97 (3.76)	-2.06 (1.3)	1.26 (0.63) *
Incoming Population	-3.83 (3.77)	4.25 (4.84)	4.75 (3.99)	-
Outgoing Population	5.87 (3.18)	-2.53 (4.28)	-6.63 (3.72)	-
Users	27.28 (3.34) ***	15.73 (2.96) ***	69.75 (7.89) ***	-1.51 (9.32)

As Table S7 shows, only the number of users in Cities A, B, and C are statistically significant for explaining the variations of commercial water consumption. In contrast, seasonality and fixed tariffs variables capture the variation of commercial water demand in City D. Furthermore, the estimates of the number of users are substantially higher than those found for domestic demand, evidencing what was expected: commercial users consume larger water volumes than domestic users since their water-consuming activities are performed more frequently and for longer periods of time.

The commuting population was expected to be especially influential because this category includes hotels, shopping, restaurants, stores, among others, which are the most common business visited by travelers. However, it is also important to consider that many of the commuters could live or arrive at

residencies and, consequently, increase domestic water demand rather than commercial. This was the case of City C, which is a touristic city, and a relation between Strata 6 domestic demand and the commuting population was proven. These residencies may correspond to rentals, such as *Airbnb's*, that due to their vacancy nature are more likely to be located in high-income residential areas.

- Industrial water consumption

The industrial water demand regression model was computed with explicative variables for seasonality, precipitation, maximum temperature, fixed tariff, and the number of users, adding 10 predictor variables. The following table presents the regression model results for the estimates employed, as well as the standard errors and the associated significance.

Table S8. Regression model explanatory variables' results for industrial water consumption. Notation: Estimate (Standard Error), p-Value < 0.05 (*), < 0.01 (**), <0.001 (***).

Parameter	*CITY A*	*CITY B*	*CITY C*	*CITY D*
Jan	1947480.47	424749.5 (685282.52)	819065.09 (182081.23) ***	81031.93 (42214.69)
Feb	(1270563.69)	323828.43 (689381.6)	828761.14 (183260.93) ***	81648.64 (42357.46)
Mar	1955207.28	363067.82 (685718.81)	828152.72 (182134.08) ***	90086.57 (42602.92) *
Apr	(1307241.79)	341008.21 (688471.38)	845317.5 (186050.2) ***	87800.31 (42531.97) *
May	1823971.67	346437.96 (690191.59)	853702.42 (188583.2) ***	82788.53 (42089.87)
Jun	(1287790.33)	373570.57 (689004.82)	854948.68 (189073.69) ***	87942.66 (41587.09) *
Jul	1784805.59	339981.35 (692839.62)	861218.37 (189661.14) ***	84368.19 (41805.08) *
Aug	(1222006.03)	373541.74 (701095.61)	864873.46 (190193.35) ***	82382.37 (42420.12)
Sep	1900500.91	340506.99 (693333.9)	858250.62 (188975.63) ***	87635.79 (42084.1) *
Oct	(1241658.34)	402361.23 (690255.72)	857371.15 (188746.58) ***	91271 (41633.59) *
Nov	1961710.66	425741.35 (689901.58)	839728.35 (187533.4) ***	89709.12 (41932.94) *
Dec	(1248099.48)	397985.11 (685934.29)	830191.52 (184800.19) ***	90998.89 (41477.94) *
Precipitation	590.98 (3184.35)	75.94 (123.69)	-58.85 (38.38)	2.7 (21.99)
Maximum Temperature	-70740.02 (43466.92)	1668.45 (8904.61)	-25803.3 (5587.4) ***	620.55 (1489.86)
Fixed Tariff	5.94 (28.86)	21.41 (5.03) ***	0.44 (0.82)	0.89 (2.34)
Users	173.55 (96.45)	51.91 (68.9)	1396.82 (66.83) ***	-142.65 (200.32)

The results show that none of the variables capture the changes in industrial water usage for City A. In the case of City B, only the fixed tariff resulted as a statistically significant explicative variable. However, a negative relation was expected, but the results indicate an upsurge in demand when the

tariffs increase. Moreover, only some months in City D are significant variables for explaining the industrial water consumption patterns. These results evidence the struggle for finding factors that could explain the variations in industrial water consumption and suggest the need of exploring more predictor variables.

In contrast, almost all the variables were significant in the case of City C, except for precipitation and fixed tariff. Hence, an increase of 1396.82 ± 66.83 cubic meters in the demand for every industrial customer was obtained. This value confirms the magnitude of consumption of industrial users, who might not be abundant but add large volumes of water use.

- Public water consumption

The public water demand regression models were fitted with the same variables used for the industrial demand: seasonality, precipitation, maximum temperature, fixed tariff, and the number of users. As well as for industrial water consumption, it is not easy to define which variables could influence public water usage since it includes a large list of institutions such as hospitals, schools, universities, among others. The following table presents the obtained explanatory variables' results.

Table S9. Regression model explanatory variables' results for public water consumption. Notation: Estimate (Standard Error), p-Value < 0.05 (*), < 0.01 (**), <0.001 (***).

Parameter	*CITY A*	*CITY B*	*CITY C*	*CITY D*
Jan	824106.08	-1130465.84 (615483.28)	295702.47 (164950.52)	61339.82 (23937.16) *
Feb	(956566.3)	-1134163.8 (614891.28)	309397.1 (166014.54)	61240.51 (23957.17) *
Mar	1077761.95	-1139180.55 (610630.27)	325592.27 (164981.55)	69482.89 (23939.22) **
Apr	(943871.85)	-1088026.28 (616460.03)	328931.26 (168537.27)	68779.73 (23858.66) **
May	1121975.78	-1110149.54 (619163.46)	340931.09 (170829.2)	68148.63 (23721.04) **
Jun	(919194.46)	-1092240.73 (618202.57)	324538.65 (171370.59)	71267.87 (23960.79) **
Jul	945737.51	-1090580.45 (621141.48)	319314.38 (171899.76)	69385.8 (23959.87) **
Aug	(899113.48)	-1112185.46 (626128.79)	323488.61 (172351.13)	72094.78 (24171.86) **
Sep	1051859.23	-1093515.45 (621429.22)	327963.21 (171248.92)	73510.82 (23931.81) **
Oct	(908146.6)	-1087840.81 (620293.89)	337267.19 (171031.83)	75703.96 (23645.53) **
Nov	1101265.83	-1096182.74 (620969.56)	324890.72 (169944.04)	70915.37 (23754.45) **
Dec	(932980.6)	-1075592.68 (611490.71)	304024.83 (167480.2)	68697.63 (23755.58) **
Precipitation	-1437.82 (1732.28)	134.72 (94.81)	-78.22 (35.05) *	23.73 (8.84) **
Maximum Temperature	-2212.24 (31424.37)	16101.04 (6608.85) *	-11154.24 (5096.24) *	1359.44 (568.29) *
Fixed Tariff	-11.8 (19.38)	-13.42 (6.3) *	3.4 (1.84)	-1.42 (0.89)

Users	330.92 (88.76) ***	691.81 (258.86) **	345 (28.64) ***	-15.47 (29.63)

Table S9 shows that the number of users was a significant variable in Cities A, B, and C, and was the only predictor variable that influences public water consumption in City A. In City B, two more parameters resulted significant: maximum temperature and fixed tariff. In the case of City C and D, precipitation and maximum temperature were also influential, meaning that weather may impact activities in some public institutions. Moreover, seasonality affects particularly public water demand in City D. This could be due to the relevance of universities in the city, so a relationship between academic activities and water consumption may be established.

- Total water consumption

The total water demand regression models were computed with variables for seasonality, precipitation, maximum temperature, incoming and outgoing commuting population, and the number of users. The following table contains the general results for total water demand. Again, the adopted significance level corresponds to 5%.

Table S10. Regression model explanatory variables' results for total water consumption. Notation: Estimate (Standard Error), p-Value < 0.05 (*), < 0.01 (**), <0.001 (***).

Parameter	*CITY A*	*CITY B*	*CITY C*	*CITY D*
Jan	-3588142.71	4786876.83 (1318587.87) ***	-1297102.1 (974337.36)	681816.8 (129060.68) ***
Feb	(5023440.23)	4323281.61 (1494048.51) **	-1502731.93 (988999.13)	719509.25 (129542.84) ***
Mar	-3789870.41	4546618.68 (1436974.69) **	-1314007.5 (979872.86)	709828.16 (130164.85) ***
Apr	(4869034.37)	4363355.65 (1408371.61) **	-1368369.5 (1001672.04)	668846.56 (130414.71) ***
May	-4383801.11	4286868.29 (1403636.43) **	-1382941.36 (1015595.68)	684747.11 (129497.42) ***
Jun	(4823476.43)	4749357.47 (1320347.44) ***	-1423405.78 (1014796.62)	675020.93 (127905.76) ***
Jul	-2366347.9	4823022.77 (1404737.01) **	-1439203.41 (1020742.86)	687138.74 (127187.69) ***
Aug	(4765582.33)	4784675.38 (1419713.25) **	-1409378.08 (1022212.85)	684910.04 (128148.79) ***
Sep	-3044059.06	4566139.38 (1439758.02) **	-1407609.5 (1017894.62)	716485.47 (128436.93) ***
Oct	(4803985.46)	4908759.47 (1381957.45) ***	-1373051.31 (1010669.51)	720884.74 (127856.41) ***
Nov	-2243398.22	4676666.57 (1405462.69) **	-1442244.73 (1005064.51)	705337.23 (129056.25) ***
Dec	(4973126.8)	5058044.55 (1305734.88) ***	-1367980.83 (988506.03)	677360.18 (127915.83) ***
Precipitation	3679.4 (6129.75)	775.7 (552.27)	-173.13 (202.48)	-2.11 (62.34)
Maximum Temperature	62409.01 (155883.57)	77997.13 (37300.8) *	50389.88 (30478.59)	4126.58 (4098.66)
Incoming Population	-22.8 (15.34)	-16.77 (37.5)	8.19 (14.77)	-

Outgoing Population	24.26 (13.36)	-2.89 (33.65)	-26.39 (14.53)	-
Users	22.39 (0.98) ***	8.56 (1.08) ***	18.22 (0.58) ***	6.54 (1.11) ***

The outcomes presented in Table S10 evidence that neither precipitation nor commuting population have a statistically significant influence on the total water consumption volumes in any city. In contrast, the number of users is always a significant estimator, where for every user (any in the different categories) an average increment of 11.13 m^3 in total water demand volumes is foreseen, with the largest rises in City C and the minor ones in City D. Moreover, as has been observed with the rest of the regression results, the maximum temperature is an important independent variable for water demand in City B. Likewise, seasonality in Cities B and D are able to explain variations in the water consumption patterns.