



SPANISH COMITÉ FOR WATER AND DROUGHT

OBJECTIVE

- The objective of this analysis is to study the consumption of water in the swimming pools in comparison to other water consumption and the optimisation of the water in swimming pools in order to reduce the consumption, as well as the comparison of other daily water consumption.

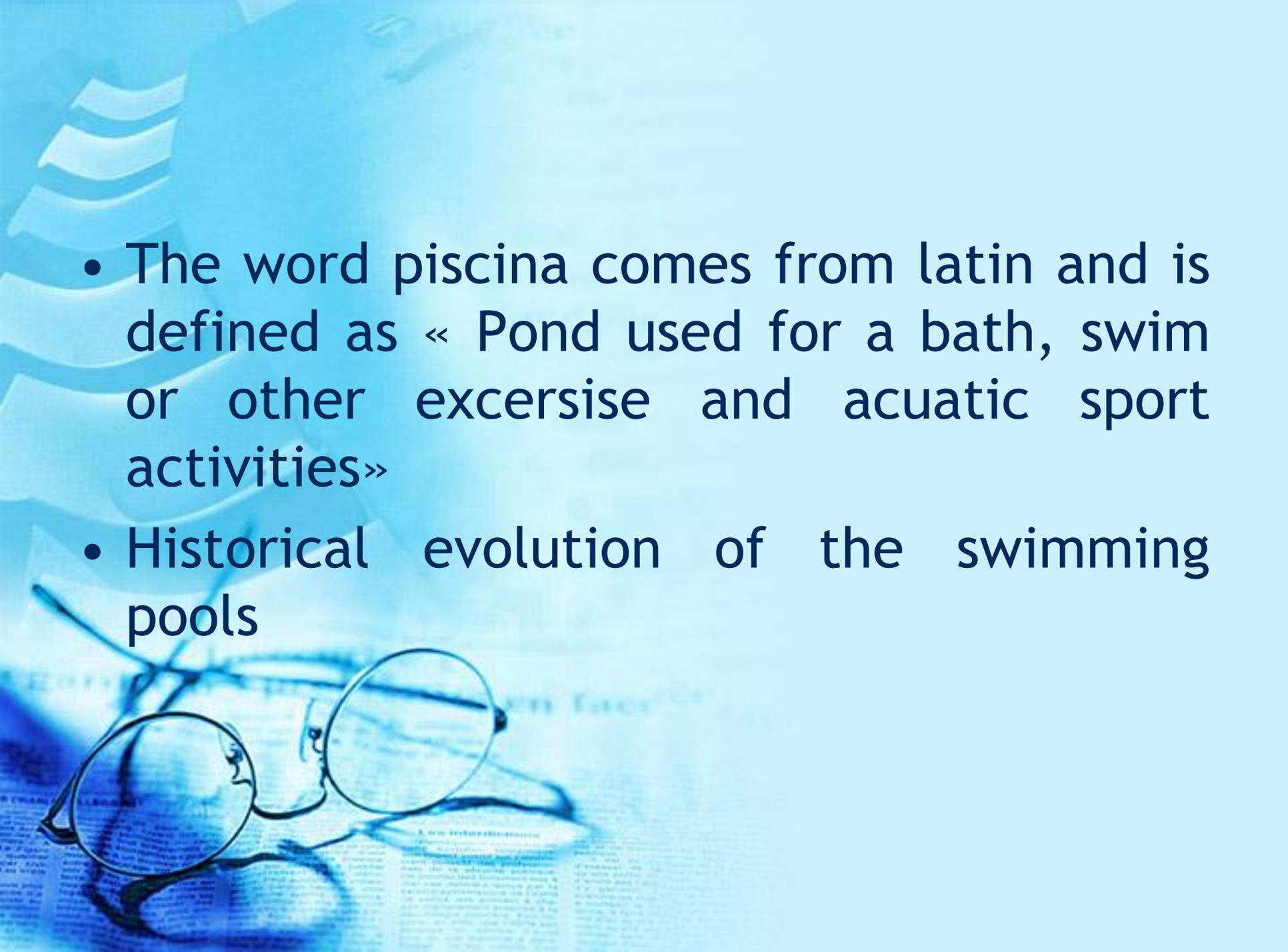


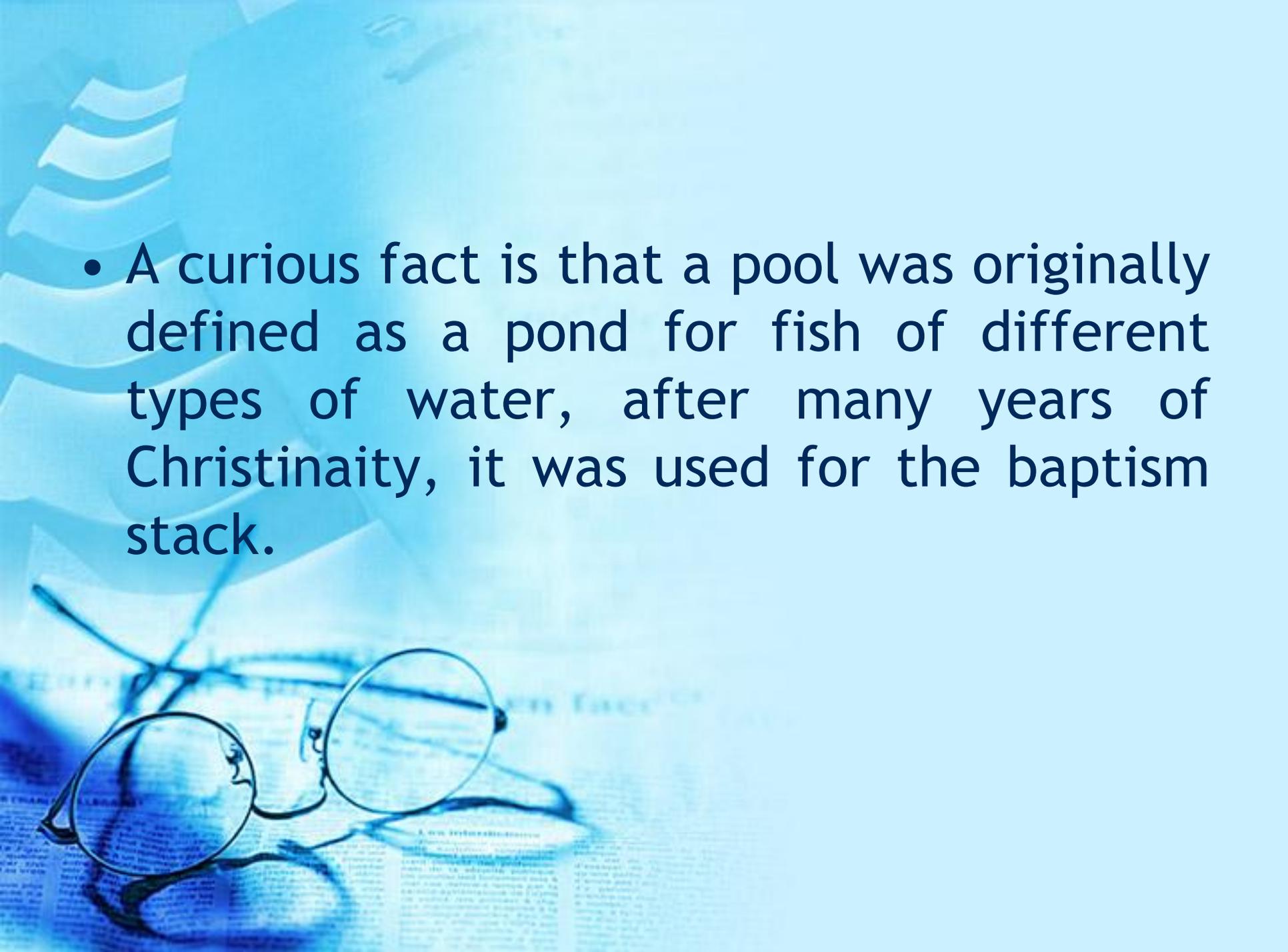
1-INTRODUCTION

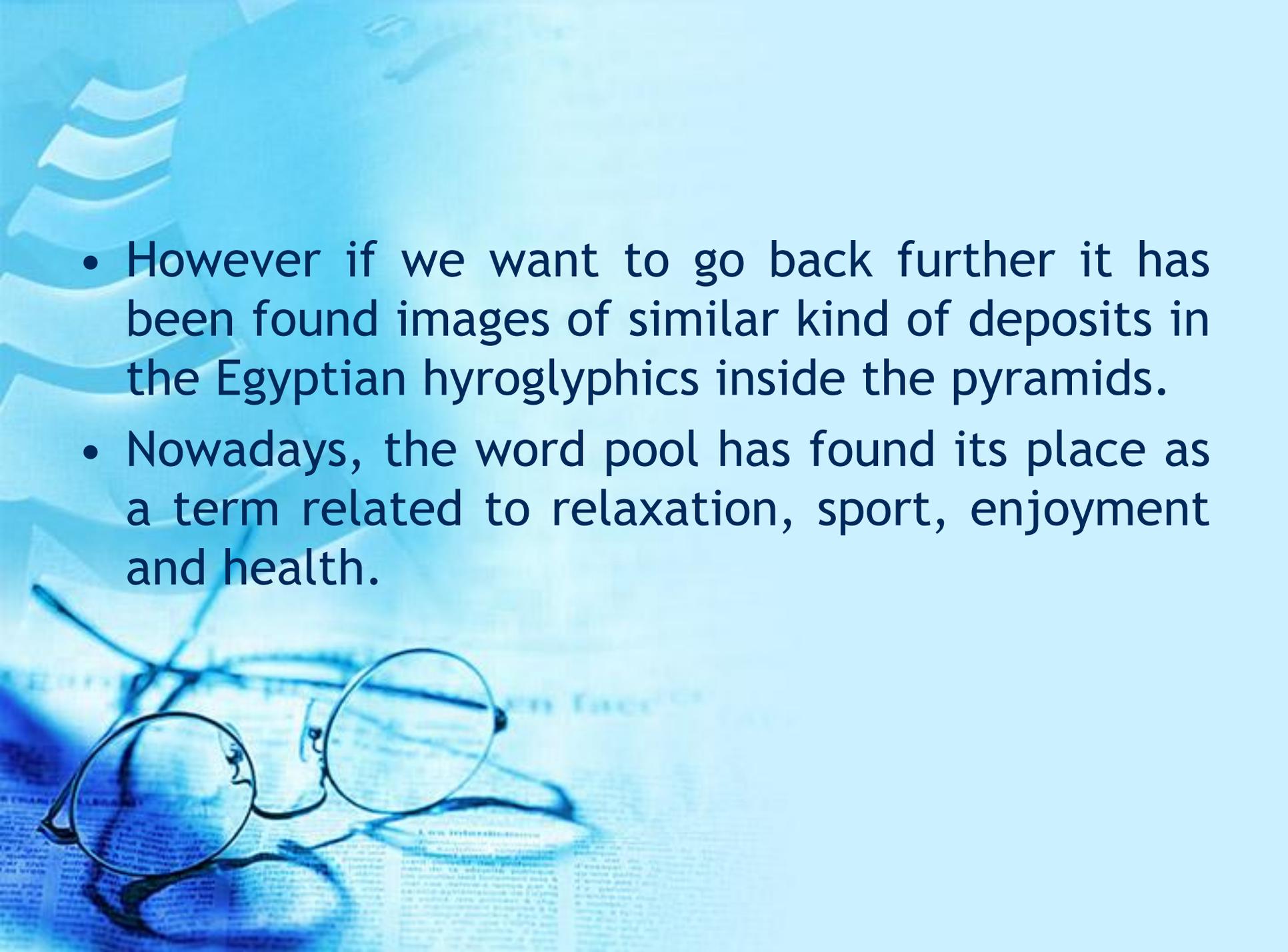
1.1. DEFINITION AND HISTORY OF THE SWIMMING POOL

- At the moment to look for the definition of the word «piscinas (pool)», there are many alternatives and answers that fulfill this word. As just an example and considering only the most significant definitions that we have found are :



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- The background of the slide is a light blue, semi-transparent image. It depicts a hand holding a pen, poised to write on a document. A pair of round-rimmed glasses is resting on the document in the lower-left foreground. The overall aesthetic is clean and professional, with a focus on text and research.
- The word piscina comes from latin and is defined as « Pond used for a bath, swim or other excersise and acuatic sport activities»
 - Historical evolution of the swimming pools

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- A curious fact is that a pool was originally defined as a pond for fish of different types of water, after many years of Christianity, it was used for the baptism stack.

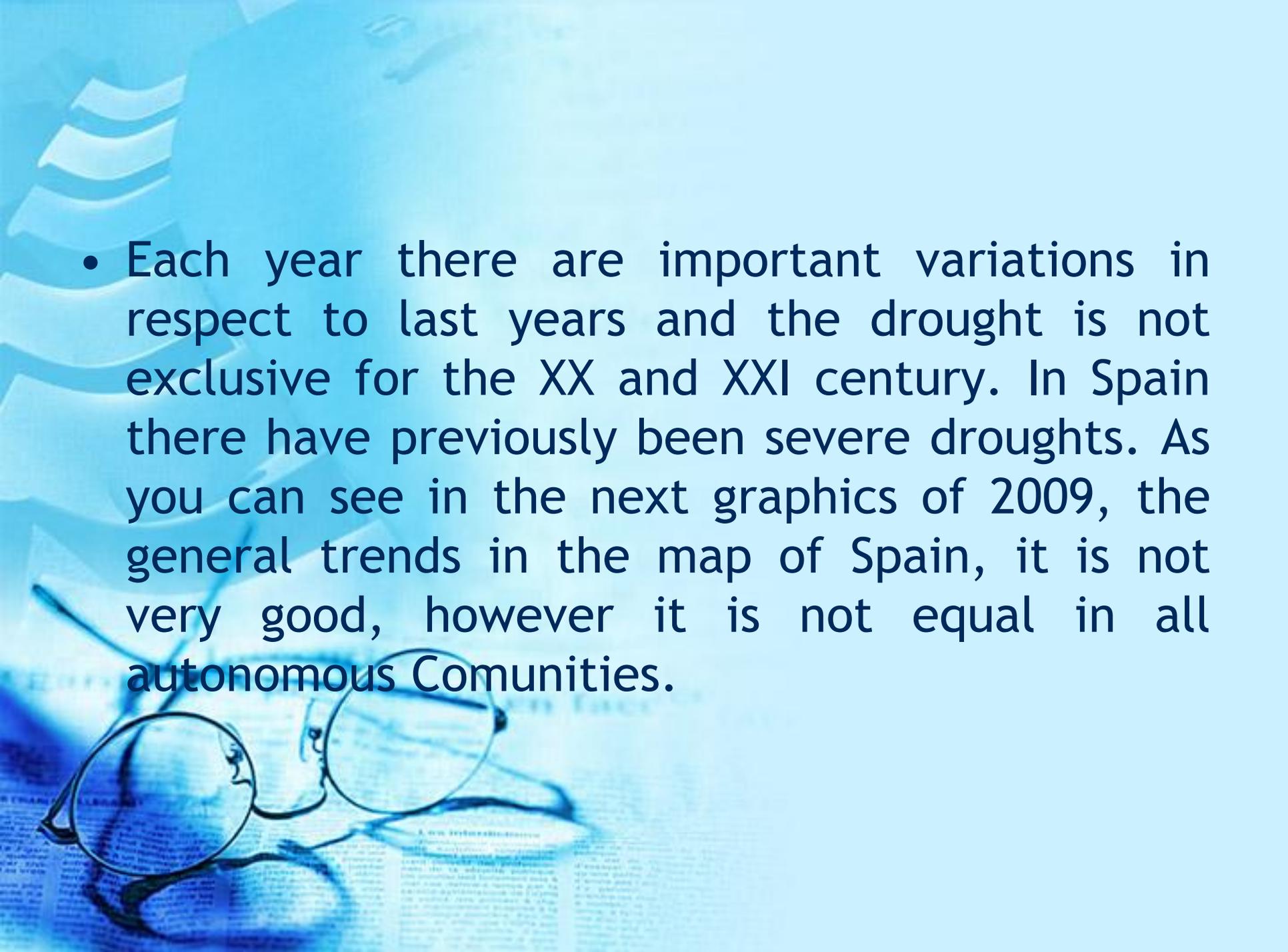
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- However if we want to go back further it has been found images of similar kind of deposits in the Egyptian hyroglyphics inside the pyramids.
 - Nowadays, the word pool has found its place as a term related to relaxation, sport, enjoyment and health.

1.2.- POSITIVE FUNDAMENTALS FOR USING A POOL

- Direct generation of employment
- Auxilliary industry that generates products for swimming pools.
- Use for therapeutic treatments and general health.
- Leisure and social activities
- Use for emergencies and heatwaves
- Used by the fire service to exstinguish fires.

1.3- DEFINITION OF DROUGHT AND ACTUAL TRENDS

- In general the definition drought is quite complex; the following are some of the concepts taken from different sources taking into account the multiple interpretations that exist around this definition :
- Prolonged absence, marked deficiency, or poor distribution of the precipitation in a determined place. Period with strong winds, low precipitation, high temperatures and usually low humidity in the air.

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- Each year there are important variations in respect to last years and the drought is not exclusive for the XX and XXI century. In Spain there have previously been severe droughts. As you can see in the next graphics of 2009, the general trends in the map of Spain, it is not very good, however it is not equal in all autonomous Communities.

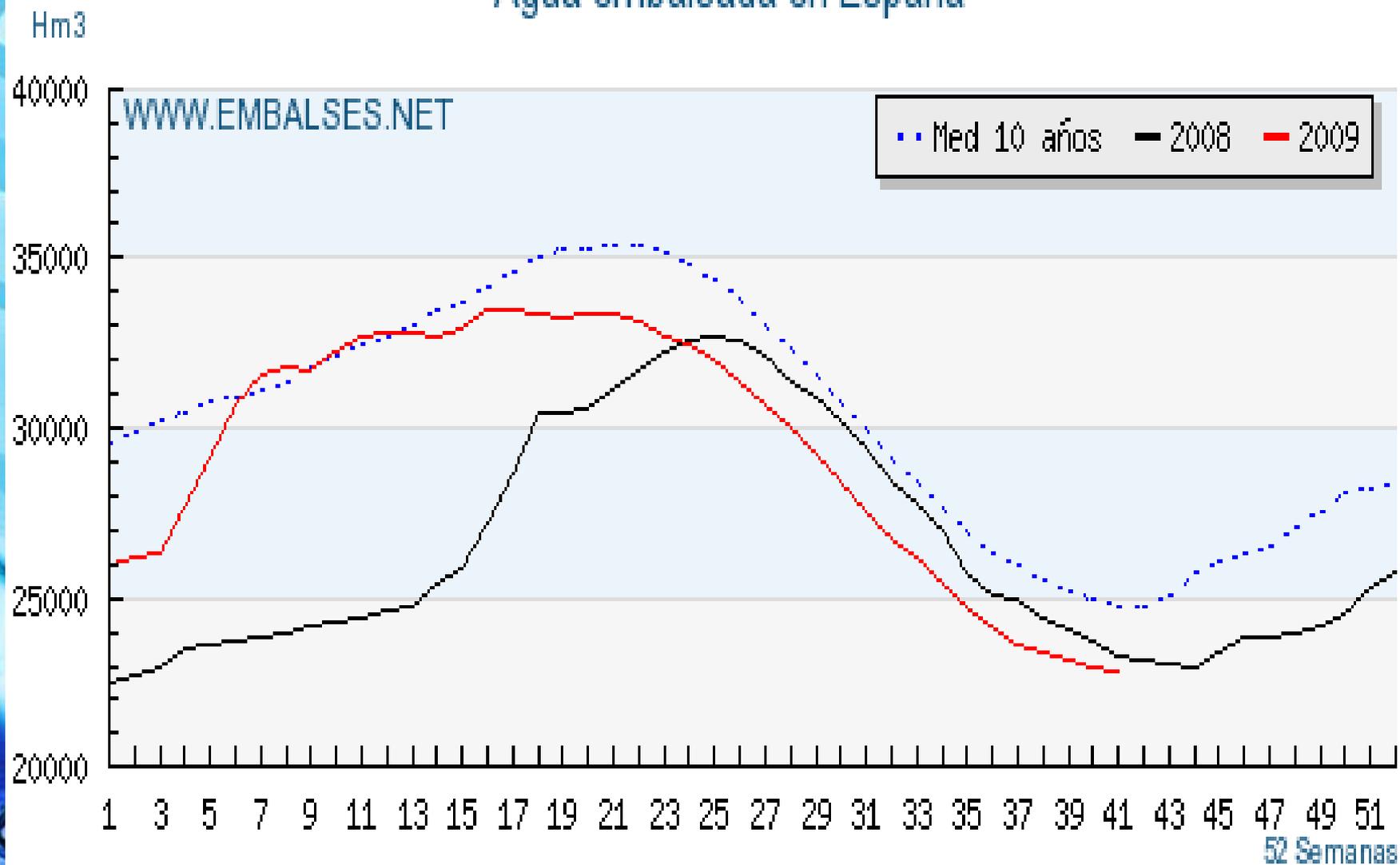
DATOS POR COMUNIDADES AUTONOMAS 3-10-2009

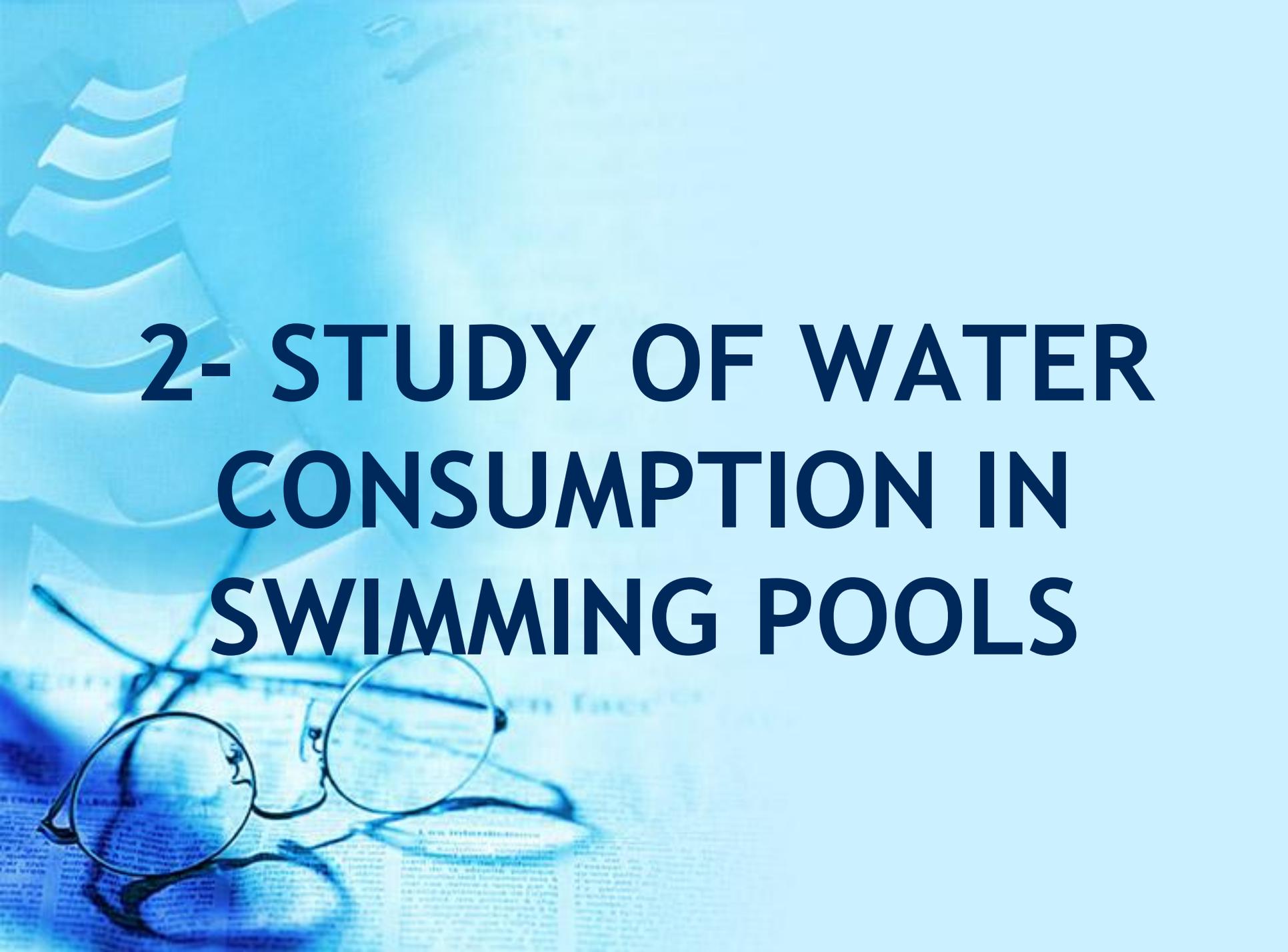
Region	Capacity	Water reserve		Variation	
Andalucía	10518	4028	(38.30%)	-19	(-0.18%)
Aragón	4326	2240	(51.78%)	-29	(-0.67%)
Asturias	509	312	(61.30%)	-27	(-5.30%)
Cantabria	586	366	(62.46%)	-7	(-1.19%)
Castilla y León	8248	3944	(47.82%)	-46	(-0.56%)
Castilla-La Mancha	5744	1286	(22.39%)	-3	(-0.05%)
Cataluña	1939	1257	(64.83%)	7	(0.36%)
Comunidad de Madrid	1060	610	(57.55%)	-12	(-1.13%)
Comunidad Valenciana	2461	855	(34.74%)	-3	(-0.12%)
Extremadura	14225	5427	(38.15%)	11	(0.08%)
Galicia	3220	1985	(61.65%)	-28	(-0.87%)
La rioja	136	26	(19.12%)	-1	(-0.74%)
Navarra	1019	271	(26.59%)	-7	(-0.69%)
País Vasco	244	153	(62.70%)	-3	(-1.23%)
Región de Murcia	137	22	(16.06%)	0	(0.00%)

Water reserve in Spain

Water reserve (13-10-2009):	22782 Hm ³	41.95 %
Variation with last week:	167 Hm ³	-0.31 %
Total capacity of water reservoirs:	54308 Hm ³	100 %
Same week (2008):	23320 Hm ³	42.94 %
Variation respect to 13-10-2009		-0,99 %
Same week in average (10 years):	24787 Hm ³	45.64 %
Variation respect to 13-10-2009		-3,69 %

Agua embalsada en España





2- STUDY OF WATER CONSUMPTION IN SWIMMING POOLS

EVAPORATION

- Hypothesis starting point:
- Private pool: 8x4x1,5 m.
- Private pool: 8x5x1,5 m.
- Private pool: 9x5x1,5 m.
- Community pool: 12x6x1,5 m.
- Public pool: 20x10x1,75 m.

	FAPS	Hispagua	Table MOPT	Article el País	Formel of Visentini
mm/year	598,60	1.131,50	1.318,00	2.000,00	2.100,00
l/(day x m2)	1,64	3,10	3,61	5,48	5,75

Evaporation Chart of MOPT

	Evaporation l/day	Evaporation l/month	Evaporation l/year	Evaporation m3/year
8x4x1,5	115,6	3.466,5	42.176,0	42,2
8x5x1,5	144,4	4.333,2	52.720,0	52,7
9x5x1,5	162,5	4.874,8	59.310,0	59,3
12x6x1,5	260,0	7.799,7	94.896,0	94,9
20x10x1,75	722,2	21.665,8	263.600,0	263,6

Covered Pools

Evaporation: 4,8l/ (day x m²)

	Evaporation l/day	Evaporation l/month	Evaporation l/year	Evaporation m ³ /year
8x4x1,5	153,6	4.608,0	56.064,0	56,1
8x5x1,5	192,0	5.760,0	70.080,0	70,1
9x5x1,5	216,0	6.480,0	78.840,0	78,8
12x6x1,5	345,6	10.368,0	126.144,0	126,1
20x10x1,75	960,0	28.800,0	350.400,0	350,4

LEAKS

- Hypothesis start point:
- The leaks of a swimming pool are considered a variable, depending on the age of the pool.
- Less than 5 years: 0%
- Between 5 and 10 years: 2%
- More than 10 years: 5%
- Taking into account the facts of the market, we would have an average loss of 2,945% per year.

	Leaks in l/day	Leaks in l/month	Leaks in l/año	Leaks in m ³ /year
8x4x1,5	3,9	116,2	1.413,6	1,4
8x5x1,5	4,8	145,2	1.767,0	1,8
9x5x1,5	5,4	163,4	1.987,9	2,0
12x6x1,5	8,7	261,4	3.180,6	3,2
20x10x1,75	28,2	847,2	10.307,5	10,3

BACKWASH

PRIVATE POOLS

Hypothesis start point :

Recirculation of the whole pool volume :
4 hours

Backwash every 2 weeks.

Backwash of 5 minutes.

Pools of continuous use

	Backwash l/day	Backwash l/month	Backwash l/year	Backwash m3/year
8x4x1,5	71,4	2.142,9	26.071,4	26,1
8x5x1,5	89,3	2.678,6	32.589,3	32,6
9x5x1,5	100,4	3.013,4	36.662,9	36,7
12x6x1,5	160,7	4.821,4	58.660,7	58,7

Summer Pools (4 months of usage)

	Backwash l/day	Backwash l/month	Backwash l/year	Backwash m3/year
8x4x1,5	23,8	714,3	8.690,5	8,7
8x5x1,5	29,8	892,9	10.863,1	10,9
9x5x1,5	33,5	1.004,5	12.221,0	12,2
12x6x1,5	53,6	1.607,1	19.553,6	19,6

BACKWASH

- **PUBLIC POOLS**

Hypothesis start point :

Recirculation of the whole pool volume :
3 hours

Backwash every week.

Backwash of 5 minutes.

Pools of continuous use

	Backwash l/day	Backwash l/month	Backwash l/year	Backwash m ³ /year
20x10x1,75	1.381,0	41.428,6	504.047,6	504,0

Summer Pools (4 months of usage)

	Backwash l/day	Backwash l/month	Backwash l/year	Backwash m ³ /year
20x10x1,75	463,0	13.888,8	168.980,5	169,0

EMPTYING THE POOL AT END OF SEASON

	Emptying l/day	Emptying l/month	Emptying l/year	Emptying m ³ /year
8x4x1,5	131,5	3.945,2	48.000,0	48,0
8x5x1,5	164,4	4.931,5	60.000,0	60,0
9x5x1,5	184,9	5.547,9	67.500,0	67,5
12x6x1,5	295,9	8.876,7	108.000,0	108,0
20x10x1,75	958,9	28.767,1	350.000,0	350,0

RENOVATION OF 5% PER DAY

- Pools of continuous use

	Renovation 5% l/day	Renovation 5% l/month	Renovation 5% l/year	Renovation 5% m3/year
20x10x1,75	17.500,0	525.000,0	6.387.500,0	6.387,5

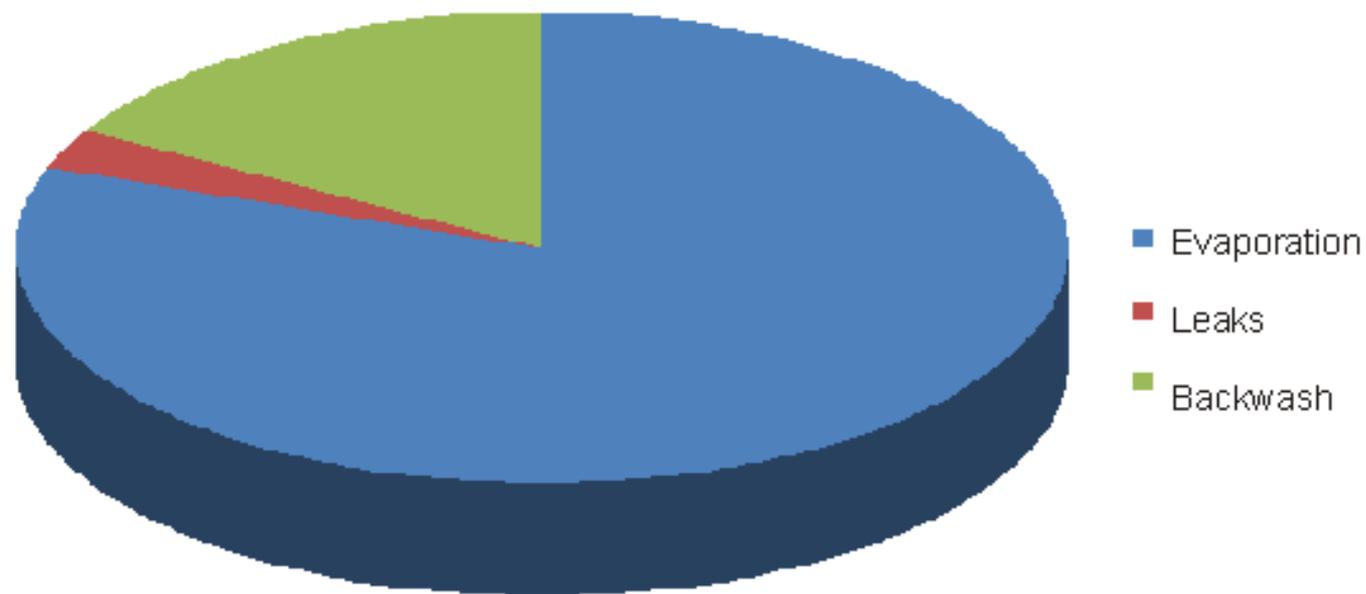
- Summer Pools(4 months of usage)

	Renovation 5% l/day	Renovation 5% l/month	Renovation 5% l/year	Renovation 5% m3/year
20x10x1,75	5.833,3	175.000,0	2.129.166,7	2.129,2

TOTAL CONSUMPTION(l/day) PRIVATE SUMMER POOLS WITHOUT EMPTYING

	8x4x1,5	8x5x1,5	9x5x1,5	12x6x1,5	%
Evaporation	115,6	144,4	162,5	260,0	80,67%
Leaks	3,9	4,8	5,4	8,7	2,70%
Backwash of filters	23,8	29,8	33,5	53,6	16,62%
TOTAL	143,2	179,0	179,0	322,3	

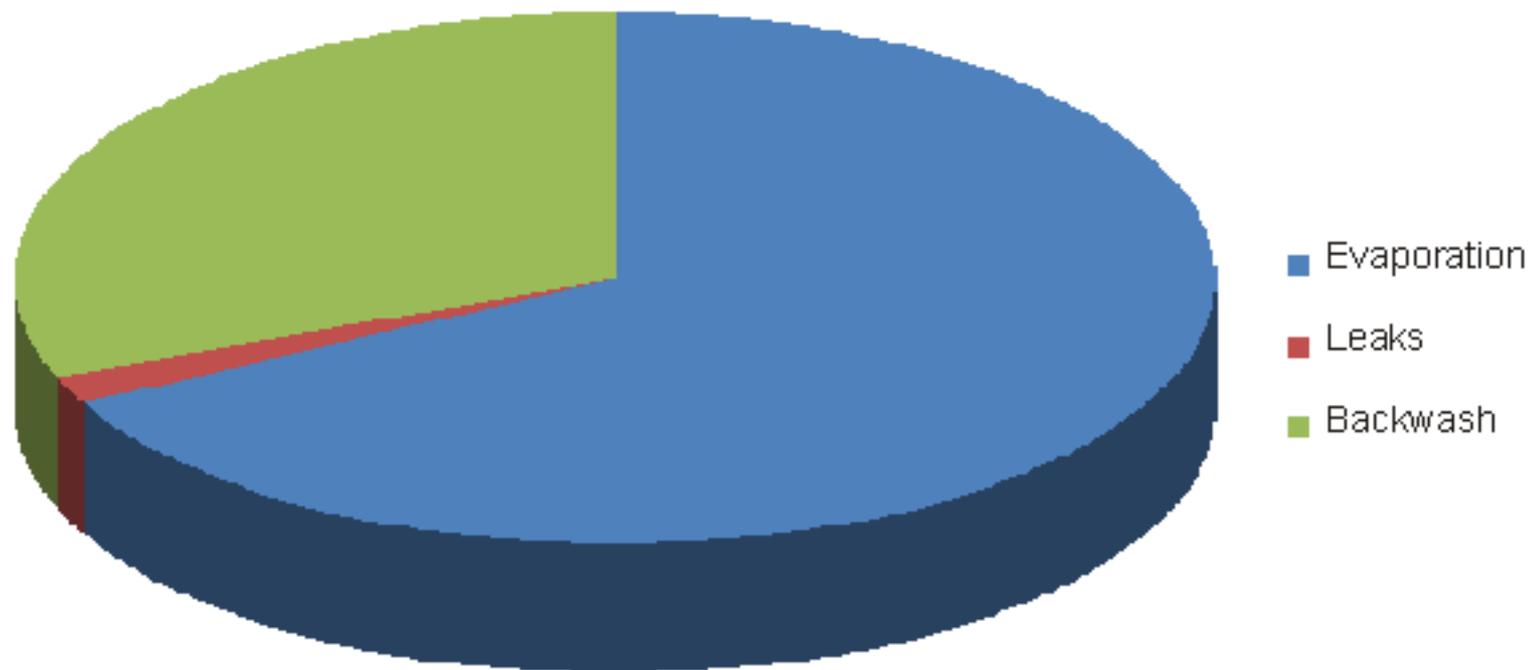
TOTAL CONSUMPTION (l/day) PRIVATE SUMMER POOLS WITHOUT EMPTYING



TOTAL CONSUMPTION(l/day) COVERED PRIVATE SUMMER POOLS WITHOUT EMPTYING

	8x4x1,5	8x5x1,5	9x5x1,5	12x6x1,5	%
Evaporation	153,6	192,0	216,0	345,6	67,10%
Leaks	3,9	4,8	5,4	8,7	1,69%
Backwash of filters	71,4	89,3	100,4	160,7	31,20%
TOTAL	228,9	286,1	321,9	515,0	

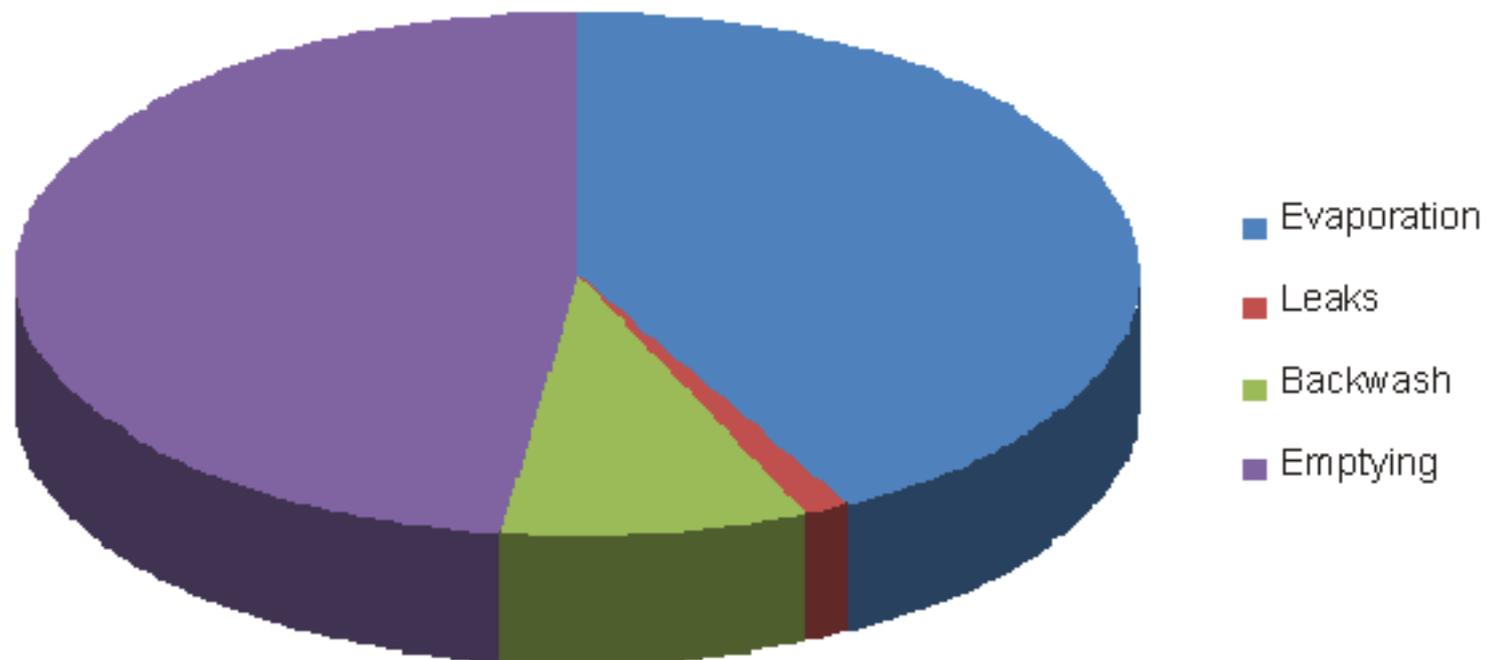
TOTAL CONSUMPTION (l/day) COVERED PRIVATE SUMMER POOLS WITHOUT EMPTYING



TOTAL CONSUMPTION(l/day) PRIVATE SUMMER POOLS WITH EMPTYING

	8x4x1,5	8x5x1,5	9x5x1,5	12x6x1,5	%
Evaporation	115,6	144,4	162,5	260,0	42,06%
Leaks	3,9	4,8	5,4	8,7	1,41%
Backwash of filters	23,8	29,8	33,5	53,6	8,67%
Emptying	131,5	164,4	184,9	295,9	47,87%
TOTAL	274,7	343,4	386,4	618,2	

TOTAL CONSUMPTION (l/day) PRIVATE SUMMER POOLS WITH EMPTYING

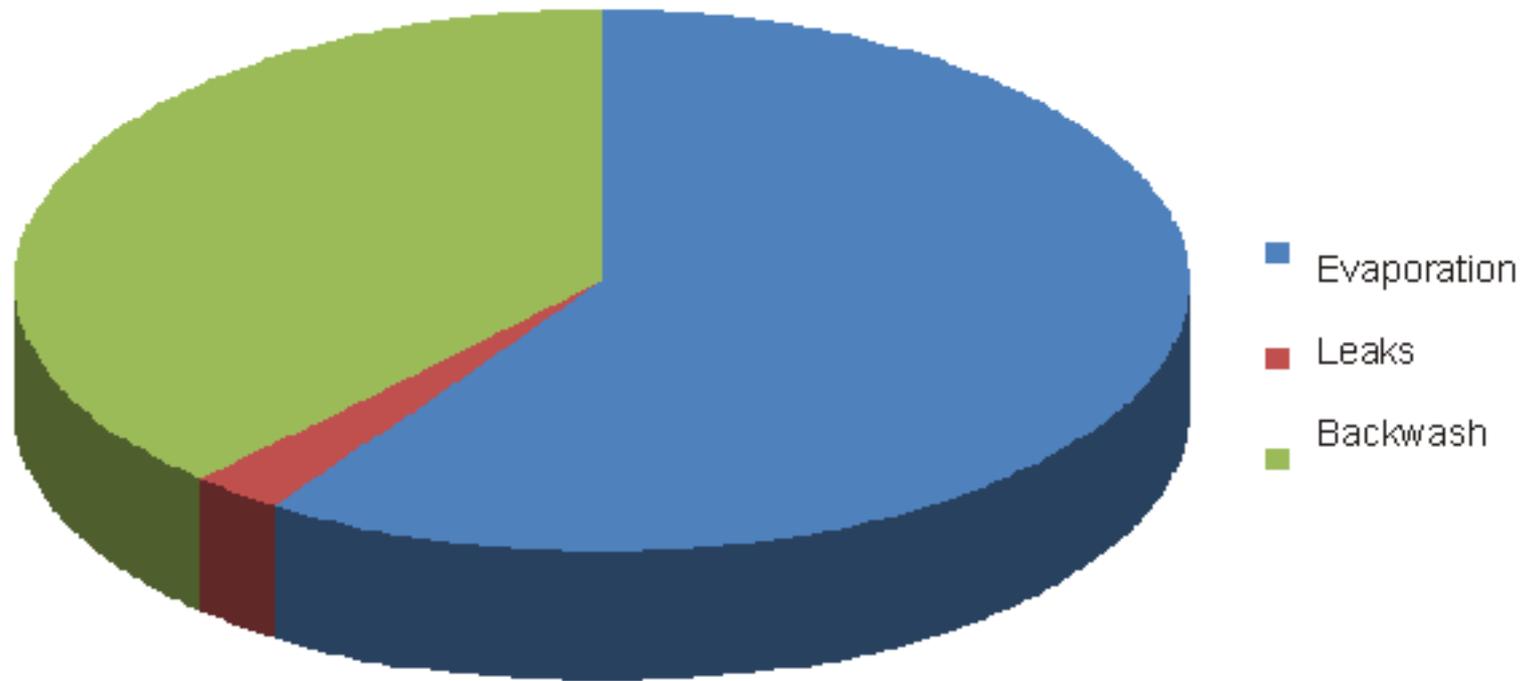


TOTAL CONSUMPTION (l/day) PUBLIC SUMMER POOLS WITHOUT EMPTYING

- Pools of continuous use

	20x10x1,75	%
Evaporation	722,2	59,52%
Leaks	28,2	2,33%
Backwash of filters	463,0	38,15%
TOTAL	1.213,4	

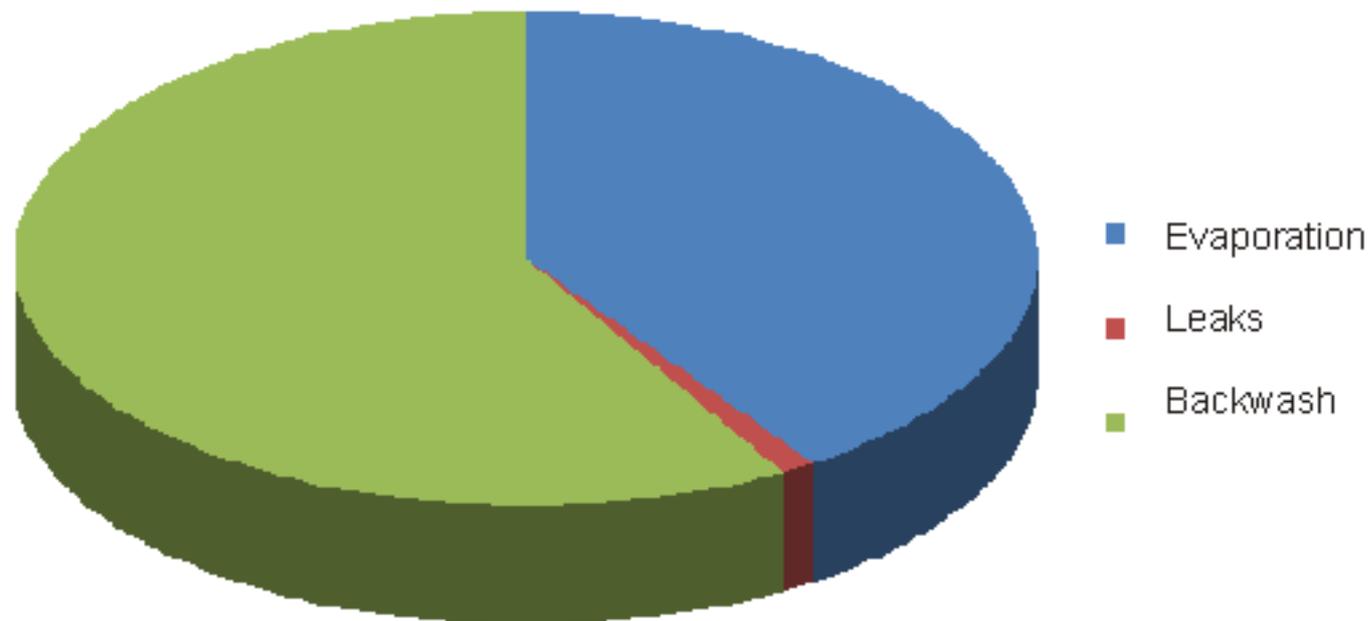
TOTAL CONSUMPTION (l/day) PUBLIC SUMMER POOLS WITHOUT EMPTYING



TOTAL CONSUMPTION (l/day) PUBLIC COVERED POOLS WITHOUT EMPTYING

	20x10x1,75	%
Evaporation	960,0	40,52%
Leaks	28,2	1,19%
Backwash filters	1.381,0	58,29%
TOTAL	2.369,2	

TOTAL CONSUMPTION (l/day) PUBLIC COVERED SUMMER POOLS WITHOUT EMPTYING

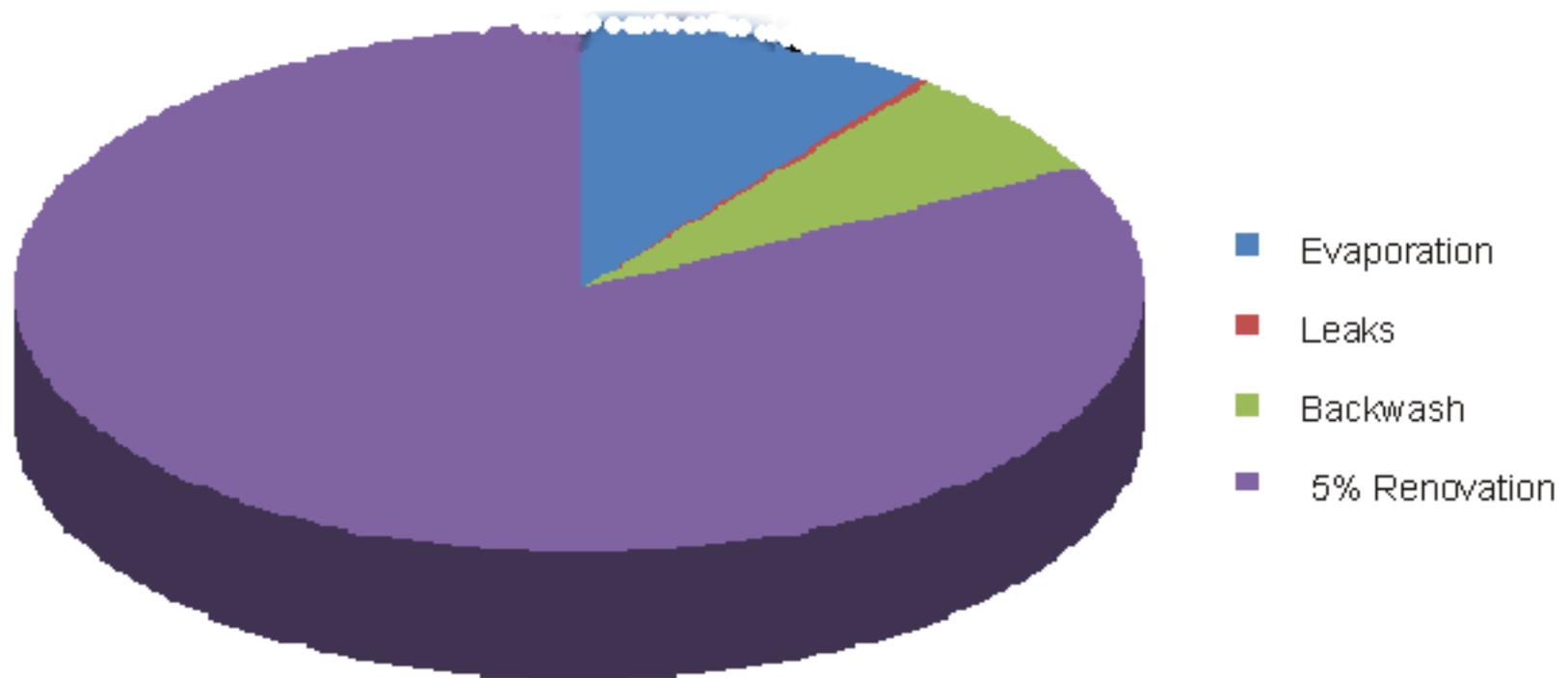


TOTAL CONSUMPTION (l/day) 5% RENOVATION PUBLIC SUMMER POOLS WITHOUT EMPTYING

- Pools of continuous use

	20x10x1,75	%
Evaporation	722,2	10,25%
Leaks	28,2	0,40%
Backwash filters	463,0	6,57%
5% Renovation	5.833,3	82,78%
TOTAL	7.046,7	

TOTAL CONSUMPTION (l/day) 5% RENOVATION PUBLIC SUMMER POOLS WITHOUT EMPTYING

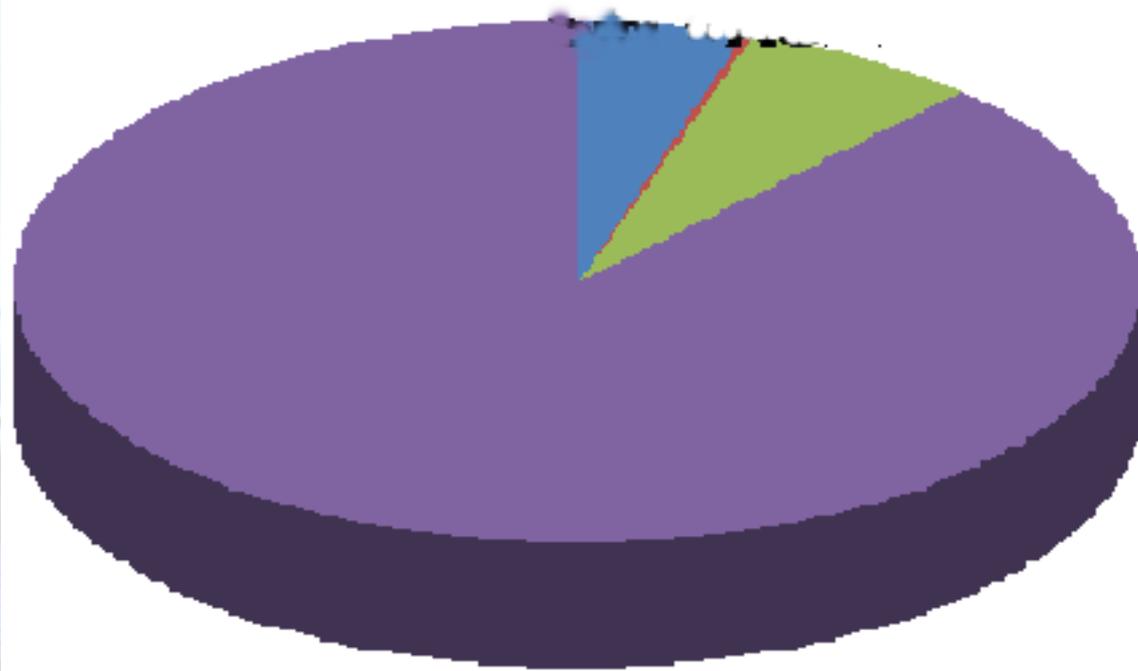


TOTAL CONSUMPTION (l/day) 5% RENOVATION PUBLIC COVERED POOLS WITHOUT EMPTYING

- Pools of continuous use

	20x10x1,75	%
Evaporation	960,0	4,83%
Leaks	28,2	0,14%
Backwash filters	1.381,0	6,95%
5% Renovation	17.500,0	88,08%
TOTAL	19.869,2	

**TOTAL
CONSUMPTION (l/day)
5% RENOVATION
PUBLIC COVERED POOLS
WITHOUT EMPTYING**



- Evaporation
- Leaks
- Backwash
- 5% Renovation

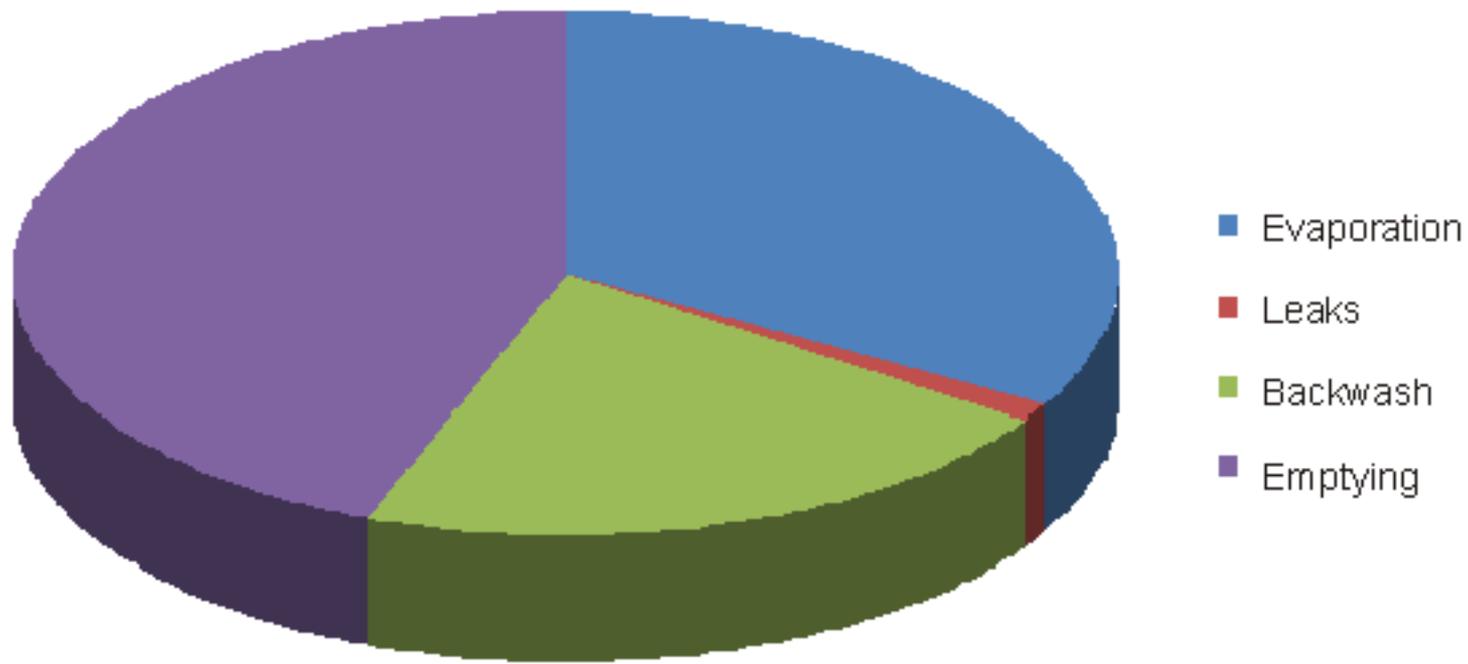
TOTAL CONSUMPTION (l/day)

PIUBLIC SUMMER POOLS WITH EMPTYING

- Pools of continuous usage

	20x10x1,75	%
Evaporation	722,2	33,25%
Leaks	28,2	1,30%
Backwash filters	463,0	21,31%
Emptying	958,9	44,14%
TOTAL	2.172,3	

TOTAL CONSUMPTION (l/day) PUBLIC SUMMER POOLS WITH EMPTYING

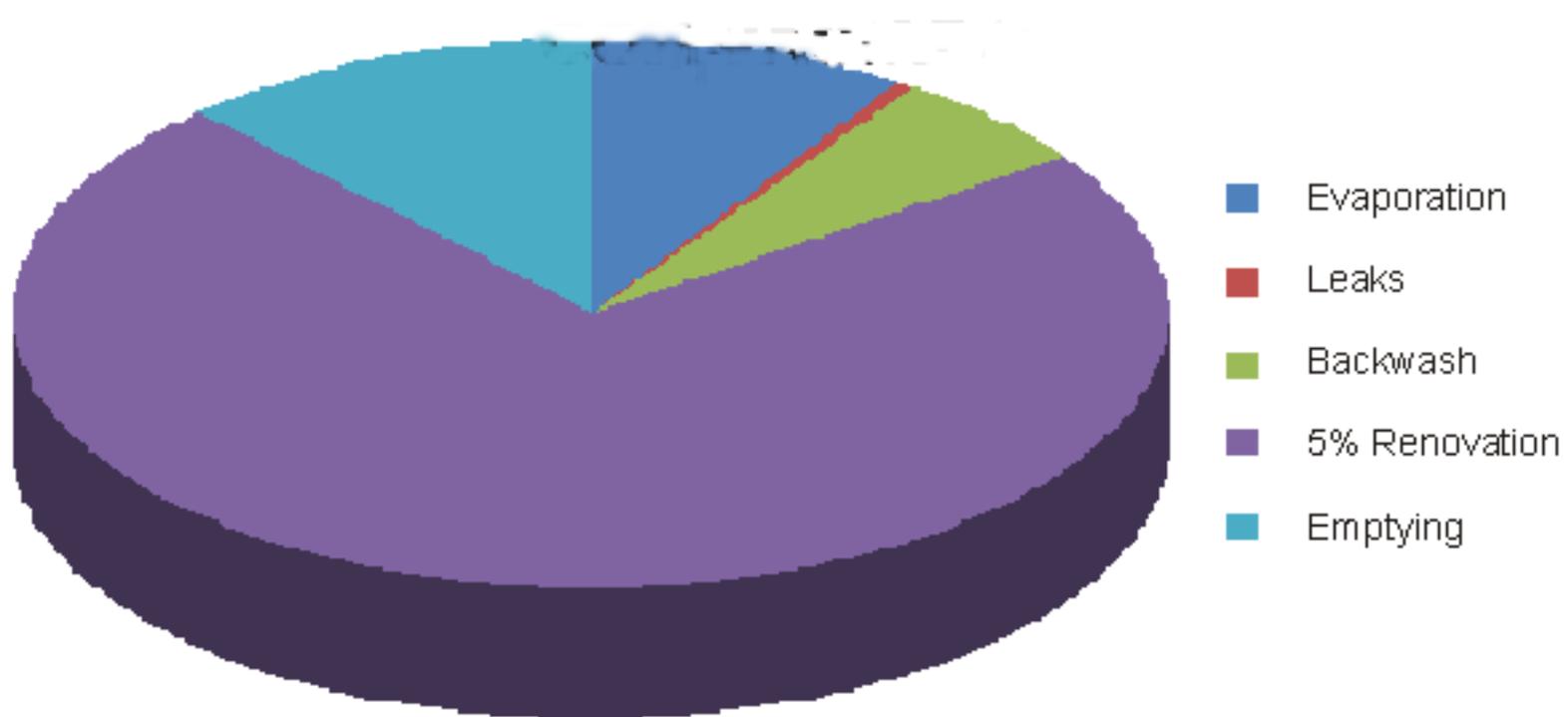


TOTAL CONSUMPTION (l/day) 5% RENOVATION PUBLIC SUMMER POOLS WITH EMPTYING

- Pools of continuous usage

	20x10x1,75	%
Evaporation	722,2	9,02%
Leaks	28,2	0,35%
Backwash filters	463,0	5,78%
Emptying	958,9	11,98%
5% Renovation	5.833,3	72,87%
TOTAL	8.005,6	

TOTAL CONSUMPTION (l/day) 5% RENOVATION PUBLIC SUMMER POOLS WITH EMPTYING



CONSUMPTION PER CAPITA

- Hypothesis start point :
 - Emptying the pool once a year.
 - Private Pool: 5 users. Average consumption of water: 372,48 l/day
 - Community Pool: 20 families of 5 members.
 - Public Pool: 1.000 users.

	Daily water consumption (l/day)
Private Summer Pool	74,5
Community Summer Pool	6,2
Públic Summer Pool	2,2

- Hypothesis start point :

- Emptying the pool once every 5 years.
- Private Pool: 5 users. Average consumption of water: 232,64 l/day
- Community Pool: 20 families of 5 members.
- Public Pool: 1.000 users.

	Daily water consumption per person (l/day)
Private Summer Pool	46,5
Community Summer Pool	3,8
Públic Summer Pool	1,4
Public Covered Pool	2,6



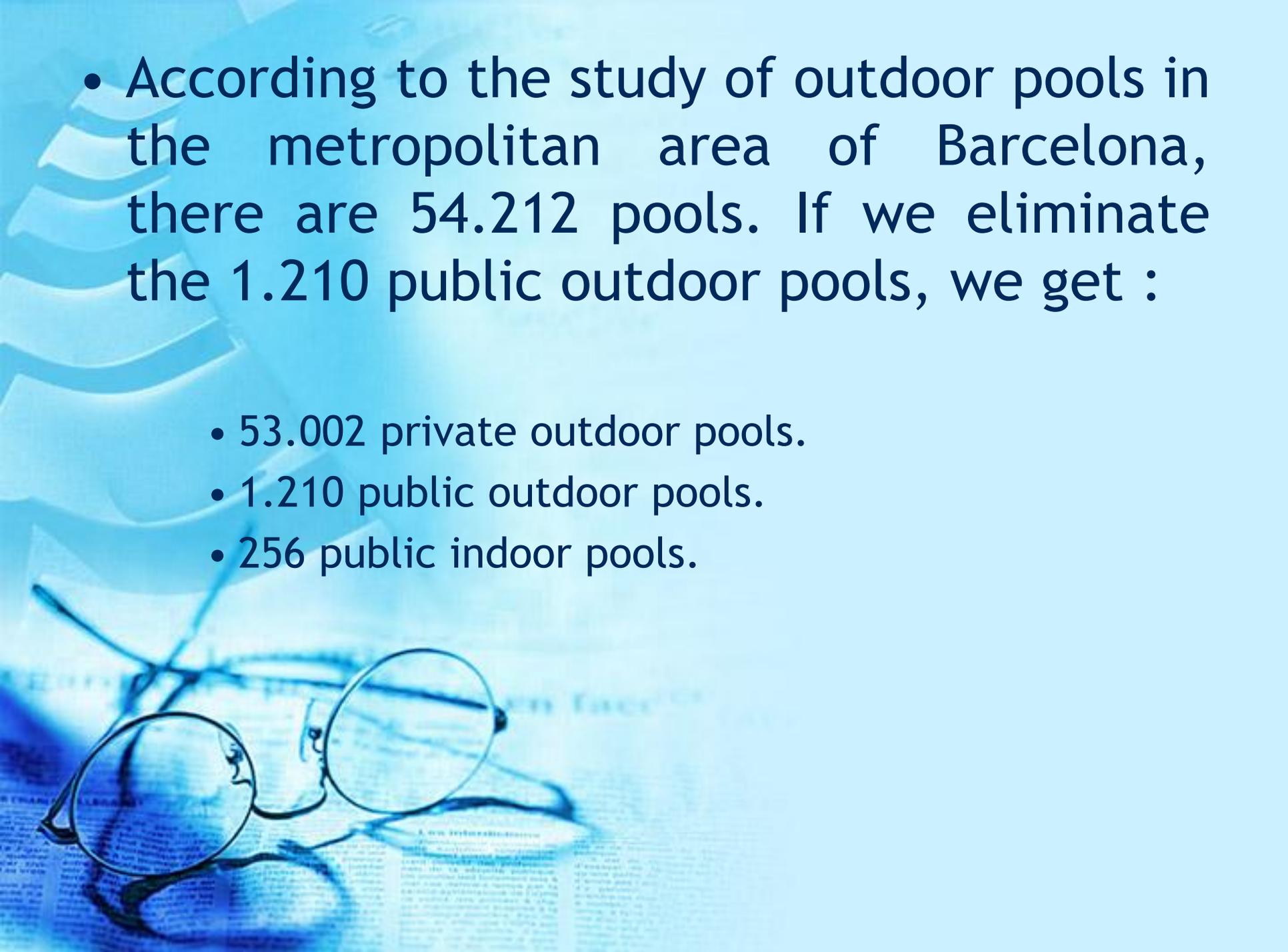
**3.- REPERCUSSION OF THE
COST OF THE WATER IN
RESPECT TO THE SCOPE OF
GLOBAL WATER CONSUMPTION**

3.1.-Census of Pools

- We have taken into account three studies in order to achieve the most precise census of pools possible :
 - National Census of Sport Installations of 2005 realized by The Ministry of Education and Science and the Sports Council.
 - Studies realized on the outdoor swimming pools in Barcelona metropolitan area.
 - Market study realized with Marketaad about private swimming pools in Spain.

The background of the slide is a light blue-tinted image. It depicts a hand holding a pen, poised to write on a newspaper. A pair of round-rimmed glasses is resting on the newspaper in the lower-left foreground. The overall aesthetic is professional and academic.

If we transfer these studies and take into account the population of each region of Spain, or the proportion to the public installations, we can get an approximate number of global swimming pools. With this study together with the market study we can determine a quite exact amount.

The background of the slide features a stack of papers and a pair of round-rimmed glasses resting on top of them. The entire scene is rendered in a monochromatic blue color scheme, with varying shades of light and dark blue creating a textured, layered effect. The papers appear to be documents or reports, with some text and lines visible but mostly blurred. The glasses are positioned in the lower-left quadrant, with their frames and lenses clearly defined against the papers.

- According to the study of outdoor pools in the metropolitan area of Barcelona, there are 54.212 pools. If we eliminate the 1.210 public outdoor pools, we get :

- 53.002 private outdoor pools.
- 1.210 public outdoor pools.
- 256 public indoor pools.

At this point we have to continue with the following two hypotheses :

HYPOTHESIS IN BASE TO THE POPULATION

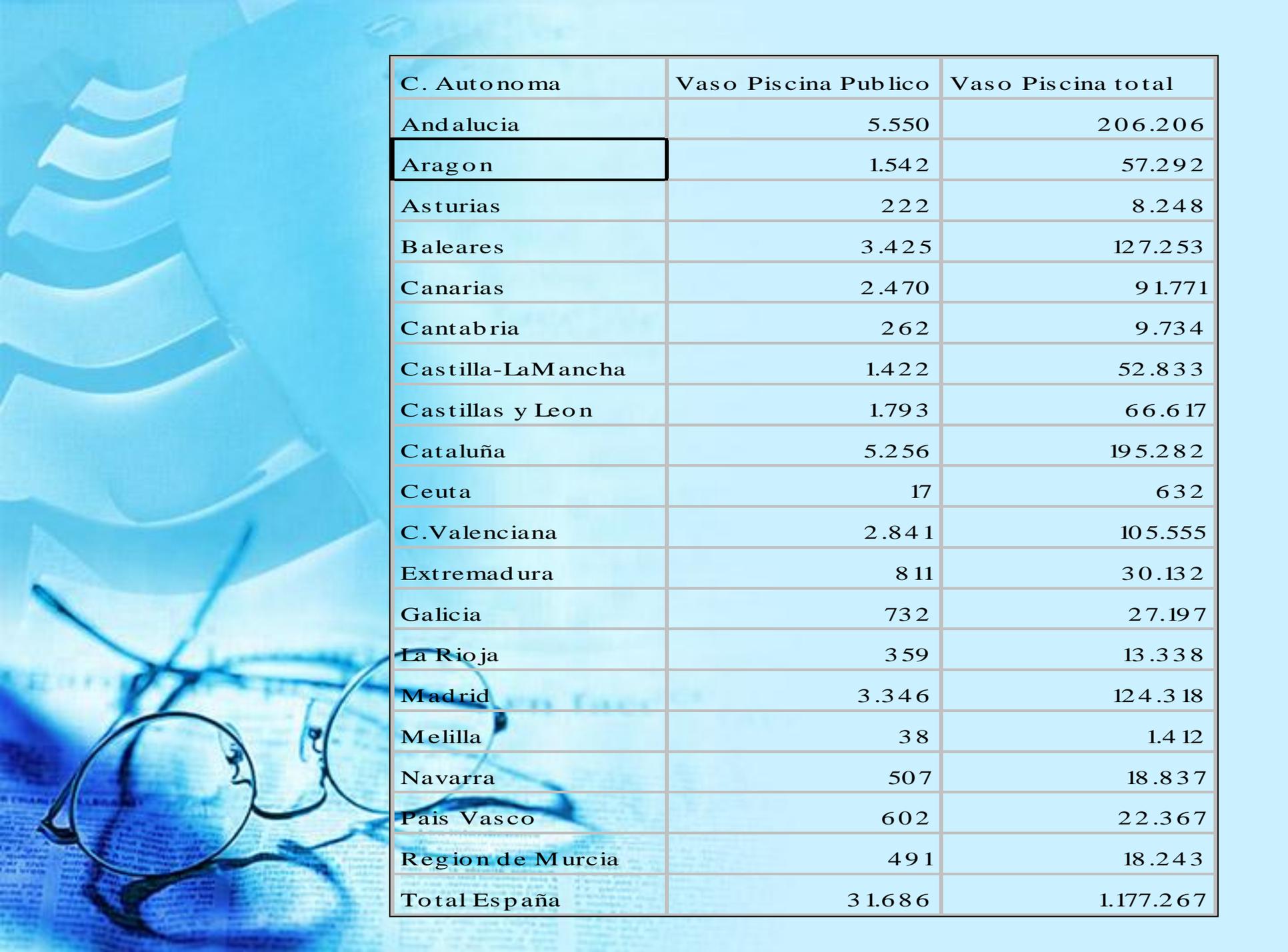
Calculate the number of pools per Autonomous Communities in base to the population and taking as reference the 54.468 pools for 5.309.404 habitants. According to the ratio 0'0102588 pools/ habitant with a total of 44.708.964 habitants $\times 0'0102588 = 458.660$ pools in Spain.



C. Autonoma	Poblacion	Nº piscinas
Andalucia	7.975.672	8 1.82 1
Aragon	1.277.471	13.105
Asturias	1.076.896	11.048
Baleares	1.001.062	10.270
Canarias	1.995.833	20.475
Cantabria	568.091	5.828
Castilla-LaMancha	1.932.261	19.823
Castillas y Leon	2.523.020	25.883
Cataluña	7.134.697	73.193
Ceuta	75.861	778
C.Valenciana	4.806.908	49.313
Extremadura	1.086.373	11.145
Galicia	2.767.524	28.391
La Rioja	306.377	3.143
Madrid	6.008.183	61.637
Melilla	66.871	686
Navarra	601.874	6.175
Pais Vasco	2.133.684	21.889
Region de Murcia	1.370.306	14.058
Total España	44.708.964	458.660

HYPOTHESIS IN BASE TO THE PROPORTION OF PUBLIC POOLS

Calculating that for each 1.466 public pool (1.210 outdoor + 256 indoor pools in the metropolitan area of Barcelona) there exists a total of 54.468 public and private pools, it means that in Spain, with a total of 31.686 public pools, we have a total of 1.177.270 pools.



C. Autonoma	Vaso Piscina Publico	Vaso Piscina total
Andalucia	5.550	206.206
Aragon	1.542	57.292
Asturias	222	8.248
Baleares	3.425	127.253
Canarias	2.470	91.771
Cantabria	262	9.734
Castilla-LaMancha	1.422	52.833
Castillas y Leon	1.793	66.617
Cataluña	5.256	195.282
Ceuta	17	632
C.Valenciana	2.841	105.555
Extremadura	811	30.132
Galicia	732	27.197
La Rioja	359	13.338
Madrid	3.346	124.318
Melilla	38	1.412
Navarra	507	18.837
Pais Vasco	602	22.367
Region de Murcia	491	18.243
Total España	31.686	1.177.267

BASE OF THE STUDY OF THE MARKET WITH REAL DATA ABOUT PRIVATE SWIMMING POOLS.

In this section the study has taken into account the existing homes in Spain, coming to a conclusion that there are 1.112.000 private swimming pools.

To this data it had to be added 23.734 public outdoor pools and the 2.751 public indoor pools reflected in the National Census of Sport Installations.

ESPAÑA	Nbr. Homes	Extrapolation in pools
ZONA 1: CATALUÑA	4.131.018	198.650
ZONA 2: BALEARES	592.369	51.772
ZONA 3: LEVANTE	3.560.163	139.954
ZONA 4: SUR	4.367.097	267.095
ZONA 5: MADRID	3.143.807	130.484
ZONA 6: CENTRO	5.018.892	153.709
ZONA 7: NORTE	3.699.989	153.569
ZONA 8: CANARIAS	986.665	17.229
TOTAL	25.500.000	1.112.000
PUBLIC POOLS NATIONAL CENSUS OF SPORT INSTALATIONS		26.485
TOTAL PRIVATE AND PUBLIC POOLS IN SPAIN		1.138.485

TOTAL PRIVATE AND PUBLIC POOLS IN SPAIN : 1.138.485

As the study in base to the proportion with public pools and the study of the market show a very similar amount, we will continue with this estimation in the future.

3.2.- Calculation of the total volume of water in pools

- Public pools: This section is clear and thanks to the National Census of Sport Installations from 2005 where we have a total of 31.686 pools.
 - 23.734 outdoor pools with 5.177.882 m² of water surface.
 - 7.952 indoor pools with a water surface of 620.410 m²..

According to the study, the average depth of the indoor pools are between 1,46 m and 2,05m so we get a result of 5.798.292 m² x 1,75 m average depth = 10.147.011 Mah of water, which means 10,15 HMG

- Private pools: Taking into account that the result of private pools are 1.112.000 and a surface of 43.239.008 m² from the market study and a average depth of 1,5 m, we obtain a total water volume of 64.858.512 Mah, which means 64,86 HMG.
- The average size of a private pool has been reduced very much in respect to the las study (14 x 7) :

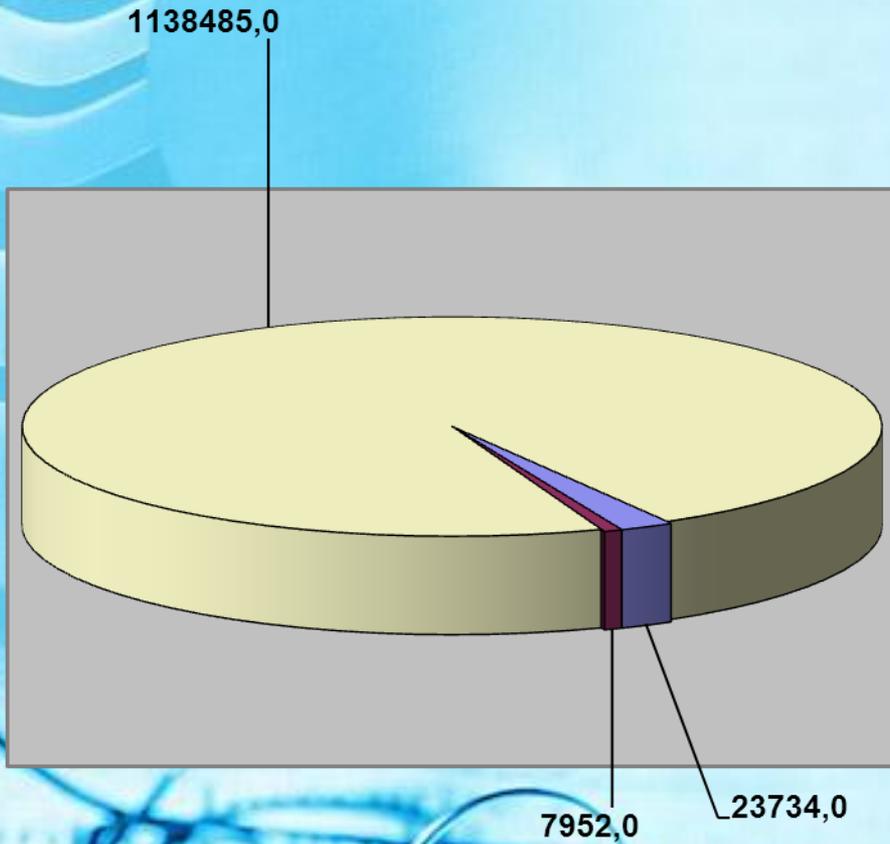
Average study	m2	Dimensions	Percentage	Nº pools	Total Surface
Less than 32 M2	32	8 X 4	42,70%	474.824	15.194.368
Between 32 and 40 M2	40	8 X 5	27,90%	310.248	12.409.920
Between 40 and 50 M2	45	9 X 5	12,80%	142.336	6.405.120
Mmore than 50 M2	50	10 X 5	16,60%	184.592	9.229.600
			100,00%	1.112.000	43.239.008

**Average surface 44.268.851 m2 / 1.138.485 pools =
38,88 m2 around 8m x 5m**

**AVERAGE SIZE OF A PRIVATE POOL IN
SPAIN:**

38,88 m2 8 m X 5 m

NUMBER OF POOLS IN SPAIN



■ Public outdoor pools

■ Public indoor pools

■ Private pools

Conclusions

1. The capacity of content of water in all pools is around 64,86 HMG in private pools + 10,15 HMG in public pools, that means, 75,01 HMG.

**CAPACITY OF CONTENT OF WATER
IN THE POOLS IN SPAIN: 75,01 Hm²**

If the total capacity of content of water according to the Ministry of environment is 53.252 HMG in December 2006 we are talking about 0,1408 %.

But in respect to the content of water from the 6th October 2009 (22.948 HMG) we talk about 0,3268 %.

Conclusions

In clearer examples this means(11.008 HMG from La Cuenca del Tajo) = 0,68 % from la cuenca del Tajo; 1,01 % from la cuenca del Ebro (7.402 HMG) or respect to the internal cuenca of Cataluña (740 HMG) is 10,14 %.

2. Another conclusión to study is how much does the water of pools represent in comparison to the loss of water in the general piping network per year.

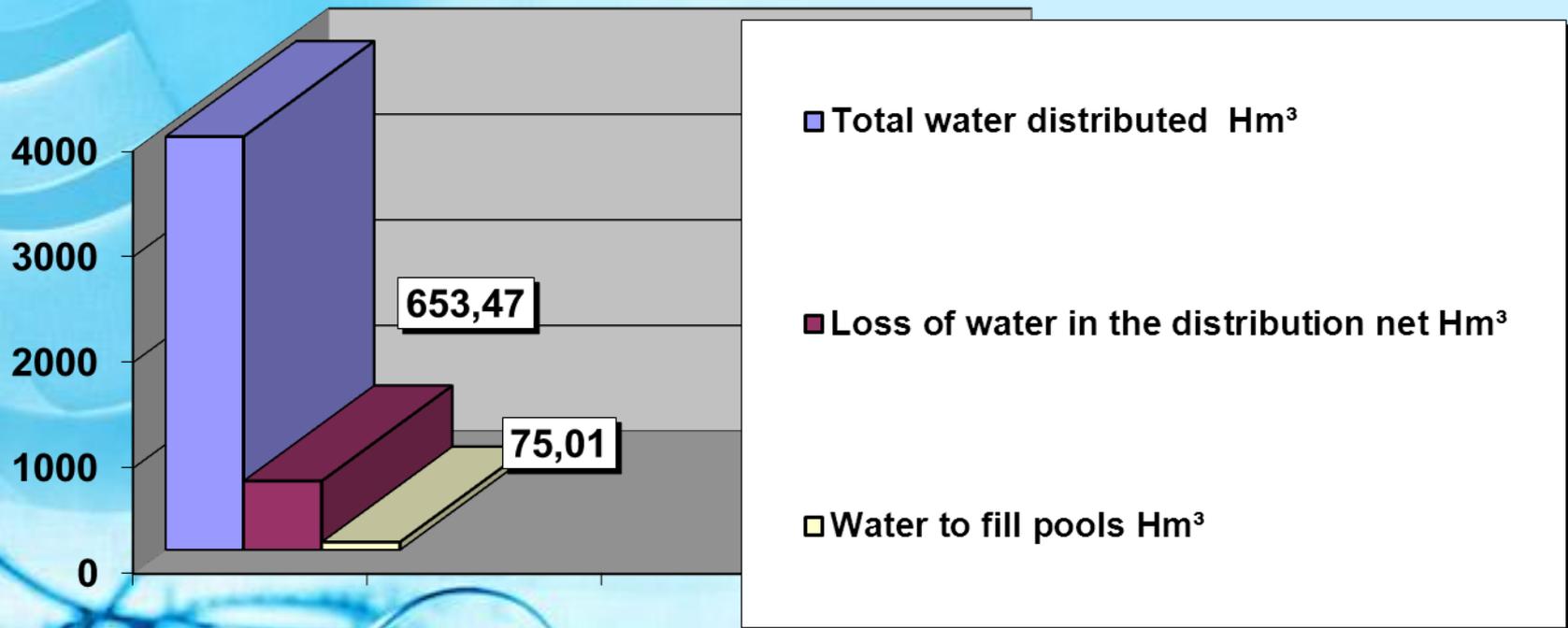
Conclusions

According to the INE (National Institute of Statistics), the study from 2006 about « Statistics and water indicators» show a loss of 16,7% in the distribution network, so taking into account that the distributed water is 3.913 HMG, the loss of water is then 653,47 HMG.

This means that filling all the pools in Spain is only 11,48% of the lost water in the distribution network in one year that on the other hand means that with the loss of water per year we could fill all the pools (private and public) during 4 years.

**THE FILLING OF ALL THE POOLS IN SPAIN IS ONLY
11,48% OF THE OVERALL LOSSES IN THE DISTRIBUTION NETWORK**

3913,0



3.3.- Consumption of the water in the pools in Spain

3.3.1.- Evaporation

Outdoor Pools:

Following the hypothesis of 1.112.000 outdoor private pools with a surface of (8 x 5) total of 43.239.008 m² and another 23.734 public outdoor pools with 5.177.882 m².

The consumption through evaporation in outdoor pools , with the data of MOPT (Ministry of Public Works) of 3,61 l/day per m², it would be for the 1.135.734 outdoor pool (48.416.890 m²) 63,80 Hm³.

Indoor Pools:

Taking into account the hypothesis of 7.952 indoor pools with a surface of 620.410 m², the consumption with an average of 4,8 l/day per m², would be 1,09 Hm³.

THE EVAPORATION IN SWIMMING POOLS IS 64,89 Hm³

3.3.2.- Backwash Lavados masa filtrante

If we consider the pools as in continuous use, according to the study of the market, around 89% of the private pools and 100% of the public pools, the consumption of water in backwashes is 43.66 Hm³.

	COEFICIENTE	AGUA EMBALSADA	CONSUMO
PRIVATE POOL MANTAINED THE HOLE YEAR (89%)	0,543	57,73	31,34
PRIVATE POOL NOT MANTAINED(11%)	0,18	7,13	1,28
PUBLIC POOL MANTAINED THE HOLE YEAR (100%)	1,0863	10,15	11,03
TOTAL CONSUMPTION OF BACKWASH Hm³			43,66

**THE CONSUMPTION OF WATER IN
BACKWASHES OF FILTER MEDIA IS
43,66 Hm³**

3.3.3.- Water losses

The water loss taking into account the market study of the age of the pools, considering that pools less than 5 years old should not leak, a pool between 5 and 10 years has a leak of 2% and more than 10 years a leak of 5% the result is shown in the following chart:

Age	percentage	Hm3	estimation water loss	loss in Hm3
less than 1 year	4,60%	3,45	0,00%	0,00
1 to 5 years	19,30%	14,48	0,00%	0,00
5 to 10 years	23,00%	17,25	2,00%	0,35
.+ 10 years	49,70%	37,28	5,00%	1,86
unknown	3,40%	2,55	2,00%	0,05
TOTAL LOSSES IN Hm3				2,26

THE TOTAL WATER LOSSES THROUGH LEAKS ARE ESTIMATED TO 2,26 Hm3

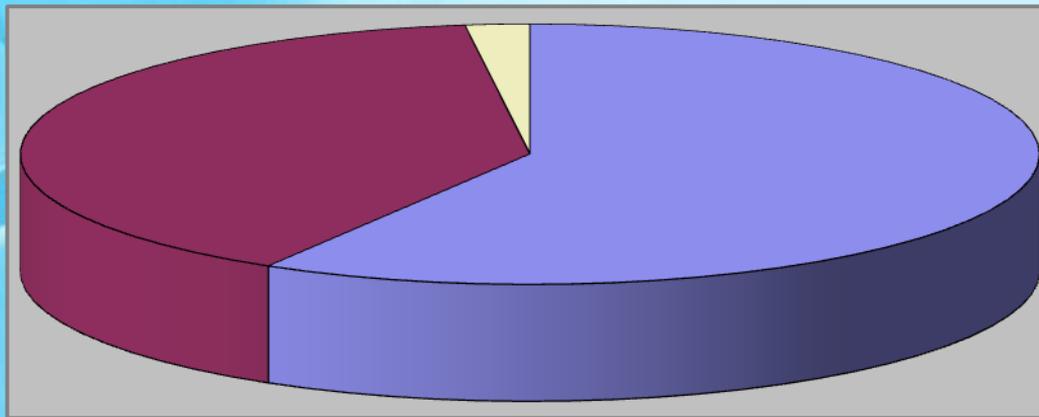
Conclusions

	Consumption evaporation	Consumption backwashes	Consumption leaks	Total
Public outdoor pool	6,82 Hm ³	9,84 Hm ³	0,28 Hm ³	16,94 Hm ³
Public indoor pool	1,09 Hm ³	1,19 Hm ³	0,03 Hm ³	2.31 Hm ³
Private outdoor pool	56,98 Hm ³	32,63 Hm ³	1,95 Hm ³	91,56 Hm ³
Private indoor pool	Not estimated	Not estimated	Not estimated
Totales Consumption	64,89 Hm³	43,66 Hm³	2,26 Hm³	110,81 Hm³

The total water consumption in swimming pools in one year is 110,81 Hm³, that means 147,73% of its total volume.

THE TOTAL WATER CONSUMPTION IN ONE YEAR IS 110,81 Hm³

GRAPHIC OF WATER CONSUMPTION



■ Consumption evaporation

■ Consumption backwash filter media

■ Consumption leaks

Comparing the 110,81 Hm³ of water consumption in pools with the 653,47 Hm³ (el 16,96 % of distributed water) lost in the piping network it is insignificant.

THE TOTAL CONSUMPTION OF WATER IN POOLS IS ONLY 16,96% OF THE TOTAL WATER LOSS THROUGH THE DISTRIBUTION NETWORK

3.4.- Consumption per user

The consumption per user is fixed from the INE in 2006 to 160 liters/habitants/day.

The consumption of water in a pool per habitant (44.708.964 habitants) is $110,81 \text{ Hm}^3/44.708.964\text{hab}/365 \text{ days}$, means 6,79 liters/habitant /day.

CONSUMPTION OF WATER PER HABITANT	160 litres/habitant/day
CONSUMPTION OF WATER IN POOLS	6,79 litres/habitant/day

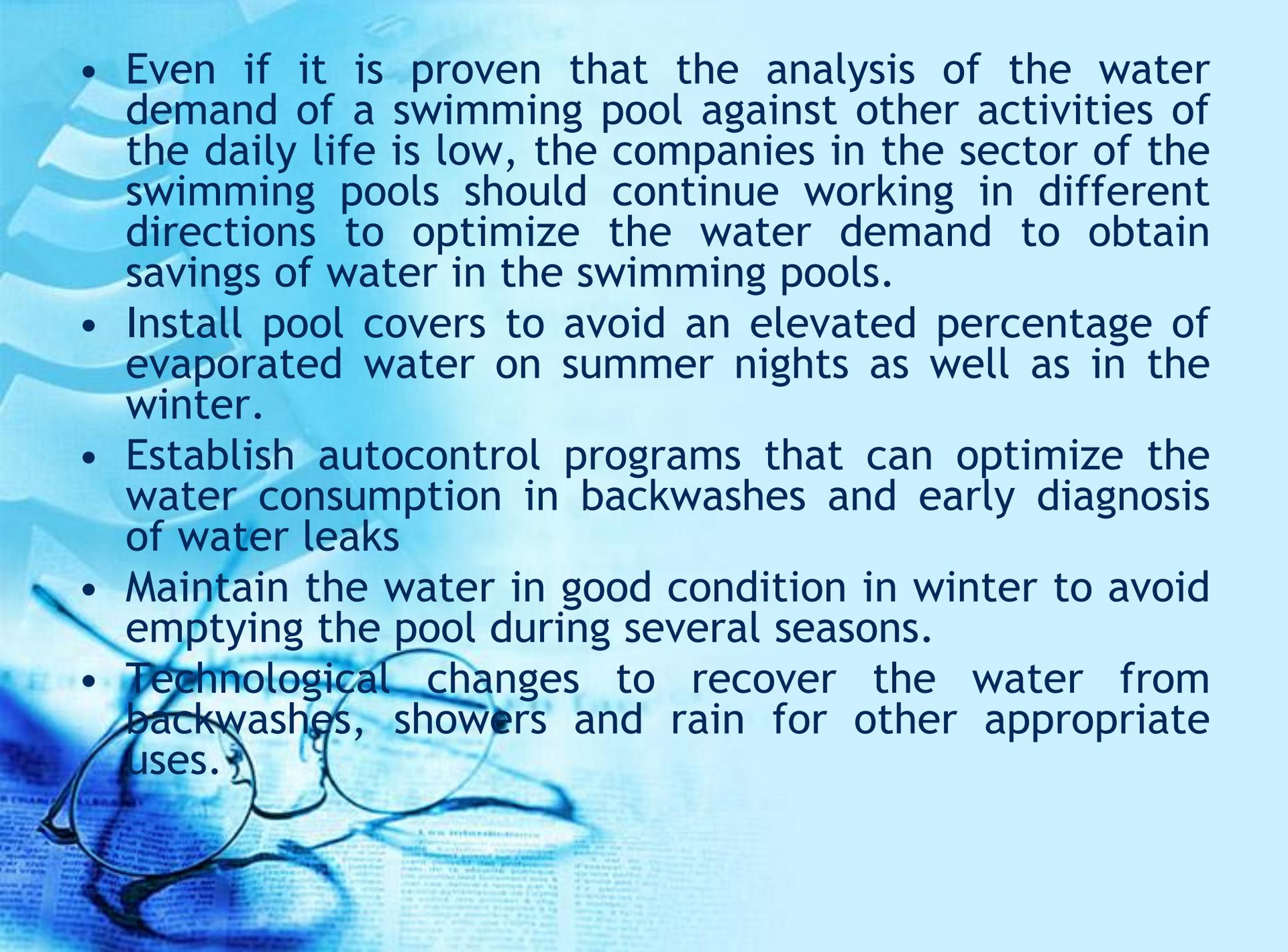
3.5.- Economical costs

As the consumption in a pool is 6,79 litres/habitant/day, and the average cost of water in Spain is 1,23€/m³ (average calculated between 0,47 €/m³ in 2005 for 175 m³/year and 1,98 €/m³ in Palma de Mallorca) we get an economical result of $1,23 \text{ €/m}^3 \times 2,478 \text{ m}^3/\text{habitants}/\text{year} = 3,05 \text{ €/habitant}/\text{year}$

**ECONOMICAL COST OF THE WATER CONSUMED FOR A
SWIMMING POOL PER HABITANT 3,05 €/YEAR**

The background of the slide features a blue-tinted image of a hand holding a pen over a newspaper. A pair of round glasses is resting on the newspaper in the lower-left corner. The overall aesthetic is professional and academic.

4. OPTIMIZATION TO REDUCE THE CONSUMPTION IN SWIMMING POOLS

- 
- Even if it is proven that the analysis of the water demand of a swimming pool against other activities of the daily life is low, the companies in the sector of the swimming pools should continue working in different directions to optimize the water demand to obtain savings of water in the swimming pools.
 - Install pool covers to avoid an elevated percentage of evaporated water on summer nights as well as in the winter.
 - Establish autocontrol programs that can optimize the water consumption in backwashes and early diagnosis of water leaks
 - Maintain the water in good condition in winter to avoid emptying the pool during several seasons.
 - Technological changes to recover the water from backwashes, showers and rain for other appropriate uses.

The background is a monochromatic blue-tinted collage. On the left, there's a stack of papers with a spiral binding. In the lower-left foreground, a pair of round-rimmed glasses rests on a newspaper. The newspaper text is mostly illegible but includes some words like 'Face' and 'A sua'. The overall composition is clean and professional, with the 'THANK YOU' text centered in a bold, dark blue font.

THANK YOU